



**Entanglements in the E-service of Land
Record in Bangladesh:
*An Action Design Ethnographic Study***

A thesis submitted for the degree of Doctor of Philosophy

By

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ABSTRACT

Understanding dynamic, unpredictable, multiple, pluralistic and entangled relations in technology and organization is an inherent endeavor of the Information System (IS) research. However, recent innovation and changes in technology and organizations have posed significant challenges to the existing theoretical and methodological lens to analyze mutually dependent, ensemble, inseparable, ceaselessly intra-actable and constitutively entangled relations in technology and organizations. In line, this study employed sociomateriality as a wider theoretical lens to analyze constitutive entanglements and disentanglements in technology and organization illustrated with a case of E-service of land record in Bangladesh. This study has applied sociomateriality along with intra-actions, diffraction, relational ontology and performativity lens to trace continuous constitutive entanglements and disentanglements in the E-service. Thus, this study identified significance of constitutive entanglement lens through tracing unprecedented changes, unintended consequences and unexpected outcomes from the intra-actions, diffractions, relationalities and performativity in the organizational context and technological process of the E-service.

This study has developed 'action design ethnographic research' (ADER) as an in-depth methodological framework through conducting 'action design research' (ADR) in the process of ethnographic research (ER). In line, this study has formulated problems in organizational contexts, designed and redesigned solutions through mutually reciprocal relations between the researcher and clients, conducted concurrent evaluation and identified learning. Consequently, this study has addressed the practitioners' problems through engaging and intervening in the organizational contexts and technological processes of the E-service of land record in Bangladesh. Thus, both the sociomaterial lens and ADER offered potentials to design and redesign the organizational contexts and the E-service processes. Along the line, the study has contributed to theory and practice of IS research through applying sociomateriality and addressing practitioners' problems. Therefore, this study has made significant contribution to knowledge and practice.

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DECLARATION

I, Muhammad Shahanoor Alam, declare that the PhD thesis titled 'Entanglements in E-service of Land Record in Bangladesh: An Action Design Ethnographic Study' contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

The following papers have been published (or submitted for publication) as a direct result of the research presented in this thesis:

Book Chapters

Paper 1.

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ABBREVIATIONS

A2I	Access to Information Program
ACL	Assistant Commissioner Land
ADC	Additional Deputy Commissioner
ADCR	Additional Deputy Commissioner (Revenue)
ADER	Action Design Ethnographic Research
ADR	Action Design Research
ANT	Actor Network Theory
AR	Action Research
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
BIE	Building Intervention and Evaluation
BRS	Bangladesh Revised Survey
CAD	Computer Aided Design
CCTV	Close Circuit Television
CS	Cadastral Survey
DC	Deputy Commissioner
DFID	Department for International Development
DLRS	Directorate of Land Record and Survey
DR	Design Research
DRR	District Record Room
DWP	District Web Portal
ESC	E-service Centre
E-service	Electronic Service
ETHICS	Effective Technical and Human Implementation of Computer based System
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GoB	Government of Bangladesh
GP	Government Pleaders
ICT	Information and Communication Technology

ICT4D	Information and Communications Technology for Development
IS	Information Systems
IT	Information Technology
JL	Jurisdiction List
LA	Land Acquisition
LAN	Local Area Network
LGD	Local Government Division
LIS	Land Information Systems
MoICT	Ministry of Information & Communications Technology
OECD	Organization of Economic Cooperation Development
RM	Revenue <i>Munshikhana</i>
RoR	Record of Right
RRDC	Record Room Deputy Collector
RS	Revised Survey
SA	State Acquisition (Survey)
SDI	Spatial Data Infrastructure
SDLC	Systems Development Life Cycle
SICT	Support to ICT Task Force
STS	Sociotechnical Systems
UALO	UnionAssistantLand Officer
UDC	Union Digital Centre
UISC	Union Information Service Centre
ULO	Union Land Office
UNDP	United Nations Development Program
UNO	Upazilla Nirbahi Officer
USAID	United States Agency for International Development
UZLO	Upzilla Land Office
VSAT	Very Small Aperture Terminal

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Chapter 1: Introduction

1.1 Overview

This thesis is about entanglements and disentanglements in the social and the material, as well as technology and organization, illustrated with a case of E-service of land record in a district in Bangladesh. It is an applied, interventional, action and design oriented research, conducted using ethnographic methods and tools and presented as an ethnographic description. This study traced continuous constitutive entanglements in the organizational contexts and the E-service processes. It used different cycles of design and redesign to intervene in the ongoing developments; it conducted concurrent and objective evaluation, identified learning and reflection and finally formalized the resulting learning. This study, thus, aimed at contributing to knowledge through the application of a sociomaterial constitutive entanglement lens – an emerging theoretical lens in the IS discipline; and using a broader methodology, namely – action design research (ADR) along with ethnographic methods and tools. Simultaneously, this study engaged in addressing practitioners' problems with the E-service.

Further, this study aims to investigate entanglements and disentanglements in this E-service and the organizational context. E-service applications do not refer to only computer and software systems; rather, it includes usage of technology, users and organizational contexts and processes that bring humans and technology together (Dahlbom, 1996). However, organizations and users rarely accept any E-service applications as they are designed; rather, every application is designed and redesigned in organizational contexts through on-going usage, practices, interactions, intra-actions and entanglements. Thus, E-service applications require managing of everyday practice and organizational processes (Wastell, 2010).

Equally, recent trends in IS research emphasize how meanings and materiality of technology and organizational contexts are enacted through constitutive entanglements and disentanglements in everyday practice (Orlikowski, 2010; Barad, 2007; Introna, 2007; Suchman, 2007). Therefore, this study uses sociomaterial constitutive entanglements as its theoretical lens to trace constitutive entanglements and disentanglements throughout designs and redesigns of the E-service application and the organizational contexts.

Intra-actions are seen as ongoing co-constitutive intra-relations that engender the ongoing becoming (Introna, 2007). A co-constitutive intra-relation is the outcome of intra-actions between human and technology. Barad(2007 p.179) noted intra-actions cut “things” together and apart. Even the nature of change and nature of possibilities of change have been changing continuously through intra-active dynamism (Barad, 2007). Barad’s (2007)views on sociomateriality have been used in information systems (IS) and management research by Orlikowski and colleagues (Orlikowski, 2007; Orlikowski & Scott, 2008; Orlikowski, 2010). They developed an argument around constitutive entanglement of technology and organization. In this, constitutive entanglement is used to trace ongoing intra-actions between technology and organizations, where intra-action treats technology and organization equally without any apriori distinctions.

Sociomaterial intra-action sees the material and the social as well as organization and technology as belonging to the same world and they are inseparable and constitutively entangled. It argues that everyday social and material phenomena are mutually dependent and intra-active. This study sees intra-actions in the E-service application and the organizational contexts,which allows for tracing their entanglements and disentanglements.

Diffraction is a physical phenomenon to trace wave movements. If a wave encounters a barrier; it seeks an aperture or gap, or it creates overlap or makes bend. Diffraction can be seen in the behavior of a wave and is commonly used in physics to analyze the movement of light. When a wave encounters an obstruction, a range of things happen, e.g. diffraction takes place through an

aperture, or overlaps and bends to show how it spreads. It can also be observed in everyday life, ie. when a stone drops in a pond the ripples in the water overlap. Amongst aperture is an important metaphoric element to trace diffraction in technology and organization. It allows to measure intra-active relation between technological processes and organizational contexts how the former try to make barrier for diffraction and the latter makes aperture for occurring of diffraction. Thus, aperture causes diffraction and it is important to understand diffraction. In line, this study applies diffraction as a metaphor to understand intra-actions in the social and the material as well as technology and organization. Barad(2007) attempted to take insights from the diffraction phenomena and apply them to understanding intra-actions in the natural and the social world; human and nonhuman; material and discursive practices. Therefore, in order to understand sociomateriality, this study uses diffraction and intra-actions in the social and the organization as well as technology.

Consistent with these, IS research in developing countries requires rigorous methodology, and it is essential for tracing design and redesign of E-service applications (Avgerou and Madon, 2004). In line, this study has used action design research (ADR) together with ethnographic research (ER) as its methodological approach. Combining ADR and ER, this study formulated action design ethnographic research (ADER) as a broader methodology to design, deploy, evaluate and redesign E-service applications and organizational processes (Brooks and Alam, 2013; Alam, Brooks and Abbott, 2012; Alam, Brooks and Khan, 2012).

The organizational context of this study is land record service which is complicated, middlemen dependent and entangled with vested interests, favoritism, nepotism, rent seeking and practices of corruption (Imran and Gregor, 2011). To address these problems, the government of the day has launched an E-service application comprising 4501 telecentres, each known as a Union Digital Center (UDC), 64 front desks called E-service Centers (ESC) and web-portals. The researcher was involved as a practitioner in the organizational process of the

land record service at Jhenidah district and later on, conducted this study on the E-service of land record at Khulna district along with its 12 UDCs, an ESC and a web portal, between 2012 and 2015.

The remainder of this chapter introduces the following: research issues, motivations and rationale, research paradigms and thesis structure.

1.2 Framing the Research Issues

Framing IS research is contingent and emergent because its direction changes through dynamic interactions between number of actors and organizational contexts (Avgerou and Madon, 2004). Following this idea, the research problems, questions and objectives of this study have been shifted during the design, interventions and evaluation of the E-service. These are discussed below.

1.2.1 Framing the Research Problem

The research problem at the heart of this study is the tracing of designs and redesigns as well as of entanglements and disentanglements in E-service management of land records in Bangladesh. The researcher has identified the research problem from the organizational contexts through engagements and intervention in this E-service in the light of the theoretical lens.

E-service applications offer greater efficiency, effectiveness, accountability and reduction of cost and time in processing of service delivery to citizens (Cook *et al.*, 2008; Heeks, 2002). As such, E-service has attracted practitioners to improve service delivery, ensure easy access to services (Horsburgh, Goldfinch and Gauld, 2011; Avgerou *et al.*, 2005).

Consequently, E-service in organizational contexts has emerged as a significant area of IS research (Avgerou and Madon, 2004; Sahay and Avgerou, 2002). However, the purview of E-service is broader than IT applications because it goes hand in hand with designs, ongoing use, redesigns and practices with multiple

iterations between technology and social settings (Sefyrin, 2010b). Thus, E-service includes social and cultural practices, building on existing organizational settings and also reshaping them (Kensing and Blomberg, 1998).

Apparently E-service is considered as a purely technical matter (Grimson, Grimson and Hasselbring, 2000; Hasselbring, 2000). However, successful E-service design requires integration of organizational contexts, networks and processes (Sahay, Monteiro and Aanestad, 2009). Consequently, E-service involves both visible and hidden problems in the organizations of developing countries (Sahay, Monteiro and Aanestad, 2009). Thus, E-service is immersed in the ongoing use of organizational contexts, infrastructures and networks (Sambamurthy and Zmud, 1999).

Evidently, numbers of E-service applications for land record service have failed due to ignoring relevant actors, processes and contexts (Acharya, 2009). Similarly, Sahay and Avgerou (2002) assert that domination of existing organizational networks is the major obstacle to implement IT applications in developing countries. Further, Walsham and Sahay (1999) identify that a lack of organizational coordination is the main barrier to GIS application in land management in India. Thus, E-service in land records is not merely a technical issue but it also rests on organizational contexts, actors and networks.

Also, inherently, land record service in Bangladesh is complicated due to the existence of three versions of cadastral records, family based aggregated land records. In addition, about 20% of records are damaged and 2%-3% of records have been tampered with. Additionally, land records are archaic, dilapidated, disorganized and mismanaged. Further, citizens do not know ID numbers of various versions of land records and how to file applications for this service. Thus, citizens' access to this service has become complicated, middlemen dependent and bribery oriented.

Aiming to address these problems, the government launched an E-service application to bring this service to citizens' door steps. Although the E-service

application was well designed, it has been facing problems. Moreover, it has increased complicity, time and cost. Thus, the researcher involved himself and engaged with the E-service context to identify the problems and designs and redesigns for this application, organizational processes and network.

Therefore, tracing problems of the E-service and design and redesign of the E-service application and the organizational processes have been identified as the research problems. The following sections discuss the focused research questions.

1.2.2 Framing the Research Questions

Every research begins with some questions of what a researcher aims to investigate, which guides the research process (Järvinen, 2000). Research questions for this study were derived from empirical knowledge, literature review and research processes. After several modifications, the following interrelated questions were settled on:

What is the significance of tracing constitutive entanglement in technology and organizations? How and why do continuously constitutive entanglements and disentanglements occur in the E-service of land record in Bangladesh?

These questions emerged from the premise of using a sociomaterial lens aiming to trace inseparable, mutually constitutive, entangled, intra-actable, temporal, plural, multi-dimensional and unpredictable relations in technology and organization. These research questions seek to trace nature, forms, processes, causes and significance of constitutive entanglements and disentanglements in technology and organization illustrated with the E-service of land record in Bangladesh.

Sociomaterial entanglement lens offers the potential for understanding inseparability, intra-actions, diffraction, relationalities and performativity in technology and organizations. It seeks to show how the social and the material are constitutively entangled and disentangled through ceaseless, dynamic, interactive, intra-active and performative relations. Moreover, a sociomaterial constitutive

entanglement lens focuses on how technologies, human work, practices and social settings are inseparable, and how they are constantly entangled and disentangled with the social and the material (Feldman and Orlikowski, 2011; Orlikowski, 2010; Orlikowski and Scott, 2008; Orlikowski, 2007; Kling and Iacono, 1989).

Notably, whether sociomateriality gives anything new than the existing theories in IS; this study attempts to answer it through tracing technology and organization relations in the E-service of land records in Bangladesh. To trace this relation, it is important to identify underlying organizational contexts and practices involved in designs and redesigns of the E-service of land records in Bangladesh.

However, tracing the underlying organizational contexts and practices are challenging. Besides, the case is complicated and has a ‘thick’ bureaucratic nature. Moreover, knowledge and processes of relating to designs and redesign of this E-service belong to both technological and organizational domains which configure and reconfigure organizational processes and technological networks as a consequence of sociomaterial intra-actions and entanglements (Sefyrin, 2010b). Thus, this study aims to explore how and why the E-service of Bangladeshi land records is constitutively entangled with organizational contexts and technological networks, along with tracing the significance of constitutive entanglements. The goals and objectives of this research are discussed below.

1.2.3 Framing the Research Goals and Objectives

Inherently, IS research carries two broad objectives: a) addressing practitioners’ current problems and anticipated issues in organizational contexts and b) contributing to knowledge of the discipline (Benbasat and Zmud, 1999). IS research on E-service involves examining design, deployment and evaluation of technology and organization along with tracing organizational changes accompanying the technology (Avgerou and McGrath, 2007; Markus and Benjamin, 1996; Orlikowski, 1996; Morton, 1991).

Therefore, this research carries three interrelated goals and objectives: (1) addressing practitioners' problems through design and redesign of the E-service and the organizational processes and ensuring citizens' easy access to this service; (2) engaging and intervening in the organizational contexts through applying a broader methodological framework –action design research (ADR) along with ethnographic methods and tools –known as action design ethnographic research (ADER) and (3) tracing entanglements and disentanglements in the E-service of land records and the organizational contexts through sociomaterial lens thereby contributing to the theoretical knowledge.

This study focuses on identifying the underlying social and organizational contexts that are involved in the design and redesign and different forms of entanglements and disentanglements in the E-service and the organizational contexts. Thus, a core objective of this study is to design and redesign the E-service of land records along with the organizational processes in a Bangladesh district. Thus, these objectives address both practitioners' problems and citizens' wellbeing.

It is worth noting that this study has been conducted in a complicated case of the E-service of land records in Bangladesh that involves a number of processes, actors, networks and contexts. To investigate this study used ADR in the process of ethnographic research (ER). As such, this study has proposed and applied a wider research methodology that is known as action design ethnographic research (ADER) methodology. Thus, this study argues that ADER offers the potential to better understand the design and redesign of technology and organizational contexts in the E-service of land records in Bangladesh.

Further, the recent trend of IS research considers that technology and human beings are inseparable and constitutively entangled. This study seeks to better understand how and why constitutive entanglements take place and shift dynamically through continuous intra-action in technology and organizational contexts. Thus, a significant objective of this research is to analyze continuous entanglements and disentanglements in technology and organization, illustrating

the case of E-service of land records service in Bangladesh. The scope and nature of this research are discussed below.

1.2.4 Framing Scope and Nature of the Research

Every scientific research can be categorized into different types and categories according to scope and nature of a research. Usually theoretical research verifies existing knowledge and aims to generate new knowledge and applied research focuses on addressing practitioners' problems (Whitman and Woszczyński, 2004). However, this study has emphasizes both theory and practice. As such, this study applied sociomateriality, a wider theoretical lens and 'action design ethnographic research' (ADER) a broader methodological framework.

In addition, this study has been conducted in a natural setting of organizational contexts. Alongside, there have been interventions and evaluations. Further, on the basis of reporting research findings, research can be seen in two categories: self-reported or researcher reported. This study has chosen the researcher reporting process, since this research has generated significant amounts of data from the researcher observations, engagement and interventions.

In terms of the nature of data, research may be qualitative or quantitative. In order to understand entanglements and disentanglements in the E-service and organizational contexts, it was important to analyze elements of E-service, organizational contexts and practices. The data for this study has been generated from the organizational contexts, behavior of organizational staff, middlemen involved in this service, citizens and researcher's intervention. Consistent with these, the nature of this research is qualitative.

Furthermore, research may be grounded theory or theory driven research. The researcher entered into the fieldwork and thereafter identified relevant theory for this study. Thus, this study has applied theory for generating, analyzing and interpreting research data. Consequently, findings of the research emerged from interplay between data and theory.

1.3 Stating the Motivations and Rationale

The core questions behind conducting any scientific research are: what is the necessity of conducting that research and what are the motivations behind carrying out that research (Cecez-Kecmanovic, 2005).

1.3.1 The Motivations of this Research

This study is grounded in three interrelated motivations: a) designing ways to address the problems of the E-service of land records in Bangladesh; b) undertaking the study with inherent goals of IS research i.e., solving practitioners' problems and contributing to knowledge; c) conducting this study in a developing country, namely Bangladesh.

Firstly, the long standing problem of land records service in Bangladesh is the main source of motivation. The researcher's observation and engagement with this service motivated him to find ways to address the problems with this service. This researcher was motivated from close observation and engagement with the problems of the E-service of land record. Consequently, this study seeks to design and redesign processes and applications in order to solve the problems of this service.

Secondly, this researcher was motivated by the research domain, that of the IS discipline -'what can be automated and how can it be done efficiently and effectively' (Järvinen, 2007 p. 43). Automation as well as the E-service of land records is a longstanding issue across developing countries (Cook *et al.*, 2008). Consequently, this study sought to design and redesign the E-service of land records in Bangladesh to ensure citizens' easy access.

Thirdly, studying technology in the organizational context of developing countries has become a significant sub-field in IS discipline and it is young and emerging but it has a lack of theory and methodology to study such a wide field (Avgerou, 2008). IS research in developing countries provides a broader view of the wider

location, the home of the majority of people in the world and yet a relatively unexplored field for the IS discipline (Avgerou, 2008; Walsham, 2001). Imbued with these, the researcher was motivated to undertake the research on the E-service of land records in Bangladesh.

1.3.2 The Rationale of this Research

Nunamaker, Chen and Purdin (1990) cogently state that IS researchers need to demonstrate legitimacy of their research. The rationale for this study is to trace the problems and intervene in designs and redesigns of the E-service of land records in Bangladesh. Although E-service of land records has attracted practitioners; only a few initiatives succeeded (Cook *et al.*, 2008; Barnes, 2007). Thus it required simplifying organizational processes, structures and activities.

Notably, land records service is connected to every sphere of Bangladeshi life. It is a densely populated country comprising 14.4 million hectares of land for its 160 million people. Its 65% of people rely on agriculture; 60% of the total labor force is deployed in agriculture which contributes to 55% of the total GDP (Moore, 2008). Consequently, land is extremely scarce and valuable. Thus, land records service is vital and subject to legal, financial and welfare services and development planning. However, the land records service was and is problematic, complicated and inconvenient for citizens. Besides, it was time consuming, middlemen dependent and bribery oriented.

Aiming to address these problems of the land records service, this study, thus, identified problems with the E-service and became involved in the design and redesign of the E-service of land records in a district, namely Khulna, Bangladesh to ensure citizens' easy access and to remove middlemen and bribery practices from this service.

1.4 Locating Paradigmatic Strands

Every research is informed by a particular paradigm that consists of a set of philosophical assumptions: ontology -beliefs about existence of nature; epistemology -assumptions of validity of knowledge; methodology -ways of knowing and axiology -ethics and value judgments (Mingers, 2001). Thus, nature of a research is determined by these assumptions. The assumptions for this study are discussed below.

1.4.1 Ontology

Ontology is a researcher's beliefs, attitudes, values and norms associated with his or her perception of reality (Wiredu, 2005). Consequently, ontology provides the lens for understanding reality. There are two dominant strands of ontology: realism and nominalism. Realism objectively seeks that the external world exists independent of a researcher's sense and experience, ideation and volition (Bunge, 1993). It discovers general principles and laws that govern the natural and the social worlds and traces causal effects (Cavaye, 1996). However, it accounts for the social in relation to the natural world. Conversely, nominalism sees reality as constructed through continual social interaction (Hirschheim and Klein, 1989). Thus, nominalism is significant for understanding complex situations but it is not suitable to develop generalized principles for IS researchers.

Thus, the researcher seeks critical realism as a middle ground between naive realism and nominalism, to trace behavior and experiences that are being generated by underlying structures and contexts (Archer *et al.*, 1998; Archer, 1995; Bhaskar, 1978). More importantly, critical realism accommodates core features of realism and nominalism. Thus, it offers a wider lens with which to uncover both causal effect relations and underlying meanings and interpretations.

Therefore, this study will use critical realism as its ontological strand and aims to understand the complex contexts and intra-actions in technology and organizational contexts of the E-service of land records in Bangladesh.

1.4.2 Epistemological Stance

Epistemology refers to the theory of knowledge, especially how we acquire knowledge with fundamental investigations: what is knowledge and how do we obtain valid knowledge (Hirschheim, 1992). Epistemological debate in IS research has a long history, with tensions existing between positivist and interpretive strands (Avgerou and Madon, 2004). Positivist research is based on the assumption that reality is objective; whereas, interpretive research considers that reality is socially constructed (Myers, 1997).

Orlikowski and Baroudi (1991) argue that interpretive studies assume that people create and associate their own subjective and inter-subjective meanings according to their interaction with participants. Thus, interpretive researchers aim to understand phenomena through meanings constructed by participants. Consequently, it provides a deeper insight to analyze the complex world from experience and interaction of its living being (Schwandt, 1994). However, more recent trends seek complementarities and inseparability between them instead of applying them separately.

Generally, IS is seen as an applied, interfaced and hybrid discipline that seeks complementarities between positivist and interpretive positions (Marshall and Rossman, 2006). The positivist perspective contributes to IS research through the virtues of repeatability, reductionism, generalizability and refutability (Checkland, 1981). In addition, it applies objective and outsider views (Evered and Louis, 1981). Conversely, the interpretive perspective seeks underlying meanings and interpretations along with the analysis of organizational contexts and applying insider views (Braa and Vidgen, 1999).

This study seeks a pluralist epistemological viewpoint that comprises both positivist and interpretive strands. Consistent with the pluralistic epistemology, the study has framed a broader methodological framework 'action design ethnographic research' (ADER) whereby elements of design research, action research and ethnographic research have been incorporated.

1.4.3 Methodological Framework

Methodological choice and relevance are guided by ontological and epistemological assumptions (Mingers, 2001; Orlikowski and Baroudi, 1991). Moreover, rigor and relevance of IS research relies on methodological soundness (Avgerou and Madon, 2004). Studying entanglements and disentanglements of the E-service in a complex organizational context requires a rigorous and broader methodology because both the E-service and the organizational contexts are dynamic and surrounded by different types of visible and invisible actors and networks. Thus, this study has framed and applied ADER, a broader methodology for intervening in the research context and generating insights along with identifying problems of the E-service and tracing its designs and redesigns.

This study employed ADR as a methodology and found that it requires additional tools and techniques to trace complex processes of entanglements and disentanglements in the E-service. Additionally, ethnographic research (ER) is seen to offer potential complementarities to ADR. Besides, ER has offered potentials to trace sociomaterial intra-actions and inseparability in organizational context and technology (Gaskin, 2012; Orlikowski and Scott, 2008). Thus, ADER as a methodology offers suitability to capture the research problem, address practitioners' problems and complementarities to the theoretical lens.

1.4.4 Strand of Ethics

All research, to some extent, carries a standpoint for ethics (Weber, 1946). Ethics applies to all scientific research (Guillemin and Gillam, 2004), and is related to the research paradigm (Burrell and Morgan, 1979). There are three broad strands of ethics in a research paradigm. These are means and end, interpretive and critical strands. Firstly, means ends seeks goal without questioning legitimacy. Secondly, interpretive seeks unintended consequences. Finally, critical strand is concerned with consequences and results of research (Iivari, 2007). This study aimed to analyze intra-actions and entanglements in technology and organization.

Thus, it has continuously traced entanglements and disentanglements in the E-service processes and organizational contexts. The researcher has intervened in the organizational context through designs and redesigns to address problems of the E-service. However, this study also seeks unintended consequences from designs and redesigns of this E-service. Thus, the strand of ethics of this study follows means ends and interpretive position aiming to analyzing designs and redesigns of the E-service and tracing different dimensions of intra-actions and entanglements.

1.4.5 Research Methods and Approaches

The correct use of methods, approaches and appropriate analyses is inevitable to ensure rigor in IS research (Benbasat and Zmud, 1999). This study applied methods and approaches that are aligned with ADR and ER. Thus this research applied archival methods, questionnaire survey, semi-structured and unstructured interviews, key informant interviews, consultation and open ended discussion, attending organizational meetings, focus group discussion and observations. Notably, participant observation and ethnographic approaches were the two main methods of study. Together, these methods, approaches and techniques helped to trace entanglements and disentanglements in the E-service of land record in Bangladesh.

1.5 Thesis Structure

The remainder of the thesis is been presented in a total of nine interrelated chapters. The following chapter conceptualizes the basic concepts and approaches and settles on the sociomaterial constitutive entanglement lens as the theoretical framework for this study. Chapter three outlines ADER as the methodological framework used to identify problems and to trace designs and redesigns of the E-service of land record in Bangladesh. Chapter four has discusses data gathering methods and techniques.

Chapter five provides contextual background to the research case. Chapter six formulates the problems of this E-service. Following this, chapter seven deals with ‘building intervention and evaluation’ (BIE)–design, intervention, redesign, evaluation and further design of this E-service. Thereafter, chapter eight present the discussion on reflection and learning generated from the BIE. Finally, chapter nine summarizes the study findings, identified contributions and provides scope and directions for further study.

Chapter 2: Constitutive Entanglement Lens

2.1 Introduction

“There is not, and never will be, a best theory. Theory is our chronically inadequate attempt to come to terms with the infinite complexity of the real world. Our quest should be for improved theory, not best theory, and for theory that is relevant to the issues of our time” (Walsham, 1993).

Identifying relevant theory for the issues of the time and contributing to improvement of theory are pertinent to any scientific research. Consequently, using a theoretical lens is significant whatever the paradigmatic strands and methodological framework of a research (Walsham, 1995). It carries three potential grounds: firstly, theory provides initial guide to research design and data collection; secondly, theory gives an iterative process of data collection and analysis and, finally theory is used as a final product of a research (Eisenhardt, 1989). Thus, a theoretical lens is inevitable from framing research issues to data collection to analyses of findings and identifying theoretical trends and contributions (Walsham and Sahay, 1999). Along the line, Zuboff (1988) asserts, “Researchers must have a theory of reality and of how reality might surrender itself to their knowledge-seeking efforts”. Consistently, this study aims to identify a relevant theory to analyze the research problem and contribute to theoretical knowledge.

However, there are insufficient theories to analyze recent innovation in technology and organization relations. Thus, there is a call for wider theoretical lens, approaches and pluralistic methodologies for IS research (Law and Urry, 2004; Barley and Kunda, 2001; Child and McGrath, 2001; Ciborra, 1996). Along the line, to identify a relevant theory, this study has explored existing theories and their limitations. Over the past decades, IS as a discipline has adapted theories

from reference disciplines to solidify its domain. This trend has given diversity, pluralism and permeability to achieve sound theoretical underpinnings (Holmström, 2005). IS studies have gained much in applying social theory to open up apparently fixed but co-evolved, emergent, contested and entangled entities in work, technology, information systems, organization and practices (Thompson, 2012). Thus, it is important to understand nature of theory and goals and assumptions of using theory. Consistently, a brief discussion has been given on nature and assumptions of theories in IS research.

Broadly, theory is a coherent description or explanation of observed or experienced phenomena. In line, Gioia and Pitre (1990) put that theory is a statement of concepts and their interrelationships that show how and why a phenomenon occurs. Thus, it is inevitable for scientific research because using a theoretical framework helps gaining deeper insights of research phenomena and contributing to theoretical knowledge (Walsham, 1995).

Every theoretical lens is inextricably connected with certain research stream. For identifying nature and assumption of theory require tracing theoretical streams. Besides, with a view to identifying assumptions and goals of using theory in IS research, Gregor (2006) has outlined five distinct theoretical streams in IS research. These are: theory for analysis, theory for explanation, theory for prediction, theory for explanation and prediction and theory for design and action. These are discussed below.

Firstly, theory for analysis says what is. This theory does not extend beyond analysis and description. No causal relationships among phenomena are specified and no predictions are made. Secondly, theory for explanation says what is, how, why, when and where. This theory provides explanations but does not aim to predict with any precision. It also does seek to develop any testable propositions. Thirdly, theory for prediction says what is and what will be. This theory provides predictions and seeks testable propositions but does not have well-developed justificatory casual explanations. Fourthly, theory for explanation and prediction says what is, how, why, when, where and what will be. It provides predictions that

have both testable propositions and causal explanations. Finally, theory for design and action says how to do something. This theory gives explicit prescriptions, for instance, methods, techniques, principles of forms and functions for constructing an artifact.

Although these five streams outline how theoretical strands are varied with assumption and nature of inquiries in IS research. Each strand comes from particular assumptions and research's goals and nature –analysis, explanation, prediction, prescription and causal analyses. Gregor's taxonomy of IS research streams shows that theory can serve different purposes according to its strands and assumptions. Though every strand has distinct feature, they are interrelated to each other. Particularly, theory of explanation and prediction seeks analysis, explanation and prediction. In line, theory of design and action is also connected with theory of explanation and prediction because every design seeks explanation and prediction.

Theory for design and action in IS field has been labeled as 'design science' and so far, it remains technology-centric because a design science in IS requires 'organizational design science' rather than 'technology centric design science' (Lee, 2010). Thus, IS needs its own design science which is organizational design science to analyze diverse, dynamic and intra-active relations in organizational contexts and technological processes and networks (Lee, 2010). In line, this study aims to design and redesign the E-services of land record through tracing various forms of entanglements and disentanglements. Consistently, its theoretical stand better fits with theory of explanation and prediction and design and action as well.

Further, according to role of the theory, Davison et al., (2012) identified two roles of theories in IS research: one is focal theory and instrumental theory. Focal theory seeks intellectual basis e.g., theory of planned behavior (Ajzen, 1991), adaptive structuration (DeSanctis and Poole, 1994) and punctuated equilibrium theory (Gersick, 1991). Focal theory alone might be incapable to analyze research problems; rather, it requires supporting instrumental theory. With this notion,

Hambrick (2007) asserts that instrumental theories are vital to organize our thoughts and develop coherent explanations and understanding.

Along the line, instrumental theory aims to explain phenomena and processes and it helps to establish and verify focal theory (see, Angeles, 1992). Thus, instrumental theories refer to tools, models or processes that theorize how work is to be done or outcomes are achieved (Davison, Martinsons and Ou, 2012, p. 766). In line, this study applies theory for explanation and prediction as a focal theory (Gregor, 2006). It plays potential role in facilitating activities e.g., problem formulation, planning, designing and evaluation in the E-service of land record. Further, this research seeks theory of design and action as an instrumental theory. Since this study engages in continuous designs and redesigns of the contexts, processes, structures and networks involved in organization and technology of the E-service of land record in Bangladesh, the theory of design and action also significant to organizational design to analyze its activities and processes.

Consistent with these, the remainder of this chapter consists of four interrelated areas: conceptualization of information, technology, artifact and public sector organization, an overview of socio technical theories in IS, emergence and features of sociomateriality as a theoretical lens for studying technology and organization and building a sociomaterial constitutive entanglement framework for tracing entanglements and disentanglements in the E-service of land record in Bangladesh.

2.2 Conceptualization: Information, Technology, Artifact and Public Sector Organization

Development of human society and technology is mutually dependent. However, there is lack of agreement on how technology and organizations interact with one another (Orlikowski, 1992). Evidently, significant number of studies have been presented that there are ambiguous and conflicting relations between organization and technology (Barley, 1990; Davis and Taylor, 1986; Hartmann, Kraut and

Tilly, 1986; Attewell and Rule, 1984). In line, the recent trend of IS research focuses on inseparability and entanglements in technology and organizations in everyday practices (Hassan and Hovorka, 2011; Orlikowski, 2010; Barad, 2007; Orlikowski, 2007; Suchman, 2007; Law and Urry, 2004). Along the line, this research aims to analyze entanglements and disentanglements in technology and organizational contexts illustrating with a case of E-service of land record in Bangladesh.

In today's world, technology is rooted in organizational process (Barua *et al.*, 2010; Grover and Ramanlal, 1999). Simultaneously, Wanyama and Zheng (2010) assert that organization is the integral part of technology. Consistently, Orlikowski and Iacono (2001), thus, conceptualize that technology as an ensemble artifact that includes software and hardware and activities and interactions performed in a specific social and cultural context. Thus, a significant number of IS research identified that mutual interaction in organizational contexts and technological process play pivotal role to enhance service delivery (Kotter and Heskett, 1992; Wilkins and Ouchi, 1983; Deal and Kennedy, 1982). Technology cannot be seen as a discrete entity beyond organization, either by domain or logic; rather, it is interwoven with human work and organizational contexts (Kling and Iacono, 1989). Evidently, dynamic relations in technology and organization develop intended and unintended consequences (Markus and Lee, 2000).

Information encompasses everything from news events to price signals into a market (Bell, 1979). It facilitates message between parties in a situation through conveying signs and language while both message and its context shapes meanings (Metcalf and Powell, 1995). Consequently, information is dependent on context and social practice and bounded by social practices and experience (Boell and Cecez-Kecmanovic, 2011).

Along the line, Goguen (1997) elaborately outlines seven contextual features of information, such as : *situational* (can be fully understood in relation to situation in which that occurs); *local* (interpretation can be constructed locally, according to time-place-space); *emergent* (emerges through on-going interactions); *contingent*

(interpretation can be modified); *embodied* (tied to physical situations); *vague* (relied on tacit knowledge) and *open* (open to revise in the light of further analyses and further events). Therefore, information is socially, materially and contextually bounded and it is inseparable from context.

Technology can be seen as affordance (Gibson, 1979) that refers to possibilities of an object to perform an action (Lâm, 2012). These possibilities belong to the context they might be varied (Lâm, 2012). For example, a rock can be used as a shelter for lizard but it also can be used as a weapon by human being (Lâm, 2012). Technology is neither an independent actor nor capable to determine human actions (Lâm, 2012). In line, Zammuto et al., (2007) assert that affordance is the result of intertwined relations between technology, organizational contexts and intents of human actors. With this notion, Barley (1986) asserts technology as a social object and its meaning is defined by social context. Similarly, technology is always interpreted by human beings in a social context (Fulk, 1993; Prasad, 1993).

Besides, it can be interpreted and reshaped by the need of situated agents (Kallinikos, 2004). If it fails to meet the expectation of its agents, it can be ignored, resisted or reshaped to achieve the goals of its users and agents (Kallinikos, 2004). Consequently, it can be seen as complex interdependent systems that rely on social, technical and organizational aspects (Kallinikos, 2004, p. 141).

Further, technology is constitutive throughout complex arrangement, processes, steps and actions with temporal, continuous and interdependent relations with its context and actors (Kallinikos, 2004). Consistently, Heidegger asserts that technology is no longer means; rather it is a way of revealing of a realm of revealing; thus, it is co-constitutive with the revealed being (Heidegger, 1977). The co-constitutive view of technology emphasizes on free interactions, in which the human essence reveals the essence of technology.

In line, sociomateriality seeks inseparability, intra-actions and entanglements in technology and organizational. Consistently, technology can be seen as mutually dependent ensemble artifact (Orlikowski and Scott, 2008). Consistently, Orlikowski and Iacono (2001) assert that IT artifact is an ensemble of techniques, applications and people. It comprises social context and background including web, infrastructure and resources to support its development and use in the social relations and processes. Thus, IT artifact and information systems in organizational context are inextricably inseparable.

Information system is a potential tool, approach and method of IS discipline. It includes both computer based and non-computer based systems. Beynon-Davies (2009) argues that information system is sociomaterial instead of socio-technical; because, socio-technical features of information system suffered with managing balance between technological systems and organizational contexts. Thus, he asserts that sociomaterial practice is vital for information system (Beynon-Davies, 2009). Thus, it can be said that an information system is not only a technological system rather it includes organizational processes and contexts equally.

IT for public service is broader than of an IT artifact (Sefyrin, 2010a). It involves with numbers of actors, contexts, users, statutes, rules along with social, political and ethical imperatives. Thus, it requires understanding the existing organizational contexts and to be keen with its consequences (Mörtberg, 2003). In line, Suchman (2007) asserts that IT is involved in configuring and reconfiguring of practices, processes and structures.

However, IT in public service does not mean just unpacking of a list of contents and applications; rather, it is inextricably inseparable from organizational processes, behavior and symbols that need to be domesticated and meshed with on-going practices and socio-economic and cultural contexts (Andrew and Petkov, 2003; Madon, 1994). Evidently, organizational culture, context, norms and processes play a pivotal role in shaping and reshaping of IT in public sector organization (Sahay, 1997; Sahay and Robey, 1996). Similarly, Walsham

(1993) finds that technological process and organizational context in public sector organization in developing countries are interdependent.

Use of IT in public sector organizations is synonymous with e-government, e-service and e-governance. They aim to organizational functions and processes; ensure effective coordination and cooperation; improve performance of government and enhance relationship between government and citizens (Ciborra and Navarra, 2005 p.144).

IT in public sector organization of developing countries needs to align with local realities; specify role of different actors; and ensure viability of IT from economic and socio-political point of view (Heeks and Molla, 2009). In, Heeks (2003; 2002) finds that design reality gaps between organizational contexts and technology. Every government is embarking on ambitious programs of leveraging IT for improving public service (Singh, Pathak and Naz, 2010). However, harnessing advantages of IT in public sector organization has remained far away in developing countries.

Citizens' expectations on public services have been increased as 24/7. Governments are taking continuous efforts to deploy technology and devise E-services (Lofstedt, 2005; Scholl, 2004). Thus, E-service has emerged as a potential field and it shares a broader purview that includes designing of IT for public service, implementation of IT in management of public sector organization, public administration, management information systems, E-government and E-governance. Although every government is striving to deliver E-service successfully, many governments, especially governments in developing countries, have been facing various problems in delivering necessary and desired E-service to their citizens (Alam, Brooks and Abbott, 2012; Alam, Brooks and Khan, 2012; Lofstedt, 2005; Sleeman, 2004).

Dynamism in organizational culture, contexts, norms and processes play a pivotal role in shaping and reshaping of IT (Orlikowski, 2005; Avgerou and Walsham, 2000; Lamb, Sawyer and Kling, 2000; Sahay and Robey, 1996). Conversely,

recent innovations have turned technology into a potential mediator of work, production, services and market places (Mansell *et al.*, 2007). In line, Latour (1987) termed this nexus as 'techno science', which refers to technology and society intimately intertwined. In a similar vein, Law and Urry (2004) seek a 'move to ontology' between technology and organization to understand dynamism between organization and technology. Consistently, Barad (2007) and Orlikowski (2008; 2007) have put forward 'relational ontology' that seeks the social and the material are inseparable. These notions claim that technology and organizations are inextricably intertwined and there is no way to separate the social world and the material world.

Networks between IT and organizations are no longer linear; rather they are heterogeneous and ubiquitous. They have dynamic and multiple relations whereby consequences are intended and unintended (Sein and Harindranath, 2004). These trends have brought challenges for studying dynamics in technology and organizations (Jones and Orlikowski, 2007). In particular, theories focus on linear or deterministic view –technological determinism or social constructivism –have become incompatible to deal with the complex realities and multiplicity of technology and organizations (Law and Urry, 2004). Thus, it is pertinent to assess intertwined and inseparable relations in technology and organizational contexts.

Along the line, sociomaterial lens offers an alternative theoretical strand and an umbrella approach to understand constitutive entanglements in materiality of technology and everyday practices in organizational contexts. Consistently, Orlikowski and colleagues have forwarded sociomaterial constitutive entanglement view to analyze IT and organization relations (Feldman and Orlikowski, 2011; Orlikowski and Scott, 2008). They seek that materiality of technology and social practices in everyday organizing belong to one world i.e., sociomaterial; rather than separating them into two distinct worlds. Sociomaterial view, thus, has presented challenges that technology is not isolated from organizational contexts, practices and processes or it is not only technical matter; rather, it is interwoven with organizational contexts and practices. Consequently,

sociomaterial constitutive entanglement offers potential to analyze dynamic forms of organizations and technology relations that are increasingly constituted of multiple layers, diversely emergent, constantly shifting, mutually dependent and constitutively entangled (Orlikowski, 2007). Consistent with these, this study seeks a sociomaterial constitutive entanglement lens as a theoretical framework.

2.3 An Overview of Socio-technical Theories in IS Research

Debate on technology and organization relation has significant contribution to advancing philosophy, theories and methodologies of IS discipline. Recently, this debate has become more contentious and contested due to heterogenous and ubiquitous relations in technology and organizational contexts (Jones and Orlikowski, 2007). In line, IS discipline has developed theoretical lens and approaches to analyze technology and organization relations. These are technological determinism, social constructivism of technology and human interpretations of technology (Lamb, Sawyer and Kling, 2000; Fulk, 1993; Prasad, 1993; Orlikowski, 1992; Bjorn-Andersen, Eason and Robey, 1986; Kling, 1980).

However, recent IS research has portrayed that potential underlying organizational contexts remained overlooked due to ignorance of the role of materiality in everyday organizing (Leonardi, 2012; Orlikowski, 2010; Barad, 2007; Orlikowski, 2007). Inherently, there has been a long felt need for rigorous theoretical lens to study technology and organizational relations and trace their ubiquitous presence, dynamism and inseparability in everyday organizing. Technological entailments in organizational aspects are not simple, straight forward, certain and predictable; rather, they are associated with a wide range of outcomes and consequences which are emergent and unintended (Orlikowski and Scott, 2008). As a result, organizational forms, norms, structure, functions and capabilities and technological design, deployment and usages are dissolved into one another. Thus, relations between technology and work practices are situational, contingent, heterogeneous and multi-dimensional.

Consistent with these, linear theoretical lens has become incapable to trace the multiplicity, emergent of, transient and inseparability in technology and work practices. Thus, significant numbers of studies argue that wider theoretical lens is inevitable for IS research to trace intra-actions, inseparability and continuous entanglements and disentanglements in organization and technology (Feldman and Orlikowski, 2011; Bijker, 2010; Orlikowski, 2010; Orlikowski and Scott, 2008; Barad, 2007; Callon, 1980). In a similar vein, Suchman asserts "...[H]uman agency is only understandable once it is re-entangled in the sociomaterial relations" (Suchman, 2007, p.261).

Linear and deterministic theoretical lens –technological determinism or social constructivism –failed to elicit total picture of technology and organization relations. Resultantly, IS researcher seeks a middle ground for analyzing dynamic, intra-active and constitutive entangled relations in technology and organization. In line, sociomateriality has emerged as a middle ground of the two deterministic lens and it employs umbrella approach that opposes to deterministic and humanist preoccupation to separate human actors from matters and technology from organization as well (Suchman, 2007).

Thus, sociomateriality has offered an alternative perspective that aims to understand constitutive entanglement in organization and technology in everyday organizing. However, its foundation and streams is yet to be settled. In order to identify significance of sociomateriality and trace distinctness, streams and relations with other theoretical lens, following sections have presented an overview of theoretical lens, perspectives and views involved in analyzing technology and organization relations.

2.3.1 Deterministic Approaches

Over the last two decades, IS studies have generated significant insights and debates about relations between IT and organizational change as influence and impact. Evidently, earlier IS research was dominated by two distinct lens: technological determinism and social constructivism. Technological determinism

seeks that technological change and development is independent of organizational context and technology determines organizational change. However, social constructivism focuses on organization, organizational influence on technology, social determinism on technology and human interpretation of technology (Lamb, Sawyer and Kling, 2000; Fulk, 1993; Prasad, 1993; Orlikowski, 1992; Bjorn-Andersen, Eason and Robey, 1986; Kling, 1980).

Technological determinism is based on the two theses: one, technological change takes place independently of human action; the other, organizational change occurs through penetration of technology into existing organizational and social systems (Leonardi, 2009; Bimber, 1994). In a similar vein, Winner (1977) provides two grounds of technological determinism: technology impacts on existing social systems and change of technology drives change in society. With a view to locating change through technological determinism, Mackenzie and Wajcman (1985) assert that technological change is autonomous and it happens outside of society but technological change results into changes of social systems. Consequently, technological determinism reveals partial truth of technology and organization relations.

However, technological change also takes place when it interacts with human being as well as with society. Thus, technological change is neither fully autonomous nor it takes place outside of the society. Further, technology is neither neutral nor independent of human action. Evidently, technological determinism fails to trace relations and innovations in technology and organization. To overcome the limitations of technological determinism, social constructivism developed to focus on social shaping of technology. As a theoretical lens, it has been developed in IS discipline for about the last three decades.

Social constructivism assumed that technology is socially constructed. It seeks how users give different meaning of technology, for example, symbolic, social and technical (MacKenzie and Wajcman, 1985). Thus, it treats “technology is a servant of human agents, and if it fails to stand up to this expectation; it can be ignored, resisted, or reshaped to achieve the goals that are usually perceived as

being tied to its implementation in particular settings” (Kallinikos, 2004). Thus, social constructivist perspective mainly aligned with social study of technology and social character and involvements of technology. It is significant to trace how technology is locally shaped and reshaped by social context (Orlikowski, 2000; Bijker, Hughes and Pinch, 1987; Suchman, 1987). Moreover, it focuses on socio-political character of technology that is context-embedded.

Contrary to this, technology itself opens up new space of possibilities. In line, Kallinikos (2004) asserts that social constructivists narrow down understanding of technology and he asserts that technology develops a complex interdependent system in technical, social and organizational elements. He has illustrated that technological change takes place in two ways: one is accumulation of experience that cut across economic, regional, national or geographical boundaries and the other is dynamism of technology itself i.e. improvement brought internally and externally by induction of technology in the form of scientific discovery and organizational change (Kallinikos, 2004). Thus, social constructivist view failed to trace relations between technology and organizations because it ignored capabilities of technology; rather, it sought that technology is embedded in social contexts.

Therefore, both technological determinism and social constructivism have failed to focus equally on and to provide full picture of technology and organizational relations. More importantly, they posed linear views and presumed organization and technology into two separate worlds. Thus, they seek how one influenced on the other. Consistent with these, there have been a number of theories and approaches evolved with these linear views to study technology and organization. The following sections have provided an overview of them.

2.3.2 Structural Models

Orlikowski (1992) asserted that a structural model to analyze technology and organization through identifying limitation of 'technological imperative model', 'strategic choice model' and 'model of technology as structural change'. To negate

the problems of these three perspectives, she developed a 'structural model' to understand interactions between organization and technology. They are discussed below.

Technological Imperative Model

At the beginning of IS discipline, significant number of studies have focused on selective aspects of technology and its impact on organizational structure, performance and processes: decentralization, job satisfaction, skills and productivity (Blau *et al.*, 1976; Aldrich, 1972; Hickson, Pugh and Pheysey, 1969; Perrow, 1967). Thus, a technological imperative model viewed that role of technology in organization is measureable and predictable. Evidently, this perspective considered that technology independently influenced on human behavior or organizational properties through unidirectional way and causal nature (Orlikowski, 1992; Giddens, 1984). Consequently, this view failed to trace the role of human interaction with technology. In line, this perspective ignored the role of human behavior in developing, appropriating, designing and redesigning technology after placing it in organizational contexts (Orlikowski, 1992). Thus, this model developed an incomplete account of interaction between technology and organizations.

Strategic Choice of Technology Model

Strategic choice of technology model seeks technology as a product of on-going human action, design and appropriation, instead of considering technology as an external object (Orlikowski, 1992). This broad model can be seen into under streams.

The first stream focuses on how the choice of human influence on design of technology and it also analyzed human interaction and redesign of technology in organizational context. A large volume of study under this stream considered that technology is dependent on human and organizational contexts and does not accept the view that technology is immutable (Zuboff, 1988; Davis and Taylor, 1986; Kling and Iacono, 1984; Markus, 1983; Child, 1972; Perrow, 1967).

Further, this model viewed that technology is physically constructed through social interactions and political choices of human actions, while it is seen as a dependent variable which is influenced by decision makers and this position does not accept technology as immutably developed through the socio-technical studies (Orlikowski, 1992). Thus, this view implied that durability of technology in organization is determined by social interaction (Latour, 2005). If it fails to adapt with social interactions; it leads to disruption of socio-technical networks (Atkinson and Brooks, 2003). Resultantly, this stream over emphasized on capability of human agents and ignores materiality of technology.

The second stream focused on interpretations of and use of technology. This stream is also aligned with constructivist view of technology (Woolgar, 1991; Bijker, Hughes and Pinch, 1987; Pinch and Bijker, 1984). However, it failed to trace material aspects of technology and interactions between technology and users (Orlikowski, 1992).

The final stream can be labeled as a Marxist study of technology. This stream seeks how technology is designed and deployed by political and economic interests of powerful actors and decision makers (Perrolle, 1986; Noble, 1984; Cooley, 1980). Consistently, this stream failed to account influence of users on technology. Although users are powerless, their interactions shaped technology significantly (Orlikowski, 1992; Jonsson and Gronlund, 1988). Consequently, limitation of this stream is selectivity in human actors.

Technology Triggered Structural Change Model

This model seeks technological influences on organizational structure and it manifests that human interventions potentially change technology (Barley, 1990; Barley, 1986). Thus, it seeks technology as a material trigger that caused anticipated and unanticipated change while meaning and function of technology considered as fixed. So, it considers that technology causes organizational change. However, throughout organizational process, organizational and technological

changes take place together (Gascó, 2003). Consequently, this model does not allow any change in technology during its use in organizational context.

Thus, aiming to address the limitations of technology imperative model, strategic choice model and technology triggered model; a structurational model has been developed. It is discussed below.

Structurational Model

Structurational model of analyzing technology and organization relations is rooted in Giddens' (1984) 'structuration theory'. Structuration theory influenced on IS studies for quite a long time (Jones and Karsten, 2008; Rose, 1998; Walsham and Han, 1991). It examines relations between organizational structure and human agency. Social structures have been developed from social practices throughout time and space and it has influenced on human agency (Rose and Hackney, 2003). Consistently, structuration theory recognizes social structure and human agency are mutually dependent. Along the line, structuration theory in IS seeks that technology is constituted by human agency and simultaneously technology constitutes of institutional practices as well as human agents (Rose and Hackney, 2003). However, Giddens' structuration theory has limited focus on technology. Consequently, Orlikowski (1992) has extended Giddens' structuration theory as 'Structurational Model of Technology' in IS research and it has focused on institutional properties, human agents and technology.

In line, Orlikowski's (1992) structurational model has identified three main forms of structural relations in organization and technology: firstly, objective and deterministic influence from organizational structure; secondly, interactions and intervention from human being and thirdly, influence of external force on organization and human being (Orlikowski, 1992). However, Orlikowski's (1992) 'Structurational Model of Technology' confined its focused on interaction between technology and organizations. Resultantly, it applies a priori separation technology and organization and seeks two distinct worlds. Consequently, it failed to understand inseparability and entanglements in technology and organization.

2.3.3 Technology in Use Perspectives

Sein and Harindranath (2004) categorized four different perspectives on use technology in organizational contexts. These are: commodity view, project view, activity view and economy view.

Project View

This view considers technology as a means of developmental impact and it seeks use of technology is targeted within development initiatives (Sein and Harindranath, 2004). Evidently, IT applications in developing countries are used as project view to improve particular social and organizational contexts (Bhatnagar and Schwere, 2000; Sirimanne, 1996; Han and Walsham, 1993; Odedra, 1993). In line, Soeftestad (2001) states that this view seeks IT for community resource management and development. Thus, the project view considers IT as a separate component in organizational process and merely focuses on interaction and entanglements in organization and technology.

Activity View

Activity view seeks how IT contributes to development planning, management of development projects and development activities for organizations (Madon, 1994). It is helpful to use of IT in collecting, organizing and developing information systems aiming to enhance development activities for improving service delivery as well removing obstacles in development planning (Madon, 1994; United Nations, 1985). However, this view has over emphasis on technology.

Commodity View

Commodity view seeks IT as a product that is used for generating economic activities for income through manufacturing, offshore computing and offshore software development (Sein and Harindranath, 2004). This view rarely accounts the role of users.

Economic View

Economic view seeks IT as a driver of an economy. It applies macro-level influence of IT on infrastructure development, education and industry (Sein and Harindranath, 2004). This view treats IT as a powerful agent for economic development through transforming products and services at organization to reduce comparative cost and increase trade flows (OECD, 1989). Thus, it also ignored users and organizational contexts.

These four distinct views on use of technology in organizational context are helpful to understand diverse roles of technology in organizations. However, their common and main limitations are: they are deterministic and ignorant about organizational contexts and processes.

2.3.4 Views on IT Artifact

Since IS research includes a number of academic fields, professions and practice, there are diverse views toward IT as well as IT artifacts. Orlikowski and Iacono (2001) have categorized five different views on IT artifact: tool view, proxy view, nominal view, computational view and ensemble view.

Tool view seeks IT as a means, an engineered artifact and a technical entity. It aims to enhance productivity, communication and social relations. *Proxy view* conceptualizes IT through human perception of using IT and focuses on critical aspects –hardware, software and technical –of technology. *Nominal view* treats IT as name only, for example, IT is equivalent to object and human resources. *Computational view* focuses on two aspects: one, IT is purely technical, algorithms and codes and the other, IT is social, economic and informational phenomena. However, these views conceive IT as a part of bigger 'package' including technologies (software & hardware) and activities and interactions relating to IT in specific social and cultural contexts (Orlikowski and Iacono, 2001). They fail to treat technology and organizational contexts equally. Thus, they provide partial understanding of technology.

Ensemble view seeks IT artifact as an ensemble or 'web' of equipment, techniques, applications and people. It defines IT in a social context and background. Thus, IT includes web, infrastructure and processes. So, they give a platform whereby people use IT (Orlikowski and Iacono, 2001). However, ensemble view focuses on organizational contexts and technical properties of technology during design and deploy of technology in organizational contexts. Consequently, it seeks technology as a network and a system of alliance between social and organizational contexts. Since, this view also considered technology and organization into two distinct and separate entity, Orlikowski and her colleague redefined this view from ensemble view to mutually dependent ensemble view (Orlikowski, 2010; Orlikowski and Scott, 2008; Orlikowski, 2007).

2.3.5 Interactional Perspectives

Orlikowski (2010) has categorized theoretical lens in IS studies into four broad spectrums in technology and organization relations. These are characterized as: *absent presence* –technology is mainly unacknowledged in organizational context; *exogenous force* –technology is considered as determinant in organizational context; *emergent process* –technology is positioned as product of ongoing human interpretations and interaction in organizational context and *entanglement in practice* –technology is understood with relationalities with organizational context instead of one influencing over the other (Orlikowski, 2010). Except the latter, all other perspectives focused on either technology or organization and they seek an ontological separation. However, the entanglement perspective is emerging and it focuses on inseparability in technology and organization through tracing intra-actions and entanglements and disentanglements. Consistently, these four perspectives are discussed below.

Technology as Absent Present Perspective

This perspective appeared as a contradictory view that technology is everywhere in organizational contexts but it is absent from the core logic of theorizing organizational contexts. Orlikowski and Iacono (2001) showed that in the past

decade technology was absent, black-boxed and abstracted from organizational contexts in a large number of IS research. Similarly, Zammuto *et al.* (2007) noted that in the past decade only 2.8% of IS research articles in four leading IS journals have focused on technology and organizations. Consistently, it has been found that significant numbers of IS research of this perspective focus on social, political, economic and institutional aspects and they merely focus on materiality in organization and technology. In line, Orlikowski (2010) argues that this perspective failed to trace materiality of technology. Thus, this perspective put priority on human and social structures than materiality of technology. Hence, echoing with Barad (2003) it can be said that this perspective focused on every matter except materiality of technology as well as matter.

Technology as Exogenous Force Perspective

This perspective conceptualizes technology as an external force. It seeks that technology as an exogenous factor for influencing on human and organizational outcomes, for example, governance structures, work routines, information flows and decision making process (Orlikowski, 2010). Consequently, technology is viewed as hardware that is distinct and separate from humans. Thus, this perspective treated technology as an independent driver of organizational change (Orlikowski, 2010). In line, it has developed as a dominant research stream in technology and organization research during 1950s and 1960s and can be distinctly traced in Pfeffer and Lebebeci (1977), Blau *et al.* (1976), Hickson, Pugh and Pheysey (1969) and Harvey (1968). For example, Blau *et al.*(1976) treated technology as machines, factory and offices that substitute human labor. In a similar vein, Fry and Slocum (1984) assessed impact of technology in workgroup. Scholars in this stream conceptualized technology as a material determinant of organizational characteristics. However, they have focused on either specific technological details or the role of human agency in shaping technology (Orlikowski, 2010). This view emphasized on generalizable principles and is inclined to look at instances rather than in-depth analysis of technology in use.

The Emergent Perspective

Emergent perspective throws challenges toward exogenous views and claims that technology is shaped by the continuous interaction of human choices and actions in social and organizational contexts (Orlikowski, 2010). So, it seeks technology as material artifacts that are socially defined and produced, and it is relevant only in relation to people engaging with them (Orlikowski, 2010). Thus, this view focused on several ways of understanding of technology as it is neither fixed nor universal; rather, it is emerged from situated and reciprocal processes of interpretations and interactions with particular artifacts (Orlikowski, 2010). Therefore, emergent process view mainly focuses on embedded and dynamic meanings, interests and activities that are produced and ensemble of technological relations (Kling, 1991; Markus and Robey, 1988).

This perspective seeks how particular interests, situated actions of multiple social groups and organizational contexts shape and reshape designs, meanings and usages of technologies over the period and in different contexts (Fulk, 1993; Prasad, 1993; Zuboff, 1988). However, this perspective contains number of streams: socio-technical systems (Trist and Bamforth, 1951), science and technology study (MacKenzie and Wajcman, 1985); social construction of technology (Bijker and Law, 1992), structuration theory (Giddens, 1984) and technologies-in-practice (Orlikowski, 2000).

Broadly emergent perspective can be categorized into three streams. The first stream, socio-technical study of technology has been criticized due to its techno centric view. This stream argues that social and technical systems as a whole (Trist and Bamforth, 1951) and social and technical system mutually shape one another and they need to be designed together (Davis and Taylor, 1986; Mumford, 1981). The second stream, social construction of technology, focuses on social shaping of technology (Bijker and Law, 1992). The third stream of the emergent perspective is influenced by Giddens' (1984) 'structuration theory' which mainly focuses on processes of social structuring instead of technology (Jones and Karsten, 2008). Thus, scholars of this stream subsequently applied a modified

‘adaptive structurational model’ to analyze how technologies are shaped during the process of their designs and usages (Jones, 1998; DeSanctis and Poole, 1994; Orlikowski, 1992). Along the line, Orlikowski (2000) has put forward this view into ‘technologies-in-practice’ aiming to understand multiple realities from interaction between technology and organization. She asserted that during interaction between technology and organization, work practices and social structure mediate and are mediated by engagement with new technology (Orlikowski, 2000). Therefore, though the emergent perspective acknowledged significance of equal attention on the organizational contexts and technological processes; it has sought technology and organization as separate entities whereas entanglement perspective seeks technology and organization are inseparable. Consistent with these, actor network theory (ANT) is one of the pioneering lens for provoking entanglements in IS research. Along the line, ANT is briefly discussed below before departing to the sociomaterial entanglement lens.

2.3.6 Actor Network Theory - Departure for Entanglement Perspective

Actor Network Theory (ANT) is developed from the works of Callon, Latour and Law in the late 1980s. It explains human interactions with inanimate objects and technology (Callon, 1999; Hassard, Law and Lee, 1999; Callon, 1991; Latour, 1987). It aims to synergize socio-technical networks through emphasizing dynamic relations between human and non-human elements (Latour, 1993). In line, ANT focuses on how human beings interact with non-human objects and it seeks ‘humanchine’ (human and technology) networks through tracing multiple relations among people, machines and non-corporeal artifacts collectively (Brooks, Atkinson and Wainwright, 2008; Hassard, Law and Lee, 1999). Thus, ANT provides an understanding of the intertwined relations between human actors and technology along with a twinning theoretical ontology (Atkinson and Brooks, 2003). In line, ANT offers significant to unveil complex relationships between human and non-human actors through examining networks between

people, machines and non-corporeal artifacts collectively (Hassard, Law and Lee, 1999).

Further, ANT aims to understand embedded rules, resource, behaviors and human actors as complex networks (Atkinson and Brooks, 2003). It explains the world as a total of networks which include humans, things, ideas and concepts as 'actors' in the networks (Latour, 2005; Law, 1992). Moreover, it provides a substantial framework that translates networks of human actors and non-human actors through four interrelated steps –problematization, interessement, enrolment and mobilization. Problematization develops ideas or artifacts to address a specific problem by actor(s) and makes it indispensable to the other actors through rhetorical means in terms of resources and capacities. The process of bringing other actors into the network is called obligatory passage point (Callon, 1986). Afterwards, process of negotiations with interests of the actors is called interessement and when relevant actors make alliances with their interests and concessions that is called enrolment. Thus, actor-networks generate an alignment of diverse interests and the basis of enrolment of different actors in the actors' network.

However, ANT is criticized for ignoring macro aspects of organizational contexts because it focuses on micro analysis actors' networks (Doolin and Lowe, 2002). Consequently, ANT failed to account wider purview of underlying organizational contexts in macro aspect. Further, Walsham (1997) identified number of fatal flaws in ANT: it deals with limited analysis of social structure; neglects political bias and morality; fails to distinguish humans and non-humans roles. Moreover, it is incapable to trace entities in actors' networks. Thus, it has been suggested that ANT needs collaboration with other theory. For instance, Brooks & Atkinson (2004) advocated for applying ANT with Structuration Theory and Pouloudi *et al.*, (2004) applied ANT with Stakeholder Theory. Moreover, ANT over emphasized on network features instead of materiality of technology. Furthermore, ANT failed to answer where network is started and where it is ended.

2.3.7 Emergence of Entanglement Perspectives

Since the inception, IS discipline has been striving to reduce gap between social and material aspects (Keen, 1987). In line, citing Hirschheim (1985), Jones (1998) argues that a priori distinction between social and technological arena leads to a continuous controversy and conflicting relationships. Thus, it is difficult to trace entanglements in the social and the material; IT and organization and the behavioral paradigm and design science paradigm. Consequently, setting any distinction between the social and the material is obstacle to trace the recent dynamism and multiplicity between organization and technology. In this regard, Orlikowski and Jones put: "...[T]echnology is both shaped by and shapes human action, and that the interaction between people and technology is ongoing and dynamic"(2007, p 297).

In addition, Law and Urry (2004) argue that linear analyses of technology and organization relationships are incompatible to deal with contemporary complex realities and multiplicity because linear theories focus on a fix frame, a boundary of demarcation and a separation of entity between the social and the material world. Thus, in order to understand complex realities between the material and the social aspects, the existing theories are inadequate. While a theory poses a priori distinction between the social and the material, it is difficult to give equal privilege to them. Consequently, toward the end of resolving the gap, conflict, controversy and contradiction between the social and the material aspects of everyday organizing, it is a longstanding need for such a theoretical lens that can account organizational contexts and technology as well as the social and the material equally.

Further, recent ubiquitous networks and innovation in technology and dynamism in organizational processes have brought challenges toward socio-technical theories of studying technology (Jones and Orlikowski, 2007). Consequently, rich theoretical underpinnings and new empirical insights are inevitable to understand dynamism and innovations between technology, organization and human work (Jones and Orlikowski, 2007). Moreover, complex realities in organization and

technology entail a wide range of innovations that are being produced within the social-material world (Law and Urry, 2004). Along the line, aiming to understand complex realities in technology and organization, Suchman (2007), Barad(2007), Orlikowski (2010; 2007) and Leonardi (2012; 2010) have put forward sociomaterial (without hyphen) lens and they argue that the social and the material are inextricably inseparable and entangled in all the process either chemically or centrifugally or socially.

Consistently, Orlikowski and colleagues have asserted that the recent innovations in IT and organizations have posed new challenges toward the existing thoughts and theories and they seek sociomateriality as an umbrella approach aiming to interpret the forms of everyday organizing that are shaped by multiplicity, emerging, shifting and interdependent technologies (Orlikowski, 2010; Orlikowski and Scott, 2008; Jones and Orlikowski, 2007; Orlikowski, 2007; Orlikowski, 2007; Orlikowski, 2005). In line, the ubiquitous network between technology and organizational dynamism has brought complex realities in organizational contexts and technological processes and it has turned the social and the material into as a single world i.e., sociomaterial world (Law and Urry, 2004).

Meanwhile, recent IS research has unearthed evidence about how technology and everyday organizing are constitutively entangled (Orlikowski, 2010; Orlikowski and Scott, 2008; Jones and Orlikowski, 2007; Suchman, 2007). The notion of constitutive entanglement departs from the views of reciprocal interactions between the social and the material because reciprocal interactions conceive them as independent entities; one influencing on the other. Such interactions between the social and the material are underlying in ontological separation. Contrary to this argument, Barad argues that they are constitutively entangled and they do not have any independent entities with inherent characteristics (Barad, 2003).

Consistently, Orlikowski (2007) has put forward Barad's proposition of constitutive entanglement whereby humans are constituted through relations of materiality, i.e. bodies, clothes, food, devices and tools; in turn, which are

produced through human practices whereby distinction between human and technology is analytical only because they are relationally entailed or enacted by one another in practice. Thus, Law (2004) opines constitutive entanglement as a thorough going relational materiality that refers to materials and realities as relational products. Consistently, Orlikowski (2007), citing Suchman (2007) and Mol (2002), has demonstrated that everyday organizing is constitutively entangled in the social and the material. Thus, sociomaterial constitutive entanglement gives better understanding of an engaged materiality in everyday organizational practice (Orlikowski, 2007).

However, Orlikowski and Scott (2008) find that IS research ignores the role of technology in organizational context, so technology is missing in action. In line, they(2008) identify a number of reasons behind the paradox in technology and organization: *firstly*, there are multiple aspects in organizational studies e.g. economic, political, strategic, technology, psychological and sociological; while, technology is just one aspect; *secondly*, lack of interest in technological aspects compare to other aspects; *thirdly*, a belief that technology is the part of institutional infrastructure that does not require particular attention and finally, technology in organization is a matter of rapid change and complex. Consistently, Orlikowski and Scott (2008) show that over the past decade about 95% of published articles in top IS and Management journals ignored materiality of technology in organizational contexts. Distinctly, this feature represents that technology is missing in action. Taken together, a sociomaterial constitutive entanglement lens aims to address limitation of existing theories in IS research. It has discussed below.

The entanglement perspectives between the social and the material are not completely new. ANT has employed an entanglement perspective whereby no entities have inherent properties; rather, they develop their forms and attributes and they are networked with other actors (Latour, 2005; Law and Urry, 2004; Law, 2002; Latour and Teil, 1995; Latour, 1991). This implies that the material – nonhuman actors need to be considered symmetrical to the social i.e., human

actors and they are networked with each other to gain particular effects (Orlikowski and Scott, 2008, p. 135). Thus, ANT is pioneer in tracing entanglements in organization and technology.

Besides, predominantly entanglement perspective can be traced back in the writings of relational ontology whereby it seeks how meanings and materiality are entangled in a sociomaterial process in everyday organizing (Barad, 2007; Introna, 2007; Suchman, 2007). Consistently, Karen Barad (2003) draws sociomaterial entanglement on Niels Bohr's metaphysics to challenge 'thingsification' i.e., recently language, culture, meanings (semiotic) and interpretation of all these aspects to turn as 'things' or 'matter'. Every relation has turned into 'things', 'entities' or 'relata' that determines boundaries, properties and meanings (Orlikowski and Scott, 2008; Barad, 2003). Thus, Barad (2003) termed that while language, culture and discourse are matters, the only thing that matter is no more a matter (p. 801).

Consistent with these, focusing on the material and the social separately gives an incomplete analysis of organization, human work and technology. Thus, contemporary theories – ANT, Complexity Theory –traced that the social and the material are inherently inseparable. These theories find that the material world is embedded in the social world (Fenwick, Nerland and Jensen, 2012). Similarly, ANT, a pioneer theoretical lens in the socio-technical stream of studying technology and organization, has put forward the view of inseparability between material agency and human agency. Further, ANT expresses its commitment to materiality because it seeks logic of strategic enactment between social and material objects – speech, bodies and their gestures, subjectivities, architectures, aircraft, firearms and technology –all are made in and help to produce relations (Law, 2002). In line, ANT applies different modes to explore recursively and productively embedded in the relations that make up objects, organizations, subjects and all the rest (Law, 2002). Consistently, material objects –commodities, machines, communication technologies, work, service products and risk phenomena –regain attention in contemporary theoretical discussions in social,

organizational, management and IS studies and emerged as new world of materiality (Orlikowski, 2007; Suchman, 2007; Latour, 2005; Pels, Hetherington and Vandenberghe, 2002).

In a similar vein, Crump and Latham (2012) analyze a planned change to everyday organizational routines in a case of accident and emergency management whereby they find that routine is an accomplishment and it consists of social and material as sociomaterial. Thus, organizational routine emerge as the obligatory point of passage during planned change in organization through different role of agency, standardization, categorization and making and unmaking of practices (Crump and Latham, 2012). Thus, sociomaterial practices focus on plurality, instead of singularity and it is potential to identify that good passages and bad passages are not fixed in time; rather, they are continuously reconfiguring (Crump and Latham, 2012; Moser, 2005).

Consistently, Orlikowski and Scott (2008) have revised conceptualization of 'ensemble view of technology' as 'mutually dependent ensemble'. The notion that the mutual dependency between technology and organizational contexts can be better understood from sociomaterial perspective of studying technology and organization. Thus, sociomateriality seeks that actors and objects as primarily self-contained entities that influence on each other either through impacts or interactions (Orlikowski and Scott, 2008; Slife, 2004).

Further, it focuses on how materiality is intrinsic to everyday activities and relations in technology and organization while material means not only tools but activities and identities (Orlikowski and Scott, 2008). Thus, the material and the social exist forever through acquiring form, attributes and capabilities, whatsoever is their relation. In line, Suchman (2007) draws example of sociomaterial practices in our everyday phenomena including photocopiers, robots, Computer Aided Design (CAD) and cyborg information systems. For instance, CAD is a workstation where technology is immersed in materiality, e.g., project sites, documents, environment and soon. Thus, everyday practice is shaped by multiple

meanings and materiality that are imbued with multiple logics, capabilities and networks.

Furthermore, Hassan and Hovorka (2011) states that sociomateriality is rooted in sociotechnical systems and ANT. Thus, research on technology, work and organization pay significant attention on practices and associated objects and this trend has developed an alternative research paradigm known as sociomaterial constitutive entanglement (Suchman, 2000). Evidently, IT is centering on practices because IT artifact involves with practices in every stage from development to implementation. Consequently, organizational practices give institutional shapes and frames of IT (Garud and Rappa, 1994). In line, organized non-individual activities can be seen as practice (Schatzki, 2005). Thus, organizational routines have been defined as “repetitive recognizable patterns of interdependent actions by multiple actors” (Feldman, 2003).

Along the line, sociomateriality seeks entanglement in technology and organization from performative relation because that relationship is not pre-given or fixed but enacted through practice (Orlikowski and Scott, 2008). Thus, performativity is inextricably connected with practice. Similarly, Reckwitz (2002) views practice as bodies that are shaped, objects that are handled; subjects that are treated and as the world is understood through performative relation. In line, from this perspective, organizations can be seen as an enacted and patterned to set of relations produced over time and space (Orlikowski and Scott, 2008).

Sociomateriality opens up a broad umbrella approach, a perspective and a way of seeing the world that contains the material and the social in one sphere. However, applying sociomaterial constitutive entanglement lens as a theoretical framework remains complicated. So far, a few research applied sociomaterial constitutive entanglement lens in IS discipline. Contrary to this, a number of IS research applied sociomateriality along with other theoretical lens. Evidently, sociomateriality was applied with ANT, complexity theory, work systems theory and practice theory. This trend has created many jargons and complicity. Furthermore, significance and contribution of sociomateriality remained under

acknowledged. Aiming to address this limitation, this study applied sociomateriality along with its philosophical strands, theoretical lens, methodology, perspectives and approaches. Moreover, this study aims to apply sociomateriality as a theoretical framework with particular focus on ‘constitutive entanglement’ lens.

2.4 Sociomaterial Constitutive Entanglement Lens

The centrality of IS discipline is to deal with technology in everyday practice rather than deeply engaging with purely technical aspect of technology (Orlikowski and Iacono, 2001). Thus, IS is in imminent danger of keeping a balanced focus on technology and organizational contexts. Consistently, citing Hirschheim (1985); Jones (1998) argues that a presumed and bifurcated view leads to a continuous controversy and conflicting relationships technology and organizational contexts. Thus, since the inception of the discipline, IS research has been striving to reduce the gap between the behavioral (social) and the technical (Keen, 1987). Thus, aiming to address this debate in IS discipline, sociomateriality seeks inseparability in the social and the technological aspects and it treats that technology and organization, and technology and its users are inseparable and constitutively entangled.

Sociomateriality poses post-humanist perspectives that seeks matter as a critical force in the constitution and recognize all entities and their relations (Fenwick, 2010). However, it is not new; rather elements of sociomateriality can be traced backed in the inquiry of ‘phenomeno-technology’ –a combination of rationalism and realism, in 1934 (Bachelard, 1984). Thus, it incorporates approaches and concepts irrespective of time frame and theories. Its ultimate goal is to analyze the social and the material inseparably as one world.

Recently, sociomateriality has appeared as a widely discussed, popular, increasingly cited and critiqued theoretical lens, approach and philosophical discourse in IS (Leonardi, 2013; Leonardi, 2012). The notion of sociomateriality

has been debated across disciplines –theoretical physics, organization studies, sociology of science and technology, feminist studies and education and learning (Fenwick, Nerland and Jensen, 2012; Orlikowski, 2010; Barad, 2007; Orlikowski, 2007; Suchman, 2007). It seeks human and material as integral in scientific and everyday practices (Leonardi, 2013; Leonardi, 2012; Orlikowski and Scott, 2008; Barad, 2007; Orlikowski, 2007). With a view to developing sociomaterial discourse, Karen Barad (2007), one of the key proponents of sociomateriality has drawn insights from a number of scientific and social theories: quantum theory, sociotechnical study of science, feminist studies, critical race theory, post-colonial theory, post-Marxist theory and post-structural theory. However, it has gained a solid theoretical foundation for studying technology and organization.

Leonardi (2012) defines that sociomateriality is an enactment of a particular set of activities that meld materiality with institutions, norms, discourses and all other social phenomena. The concept ‘sociomaterial’ is a synthesis of social and material with reference to a philosophical paradigm, a number of theoretical tools, an umbrella approach and a methodology (Kallinikos, Leonardi and Nardi, 2012; Contractor, Monge and Leonardi, 2011; Orlikowski, 2010; Orlikowski, 2007; Suchman, 2007). Further, Orlikowski and colleagues termed this as 'sociomaterial' instead of socio-material (Orlikowski and Scott, 2008; Orlikowski and Scott, 2008; Orlikowski, 2007). In line, they argue that the social and the material aspects are integral to one another and the relations in the social and the material is inseparable. Consequently, sociomateriality seeks constitutive entangled, relationalities and re(con)figuring in the social and the material (Orlikowski and Scott, 2008; Barad, 2007; Suchman, 2007; Barad, 2003). It reminds that all materiality is created through social process, because materiality can only be traced through its relational enactment with the social (Law, 2012).

Along the line, materiality is interpreted and used in particular social context and every social action and organizing happens through some materiality (Leonardi, 2012). In line, Barad (2007; 2003) has developed a detailed account of sociomateriality and argues that social and material aspects are constitutively

entangled. Everyday social and material aspects are inseparable, incessant and entangled in constitutive manner. Thus, sociomateriality aims to accommodate material and social aspects of everyday organizing without emphasizing one at the cost of the other and it does not attribute any privilege to one over the other.

Consistently, the core aim of sociomateriality is to understand constitutive entanglements and disentanglements in the social and the material. It relies on two main tools: one is agential realism -treating human and material agencies equally; and the other is intra-action -seeking inseparability in the social and the material. Further, sociomateriality focuses on understanding of agential realism and seeking a middle ground in technological determinism and social constructivism through intra-action analyses. As a result, sociomateriality seeks that the social and the material are neither separable nor influential rather they are inextricably inseparable and constitutively entangled (Jones, 2013; Orlikowski, 2010; Orlikowski and Scott, 2008; Orlikowski, 2007).

Furthermore, Barad (2007) asserts that entanglement in the social and the material cannot be separated either socially, chemically or centrifugally. Barad's view has forwarded by Orlikowski (2007. p.1437) as "There is no social that is not also material, and no material that is not also social". Thus, entanglement between the social and the material is the core concern of sociomateriality. With a view to understanding entanglement between the social and the material, sociomateriality applies number of tools, approaches and metaphors. It aims to avoid both radical technological determinism and rampant social constructivism in analyzing technology and organization relations (Orlikowski and Scott, 2008; Orlikowski, 2007).

Along the line, understanding of constitutive entanglement in the social and the material is the core concern of sociomateriality. A constitutive entanglement refers to dynamic, continuous, ceaseless and inseparable relations between the social and the material. It seeks that the social and the material belong to one world; thus, it denies a priori separation in the social and the material. Since the contemporary forms of organizing the social and the material are multiple,

emergent, shifting and interdependent; sociomateriality seeks to analyze such forms of organizing with an equal attention to them. Thus, it does not allow any privilege to either the social (organization or human beings) or the material (technology); rather, it seeks that the social and the material are constitutively entangled (Orlikowski, 2010; Orlikowski and Scott, 2008; Barad, 2007; Orlikowski, 2007). To this end, sociomateriality applies number of approaches, perspectives and vocabularies: diffraction, relational ontology, performative epistemology, intra-action instead of interaction, mutual dependency and constitutive entanglement (Hassan and Hovorka, 2011; Orlikowski, 2010; Barad, 2007; Orlikowski, 2007; Suchman, 2007; Law and Urry, 2004).

Consistent with these, sociomateriality aims to analyze how and why human and nonhuman and social and material factors are constitutively entangled in scientific and everyday practices in organizational contexts (Barad, 2007). Thus, sociomateriality emphasizes on materiality of technology and explores how materiality is entangled with social and organizational contexts as well as in everyday organizing. Evidently, it is a potential lens to analyze how human and technology are constitutively entangled. Thus, aiming to analyze constitutive entanglement in the social and the material, Barad (2007) has developed a new ontology, epistemology, ethics, methodology and vocabularies whereby features of sociomateriality can be traced. These are discussed below.

2.4.1 Features of Sociomateriality

Sociomateriality incorporates a wide range of views, approaches and perspectives which are taken irrespective of timeframe, paradigms and theories. For instance, elements of sociomateriality can be traced from the inquiry of ‘phenomeno-technology’– a combination of rationalism and realism, in 1934 (Bachelard, 1984); Latour’s (1987) ‘technoscience’ –science depends on its technological instruments and Foucault’s (1970) ‘archaeology of knowledge’– technology is not only power but also attribution to the evolution and progress of knowledge. Consistently, sociomateriality has brought a holism, a novelty and a

performativity in IS research through focusing on the emergence of materiality in every element (Hassan and Hovorka, 2011). Thus, it aims to bring a unique identity for IS field. From the above features, it can be inferred that uniqueness of sociomateriality is drawing attention on materiality and dealing with the social and the material with an equal attention and without any apriori separation. Thus, using sociomateriality as a theoretical lens requires a better understanding of materiality. Consistently, the following section discusses the materiality.

2.4.2 Materiality

Materiality, sociomateriality and socio-technical system are three interrelated terms and they play vital role to shape the recent theoretical trends of IS discipline. Along the line, theoretical framework of this research is involved with them. Materiality refers to properties and attributes of a thing, matter or a technology and those properties and attributes transcend space and time. However, materiality is used differently in practice and it is not neutral; rather it is consequential (Carlile *et al.*, 2013). However, materiality does not refer to solely to the material properties or physicality but it also includes forms and attributes of any matter or technology (Leonardi, 2012). Thus, Leonardi (2012) cogently asserts that materiality refers to material properties, attribution and forms that do not change themselves across differences in time and context. Similarly, materiality can be seen as those constituent features of technology that are (in theory) available to all users in the same way (Leonardi, 2012). For instance, technology has a materiality that makes certain action possible and others impossible or difficult (Faraj and Azad, 2012).

Materiality is significant in studying technology and organization, because material properties of artifacts are tangible resources that enable human being to do old things in new processes (Leonardi and Barley, 2008). Although materiality is an inextricable and seamless tapestry in everyday organizing; it is underexplored either through ignoring or taking a priori assumptions (Orlikowski, 2007). Thus, materiality of technology becomes inevitable in the process of

organizing and everyday practices (Kallinikos, Leonardi and Nardi, 2012). Materiality plays important role in how individuals and organizations are performed and make systems are workable in practice. In line, it focuses on the micro-level practices of those developing, using, and repairing such systems over the period through power, social networks and human interpretations (Orlikowski and Yates, 2006).

Further, all materiality is social; created through social processes and interpreted and used in social contexts (Leonardi, 2012). The other way around is that all social action is possible because of some materiality. In line, sociomateriality means collective spaces whereby people come into contact with the materiality of an artifact and produce various functions and systems (Leonardi, 2012). With a view to tracing material aspects of technology, scholars in the field of IS have developed terminologies such 'technology-in-use' (Orlikowski *et al.*, 1995) and 'socio-technological ensembles' (Bijker, 1995) to replace the word 'technology'. Subsequently, a number of studies have identified the material features of technology (Leonardi, 2007; Volkoff, Strong and Elmes, 2007; Orlikowski, 2005). However, materiality is not limited to material properties and physicality; rather it is the constituent features of technology that belong to users in the same way (Leonardi, 2012). Materiality influences on organizing; thus, technology has such materiality that makes certain actions possible and others impossible (Faraj and Azad, 2012).

Consistent with these, sociomateriality reminds us two things: one, all materiality is created in social processes and interpreted in social contexts and the other, every social action has some materiality. In line, Mol (2002) and Barad (2003) argue that social and material are not predetermined; rather they are enacted through practice. In a similar vein, Orlikowski (2007) asserts that materiality is integral in organizing the social and the material that are constitutively entangled in our everyday life. Thus, sociomateriality offers potential lens in studying technology and everyday organizing of human work, practices and organizational processes.

Thus, materiality can be understood through relational effect because something becomes material while it makes a difference and conversely, matter that fails to make a difference does not matter (Law, 2012). Consistently, this difference is somehow detectable or measurable. Thus, Leonardi (2012) asserts that sociomateriality is an enactment of a particular set of activities that meld materiality with institutions, norms, discourses and all other social phenomena. Consequently, materiality depends on a relation between which is detected and that which does the detecting (Law, 2012). It cannot be assessed beyond the enactment of relations i.e. the practices involved with the relations (Law, 2012).

Furthermore, materiality can be seen as an arrangement of artifact that might be physical and/or digital, which are varied across time, place and users (Leonardi, 2012). It is not beyond the social domain; rather social life is entangled with material: artifacts, technologies, tools and clothes (Suchman, 2007; Latour, 1991). In line, material agency means how materiality of an artifact or technology acts and it is activated by human intentions and use in particular context (Leonardi, 2012). Within the existing theoretical lens in IS studies, there are two major streams of studying materiality in organizational research. The first stream disregards and downplays role of materiality in theorizing material artifacts, arrangement and infrastructure through which practices are performed in organization (Orlikowski, 2007). In this regard, Barad (2003) notes that while culture, language and discourse are matters; the matters are not matter. As a result, this stream considered technology as an infrastructure of organizations and it has rarely received attention in the discussion of organization, work and technology.

The other stream treats materiality as technology adoption, diffusion and use within and across organizations (Walsham, 1993; Orlikowski, 1992; see e.g., Barley, 1988; Zuboff, 1988). This stream has brought valuable insights from technologies in organizational contexts but generated difficulties in understanding materiality (Orlikowski, 2007). It focuses on that materiality is occasional and it occurred while technological events take place. Consequently, it seeks materiality as circumstantial. This stream, also fails to account how every organizational

practice is always bound with materiality, as an integral aspect of organizational life (Orlikowski, 2007). Besides, this view relies on either techno-centric approach – understanding how technology leverages human action; or human centric approach – how human interpret and interact with technology in different contexts (Orlikowski, 2007).

In order to understand an engaged materiality in everyday organizational practice requires understanding integral relationships in social and material and needs to understand how these relationships are constitutively entangled (Orlikowski, 2007). Thus, a constitutive entanglement accounts the social and the material as equally and mutual reciprocally – ‘there is no social that is not also material, and no material that is not also social’ (Orlikowski, 2007). In line, the constitutive entanglement view focuses on that matter and meanings cannot be separated either through physical processes including chemical, centrifugal and nuclear processes or social processes of everyday organizing and performing; rather, they are entangled and fused together (Barad, 2007).

While conventionally the world is divided into two categories: the ‘social’ and the ‘natural’, Barad(2007) denies the categorization and seeks a way of analysis that enables us to theorize the social and the material together, toward the end of better understanding and clarification of the relationship between them. She, thus, argues that focusing on meaning and matter separately is the way to elide the potential aspects of matter and meaning by design (Barad, 2007).

Thus, Barad (2007) has pinpointed that the importance of taking matter and meaning together. However, it does not mean forcing together, ignoring differences or treating in the same manner; rather, it means focusing on emerging integral aspects between human and non-human, material, discursive; and natural and cultural factors in everyday practices. To this end, Barad (2007) applies diffraction, a trans-disciplinary approach, to analyze how material and discursive practices work together and how conceptions of materiality and social practices must change to accommodate the mutual involvement –entanglement and disentanglement –of matter and meaning.

Further, Orlikowski asserts that “every organizational practice is always bound with materiality” (Orlikowski, 2007, p. 1436). The importance of materiality has been downplayed in the field of IS for a quite long time. However, the socio-technical stream of IS research, especially ANT, asserts that it is difficult to separate nonhuman actors and material actors from the human actors and social agents. Consequently, there remains a blurred boundary between the social world and the material world. These trends turned the nonhuman actors as material agency (Sefyrin, 2010a; Rose and Jones, 2005; Rose, Jones and Truex, 2005). In line, Suchman (2007) states that boundary and performance between the social and the material actors are temporarily enacted instead of a taken granted separation between them. Similarly Pickering (1995) argues human and material agencies are reciprocally and temporally constituted in organizational contexts. Therefore, apriori and presumed distinction between human and material agencies can be done only in ideological point of view but practically it is difficult to draw any boundary between them.

However, the traditional view of materiality includes only tools, technologies, bodies and objects but not in ways that treat these as ‘brute’ or inherently separate and distinct from humans as users and designers (Fenwick, Nerland and Jensen, 2012). Consequently, materiality as an isolated view decenters human actors from the core of practice and treats material things as mere appendages to human intention and design (Fenwick, Nerland and Jensen, 2012). To address the limitation of existing views of materiality, Orlikowski (2007) argues that materiality is neither incidental, nor intermittent aspects of organizational life; rather, it is integral because every organizational practices always bound with materiality. The material, e.g., tools, technology, body and objects and the social e.g., work, routines, practices and symbols are inseparably embedded in one world. It is difficult to distinguish the social world isolating from the material aspects and the material world isolating from social and organizational aspects.

Therefore, material objects –commodities, machines, communication technologies, work, service products and risk phenomena –regain attention in

contemporary theoretical discussions, particularly in post-structural theory, post-colonial theory and socio-technical stream of science and technology study (Orlikowski, 2007; Suchman, 2007; Latour, 2005; Pels, Hetherington and Vandenberghe, 2002). Along the line, foundation of sociomateriality laid on understanding inseparability of the social and the material whereas materiality is integral with the social and the material. However, although sociomateriality seeks materiality is integral with the social and the material, there have been developed different streams in sociomateriality according to using concepts and lens. The following section discusses the two distinct streams of sociomateriality.

2.4.3 Streams in Sociomateriality

Sociomateriality is indebted to sociotechnical study of technology for locating materiality in everyday organizing. With this regard, Orlikowski and colleagues, the forerunners of sociomateriality in IS research, acknowledge that sociomateriality is an umbrella approach in which ANT has a significant contribution (Orlikowski, 2010; Orlikowski and Scott, 2008; Orlikowski and Scott, 2008; Orlikowski, 2007). Although Barad's (2007) understanding of sociomateriality is much wider and deeper; it has gained insights from the socio-technical streams of science and technology study. As a result, sociomateriality shares significant features with ANT, complexity theory, work systems theory and other post structural and post-colonial theories that intend to focus on the social and the material aspects with equal importance. For example, ANT considers both human beings and materials as actors (Law, 2002). However, so far sociomateriality has been applied mostly as a perspective along with numbers of theoretical lenses: ANT, Complexity Theory, Practice Theory, and Work Systems Theory (Alter, 2012; Fenwick, Nerland and Jensen, 2012; Feldman and Orlikowski, 2011; Orlikowski, 2007). Consequently, sociomateriality has been presented in complex manner and it has contained many academic jargons (Sutton, 2012).

Thus, applying sociomateriality with diverse approaches and lens have been developed two distinct streams of sociomateriality in IS research. The first stream focuses on sociomaterial constitutive entanglement lens and it has lucidly appeared in the writings of Suchman (2012; 2007), Orlikowski and colleagues (2010; 2009; 2008; 2007). This stream is influenced by Barad (2007) and finds that continuous intra-action in the social and the material is the process of constitutive entanglement. It seeks that entanglement is a continual process in the social and the material while intra-actions and diffraction provide flow of entanglements in the social and material. Thus, Barad's (2007) concepts 'diffraction' and 'intra-actions' have widely used in this stream to analyze how and why the social and the material are constitutively entangled and belong to the same world.

On the other hand, the second stream focuses on sociomaterial assemblage and practices. This stream can be traced clearly in the writings of Leonardi (2012; 2010) and Zorina and Avison (2011). It applies 'interaction' and 'imbrication' as core concepts to understand sociomaterial assemblage and practices. Proponents of this stream argue that interaction and imbrication are two potential concepts to understand socio-technical dimension of technology. Considering sociomateriality from the second stream, Kautz and Jensen (2012) argue that sociomaterial practices exists in 'system thinking'(Checkland, 1981) and 'sociotechnical systems' (Mumford, 2000; Mumford, 1985). However, sociomateriality is something more than socio-technical systems and system thinking.

Although Kautz and Jensen (2012) argue that sociomateriality can be better understood from the second stream that applies imbrication lens to understand mutual relationship between human and material agencies; imbrication echoes separate entities: the social and the material e.g. see Leonardi (2012; 2010; 2010) and Zorina and Avison (2011). Consequently, imbrication fails to analyze ceaseless constitutive entanglement.

Conversely, compare to interaction and imbrication; diffraction and intra-action are potential to understand sociomaterial constitutive entanglement. Keeping the

social and the material into two separate worlds, sociomaterial entanglements cannot be traced properly. Thus, a constitutive entanglement seeks to continuous entanglements and disentanglements in the social and material processes. It seeks the social and the material into one world and does separate them in anyway.

Along the line, this study has applied Barad's (2007) 'diffractive' and 'intra-action' analyses to understand constitutive entanglement: entanglements and disentanglements in the E-service of land record in Bangladesh. Thus, following section has focused on building a framework of sociomaterial constitutive entanglement.

2.5 The Theoretical Framework of this Research

Orlikowski and colleagues, the forerunners of advancing sociomateriality in IS, have stated in their early work that sociomateriality is an umbrella approach that belongs to ANT (Orlikowski and Scott, 2008). However, in their subsequent works, they explored sociomateriality with practice theory (Feldman and Orlikowski, 2011). Moreover, sociomateriality does not look upon technology as black box (Hassan and Hovorka, 2011). Further, Fenwick (2010), a prominent advocate of using sociomateriality in the field of work, education and learning, has applied both ANT and complexity theory within the broader umbrella of sociomateriality. Likewise, Sele (2012) draws sociomateriality on Convention Theory (Boltanski and Thévenot, 2006). Recently, Alter (2012) explores sociomateriality along with Work System Theory (Alter, 2012). Resultantly, so far limited numbers of studies applied sociomateriality a lens without help of other theories. Along the line, this study aims to apply sociomaterial constitutive entanglement lens as a theoretical framework without using any other lens. Thus, it relies on relevant tools and approaches of sociomateriality only instead of relying on other theory.

Consistently, with the view to understanding of constitutive entanglement in the social (human) and the material (nonhuman), sociomateriality applies number of

approaches and terminologies: relational ontology, intra-action, performativity, materialization, technoscience and re(con)figuration. In order to trace constitutive entanglement in the social and the material, Barad (2007) emphasizes on intra-actions and diffractive lens. An understanding intra-action gives continuous and ceaseless entanglements and disentanglements in organization and technology. Thus, tracing sociomaterial constitutive entanglements and disentanglements require focusing on intra-action instead of interaction; performativity instead of representationalism and relational ontology instead of ontological separation. These have been briefly discussed in the following sections.

Relational Ontology

Sociomateriality seeks a relational ontology in the social and the material (Barad, 2007; Suchman, 2007). Relational ontology can be traced in sociotechnical study of science whereby Law and Urry's (2004) writing on relational ontology has appeared as 'move to ontology'. Further, Barad (2007) has put forward this view that there is no ontological separation between the social and the material; rather they are entangled within intra-actions (as opposed to interaction) that produce and co-produce of one another. Material elements have meaningful existence in scientific and social practices that with an entanglement, which gives a relational ontology between the material and the social (Slife, 2004).

Aiming to understand production and co-production in the social and the material, sociomateriality seeks an 'intra-action' unlike 'interaction' (Barad, 2007). Thus, 'intra-action' challenges conventional theoretical constructs that measure technology as an independent or a dependent variable. Rather, sociomateriality focuses on technology as situated action, which includes context, background and material resources that are themselves produced and co-produced (Hassan and Hovorka, 2011; Suchman, 2007).

Further, in order to understand sociomaterial world, Law and Urry (2004) apply 'move to ontology' that seeks the world is moving towards from a universe to 'pluriverse' which is made up of objects, institutions and people. Similarly,

infrastructure also can be seen as a relational that relates to organized practices (Jewett and Kling, 1991). In line, sociomateriality seeks that inherently there is no boundary between things (artifacts), technologies, people, and organization (Barad, 2007); rather, they are constitutively entangled with meanings, boundaries and properties that are continually produced and reproduced (Pickering and Guzik, 2008; Pickering, 1995). Moreover, Orlikowski (2007) asserts that materiality is integral to everyday organizing and it leads to a constitutive entanglement in the social and the material aspects. She elaborates that “[a] position of constitutive entanglement does not privilege either humans or technology...[rather it seeks], the social and the material are inextricably related—there is no social that is not also material, and no material that is not also social” (2007, p. 1437).

Agential Realism or Agency as Assemblage

Agential realism questions the ontology of materiality and agency (Barad, 2007). It denies both humanism and anti-humanism and takes a position of post-humanism that accounts for a boundary of practice between human and matter. With this position, agential realist opposes to any division between nature and culture (Barad, 2007). Consequently, agential realist recognizes matter as an active participant in the world of becoming through ongoing intra-actions (Barad, 2007). The universe is a form of agential intra-activity whereby agency does not consist of attributes; rather it reconfigures the world through on-going intra-actions (Barad, 2003). Ontologically the main focus of agential realism is to seek how the social and the material are inseparable and belong to one world (Barad, 2007). In line, Suchman asserts “... [H]uman agency is only understandable once it is re-entangled in the sociomaterial relations” (Suchman, 2007, p.261).

Thus, sociomateriality opposes humanist preoccupation that seeks to separate human actors from matters (Suchman, 2007, p.261). Consistently, agential realists seek agency as an assemblage of human and non-human; put privilege with none of them and do not seek relevance or irrelevancy of one over the other (Angelo, 2011; Brenner, Madden and Wachsmuth, 2011; McFarlane, 2011a; McFarlane,

2011b). With this notion, Pickering (1995) states, "...human and material agency reciprocally engaged by means of a dialectic of resistance and accommodation – the mangle" (Pickering, 1995). In a similar vein, Dant (2006) argued that putting over emphasis on social aspects and ignoring material status, networks and agency gives poor understanding of material civilization. He, thus, puts it as,

"The materiality of a culture impacts on the materiality of people and it is their embodiment that is at issue; the embedded material capital of objects is realized through its relationship with bodies. Water quenches thirst and washes bodies, but can wash away people and homes. Cars give people mobility but can cause damage, injury and death to their bodies" (Dant, 2006, p. 300).

Besides, agency is not limited within humans, if we consider that non-humans are also actors (Rosenbaum, Day and Ma, 2009). Thus, it is obvious to consider that technology as a material agency is helpful to think about technology as a material object and artifact because it gives closer relationships between materiality and the social aspects (Rosenbaum, Day and Ma, 2009). Consequently, agency can be better understood from the everyday organizational practice of how a material object acts and enacts as agency. Consistently, technology as a material object relates to some extent in the social world with occupancy of space and time and becomes capable of enabling and constraining human beings (Harré, 2002). Furthermore, material objects are inevitable in the performance of the social world as active mediators, fixers and stabilizers of social, cultural and political networks that lead constitutive effects within sociality and materiality and they (material objects) can be understood as agency constituted with 'actants' (Pels, Hetherington and Vandenberghe, 2002). Therefore, agential realism also focuses on performativity of the social and the material instead of seeking how the one influence on the other.

Performativity

Performativity is a widely used interdisciplinary term that focuses on performance but all performances are not performative (Barad, 2003). It refers to networks of

interacting elements between the social and the material (Faulkner, Lange and Lawless, 2012). Sociomaterial world can be perceived through performativity (Callon, 1998) because performativity is inevitably inextricable to materiality (Butler, 1989), ‘material figuration’ (Haraway, 1991) and nature of the production of matters (Barad, 2003). Materialization can be seen as an entangled process i.e., intra-action among forces –human and nonhuman. It can be better understood from the relationship between “discursive practices and material phenomena an accounting of ‘nonhuman’ as well as ‘human’ forms of agency and ... causal nature of productive practices [and]... its on-going historicity” (Barad, 2003, p.810). Thus, performativity is potential to understand sociomaterial entanglements.

A performative view helps to understand how organizational routines are made or unmade and maintained (Crump and Latham, 2012). In line, Crump and Latham (2012) analyze a planned change to everyday organizational routines in a case of Accident and Emergency management in which they find that routine is an accomplishment and it consists of social and material as sociomaterial. Further, it also the notion of obligatory point of passage that to explores on-going and emergent nature of organizational routines, processes and entanglements (Callon, 1986). The organizational routines and practices cause of enabling and constraining of individuals by sociomaterial practices (Crump and Latham, 2012; Moser, 2005).

Since sociomateriality focuses on plurality of practices, performativity offers potentials to trace continuous reconfiguring (Crump and Latham, 2012; Moser, 2005). Consistently, Haraway (1991), Latour (2005; 1991; 1987) and Rouse (2002) have developed a performative understanding to analyze nature of scientific practices. In line, Barad (2003) applies performativity that incorporates material and discursive practices, social and scientific practices, human and non-human and natural and cultural factors (p. 808). Thus, performativity focuses on emergence of every element from intra-actions and entanglements in the social and the material (Hassan and Hovorka, 2011).

Intra-action

The relational ontology in the social and the material seeks individuals, worlds and things are inherently inseparable, co-emerge, mutually constituent and entangled in practice (Orlikowski, 2010; Iedema, 2007; Suchman, 2007). They represent a pattern of intra-action rather than interaction. Barad (2007) states as:

“Intra-actions are non-arbitrary, non-deterministic causal enactments through which matter-in-the-process-of-becoming is iteratively enfolded into is ongoing differential materialization” (2007, p. 179).

An interaction refers to an external parameter of understanding dynamics. Thus, from an interactional strand materialization as well as the dynamics of materiality can merely be understood. To address this limitation, Barad (2007) asserts “materiality is an active factor in the process of materialization” (p. 179). In line, she emphasizes on intra-action as:

“...[I]terative intra-actions are the dynamics through which temporality and spatiality are produced and iteratively reconfigured in the materialization of phenomena and the (re)making of material discursive boundaries and their constitutive exclusions” (2007, p. 179).

From an agential realist perspective, Barad (2007) asserts that “discursive practices are not human-based activities but specific material reconfigurings of the world through which boundaries, properties, and meanings are differentially enacted” (p. 179). Material is not a fixed essence; rather, it is substance in intra-active becoming i.e., not as a thing but as a way of doing (Barad, 2007). For instance, technologies are forms of material reconfigurings or discursive practices that produce on-going material phenomena (Barad, 2007). However, discursive practices of everyday organizing and material phenomena do not stand independently as an external relationship to each other; rather they are mutually implicated in the dynamics of intra-activity (Barad, 2007). Thus, performativity in the social and the material can be seen as an iterative intra-activity rather than citing interactions (Barad, 2007).

Consistently, intra-actions are relational and caused of changes in technologies and organizational contexts. This relational ontology thereby shifts attention of reflexivity to practice to understand the relationalities, patterns, exclusions and boundaries created by intra-actions between material and social world (Keevers and Treleaven, 2011). In this regard, Tanesini(1999) argues that to analyze the patterned intra-actions requires new ways of reflexivity rather than the conventional one and it can be detached reflection from outside when it is problematic (Keevers and Treleaven, 2011). Consequently, Barad (2007) applies diffractive analysis to understand intra-actions.

Diffraction

Diffraction is a physical phenomenon relating to wave behavior and it is commonly used in physics to analyze light. However, diffraction of wave can be traced from water waves and sound waves. When a wave encounters an obstruction, diffraction takes place through aperture, overlaps, and bends and then it spreads. It can be observed in everyday life, for example, water waves diffract when there is an opening or aperture in its obstacle or when a stone drops in a pond, the ripples overlap. Diffraction plays a potential role in the debate over 'wave-particle duality paradox' in quantum physics: the nature of light as a wave or particle. In line, Barad (2007) applies diffraction to develop in-depth insights through tracing intra-actions in the social and the material. Thus, diffraction can be seen as a methodology for analyzing constitutive entanglements in the natural and the social, human and nonhuman, material and discursive practices.

Therefore, Barad (2007) put forward diffractive analysis as a methodology to understand entanglements in the social and the material. A diffractive methodology aims to explain the relationship in 'the natural' and 'the social' without placing one over the other, without a priori separation or taking for granted view that one is fixed to the other (Barad, 2007, p. 30). Thus, Barad claims that diffractive analysis gives insights through one another and unfolds differences without predicting exteriority. Along the line, Keevers and Treleaven (2011) assert, "diffraction is thereby a way of understanding the organization

within practice, accounting and taking responsibility for what becomes in organizational practices” (p. 509). Consequently, it is a potential methodology for sociomaterial analysis and it helps to identify the consequences of practices and interventions, because it analyzes intra-actions as a process of producing differences rather than analyzing interaction (Keevers and Treleaven, 2011).

Further, Barad (2007) has put forward diffractive analysis of understanding the relational ontology between the social and the material. Thus, she argues that diffraction is a pattern of difference that makes a difference and that pattern aims to cordon off the boundary of entering into separate domains that makes the entanglements visible (ven der Tuin and Dolphijn, 2012).

Thus, diffraction is a potential methodology for sociomaterial analysis and it helps to identify consequences of practices and interventions, because it analyzes intra-actions as a process of producing differences rather than analyzing interaction (Keevers and Treleaven, 2011). Consequently, Barad (2007) has emphasized on diffraction as an important analytical apparatus to use the following approach of entanglement:

“[T]o rethink the nature of nature based on our best scientific theories, while rethinking the nature of scientific practices in terms of our best understanding of the nature of nature and our best social theories, while rethinking our best social theories in terms of our best understanding of the nature of nature and the nature of scientific theories” (Barad, 2007, p. 30).

A diffractive analysis, thus, gives potential insights without giving any privilege to either on the social or the material. Rather, it aims to analyze them through relationalities because diffraction does not make any a priori fixed frame “what is object and what is subject” (Barad, 2007, p. 30). Thus, it illuminates emerged differences that how difference is made, what is excluded and how is the exclusion matter (Barad, 2007, p. 30).

Along the line, relational ontology, agential realism, performativity, intra-action and diffraction are potential approaches and tools for understanding and applying sociomaterial constitutive entanglement lens to trace entanglements and in disentanglements in the social and the material. Particularly, in order to apply sociomateriality from the point of view of intra-action and entanglement lens, these approaches and tools offer potentials to analyze technology and organizational relations.

The notion of constitutive entanglement departs from the views of reciprocal interactions between the social and the material, because reciprocal interactions conceive them as independent entities while one influences the other. Such interactions between the social (human) and the material (technology) are underlying in ontological separation. Rather, Barad (2007) argues constitutive entanglement presumes that there are no independently existing entities with inherent characteristics. Consequently, it is inevitable to trace intra-actions in the social and the material for understanding continuous constitutive entanglements and disentanglements in the social and the material.

In line, Orlikowski (2007), thus, citing Suchman (2007) and Mol (2002) has demonstrated that everyday organizing is constitutively entangled between the social and material aspects. Materiality is inextricable and seamless tapestry in everyday organizing; however, it is underexplored either through ignoring or taking a priori assumption (Orlikowski, 2007). To overcome this limitation, IS research requires understanding how the social and material aspects are constitutively entangled and disentangled.

Along the line, Orlikowski (2007) has put forward the notion of constitutive entanglement that humans are constituted through relations of materiality –bodies, clothes, food, devices, tools, in turn, which are produced through human practices –whereby distinction between human and technology is analytical only, because they are relationally entail or enact one another in practice. Thus, Law (2004) opines constitutive entanglement as a thorough going relational materiality that materials and realities are relational products; they neither exist in nor of

themselves. Consistently, sociomaterial constitutive entanglement lens is emerged with wider umbrella and it is significant to understand engaged materiality in everyday organizational practice (Orlikowski, 2007).

However, researchers have partial access to properties of materiality, such as, in a particular setting of stones and stone crusher factory. This context is built with an interaction between stones and stone crusher organization. During this interacting phase, the stone crushing process and the stone crushing organizational process overlaps one another. For example, throughout the stone crushing process, the stone attempts to break the stone crusher and conversely the stone crusher aims to break the stones. This relation can be seen as interaction. From this interaction between stones and the stone crusher, over the period develops dynamic relationship through change of materiality and that dynamism gives intra-action between them instead of interaction. Throughout the period, stones become harden rock due to exploiting the surface rock. Along the line, the stone crusher's efficiency gradually has been increased. Consequently, the stones and the stone crusher develop intra-action from their long term interaction.

Thus, the relations in the social and the material can be seen as different strata from interaction to intra-action which is similar to different worlds in critical realism, that is, the empirical domain within the actual domain and the actual within the real domain and the other through accounting horizontal existence of entities, that is, objects, entities and structures are as an ensemble (Strong and Volkoff, 2010). In line, this study has focused on intra-action stream of sociomaterial constitutive entanglement through tracing interaction, intra-action, diffraction, performativity and relationalities in the social and the material.

This study, thus, has not confined its theoretical framework within any particular frame; rather it has kept an open and broader framework within the purview of sociomaterial constitutive entanglement lens. It has accommodated the core concepts and approaches involved with constitutive entanglements lens to analyze technology and organizational relations. Along the line, this study has applied

intra-actions, diffraction, relational ontology and performativity to trace constitutive entanglements in the E-service of land record in Bangladesh.

2.6 Conclusion

Sociomateriality has emerged with many new vocabularies, concepts and approaches to study technology and organizational relations. Now it is high time to identify contributions of sociomateriality to understand dynamics of artifacts, practices, processes and organizing and their significance in IS research. It is also a matter of question whether sociomateriality has contributed to beyond system thinking, sociotechnical, phenomenological and actor network theory (Kautz and Jensen, 2012). Further, Sutton (2012) cogently criticized that though sociomateriality has appeared as a significant topic; it remains over complex and has created some jargons only.

Besides, applying sociomateriality lens along with other theories has failed to portray the distinct position of sociomateriality in IS discipline; rather, there are strong camps in academic community who criticized that sociomateriality has created more academic jargons than revealing any significant contribution. It is appeared that applying sociomateriality with other theoretical lens turns it to jargons and gives its inconsistent use as a theoretical framework. Thus, yet sociomateriality is a matter of debate and contentions as well as vague to a large extent.

Aiming to address the limitations and critiques of sociomateriality, this chapter has provided an overview on trends, streams, concepts and approaches of sociomateriality and identified its strength and relevance in studying technology and organization relations. Particularly, sociomateriality has its distinctive position, lens, vocabularies and concepts that give its wider umbrella approach and broader purview. Further, it is well equipped to elicit underlying relationalities and contexts of technology and organization. Taken them together, this study has left its framework open and wide within broader purview of

sociomateriality. Thus, it has avoided theoretical biasness and rigidity. However, its main thrust is on tracing sociomaterial constitutive entanglements and it is illustrated with a case of E-service of land record in Bangladesh.

As this study aimed to apply sociomaterial constitutive entanglement, a wider lens, in a complex case of E-service of land record in Bangladesh, it demands wider methodological approaches and tools. Consistent with the theoretical lens of this study, the following chapter has focused on 'action design ethnographic research' (ADER) a broader methodological framework.

Chapter 3: Action Design Ethnographic Research

3.1 Introduction

This chapter aims to build a rigorous methodological framework to analyze constitutive entanglements and disentanglements in the E-service of land records in Bangladesh. In line, it comprises three major sections: basic premises and paradigms, outlining a methodological framework and finally, analyzing the methodological framework.

Information Systems (IS) research mainly focuses on how technology is created, used, interpreted and reshaped by on-going use in organizational contexts (Sein *et al.*, 2011; Braa and Vidgen, 1999). Consistently, significant numbers of IS research claim that technology is co-evolved, ensemble, mutually dependent and constitutively entangled in work, organization and technology (Orlikowski and Scott, 2008; Orlikowski and Iacono, 2001; Barley, 1996). Further, the recent trend of IS research is modeling itself on the disciplines in professions, such as medicine, engineering, architecture, and law (Lee, 2010). In addition, IS research aims to contributing to knowledge and addressing practitioners' problems. Thus, designs and redesigns of technology and organizational process require broader methodology.

Consistently, rigorous methodology is a long standing need in IS research (Braa and Vidgen, 1999; Baskerville and Wood-Harper, 1996). However, there are dearth of methodologies for studying IS phenomena in developing countries (Avgerou and Madon, 2004). Consistently, this study applied Action Design Research (ADR) (Sein *et al.*, 2011) along with ethnographic research (ER) as a

broader methodological framework called 'action design ethnographic research (ADER)' for studying the E-service of land record in Bangladesh.

The following section analyzed relevant research paradigms that are the basis for framing a methodology. Thereafter, ADER has been outlined and finally, ADER has been analyzed in relation with ADR, ER and paradigmatic strands.

3.2 The Research Paradigms

A paradigm is a way of viewing the world and it consists of a set of assumptions, beliefs, common perceptions, practices and ways to acquire knowledge to understand the world (Hirschheim and Klein, 1989). The concept of paradigm is appeared in scientific arena from Kuhn's (1962) '*The Structure of Scientific Revolution*' whereby he argues that scientific advancement takes place dramatically rather than incrementally. To trace the process of scientific advancement paradigm shift is inevitable. There are mainly four philosophical paradigms in IS research: ontology – *nature of existence of the world as well as knowledge*; epistemology – *source of knowledge or the ways of knowing*; methodology – *whole process of searching and generating knowledge* and ethics – *value or utility of knowledge* (Iivari and Venable, 2009; Iivari, Hirschheim and Klein, 1998; Burrell and Morgan, 1979).

Every scientific research involves with complex intellectual processes and interpretations, whereby research paradigms play pivotal role (Parsons, 1968). At the outset, it is important to clarify strand on philosophical paradigms because they generate consistent findings and coherent analyses (Walsham, 1995). A research framework relies on four basic paradigms: ontology, epistemology, methodology and axiology (figure 3-1). They consist of beliefs and assumptions or worldviews to guide whole research activities, analyses and findings (Guba and Lincoln, 1994). These four paradigms provide scientific basis of a research and they are integral with producing valid knowledge and refining existing knowledge (Burrell and Morgan, 1979).

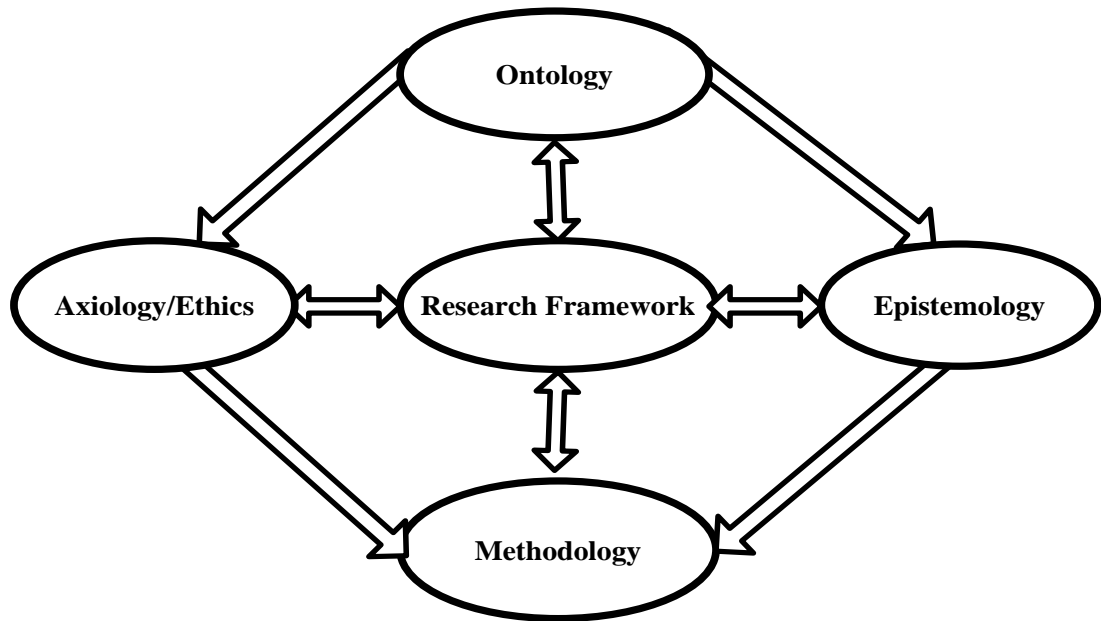


Figure 3-1: Research Paradigms

A research methodology is being framed through dynamic interactions of the paradigmatic strands: ontology, epistemology and axiology (Iivari, 2007; Iivari, 1991). Along the line, ontology determines epistemological strand and ethical or axiological view. In turn, answer to epistemological assumption demands consistency with ontological beliefs (Guba and Lincoln, 1994). Further, ontological beliefs, epistemological assumptions and axiological position determine methodological choices with a view to attaining desired ends, such as, particular epistemological assumptions decide particular methodology (Rowland, 1995 p. 278). Thus, paradigmatic strands and concepts shape methodological framework of a research methodology. They are discussed below.

3.2.1 Ontology: Critical Realism

There are two main ontological strands in IS research. One is realism and the other is anti-realism. However, there are numbers of streams in anti-realism: subjective realism, nominalism, social constructivism and critical realism. The latter has attracted IS researchers through accommodating strengths of anti-

realism and avoiding limitations of naive realism. Critical realism accepts realism through recognizing its criticisms and limitations (Archer et al., 1998; Archer, 1995; Bhaskar, 1978). Thus, as an ontological stance, critical realism strives to retain core elements of realism. In line, this study seeks critical realism as its ontological strand.

In line, critical realism aims to maintain a realist position alongside with empirical and naturalist views of science (Mingers, 2004a; Mingers, 2004b; Dobson, 2002; Dobson, 2001). For instance, it assumes that objects, entities and structures have an independent existence and claims that our knowledge of these items is socially and historically conditioned (Mingers, 2004a). Further, it examines the world with relational perspectives and seeks society as “an ensemble of structures, practices and conventions that individuals reproduce and transform” (Bhaskar, 1991 p.76).

Consistently, critical realism has been drawn from critique of ‘dogmatic realism’ and it is skeptical about causal effect relationships. With this notion, Bhaskar (1978) argues that causal effect generated from uninterrupted environments of the natural world, but they are not generalizable in social world (Mir and Watson, 2001). It, thus, seeks that objects, entities and structures belong to ‘real domains’ but this reality is not directly accessible to us; rather that reality develops events i.e. ‘actual domains’ and portions of these events of actual domains are observed by researchers i.e., ‘empirical domains’ (Strong and Volkoff, 2010).

Thus, it recognizes independent existence of real entities which develop events in actual and empirical domains (Strong and Volkoff, 2010; Bhaskar, 1998). Thus, critical realism emphasizes on two significant claims: tracing different layers of the world and identifying ensemble entities. In line, it seeks world as three stratified domains: empirical, actual and real. The empirical domain is within the actual domain and the actual domain is within the real domain. Further, it traces existence of entities that includes objects, entities and structures as an ensemble (Strong and Volkoff, 2010).

Along the line, critical realism offers potential lens in tracing entities, objects and structure. Similarly, sociomateriality, as a theoretical lens, also strives to trace objects, entities and actors and seeks their constitutive entanglements. In order to understand complex contexts, critical realism and sociomateriality have common ground, that is, both emphasize the world as an ensemble and constitutively entangled; instead of seeking causal-effect relations. Thus, critical realism offers complementarities to sociomateriality that also focuses on an ensemble world through understanding constitutive entanglements in the social and the material. As a result, both critical realism and sociomateriality are keen to trace ensemble and constitutively entangled technology, practices, entities and actors.

More importantly, critical realism acknowledges materiality in technology and it traces interaction between technology and organization in the three different strata. On the other hand, sociomateriality denies that technology has no materiality in itself. However, technology inherently has some materiality in itself. Consequently, tracing materiality in empirical world requires analyzing intra-actions in technology and contexts and practices. Thus, both sociomateriality and critical realism complements one another. In line, critical realism recognizes materiality of technology in its interaction into different strata and entities. Similarly, sociomateriality seeks intra-action in the social and the material. Therefore, this study has anchored its ontological strand on critical realism to understand entanglements and disentanglements in technology and organization in the E-service of land record in Bangladesh.

3.2.2 Epistemology: Positivism and Interpretivist

Positivism is based on natural science and it treats ‘facts’ as value free and describes the social world in terms of generalized laws identical with natural science (Nandhakumar and Jones, 1997). Consequently, positivist paradigm analyzes social phenomena with rules and assumptions of natural science. It argues that social reality is observable and understandable through conducting study under rules and procedures of natural science and the social reality gives

same result for everyone in a context of scientific study. Thus positivist research generates accurate descriptions of phenomena, devises valid explanations and enhances predictability and generalizability.

Although, methodologically a positivist strand rests on its claim to be able to prove things but there are many things which cannot be proved methodologically e.g., social behaviors - rhetoric, exaggerative and face-saving excuses (Probert, 2004). These social aspects are rarely taken into account by positivists. Thus, positivist paradigm limits critical thinking and researcher's reflection.

Besides, human intervention and action involved with good, bad or indifferent intentions (Probert, 2004). For example, intervention on a medical patient is a good intention to cure patient. Consequently, it is difficult to separate facts from value in the social world. Thus, positivist is not tenable to analyze complex social world. In line, Jarvis (1998) states that positivism puts less attention in tracing change for future because it accumulates past and present. In order to change the future, it is essential to design a road map showing how and in what way to reach to the goal. Thus, guiding the future relying on the past is a significant limitation of positivism (Probert, 2004).

However, a positivist view offers numbers advantages: it includes wide range of situations under investigation; conducts study faster and economic manner; ensures rigor and produces replicable research result (Avison, 1997). Thus, positivist paradigm contributes to IS research with the virtues of repeatability, reductionism and refutability (Checkland, 1981). Besides, it is helpful to generalize research outcome through building rationalistic model (Evered and Louis, 1981). Further, it applies outsider mode of inquiry and observe phenomena objectively and without intervening into contexts (Nandhakumar and Jones, 1997). Therefore, positivist carries significant in IS research but it is not a panacea.

Recently, interpretive paradigm has become a suitable lens to analyze dynamic relations in work, technology and organization (Baskerville and Wood-Harper,

1996). In line, Orlikowski and Baroudi (1991) argue that interpretive study gives insights; because, it assumes that people create and associate their own subjective and inter-subjective meanings according to their interaction with the real world. Consistently, interpretive paradigm is significant for delving with underlying issues, theory building and contribution to the existing theories through interpreting processes and practice from actors' perspectives (Easterby-Smith, Thorpe and Lowe, 1991). Thus, interpretive paradigm is significant for conducting rigorous research in IS discipline.

In line, an interpretive perspective aims to understand such meanings that are used by actors to make sense of their lives (Schutz, 1967). It investigates phenomena through engaging with actors and practices to understand interpretations along with underlying contexts (Nandhakumar and Jones, 1997). Besides, it analyzes phenomena through insider mode of inquiry (Evered and Louis, 1981). Thus, it is important to understand research contexts and learning (Evered and Louis, 1981). Consequently, interpretive research is suitable for employing long-term involvement and interventional research (Orlikowski, 1992), participant observation (Jones and Nandhakumar, 1993) and ethnographic approaches (Easterby-Smith, Thorpe and Lowe, 1991).

Consistently, interpretive research seeks deeper insights to analyze the complex world from empirical evidence and interactions with living beings (Schwandt, 1994). Further, it asserts that reality is socially constructed, while researcher attempts to reveal it (Walsham, 2006). Furthermore, it represents the social world through interaction between the researcher and the participants (Mingers, 2001). Therefore, interpretive analysis is vital to bring such subjectivity to fore and backed by quality arguments, evidence, explanations and interpretation; rather than statistical exactness (Garcia and Quek, 1997).

Besides, interpretive paradigm assumes that there is no right and wrong theory, because there are many ways to view the world. So theories may be interesting or less interesting (Walsham, 1993). Further, Sahay and Robey (1996) assert that there are three basic assumptions underlying with interpretive research in IS.

Firstly, neither human actions nor technologies pose direct causal impacts; rather, consequences are derived from interactions between technology and human actors; (cited in, Markus and Robey, 1988). Secondly, actors' involvements and interactions with technology with their social meanings shape technology (see, Fulk, 1993; Prasad, 1993; Walsham, 1993). Finally, it aims to increase understanding of social contexts because knowledge is inherently contextual in nature.

Further, interpretive paradigm conceives that reality is constructed and reconstructed by subjective and inter-subjective interactions with the world around them and researchers attempt to understand phenomena through entering into the actors' reality and their worlds (Orlikowski and Baroudi, 1991). Thus, Walsham (1993) asserts that interpretive perspective considers that knowledge of reality and action of human domain is socially constructed by researched objects, contexts and researcher equally. Consequently, IS researcher strives to reveal reality; rather than, discovering objective and external reality (Walsham, 2006).

However, interpretivist is also not a panacea to IS research. More importantly, as an interface discipline, IS research seeks a co-existence between positivist and interpretivist to achieve rigor in IS research. In line, positivist approach relies on scientific methods like empirical and experimental design and interpretive approach involves with phenomenology, hermeneutics and ethnography. Consequently, applying positivist with a non-positivist approach gives complementarities (Avison, 1997). Conversely, applying interpretive paradigm along with positivist approach is significant for unveiling underlying complex organizational context in IS research. Since IS is an interface discipline between natural science and social sciences and its domain is wide. Thus, harnessing advantages from complementarities of positivist and interpretivist paradigms is significant. In line, Allen Lee (1991) is one of the pioneer advocates for applying positivism and interpretivist as an integrated framework. He provides a triangulation with three levels of understanding (figure 3-2). The first level observes from subjective point of view i.e., everyday phenomena and common

sense observation. The second level applies to researcher's views on common sense as well as native understanding and everyday practices. Final level of understanding emerges from inter-subjective analyses (Figure 3-2).

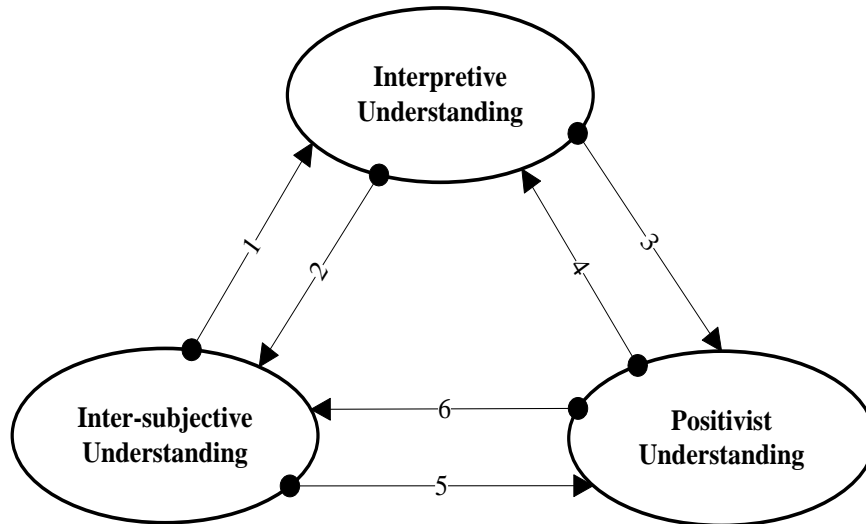


Figure 3-2: Paradigmatic Complementarities

An interpretation is not the end, but applied research required formulating logic and rules of understanding from interpretive means and applying its subjective understanding. This is how, positivist and interpretivist approaches co-exist and provide deeper understanding. Consistently, Mingers (2001) advocates that pluralistic paradigms enriched research findings. Similarly, Marshall and Rosemann (2006) claim that IS research nature, strategy, questions, methodology and methods require epistemological complementarities and pluralism.

Ontology	Epistemology	Methodology
External Realism	Positivism	Nomothetic
Internal Realism	Post-Positivism or/and Interpretivist	Idiographic
Critical Realism	Positivism or/and	Nomothetic

	Interpretivist	Idiographic
Subjective Realism	Normative or/and Critical Approach	Idiographic

Table 3-1: Paradigmatic Relation

Consequently, this study seeks a pluralist epistemology aiming to harness complementarities from positivist and interpretive epistemological stands. The relationship among the research paradigms may be outlined as follows (table 3-1).Consistently, this study locates its position in ontologically on critical realism, epistemologically on positivist and interpretive, methodologically on nomothetic and idiographic and from axiological point of view, it is means end and interpretive.

3.2.3 Ethics: Means End and Interpretive Views

Axiology or ethics as a philosophical paradigm refers to utility and value of knowledge. There are three strands in ethics: means-end, interpretive and critical. Firstly, means-end aims at generating knowledge for achieving ends without questioning its legitimacy. Secondly, interpretive strand questions on the goal directed action; rather, it aims to enrich understanding people’s action and how social order is produced and reproduced. Finally critical strand seeks to identify and remove domination and ideological practice (Iivari, 1991; Chua, 1986).

Since IS research inherently aims to serve dual purpose through making theoretical contributions and addressing practitioners’ current problem as well as meeting future interests of stakeholders; thus, it demands a broader approach in ontology, epistemology, methodology and ethics (Sein *et al.*, 2011; Rosemann and Vessey, 2008; Iivari, 2003; Benbasat and Zmud, 1999). IS research deals with both human and non-human actors and engages in contributing to knowledge and addressing practitioners' problem. Consequently, locating strands of ethics in IS research is challenging. Further it is important in IS research to identify problems and address them in real life contexts. Consistent with the ontological strand –

critical realism, epistemological strand – positivist and interpretive; this research seeks an ethics that accommodates means end and interpretive strand. Consistently, methodological framework discussed below.

3.3 Methodology: Action Design Ethnographic Research

Research methodology consists of processes, methods, tools and techniques applied to conduct a research (Nunamaker, Chen and Purdin, 1990). It includes whole strategies and procedures of research for investigating an empirical world (Blumer, 1969 p. 23). Thus, it is a set of guidelines to conduct research in pursuit of generating valid knowledge (Mingers, 2001; Hirschheim, Klein and Lyytinen, 1995; Nunamaker, Chen and Purdin, 1990 p.90). Consequently, methodology plays significant role in achieving rigor and relevance in IS research (Mingers, 2001). Toward this end, this study aims to build a rigorous methodological framework namely action design ethnographic (ADER) through conducting action design research (ADR) in the process of ethnographic research (ER).

Without rigorous methodology, research is worthless and it becomes fiction and loses its utility (Morse *et al.*, 2002). However, due to excessive complexity in IS research context, IS research in developing countries faced challenges to ensure rigor and relevance. In line, studying IS phenomena in developing countries emerged as a complex sub-field of IS discipline and this field requires rigorous research methodology and methods because as usual quantitative analyses and descriptive methods are incapable to reveal underlying contexts and insights and the practioners' problems (Heeks, 2010; Unwin, 2009; Avgerou and Walsham, 2000). Similarly, Ciborra (2005) finds that studying IT in the government organizations of developing countries develops new form of corruption, favoritism, bribery and new intermediaries. Therefore, a wider and in-depth methodology is inevitable for IS research in the context of developing countries.

IS research focuses on organizational design in which information system is the inevitable part (Drechsler, 2012). Organizational design starts with identifying of organizational problems or actors' goals (van Aken, 2005) and design of artifact aims to solve organizational problems or achieve goals (van Aken, 2007). Design-oriented IS research deals with organizations and individuals in society and economy; thus, it includes people, technology and organizational contexts, and their interrelationships (Österle *et al.*, 2011). Further, the recent trend of IS focuses on intra-active relations in technology, organizations, people and processes (Orlikowski and Scott, 2008; Suchman, 2007). Thus, IS research demands innovative, exploratory, critical and interdisciplinary research methodologies (Rosemann and Vessey, 2008).

Methodology is shaped by interests, values and assumptions of a wide range of practitioners, investigators and users (Orlikowski and Iacono, 2001). Thus, IS research seeks a holistic view through integrating tools and techniques from relevant disciplines (Sawy, 2003). As an applied discipline, IS research poses a multi-disciplinary endeavor and involves in design, development, implementation and usage of information systems and technology in organizations. Consistently, IS research aims to develop and apply wide range of methodology from social science and natural science.

In line, IS research employs multidisciplinary navigation to incorporate new concepts and methodologies from reference disciplines and develop new techniques and methodologies, for instance, ETHICS (Effective Technical and Human Implementation of Computer based System) (Mumford and Weir, 1979); Action Research (AR) (Baskerville, 1999a); Grounded Action Research (Baskerville and Pries-Heje, 1999); Canonical Action Research (Davison and Martinsons, 2007; Davison *et al.*, 2004) ; Design Research (Hevner, 2007; Hevner *et al.*, 2004), Action Design Research (ADR) (Sein *et al.*, 2011) and Participatory Action Design Research (Bilandzic and Venable, 2011). Further, IS research contexts in developing countries are complex and dynamic. Consistently, relations in work, organization and technology are loosely informal, dual and

plural. Thus, IS research in developing countries demands rigorous methodology (Avgerou and Madon, 2004).

In line, the research context of this study, the E-service of land record in Bangladesh, is such a complex, dynamic, and loosely informal and vested interest driven contexts, it was challenging for the researcher to analyze the underlying contexts, insights and interpretations. This study, thus, seeks a wider methodology called 'action design ethnographic research' (ADER) whereby ADR has been conducted in the process of ER. Consistent with these, the researcher argues that ER offers potentials to conduct ADR in a complex organizational context. More importantly, there are underlying ethnographic approaches in the process, stages and principles of ADR. Thus, ADER is significant for formulating problems in organizational contexts, designing artifacts through applying reciprocal roles between researchers and the organizational actors and engaging with contexts through internal and external perspectives and generating learning and reflection from the contexts and developing insightful analyses known as thick description. Further, the researcher argues that ER methods, approaches and tools are fits well with the ADR throughout the processes, stages and principles of ADR. Thus, ER does not require any extra steps to fit with ADR; rather, it enhances ADR and adds potential value to ensure rigor and relevance of IS research as well as ADR. Therefore, this study formulated ADER as a methodology along with relevant processes, approaches and guidelines. Consistently, the following section provided an overview of IS research methodology aiming to identify relevant grounds of formulating ADER as rigorous methodology.

3.3.1 Trends in IS Research Methodologies

Before outlining the proposed methodology – action design ethnographic research (ADER), this section provides recent trend of IS research. Earlier IS research did not encourage to apply diverse approaches and methods (Mingers, 2001; Benbasat and Weber, 1996; Robey, 1996). However, recent trend of IS research has attracted paradigmatic and methodological pluralism (Chen and

Hirschheim, 2004). Now diversity of paradigms and methods is considered strength for IS research (Robey, 1996). Knowledge based on different research methods aims to understand real-world complexities (Mingers, 2001). In line, Landry and Banville (1992) seek ‘disciplined methodological pluralism’ and they triggered IS as a ‘fragmented adhocracy’. In this regard, Hirschheim and Klein (2003) suggest that there is opportunity to build a body of knowledge through applying alternative paradigms in IS research.

Further, IS research involves in development, implementation and usage of information systems and IT in work, organizations and people (Niehaves, 2005; Niehaves et al., 2004; Wade and Hulland, 2004; Fitzgerald and Howcroft, 1998). Thus, it involves with ‘development of IT artifact’ and ‘use of IT’ in organizational contexts (Zmud, 1997). Resultantly, IS research explores complementarities in behavioral science and design science and seeks multi-disciplinary endeavor (Lee, 1999; Davis and Olson, 1985).

Consistently, IS researchers accommodated, modified, generated or shaped significant number of rigorous and applied methodologies from relevant disciplines. They are: action research (AR) (Baskerville and Wood-Harper, 1998), ‘grounded action research’ (Baskerville and Pries-Heje, 1999); ‘canonical action research’ (Davison et al., 2004); ‘participatory action research’ (Kemmis and McTaggart, 2005); ‘design research’ (Hevner et al., 2004) ‘participatory action design research’ (Bilandzic and Venable, 2011) and ‘action design research’ (Sein et al., 2011).

Along the line, there is a dominant trend of cross fertilization and hybridization between AR and DR (Figueiredo and Cunha, 2007; Järvinen, 2007). These two research methods belong to two distinct paradigms, that is, behavioral science and design science respectively. Thus, AR seeks to develop and justify theories for explaining or predicting organizational and human phenomena through analysis, design, implementation, management and use of information systems (Hevner et al., 2004). Conversely, DR is rooted in design science paradigm (Simon, 1996) and

aims to solve problems solving through innovating artifacts, ideas, practices and processes (Tsichritzis, 1998; Denning, 1997).

Thus, both behavioral science and design science paradigms are relevant to analyze relations in technology and organizational contexts through tracing their creation, application, tests and modifications (Hevner et al., 2004; Markus, Majchrzak and Gasser, 2002; Walls, Widmeyer and El Sawy, 1992). They are essential to understand multifaceted interfaces in organization and technology (Niederman and March, 2012; Hevner et al., 2004; March and Smith, 1995). They complement one another in their focus, goal, perspective and contribution (table: 3-2).

Research Focus	Streams	
	Behavioral Sciences	Design Sciences
Research Goal	Descriptive, seeks explanation	Prescriptive, seeks change
Perspective on IT Innovation	Retrospective, driven by innovation	Prospective, driving innovation
Key Contribution	Strengthen the foundation of knowledge	Renewal and boundary spanning practice and knowledge

Adapted from Baker et al., (2011)

Table 3-2: Research Streams and Focus of IS Studies

Though apparently it seems that there is a dichotomy between these two streams, nevertheless, they offer complementarities for bridging them and reinforcing one another (Baker et al., 2011). In line, Evered and Louis (1981) accommodate these two streams with an ‘Alternative Model of Inquiry’. Similarly, Mantei and Teorey (1989) incorporate behavioral science and design science techniques simultaneously through 'Systems Development Life Cycle' method that aims to design and implement technology in organization. Further, Braa and Vidgen (1997) present an ‘in-context’ research framework with a triangulation among

interpretation and intervention combining these two streams. Furthermore, Ven de Ven (2007) strives to develop a form of ‘Engaged Scholarship’ through incorporating methods and tools from both the streams. Recently, Sein et al., (2011) have developed a broad research method –ADR through integrating AR and DR to study IT and organizational contexts simultaneously setting problems in organizational contexts, designing technology, tracing on-going use and intervention and conducting concurrent evaluation.

Consistently, ADR aims to solve immediate problems and conduct concurrent and objective evaluation. Thus, ADR unfolds significant features as a rigorous research method for studying IT in developing countries. However, ADR says little about strategies of formulating problems in organizational contexts, designing solutions reciprocally and conducting evaluation concurrently in complex organizational contexts particularly in developing countries contexts. On the other hand, ADR emerged from a case of developed world and from the context of a corporate organization - Volvo. Thus, the researcher faced problems in applying ADR in the context of a developing country.

This study has identified that applying ADR in complex contexts of developing countries requires additional lens to unearth hidden organizational contexts and to conduct objective and concurrent evaluation. Along the line, ethnographic researcher (ER) offers a basket of research strategies and tools to elicit insights and to conduct objective evaluation (Walsham, 1995; Orlikowski, 1992). In line, this study has conducted ADR along with the processes, methods and tools of ER. Thus, conducting ADR in the processes of ER is termed as ADER –a broader, interventional and evaluative methodology. Consequently, ADER is rooted in AR, DR, ADR and ER for studying dynamic and multifaceted complex relations in organization and technology in complex organizational contexts. Resultantly, ADER incorporates wide range of concepts, methods and strategies.

In order to give a clear outline of ADER, relevant concepts, methods, paradigms have been briefly discussed in the following section.

3.3.2 Conceptualizing ‘Action’ ‘Design’ and ‘Ethnography’

Action

The concept ‘action’ is derived from purposiveness (Argyris, Putnam and Smith, 1985). For instance, a battlefield has two directions: one is front and the other is back; while purposes of human beings drive both the direction. So, action is the purpose that develops and designs further action (Argyris, Putnam and Smith, 1985). Conversely, action is a way of knowing tacitly (Polanyi, 1967). Thus, Schön (1983) explains that tacit knowledge is embedded in action and knowing of that action, because reflection happens while doing an action. He added that reflecting in action is a way of turning some tacit knowledge into explicit. In a similar vein, Argyris et al.(1985) suggest that ‘act and reflect on your action’. Thus, action is a significant process of gaining practical knowledge and learning.

Further, action is an attempt to change a situation. Thus, it also involves with designs certain processes to achieve intended result (Argyris, Putnam and Smith, 1985). In line, it goes with exploring a situation and intending to change a situation (Argyris, Putnam and Smith, 1985; cited from Schön, 1983). Consistently, action traces practices and generates reflection and learning. Therefore, action is the core process of AR and interventional research in IS, for example, DR, ADR and ER. More importantly, action is inevitably inextricable with designs.

Design

The notion of design involves in shaping and reshaping of forms and meanings of processes and material (Cross and Christiaans, 1997). Further, it refers to process of creating artifacts that require designs of further processes (Bratteteig, 2002). Thus, design means both process and product and it is a core tool in IS research (Denning, 1997). Consequently, design is pertinent to develop and implement information systems to achieve a desired process and situation instead of existing processes and situation of any organization (Vaishnavi and Kuechler, 2011).

As a process, design interacts between ideas and materials that involve contexts, actors, organization and culture (Bratteteig, 2003). Design involves in a series of stages from an idea to a finished product (artifact): making visions, sketches, specifications and levels of abstractions (Bratteteig and Stolterman, 1997). Further, design involves with decision making processes that again involve in concerned resources and design result (Bratteteig, 2002). Furthermore, as a work process, design can be seen as social processes that involves with various societal level as individual, group, organization and society and analytical level power, meaning, activities and change processes (Bratteteig, 2002). Thus, design is an iterative process between a designed artifact and reflection of its ongoing use (Swann, 2002; Schön and Bennett, 1996). Therefore, design can be seen as action process and activities in one hand and on the other, it is also a finished product (Swann, 2002).

Besides, design seeks a novel way of doing things and trace changes that require negotiation, intervention and interactions with various roles, responsibilities and power (Bratteteig, 2002). However, it is not a careful planning and execution process but it seems to be a dialogue between process and materials and it engage with dialogues to reveals unexpected interruptions and contribution. Consequently, researchers need to listen to emerging design and reflection (Winograd, 1996).

Consistently, Blessing and Chakrabarti (2002) state that design is a complex activity, involving artifacts, people, tools, processes and organizations. Thus, design is the core of process, method and product of DR. Consistently, design also offers potential complementarities to ethnography, particularly applied nature of ethnographic research that aims to solve practical problems.

Ethnography

Ethnography means writing or describing about peoples, beliefs, attitudes, behavior and culture. However, it has cross disciplinary and trans-disciplinary

applications (Guba and Lincoln, 1981). It is also used as a theory, a perspective and a basket of methods, tools and techniques (Stanley, 1990). Besides, it is a sub-field of anthropology and a philosophical paradigm. Further, it is a broader methodology used in both behavioral science and design science paradigms (Nilsson, 2000). Consequently, it contributes to design and implement of technology in the social and organizational contexts (Myers, 1999).

Distinctly, ethnography provides description along with meanings of contexts, actions, symbols and practices. In line, Linstead (1993) asserts:

“Ethnography has ... the capacity to embody a variety of perspectives and settings; it can be regarded as the natural methodological and discursive response to epistemological and existential fragmentation; as qualitative account its strength has benefits in theoretical description” (Linstead, 1993, p. 98).

Consistently, ethnography seeks iterative and inductive research that evolves with a group of approaches, tools and techniques to study on going contexts, practice, routines and usages of technology. Thus, it applies tools to see what happens, listening to what is said, asking questions, and producing a rich description that acknowledges the role of theory as well as the researcher’s own role and it treats humans as part of object and part of subject (Pink *et al.*, 2010; O’Reilly, 2005). Evidently, ethnography offers wider lens, approaches and techniques to study technology and organization. Thus, there are commonalities in 'action', 'design' and 'ethnography'. These complementarities offers cross fertilization in the process, stages, cycles and approaches of AR, DR, ADR and ER. Consistently, AR, DR, ADR and ER discussed below along with their common grounds and complementarities.

3.3.3 Action Research, Design Research and Ethnographic Research

Action Research

Action Research (AR) was originated to address problems emerged from the battlefield experiences of the Second World War (Trist and Bamforth, 1951;

Lewin, 1946; Lewin, 1945). It seeks to discover facts and improve unsatisfactory conditions (Curle, 1949). In line, it addresses practitioners' problems and generates knowledge (Rapoport, 1970 p.499). Thus, AR has gained significance in IS research since 1990s (Baskerville, 1999b).

Susman and Evered (1978) outline features of AR as: (1) it is *future oriented* – with goals and planning process; (2) it is *collaborative* –between client and researcher; (3) it is *implied system development* - through diagnosing, action planning, action taking and specifying learning;(4) it is *theory ingrained* - actions guided by theory; (5) it is *agnostic* – driven by research process and (6) it is *situational* – focuses on contexts. Thus, AR contextualizes knowledge and artifacts through three dynamic

relationships i.e., work practices and dialogues among actors; dialogues between researchers and actors and the dialogues between researchers (Nilsson, 2000). Consequently, AR offers potential for analyzing IT along with its organizational contexts (DeLuca, Gallivan and Kock, 2008).

Major Features of Action Research

- AR solves a problematic situation.
- AR modifies a given reality and create a new one.
- AR contributes to generate, use, test and modify knowledge.
- ARcollaborates between client and researcher.
- AR intervenes in action planning and action taking.
- AR employs theory ingrained research.
- ARnumbers of cycles between problems diagnosis and interventions.
- AR analyzes and refine methodology and research questions in each cycle.
- AR interprets data in each cycle and reflect them in following cycles.
- AR tests the result of agreements and explain the result of disagreements.

Box 3-1: Major Features of Action Research

AR poses as post-positivist and idiographic paradigm for studying technology in human context (Baskerville and Wood-Harper, 1996). It understands problem along with provoking change for addressing that problem (Hearn and Foth, 2005). Thus, there are three basic features for AR in IS i.e., demonstrating potential contributions to practice (practical action), contribution to knowledge (involved with design) and it also brings methods and findings in manuscript (closely connected to ethnography) (Baskerville and Myers, 2004).

In line, AR is both intellectual process and practice. IT also is a process of underpinning in the philosophy of knowledge and social action (Reason, 2002, p. xxv). Thus, the recent trend of using interventional methods and approaches for analyzing data and theories have developed various forms of AR in IS discipline (DeLuca, Gallivan and Kock, 2008 p. 53), for instance, AR with participant observation combining as participatory action research (Damgaard and Torfing, 2010; Braa, Monteiro and Sahay, 2004); AR with participatory design research as participatory action design research (Bilandzic and Venable, 2011); Ethnography with AR as action ethnography (Nilsson, 2000) and AR with DR as ADR (Sein *et al.*, 2011).

Design Research

Design research (DR) is a method and research paradigm that deals with human problem through creating innovative artifacts and it contributes to knowledge to understand human problems (Hevner and Chatterjee, 2010). It aims to create new and innovative artifacts consisting of constructs, models, methods and instantiations (Hevner *et al.*, 2004; March and Smith, 1995). Thus, DR involves

in designing innovative artifacts along with evaluation of their performance and understands behavioral aspects (Vaishnavi and Kuechler, 2011). The significant features of DR are ‘build’ artifact first, and then ‘evaluate’ its performance (Sein *et al.*, 2011).

Major Features of Design Research

- DR aims to develop an artifact to address a problem.
- DR is initiated by researcher to develop artifact.
- DR produces technical development as its output to improve the existing situation.
- DR develops new concepts, model and methods.
- DR evaluates utility of artifact in the context.
- DR contributes to theory and practice through new artifacts and methods.
- DR evaluation determines value and utility of artifact.

Box 3-2: Features of Design Research

DR is a set of analytical techniques, lens and perspectives combining both positivist and interpretive epistemology to study use and performance of artifacts to understand, explain and improve behavioral aspects of information systems (Vaishnavi and Kuechler, 2011). It contributes to creating reality rather explaining existing reality or making existing reality effective (Iivari and Venable, 2009). Consequently, DR seeks to address a class of problems through developing artifact or inventing solutions (Venable, 2006; Walls, Widmeyer and El Sawy, 1992). In line, Simon (1996) noted that as an interface discipline, IS is in imminent danger of losing its focus on the IT artifact in context whether focus on the inner environment or the outer environment (Niederman and March, 2012).

The core limitation of DR is separating between ‘designs’ and ‘evaluation’. Thus, DR fails to uphold balance between ‘addressing a class of problems’ and ‘intervening and evaluating authentically’ (Hevner, 2007; Nunamaker, 2007). Thus, Sein et al. (2011) outlines a broader version of DR known as ADR through incorporating AR principles in DR as ‘design’ and ‘evaluate’ technology in organizational contexts simultaneously. But, applying AR principles in DR is really challenging and it requires additional lens. The following sections; thus, seek relevance of ER to conduct ADR.

Ethnographic Research

Ethnographic research (ER) is widely used in IS discipline. It is a systematic, scientific and rigorous methodology that applies significant number of methods, strategies and tools i.e., living in the research field, conducting participant observation and open ended interviews. Additionally, it applies key informant interviews and emic (insider or native) and etic (outsider) views. Notably, it seeks inter-subjective ways of knowing through ‘reflexivity of actor’ –inquiring of researcher self and ‘reflexivity of accounts’ – ways of knowing sense of clients or users (Crabtree, Rouncefield and Tolmie, 2012). Moreover, it interprets meaning and contexts rather than their description. It also ensures

Major features of ethnographic research:

- It discovers problems at the context through first-hand experience.
- It conducts research in natural settings.
- It unfolds context as an insider actor.
- It interprets meaning of every phenomenon.
- It produces transferable knowledge.
- It generates insightful description.
- It generates theory ingrained findings.
- It contributes to knowledge and practice.
- It is flexible with methods, tools and techniques in data collection.
- It applies suitability of the contexts and capacity of researcher.

Box 3-3: Features of Ethnographic Research

rigor and reproducibility and generates story, explanations and theories from the events of natural settings.

In line, ER is not only process of conducting a research; rather, it is ended with a finished product through generating interpretive analyses, narratives, meaningful and surprising insights (LeCompte and Preissle, 1993; Pelto and Pelto, 1978). Thus, ER unfolds valuable theoretical description and contributes to theoretical knowledge. Consistently, ER is potential to gather data from complex organizational contexts. Thus, ER offers potentials methods, approaches and techniques for IS research in developing countries. Access to data in organizational contexts of a developing country is challenging because organizational contexts are informal, dual, underlying and limited accessible. Besides, there are resistance from different interest groups and stakeholders.

However, ER overcomes these challenges because it turns researcher into an actor of a research context. Further, ER is ‘omnivores’ in data collection: it includes all types of qualitative and quantitative data (Spindler and Spindler, 1992; Pelto and Pelto, 1978). It starts with qualitative approach to develop insights in particular contexts along with few quantitative measures –sample survey. ER provides significant opportunity to access into data from IS research in developing countries.

The inherent nature of ER is the identification of problems in social and organizational contexts. Contemporary ER offers to intervene with a commitment to find ways to solve problems and act more effectively to improve a deplorable situation. In line, ER employs intervention to address problems; they are identified in natural settings. Thereafter, it observes and evaluates responses and results from intervention and interaction. Further, it investigates how people solve problems at work (Barley and Kunda, 2001). The IS research employs ER to solve practitioners’ problems in organizational contexts. Consequently, ER has become popular in IS research.

More importantly, reciprocal involvement is the hall mark tradition in ER. It builds rapport and gains trust and confidence of participants. Besides, mutual assistance, participation in identifying problems and designing solution are the building block of ER. Thus, mutual reciprocal learning is the core principle of ER. Consequently, ER offers potentials to ADR through reciprocal opportunity of reciprocal designs, redesigns, evaluation and learning.

Further, ER is important to evaluate organizational and social problems (Lecompte and Schensul, 2010). It reduces bias and tainted accounts through extensive observation. ER provides multilevel approaches to unveil detail and precise understanding of complex and hierarchical relationships in organizations (Heinrich and Lynn, 2000). An ER evaluation on implementations of IT provides insights from conceptions to designs to redesigns and evaluation. Thus, ER is widely used with AR to understand traditions, practices, working methods and

structures and cultural and historical contexts of organization (Nilsson, 2000). ER generates explanations and theoretical findings from designs and redesigns whereby it explains how people think, believe and behave with particular processes, culture and organization.

Furthermore, ER offers potential to DR through eliciting function, meaning and relations of processes and artifacts. As a product or an artifact, design derives three characters: function, meaning and communication: *function* refers to its usefulness with respect to human activity; *meaning* refers to its symbolic value in particular context, and *communication* refers to its interactions between meaning and function (Bratteteig, 2002). Apparently, an artifact can be understood through analyzing its functions (roles, activities and usages) and meanings (form and existence) (Bratteteig, 2002; Winograd, 1996). Nevertheless, function and meaning of an artifact cannot be understood beyond its context of use (work, learning and everyday life) because artifact and human being mutually influence on each other. Thus, applying ER is important to identify function, meaning and communication between IT artifact and organizational processes.

Distinctly, ER applies dual mode of inquiries i.e., emic (insider or native) and etic (outsider or researcher self) views. In order to understand inseparability of work, technology and organization, Barley (1996) applied both insider (emic) and outsider views (etic). The insider view reveals context, practices and way of life from the perspective of participants along with concepts of native's worldview. Contrary to, outsider view aims to analyze context, practices and ways of life theoretically (Barley, 1996). Consequently, applying both the views gives rich insights. In line, Barley (1996) asserts that applying insider and outsider view require collaborating role in two ways: one is to take a collaborating role with the clients and the other is engaging the context for a long term involvement. Further, Schultze (2001) asserts that IS researchers need to apply both the views to observe closely, record routine events and engage in the daily life of researched people. Thus, applying insider and outsider views are significant to evaluate IT in

organizational contexts and to generate valuable insights for academics and practitioners (Harvey and Myers, 1995).

From a wider point of view, ER in IS research more than a method or a theory; rather it is a methodology for processing and presenting a written account – a text (Putnam *et al.*, 1993). Thus, ER seeks for multiple realities and unfolds complex sets of meanings along with their contexts (Prasad, 1997). AR researchers need to intervene in organizational context as objective outsider and subjective insider to bring unexpected outcomes and unintended consequences. Consequently, ER offers potentials to IS researchers through applying insider and outsider views as dual mode of inquiry to intervene in the contexts and reveal unintended consequences and unexpected outcomes.

Consistently, Geertz (1983) suggests applying insider view to search and analyze symbolic forms, words, images, institutions, behavior of people and contexts. Thus, ER interprets their meanings from themselves to themselves and most local of local details. In line, Lee (1991), citing Taylor (1979) explains that from an outsider view, behavior of researched people is absurd, peculiar, pointless, irrational, surprising and confusing but insider view seeks meaning and underlying reasons and do not leave a research field with any actions that are absurd, irrational or confusing.

In addition to, ER applies inductive, iterative and recursive processes to build theories to explain behavior and contexts (Lecompte and Schensul, 2010). Inductive research generates data bits by bits and aggregates them into taxonomies and structures that help to build concepts, models and theories. Recursive nature of ER allows researchers to move back and forth between problems and, transforming inductive analysis to general statement –deductive. Thus, ER adds potential value in empirical and interventional IS research for tracing research problems, intervening and designing processes, evaluating objectively and generating valid knowledge. Consequently, ER is important to formulate problems through eliciting insights of the contexts, applying its tools and techniques.

Moreover, paradigmatically, although ethnography is originated with positivist paradigm, recently it is evolved with interpretive paradigm but it shares significant features with positivist, empiricist and objective realism (Robert and Sanders, 2005; Hammersley and Atkinson, 1995). Further, ethnography emphasizes a soft interpretive strand to understand social reality and aligns with a social scientific approach (Beynon-Davies, 1997; Agar, 1986).

Therefore, ER offers potential lens while problem is visible but causes are invisible, underlying and driven by informal relations. It is also important while data collection from complex research contexts where other methods are incapable. Further, it is potential for identifying emerging trend and reflection from designs. Along the line, ER offers potential complementarities to AR and ER with DR through setting problems in research contexts, interacting with research clients, participants and scientific community and achieving rigor and relevance of IS research. Therefore efforts of using ER with AR and DR are remarkably visible and contributed to address the practitioners' problems and contributed to knowledge through generating valuable findings, narratives and 'thick description'. Consistently, following section briefly discussed complementarities AR, DR and ER aiming to frame the ADER.

3.3.4 Complementarities in AR, DR and ER

AR and DR have remarkable cross fertilization and complementarities (Loebbecke and Powell, 2009; Figueiredo and Cunha, 2007; Järvinen, 2007; Lee and Mendelson, 2007). In line, conducting DR in the process of AR offers opportunity to explain problems in research context and developing solution (Figueiredo and Cunha, 2007). Contrary to, AR receives iterative principle of DR to conduct multiple cycles between problem formulations to evaluation (Walls, Widmeyer and El Sawy, 1992). Further, DR involves in designing and building IT artifact but it focuses on technology based design (Hevner *et al.*, 2004 cited in; Boland, 2002). Thus, DR failed to acknowledge role of organizational context that shape design and deployed artifact (Sein *et al.*, 2011; Peffers *et al.*, 2007). Thus, it

has been suggested that DR needs to add two steps more: one is ‘Building’ – taking consideration into organizational contexts and the other is ‘learning’ – deriving ideas from intervention while solving problems (Hevner *et al.*, 2004; Baskerville and Wood-Harper, 1998).

The complementarities between AR and DR are significant to design consequences and redesign them through evaluation. DR helps to guide initial design and capture ensemble artifacts that emerge through use and redesign (Sein *et al.*, 2011). ADR aims to study ensemble artifacts in organizational contexts to “generate prescriptive design knowledge through building and evaluating ensemble IT artifacts in organizational settings” (Sein *et al.*, 2011). Thus, designing an ensemble artifact requires interactions between technological and organizational contexts (Gregor and Jones, 2007). The organizational contexts, structures and networks play significant roles in designing and redesigning. Consequently, ensemble IT artifacts emerge from design, use and on-going refinement. Thus, ADR traces ensemble artifact through researcher’s intent, theoretical knowledge, influence of users and context of on-going use (Sein *et al.*, 2011).

Since AR is guided by future oriented goals, objectives and ideals; it is effective in planning process. Further, AR emphasizes on actors role and their present situations and accordingly it takes planned actions with a view to achieving intended outcomes (Susman and Evered, 1978). Consequently, AR's planning processes enhance DR. So, AR is significant for implementing any designs and evaluating that in organizational context (Dunbar and Starbuck, 2006; Romme, 2003; Benbasat and Zmud, 1999). Thus, ADR conducts DR in the process of AR.

Consistently, AR and DR are two significant methodologies in IS for developing, implementing and assessing innovative artifacts, processes, strategies in organization and technology. In line, DR includes constant cycle of activities: designing, evaluating innovative IT artifacts that address social, organizational and individual problems along with theorizing or justifying theories with contexts (Baker *et al.*, 2011). However, DR needs collaboration with AR because an AR

recognizes role of organizational contexts during designing artifact or processes (DeLuca, Gallivan and Kock, 2008).

Further, without participating in a research context AR is incomplete. Thus, AR itself has been moving towards participatory trend which is now dominantly emerging as participatory action research through incorporating ethnographic approaches and techniques as well as participant observation tools (Ho and Tan, 2004). Consequently, conducting AR with ER processes includes participant observation and ethnographic approaches reveal underlying participates in research context.

Furthermore, ER is significant to gather information for system design, knowing users behavior, knowledge and practices. Thus, conducting DR along with ER processes is potential for designing IT and organizational processes (Anderson, 1994). Because of, any design required well understanding of ongoing social practices and cultural processes (Suchman, 2007). In addition, ER applies a performativity view how IT and the human beings are to perform with a given context (Greenhalgh and Swinglehurst, 2011). Consequently, ER approaches, tools and techniques provide deeper understanding of IT design in organizational contexts. Thus, ER is a preferred methodological approach to AR and DR for studying IT in complex contexts.

However, building and evaluating artifact in organizational context increase conflict of interests between researcher and clients and it is obstacle for concurrent and objective evaluation (Avison *et al.*, 1999). To address this problem, Checkland and Howell (2007) suggest applying ER approach to trace: the role of researcher - the outsider's perspective and the other is role of 'participant'- insider's perspective. Moreover, in the case of DR, Barab (2004) suggests that ethnographic perspective plays significant role to add methodological rigor in DR research.

Aiming to ensure relevance of DR in IS, Hevner et al. (2004) aims to build artifact address organizational problem; evaluate utility of artifacts in

organizational context and communicate relevant design outcomes to professionals and academics. Thus, applying DR with ER approach is significant to trace every context and role of every actor to ensure relevance of DR in IS research. ER is potential in designing IT in organizational context because it provides skills and tools to understand users' needs and preferences (Petersen, Nyce and Lützhöft, 2011). In line, Petersen, Nyce and Lützhöft (2011) assert:

“...[I]t is necessary to build a kind of ethnography that takes the ‘interpretation’ of research findings ... [that is] self-evident and logical”(Petersen, Nyce and Lützhöft, 2011).

Along the line, ER is significant to identify problems in organizational contexts through intervening and interpreting of every phenomenon, event and practice. Consistently, ER traces organizational contexts during designs and redesigns of technology and organization and it derives learning and insights from interventions. Along the line, Sein et al., (2011) forwarded relevance of DR in IS through proposing ADR that aims to build IT artifacts in organizational contexts and evaluate it through organizational interventions. The stages processes and principles are discussed below.

3.3.5 Action Design Research

ADR is a newly developed research method that aims to synergize AR and DR for generating prescriptive design knowledge through building and evaluating ensemble IT artifacts in organizational settings and solving practitioners' problems (Lempinen, Rossi and Tuunainen, 2012; Sein *et al.*, 2011). It requires researcher's involvement in setting problems and designing and implementing and evaluating artifacts. Thus, ADR seeks to design artifact and analyze interactions between technological and organizational dimensions (Gregor and Jones, 2007). Furthermore, ADR emphasizes on organizational intervention and concurrent evaluation equally during designing and evaluating artifacts. Thus, it demands designing and evaluating artifact concurrently as well as tracing the context of on-going use (Sein *et al.*, 2011).

The salient features of ADR are: *firstly*, it focuses on ensemble artifacts, the core of DR but does not go with Stage-gate model; *secondly*, it starts with problem formulation in organizational settings; *thirdly*, it differs with controlled evaluation rather focuses on evaluation in organizational context and concurrent basis with building (designs and redesign) and *finally*, it defines innovations as class of systems typified by ensemble artifacts (Sein *et al.*, 2011). Thus, ADR comprises four inseparable stages: problem formulation, building intervention and evaluation, reflection and learning and formalization of learning.

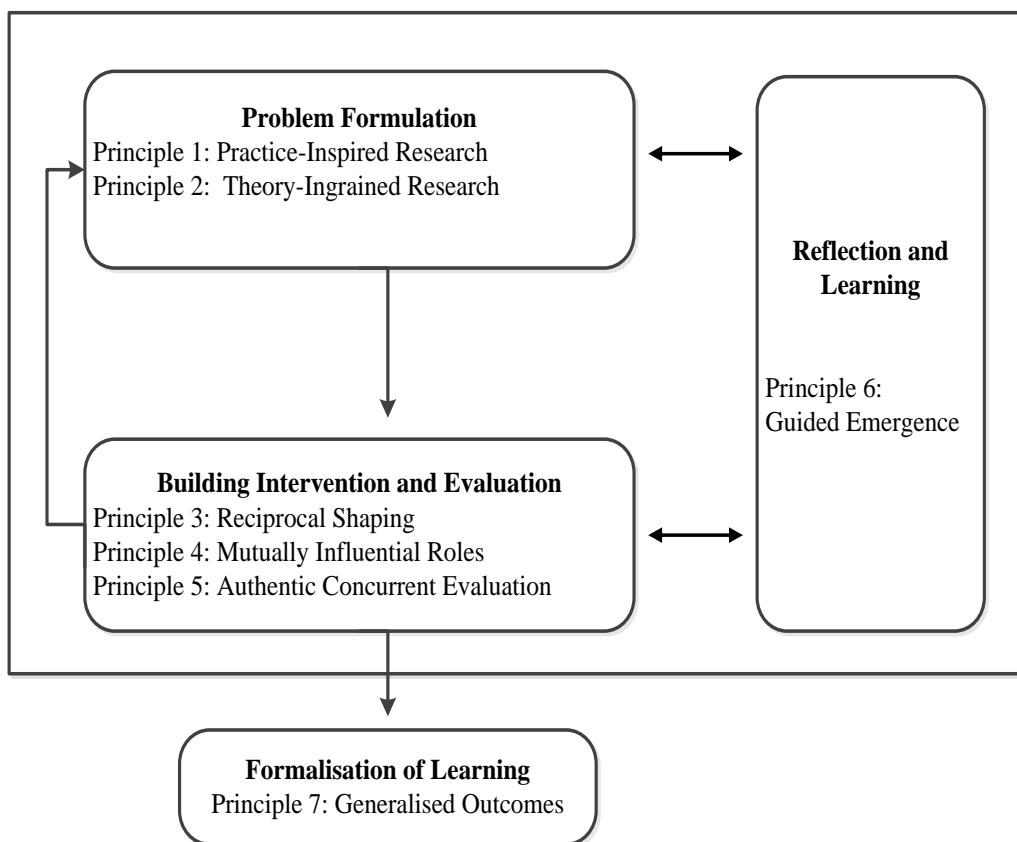


Figure 3-3: Action Design Research

ADR has framed DR in the essence and process of AR to reinforce DR by avoiding separation of sequences in DR and overlapping between AR and DR (Figueiredo and Cunha, 2007). Thus, ADR seeks to bring together design, intervention and evaluation in real life setting along with concurrent and objective evaluation. Consistently, ADR formulate problems in organizational contexts for

addressing empirical problems and/or anticipatory problems. Afterwards, it designs artifacts through organizational interventions and evaluate on-going basis and uncontrolled environment. Therefore, ADR poses significant features for addressing practitioners' problems and contributing to knowledge in the field of technology and organization relation. ADR comprises of four stages: problem formulation, building intervention and evaluation, reflection and learning and formalization of learning. Further, these steps are guided by seven principles (see figure 3-3).

Problem Formulation

ADR formulates problems in organizational contexts drawing from empirical cases, data driven from end-users, existing technologies and/or previous research (Sein *et al.*, 2011). It starts with research opportunities based on existing theories and technologies; involvement and commitment; research questions and setting up roles and responsibilities. Thus, this stage follows two principles: practice-inspired research for contextualizing problems and solving a class problem; and theory-ingrained research - focusing on ensemble artifacts that are informed by theories (Sein *et al.*, 2011).

Building, Intervention and Evaluation (BIE)

This stage iteratively interweaves between three core activities i.e., building artifacts; intervening organizational settings and evaluating concurrently and objectively (Sein *et al.*, 2011). BIE has two distinct streams, IT dominant and organization dominant. Technological innovation requires IT dominant BIE where initially role of practitioner is limited. On the other hand, organization dominant BIE is involved with designing and redesigning of technology and organizational contexts and it emphasizes on innovation through organizational intervention. Consequently, the practitioner and users play a potential role in this stream (Sein *et al.*, 2011). This stage includes three principles: reciprocal shaping between artifact and organizational contexts; mutual learning between researcher and practitioners and applying on-going authentic and concurrent evaluation (Sein *et al.*, 2011).

Conversely, separation between ‘building’ and ‘intervention’ goes with the limitation of ‘stage-gate model’ in sequencing problems to goals in conceptualizations to design for evaluation (Peppers *et al.*, 2007; Walls, Widmeyer and El Sawy, 1992). Thus, Sein *et al.*, (2011) argue that sequencing process between ‘building’ and ‘evaluating’, fails to meet rigorous designing and intervening. Consequently, DR considers innovation and design as its primary goal and secondary goal is intervention and evaluation (Cole *et al.*, 2005). Opposing this view, Sein *et al.*, (2011) argue that concurrent intervention and evaluation is significant in building and evaluating ensemble artifacts to address a class of problems.

Reflection and Learning

Reflection and learning is derived from formulated problems, theoretical premises and emerged solution that contribute to research process and knowledge (Sein *et al.*, 2011). It applies ‘guided emergence’ a principle containing two contrast views ‘guided’ and ‘emergence’. The former implies an external perspective i.e., guided intervention. The latter portrays a sense of organic evolution which can be seen as an insider’s perspective (Sein *et al.*, 2011). Both the perspectives help to trace shapes and reshapes of a designed artifact in an on-going use of technology in organizational context (Garud, Jain and Tuertscher, 2008).

Formalization of Learning

This stage aims to formalize learning through generalizing the ‘situated learning’ (van Aken, 2004). The situated nature of ADR outcomes includes organizational change and implementation of an artifact. Thus, a researcher outlines accomplishments and describes organizational outcomes to formalize learning in this stage. It suggests three levels of outcomes: the problem instance; generalization from solution instances and identification of design principles.

From the above discussion, it appeared that ADR has number of elements from ethnographic perspectives i.e., internal and external perspectives to trace reciprocal roles in designing artifact and identifying learning and reflection from intervention. Further, while applying ADR, it has been found that throughout the

ADR process ER fits well for gathering data and revealing insights. Thus, applying ADR along with ER does not require any extra steps, rather it helps to enhance the ADR process and add potential value to IS research. Further, ER helps to address limitations of ADR. These are discussed below.

3.3.6 Limitations of ADR

Firstly, ADR is ambitious in its goals but it says little to a to achieve them. For instance, ADR focuses on formulating problems in organizational contexts, building IT artifacts through reciprocal shaping, evaluating authentically and objectively and formalizing of learning. All these principles and stages are not well explained how to apply them.

Secondly, ADR failed to recognize tools of across methodologies and disciplines. It has incorporated significant concepts and tools across methodologies and disciplines. Consistently, applying internal and external perspectives in ADR to trace reciprocal shaping of IT artifacts and conducting authentic and subjective interpretive evaluation goes with insider and outsider views that are derived from ethnographic research (ER).

Thirdly, ADR fails to trace mutual dependency and constitutive entanglements in IT and organizational contexts because it bifurcates technology and organization into two streams i.e. technology dominant and organization dominant. While IT artifact is mutually dependent ensemble and constitutively entangled, it is difficult to divide such streams outlined by ADR because technology and organization are inseparable, relational and mutually dependent.

Fourthly, the recent trend of IS research seeks mutual dependency and constitutive entanglements in IT and organizational contexts (Orlikowski and Scott, 2008). This trend equally emphasis material properties of technology and organization. Nonetheless, ADR bifurcates technology and organization into two streams i.e. technology dominant and organization dominant. While IT artifact is mutually dependent ensemble and constitutively entangled, it is difficult to divide such

streams outlined by ADR because technology and organization are inseparable, relational and mutually dependent.

Fifthly, ADR has portrayed significant features of rigorous research methodology to address practitioners' problems and contribute to knowledge. However, it says little to apply its stages and principles. For instance, ADR focuses on formulating problems in organizational contexts, building IT artifacts through reciprocal shaping, evaluating authentically and objectively and formalizing of learning. All these principles and stages are not well explained how to apply them. ADR has successfully identified tasks and steps but said very less how to achieve them.

Sixthly, to build a rigorous methodology and to bridge between DR and AR, ADR has incorporated significant concepts and tools across methodologies and disciplines. For instance, applying internal and external perspectives in ADR to trace reciprocal shaping of IT artifacts and conducting authentic and subjective interpretive evaluation goes with insider and outsider views that are derived from ethnographic research (ER). Thus, acknowledging roots, processes and approaches of ADR showed that already there are ER elements.

Seventhly, ADR seeks authentic and concurrent evaluation (Sein *et al.*, 2011) but it doesn't explain how to achieve it. However, understanding and intervening with organizational contexts can be better understood through participant observation which is an ethnographic tradition. As ADR seeks intervention, applying participant observation in ADR does not require extra stages. Further, applying insider and outsider view of ER approach is significant to conduct objective and subjective and interpretive evaluation.

Finally, ADR evolved from an empirical study conducted in developed countries' context but applying it in developing countries' contexts are challenging where IT is intertwined with underlying organizational and socio-economic contexts. Thus, IS studies in developing countries required applying wide range of tools, techniques and perspectives to unfold hidden reality of social and organizational

contexts (Heeks, 2010; Heeks, 2006). Applying ADR in the case of E-service of land record in Bangladesh, it is appeared that ADR require additional lens to formulate problems in organizational contexts and design and evaluate of the E-service. The researcher argues that ER is a potential complementary lens to ADR. ER is vital to unfold deeper insights of research contexts through applying a basket of tools – seeing problems as insiders’ and outsiders’ views, applying participant observation for long term involvement, conducive to open-ended and ethnographic interviews. Consistently, this study has incorporated ER in the process of ADR. Thus, this study has developed as a methodological framework called ADER through conducting ADR in the process of the ER and illustrated with a case of E-service of land record in Bangladesh.

In line, this study has framed ADR in the process of ER to trace constitutive entanglement of IT and organization in the E-service of land record in Bangladesh. Consistently, the following section has focused on ER elements that are relevant in conducting ADR.

3.3.7 Ethnographic Research Elements in ADR

There are numbers of ER elements that are embedded in the process and principles of ADR. They are: engaging with research context, applying internal and external perspectives to trace reflection and learning and reciprocal role of actors in designing artifact. Further, throughout intervention, designs, redesigns, evaluation and learning and reflection of the ADR, ethnographic engagement, participant observation, dual mode of inquiry and thick description offer significant advantages in identifying problems, designs and redesigns solution, conducting authentic and concurrent evaluation and tracing learning and reflection. Thus, conducting ADR in the processes of ER does not require any extra steps in ADR; rather it enhances ADR processes and adds potential relevance to solve practitioners’ problems. Moreover, applying ER with ADR generates valuable insights and meaningful analyses and interpretations known as ‘thick description’. Consistently, this study identified four interrelated ER

elements: ethnographic engagement, participatory observation, dual modes of inquiry and thick description. These are discussed below.

Ethnographic Engagement

ER applies two types of engagement in research context: interpretive and subjective. The former emphasizes on the social construction of meaning and the latter seeks a researcher's emotional response whereby ethnographic research generates knowledge and contributes to redress problems of research contexts (Kirschner, 1987). Ethnographic engagement in research context provides mediation between interpretivist and subjectivist orientations or empathetic style (Henry, 2012). Further, it leads to richer understanding through facilitating mediation of conceptual divide between meaning and feeling, observer and the observed and drawing on feeling to convey meaning and on meaning to convey feeling (Henry, 2012).

Besides, ethnographic engagement is significant to trace reciprocal involvement. It also seeks intimate involvement with the contexts through building rapport, gaining trust and confidence of participants. Besides, mutual aid, assistance, participation in identifying problems and designing solutions is the building block of ethnographic methodology. Evidently, ethnographic engagement is the root method of involving in research context and engaging through mutually reciprocal relation and identifying learning from research context. Thus, applying ADR with ER offers opportunity to reach to in-depth of a research context, contribute to solve problems and identify learning.

In order to understand an in-depth of organizational context, one must get inside and engage with the actors' world (Rosen, 1991). Nevertheless, there are at least four ways to engage with actors' world and interpretations (Nandhakumar and Jones, 1997). Firstly, understanding actors' behavior and interpretations require knowing the social settings of everyday life and context (Nandhakumar and Jones, 1997; Taylor and Bogdan, 1984). Secondly, actors' interpretations and accounts need to be contextualized with researcher's reality what happens and what should happen in reality (Nandhakumar and Jones, 1997; Taylor and Bogdan, 1984).

Thirdly, no social action and process escape from deliberative secrecy due to the nature of sensitivity (Mitchell, 1991; Goffman, 1990). Consequently, actors may mislead the researcher in deliberated manner due to three grounds: disreputable interests or shameful events; perceived character of defects and collective secrets (van Maanen, 1979). Finally, actors' ability to say is less than they know (Giddens, 1984). Besides, actors may not be able to give account of their actions because they are tacitly aware of them (Nandhakumar and Jones, 1997). Thus, a researcher's engagement is significant to observe actors' response, note their gesture and watch their bodily response, response what's going around them (Goffman, 1990).

Further, Nandhakumar and Jones (1997) argue that an engaged interaction with actors is potential, because it is difficult to sustain deception for a longer period. Besides, actors are not capable of misleading deliberately for long time, as they are limited by culture, custom, natural impulses, habits and longstanding interaction. Further, researcher's repeated experience may provide insight on local meanings, dominant perceptions and tacit knowledge (Nandhakumar and Jones, 1997). Further, researcher's engagement with realize contexts of actors gives insights of the social processes to be observed (Nandhakumar and Jones, 1997).

Thus ethnographic engagement is potential for identifying emerging trend from solutions, artifact, process and technology. In line, ethnographic engagement is potential to AR and ADR because it is useful for setting problems in organizational contexts, interacting with research clients, participants and scientific community. Consequently, ethnographic engagement is useful to address the practitioners' problems and to identify research contribution through generating story, narratives, and rich description known as 'thick description'. Consistently, ethnographic engagement is interrelated with thick description, participant observation and dual modes of inquiry.

Participant Observation

Participant observation is ER a method (Atkinson & Hammersley, 1994). It gains first-hand experience through engaging with context (Goffman, 1990). It is a

method for conscious and systematic sharing of everyday life-activities, occasions and interests insofar as circumstances permit (Kluckhohn, 1940). The basic difference of participant observation and AR is that AR intervenes deliberately with research contexts to bring desirable change while participant observation is significant to generate credible interpretive data in IS research (Prasad, 1997). Nandhakumar and Jones (2002) apply participant observation method to study Executive Information Systems (EIS) in a complex organization and conclude that it gives insights and data for interpretive research in IS.

Dual Modes of Inquiry

Ethnographic research is unique for its dual mode of inquiry i.e., emic (insider or native) and etic (outsider or researcher self) views. In order to understand the inseparability of work, technology and organization, Barley (1996) applied insider view (emic) and outsider view (etic). The insider view depicts context, practices and way of life from perspectives of participants along with concepts of native's worldview. The outsider view relies heavily on the perspective of the researcher, uses theoretical concepts and aims to analyze the context, practices and ways of life theoretically (Barley, 1996). Though applying both the perspectives give rich insights, it is difficult to apply them. Barley (1996) showed it is possible to apply both the perspectives in two ways: one is taking a collaborating role and the other is committed to long term involvement. Further, Schultze (2001) asserts that IS researchers need to closely observe record and engage in the daily life of the people under study and describe details to apply both insider's and outsider's perspectives.

Thick Description

'Thick description' is a powerful technique of ER analyzing data and developing insightful description (Geertz, 1973). Consistently, Greenhill (2004) applies thick description as a methodological approach in IS research for contextualizing practices and find that it is suitable for gathering and analyzing data in a complex context. Applying thick description as technique of data analyses provides a

holistic, careful and accurate exploration and experience of research subjects as they have been observed by researchers (Geertz, 1996). Consistently, thick description gives bigger picture of research subject. It focuses on data analyses rather than involvement in field. Thus, thick description is a potential technique of analyzing and interpreting data, evidence, events, processes and contexts.

Consequently applying thick description enables a researcher to capture a holistic view in organizational contexts and practices. Further, Thick description aims to produce scientific description through face-to-face interaction and long term involvement with social and organizational contexts. Thus, Geertz (1973) advocates that 'thick description' as a writing methodology for describing how people within a culture are interpreting themselves and their own while a researcher needs to incorporate himself in his research account instead of making detached observation. Although 'thick description' is widely discussed and praised, it is difficult to apply without ER processes because it requires researcher engagement, intervention, interaction and immersion in context (Sanday, 1979). Thus, ethnographic engagement, participant observation, dual modes of inquiries and thick description -offers potential to apply ADR to analyze technology and organizational relations, address practitioners' problems and eliciting insights, interpretations, reflection and learning. Along the line, this study argues for ADER as a wider methodology through conducting ADR in the processes of ER.

Complementarities between ADR and ER

ADR aims to intervene in the organizational contexts – Ethnographic Engagement and Participant Observation. In line, ethnographic engagement and participant observation are potentials to conduct effective intervention in the organizational contexts along with designs and redesigns. Besides, ADR seeks authentic and concurrent evaluation- Dual Modes of Inquiry. In line, applying insider and outsider views of ethnographic research is significant to conduct objective and subjective and interpretive evaluation. Further, ADR aims to outline learning and reflection for practitioners and discipline –Thick Description. Thick description is

an important ethnographic tool that help to outline important learning and reflection from intervention because it does not leave any event as unanswered.

3.3.8 Action Design Ethnographic Research

The principles and processes of ADR are closely connected with the tools, techniques and methods of ER. In line, this study has conducted ADR in the process of ER and thereby it has framed ADER as a distinct and broader methodology.

The researcher finds Evered and Luis's (1981) framework for organizational research offers potentials for conducting ADR in the process of ER and building ADER as a broader methodological framework. Evered and Luis (1981) provides a detailed discussion on applying insider and outsider inquiry along with researcher's engagement with the context, applying numbers of methods and identifying learning and reflection (figure: 3-3). They outline that applying both the views are complementarities to one another and help to elicit insights of organizational contexts. The outsider view generates research data from quantitative data, questionnaires and researchers', unobtrusive observation and empirical observation. Research data can be generated by being within and becoming immersed in the organizational activities through participant observation and playing a role of organizational actor. Furthermore, ethnographic perspective brings together both the world of interpretation (interpretive approach) and the world of scientific theory (positivist approach) through applying a basket of tools and lens (Lee, 1991). Thus, this study has been used ADER as a methodological framework that showed below (figure 3-4) how ADR fits in the process of ER.

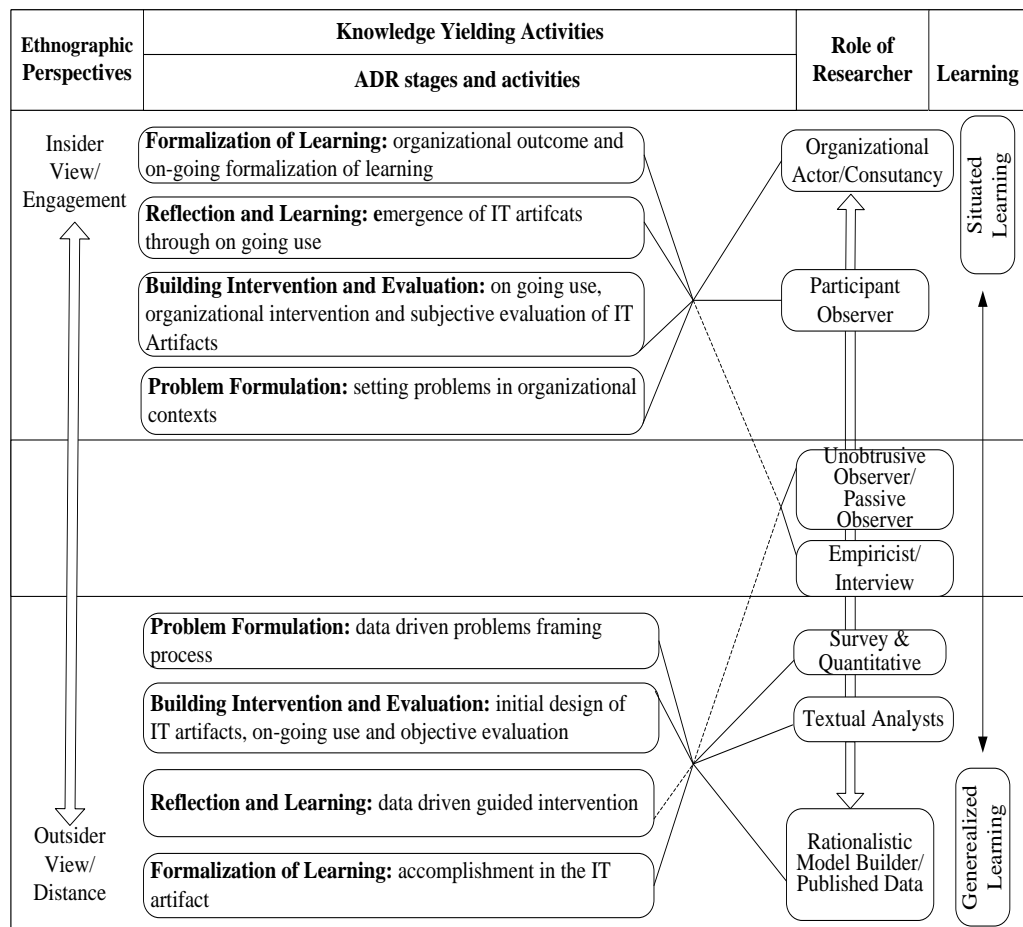


Figure 3-4: Action Design Ethnographic Research Process

Problem Formulation: Organizational Contexts and Anticipation

The insider view focuses on organizational contexts that comprise whole complex fabric of local culture, people, resources, earlier events and future expectations within the purview of time, space and situation (Evered and Louis, 1981). This view conveys that fact without context has no meaning. Further, Geertz’s (1973) ‘thick description’ unfolds multiple layers of meaning held by members and practices of organization (Nilsson, 2000). Evidently, insider view discovers underlying meanings of organizational contexts that are expressed through actions and artifacts (Prasad, 1997). Thus, applying insider view enhances in setting context driven problem.

The outsider view applies to ‘looking on’ in the sense of witnessing and examining processes and contexts externally from a researcher’s eye to produce logical meaning and measurement (Evered and Louis, 1981). Consequently, this view allows that researcher to frame data driven problems. Similarly, ADR formulates data driven problems, too, because it follows a cyclical process between problem formulation to evaluation and learning stages (Sein *et al.*, 2011).

ADR starts with formulating problems from organizational contexts and initial design of artifacts. Afterward on-going use and organizational intervention reshape artifacts which generate empirical and logical data through on-going evaluation. Thus ADR follows a process of ‘system development life cycle’ as an iterative process in the manner of problem-fix-problem-fix (Mantei and Teorey, 1989). Consequently, applying ER with ADR in problems formulation stage is significant to identify problems emerged from organizational contexts and driven from data and empirical evidence.

BIE: Initial Design, On-going Use and Objective Evaluation

Reciprocal shaping of designing constructs and understanding of organizational contexts with an iterative interpretation; bringing together researcher knowledge of theory and knowledge of the organizational actors and conducting evaluation concurrently and authentically (we refer as objective and subjective.) are three principles of BIE (Sein *et al.*, 2011). However, to apply these principles in designs, redesigns and evaluation require applying close observation, involvement, interpretation and intervention on the one hand and on the other, researcher’s theory of knowledge and existing technologies and resources.

Consistently, ER offers participant observation and the role of organizational actor (researcher engagement through researcher-client agreement) allow to apply the insider view in organizational research and enable researcher to understand multifaceted interactions among work, organization and IT artifacts (Trauth, 2001; Trauth and Jessup, 2000). Further, participant observation is significant in information system design, implementation and use, because it seems nothing to be surprising (Nandhakumar and Jones, 2002). Besides, it seeks meaning of every

phenomenon, event and observation; what do those *mean* and *why* (Kelly and Gibbons, 2008). Thus, applying insider view, engagement with context, participant observation reveal meaningful insights and interpretations from iterative relations between organizational contexts and designed artifact. Further, interpretations help to understand reciprocal shape to the designed artifact through designs and redesigns.

Besides, the insider view is enable to bring forth ‘live experience’ of the research context because researchers live in the situation and understand behavior, attitudes, practices and roles of concerned actors and organization (Howcroft and McDonald, 2004). It is noteworthy that participant observation in ER goes beyond being simple participant observers; rather it helps to change agents supporting local transformation (Barab *et al.*, 2004). Thus, applying ethnographic engagement, insider view and participant observation enhances mutually influential roles between researcher’s knowledge and skills and actors’ knowledge and practices. Consistently, Sim (1999) notes that ER has potential in order to design artifacts and redesign them through contextualizing organizational practices.

Distinctly ADR seeks ‘evaluation’ is inseparable in building design constructs and interventions rather; it is iteratively connected between design constructs and interventions. Consistently, ER offers to conduct on-going and both objective and subjective evaluation through applying dual mode inquiry. However, a researcher’s involvement in organizational context hinders objective evaluation and emerges conflict of interests (Davison, 2001). To overcome this problem, ER’s dual modes of inquiry is valuable. Consequently, Checkland and Howell (2007) suggest that researcher needs to be aware of her or his dual role in evaluation i.e., one is the role of ‘researcher’ and the other is the role of ‘participant’. Thus, in order to identify learning and reflection from designs and redesigns and conducting objective and subjective evaluation, the dual mode of inquiry is valuable.

Besides, insider view provides insights from evaluation of technology in organizational contexts (Nedevschi *et al.*, 2006). It does not leave actions as: being absurd, peculiar, pointless, irrational, surprising or confusing; rather it finds their existing meanings laying in the local context and culture (Lee, 1991). So applying insider view gives opportunity to conduct a critical evaluation of IT artifacts in organizational contexts. We refer to it as interpretive subjective evaluation; subjective does not mean here bias, rather it aims to seek contextual meanings and examine how meanings interact with IT artifacts. Thus, ER identifies reflection and learning during evaluation through tracing the actor's views and experience.

Conversely, outsider view gives opportunity to conduct a context free and objective evaluation and it allows researcher to filter on-going activities as well as learning through his or her preset categories, codings that derive factual data and results as an objective evaluation (Evered and Louis, 1981). Though ADR is a highly situated nature of research, it seeks to generalise learning as an outcome of it.

The focus of ER has been shifted over the period from savage to primitive to subject to native to informant to interlocutor to ultimately co-author (van Maanen, 2006). Thus, inventive ways of doing include various focuses and roles of ER e.g., empirical witnessing through seeing, hearing, and experiencing in a social settings (van Maanen, 2006). Thereby, ER offers significant lens for on-going designs and redesigns and objective and subjective evaluation of IT and organizational processes.

Reflection and Learning: Tracing Emergence and Guided Intervention

Emergence refers to evolutionary and developmental process as individual skills and communities of practice that may change relationships, purposes and questions (Reason, 2004; Reason and Bradbury, 2001). Thus, it reveals new insights, capacities, skills and practices of participants. ADR itself recognizes that understanding emerging IT artifacts through on-going use requires internal perspective. Besides, researchers' guided intervention for redesigning emerging

artifacts requires external perspective (Sein *et al.*, 2011). Organizational contexts, practices and role of users reshape initial design of IT artifacts and from outsider view i.e., statistical analyses, questionnaire and interviews. It is difficult to trace emerging shape of artifacts without close observation. Further, designs and redesigns of emerging artifacts require guided intervention required outsider views to apply logic, model and theory. Consequently, insider and outsider views of ER enhance learning and reflection

Formalization of Learning

ER approaches are significant to bridge gap between academics and practitioners through generating valuable learning and contributing to knowledge (Myers, 1999; Harvey and Myers, 1995). In line, Nilsson (2000) argues that combining ER with AR is beneficial to organizational development and contribution to knowledge. Thus, ER provides insightful analyses that are communicable and predictable like a product of linguist's that according to rules someone can learn a foreign language (Sanday, 1979). Identifying organizational outcome through formalization of learning is situated. Consequently, formalization of learning required bringing the learning and reflection in organizational practice. To this end, insider view, participant observation and engagement with context offer potentials to identify outcome and formalized them among practitioners. Further, applying outsider view aims to transmit contextual learning into generalized learning that could be applicable to the similar contexts (Evered and Louis, 1981). Consistently, applying outsider view develops rationalistic model that generates generalized design principles from situational learning and outline accomplishment from BIE. Thus the ER processes and approaches are very much relevant and enablers for conducting ADR. Therefore, this study has framed ADER as a methodology (figure 4-5).

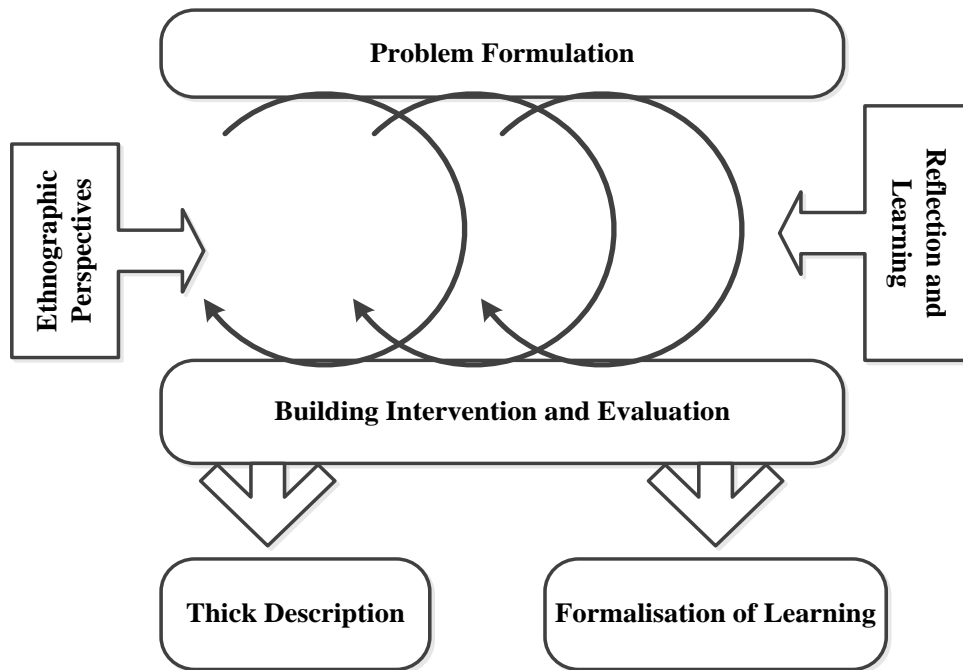


Figure 3-5: Action Design Research Framework

Thick Description

ER approaches offer potential complementarities throughout stages and activities of ADR (figure 3-5). They allow formulation of problems and design artifacts in multiple cycles; evaluate on-going use of artifact from different positions and identifying and transferring learning. More importantly, ER offers multiple iterative between problem formulation and BIE and it generates significant insights and detailed findings. Thus, applying ADR with ER develops insightful interpretive description that can be termed as thick description that aims to describe social events, behaviors, institutions, processes and context intelligibly (Geertz, 1973). Consistently, ‘thick description’ unfolds multiple layers of meaning held by the members and practices of the organization (Nilsson, 2000). Thus, thick description is significant to contribute to knowledge through eliciting underlying contexts, interpretations, reflections and learning.

Thick description is also potential in DR (Carlsson *et al.*, 2011; van Aken, 2005). In the case ADR from problem formulation to formalization of learning, thick description helps interpreting particular contexts and situation. Besides, it generates findings for practitioners and contributes to knowledge through interpreting findings with theoretical contexts. Consequently, ER provides potential value in every stage of ADR. Notably thick description aims to contribute to knowledge through providing detailed analysis of ADR findings. Although ER and thick description belong to the same impetus, applying thick description as technique of data analyses provides a holistic, careful and accurate exploration and experiences of the research subjects as they have been observed by researcher (Geertz, 1996). Further, thick description provides bigger picture of research subject and it focuses on data analyses interpretations, insights, meanings from problem formulation, BIE, learning and reflections. Thus, thick description is a potential approach to identify learning and reflection.

While ER seeks a holistic view to capture social and cultural practices; thick description aims to produce scientific description through face-to-face interaction and long term involvement with social and organizational contexts that aims to capture people's cultural beliefs within the social sciences. As Geertz (1973) applies 'thick description' as a writing methodology for describing how the people within a culture are interpreting themselves and their own simultaneously a researcher needs to incorporate himself in the ethnographic account instead of making detached observation.

Further, thick description generates multiple layers of interpretation through applying insider and outsider views. ER seeks to understand the multiplicity of complex structures which are super imposed, knotted, strange, irregular and inexplicit through building rapport with the participants, conducting in-depth interviews with key informants, mapping fields, keeping a personal diary and a basket of other techniques. Thus, thick description brought interpretive, analytical and reflective, confessional and critical analyses.

Consequently, developing thick description requires researcher's long term involvement, intervention and the first-hand experience of a particular context. Thus, conducting ADR in the ER process provides potential opportunity to develop thick description. In line, ER gives opportunity to develop analytical, interpretive, reflexive, confessional accounts, multiple layers of explanation and critical analyses known as thick description. Therefore, this study has framed ADER as a potential methodological framework through conducting ADR in the processes of ER illustrating with a case of E-service of land record in Bangladesh.

3.4 Integration, Complementarism and Triangulation in ADER

3.4.1 Significant and Nature of Complementarism in IS Research

Inherently, IS research is multidisciplinary in nature; it employs business administration, management, development studies, governance, computer science, informatics, sociology, anthropology and psychology to develop, deploy and use of information systems and technology in organizations (Niehaves *et al.*, 2004; Wade and Hulland, 2004; Fitzgerald and Howcroft, 1998). Although in the past there was resistance of using pluralism in epistemological strand and methodology, number of recent IS research advocated for methodological pluralism (Mingers, 2001; Falconer and Mackay, 1999; 1996; e.g. see Lee, 1991). In line, Landry and Banville(1992) outlines three forms of pluralism as: *loose pluralism* – holding variety of paradigms and methods without specifying them how and when they are used; *complementarism* –paradigms having internal consistency in various assumptions in the context of use and apparently appropriate for a particular research situation, and *strong pluralism* – contributing to each other between a range of methods with a view to understanding complex contexts.

Besides, IS research is not a discrete or singular event, rather it contains a number of processes and phases and they pose number of tasks and relations with each other while combining a range of approaches desirable for better result in a research (Mingers, 2001). Thus, recent trend of qualitative IS research seeks integration in different epistemological strands, theoretical traditions and range of methodologies and methods (Frost *et al.*, 2010).

Further, organizational contexts and respondents' worlds are stratified into different layers. Thus, a wider and pluralist methodology helps understanding the different layers of their worlds and organizational contexts. In line, Lee (2001) argues that seeing the world from a particular paradigm can give a limited view of a particular research situation, for instance, a telescope, an X-ray machine or an electronic microscope, each of the instruments reveals only a certain aspect of an object. Thus, applying wide range of methods provides in-depth understanding of a complex context.

Along the line, 'integration', 'triangulation' and 'complementarism' are widely used to apply pluralistic paradigms, methodologies and methods. They are often employed interchangeably or synonymously but each of the concepts has its own locus. Triangulation is an epistemological claim that seeks to apply together two or more methods in a study to analyze a phenomenon from various points of view to increase reliability and research outcomes (Moran-Ellis *et al.*, 2006). Consistently, triangulation seeks to understand the social world from different lens and generate essential data for robust explanation.

On the other hand, integration seeks to bring methods through identifying their focus, weight and epistemological orientation. Thus, it is significant to operationalize multiple methods in research context. Consistently, Pawson (1995) and Coxon (2005) argue that it is essential to integrate methods at the outset and need to remain integrated in the process of data analysis and interpretation. To do so, it is important to be consistent to theoretical lens from methodological framework and data collection and analysis. Moreover, complementarism also helps in theoretical interpretations to build coherent. They are: design oriented

action research, grounded action research and network action research. In line, design research is seeking complementarism to action research to build artifact in organizational contexts and evaluate relevance of artifact in organizational context. Consistently, ADR emerged from AR and DR. Further, DR is moving toward ethnographic trend as design ethnography. Similarly, AR is also moving toward participatory action research through applying ethnographic approach. Evidently, ADR requires applying ethnographic approaches to frame artifact in organizational context. Along the line, this study applies ADR in the process of ER and has framed ADER as broader methodology. Therefore, ADER seeks integration, complementarism and triangulation from AR, DR, ER and ADR and they have been discussed below.

3.4.2 Integration in ADER

AR process attempts to develop and justify theories for explaining or predicting organizational and human phenomena that involve analysis, design, implementation, management and use of information systems. Contrary to this, DR aims to innovate artifacts that define ideas, practices, technical capabilities and products and aims to analyze design, implementation, management and use of information systems effectively and efficiently. However, artifact is emerged from its application, testing, modification and extension through experience of creativity, intuition and problem solving capabilities of researcher (Hevner *et al.*, 2004; Markus, Majchrzak and Gasser, 2002; Walls, Widmeyer and El Sawy, 1992). Thus, artifacts are designed through DR driven research but it needs to build bridges to the theoretical bodies of ‘action ability’ with the view of attaining relevance (Jarzabkowski and Wilson, 2006).

In a similar vein, Fendt and Kainska-Labbe (2011) argue that design driven AR enhances creativity, facilitate change and reduce relevance gap. Thus, there have emerged trends of paradigmatic integration; complementarism and triangulation between AR and DR. Consistent with these, Sein et al. (2011) have forwarded integration between AR and DR through building ADR. It has also integrated

epistemological grounds between positivism (incorporating initial design of artifacts in 'Building, Intervention and Evaluation' stage of ADR) and interpretive (adding problem formulation in organizational context as a stage in ADR – for contextualizing artifacts in organizational settings).

Along the line, ADER seeks integration between ADR and ER through incorporating engagement with research context and participant observation for problem formulation and BIE. Besides, ADER has incorporated dual modes of inquiry and participant observation in the process of ADR to trace mutually reciprocal processes between the researched context and designed artifacts or processes. Further, applying insider and outsider views in ADR has enhanced concurrent and objective-subjective evaluation; generate essential learning and reflection and finally ADER of this study has developed valuable and insightful description. Consistently, ADER has forwarded one step further through integrating ADR with ER.

3.4.3 Complementarism in ADER

Prior to ADR, researchers suggest incorporating the whole DR into AR processes as a dialogical AR (Davison *et al.*, 2004). Other researchers suggest that DR needs to be conducted separately and after designing artifact through DR and AR needs to be conducted separately for evaluating the designed artifacts (Iivari, 2007; Cole *et al.*, 2005). However, these were inconvenient for IS researchers and practitioners due to limitation of time and resources. Further, same researcher may not be involved in AR and DR process. Consequently, outcomes may be varied from DR and reflections and learning may be varied from AR. Furthermore, there may be time and context gap between developing artifact through DR and applying it by AR. Thus, through setting complementarism in DR and AR, ADR has avoided dialogical, overlapping and loose integration in AR and DR.

Thus, ADR seeks complementarism from AR to formulate problems in organizational contexts, build artifacts, and intervene in technological and organizational processes, along with conducting concurrent and authentic

evaluation and identifying learning and reflection. Further, AR seeks to build theory while often social theories have limitation in the case of IS research to analyze technology and organizational contexts. Consequently, conducting AR along with designs and redesigns of artifacts in the organizational contexts find more relevance in IS research and contributes to building theories. Thus, this complementarism avoid conducting AR and DR separately in a IS research project.

Further, since organizational contexts inscribe development and use of artifact that bring intended and unintended consequences in organization (Sein *et al.*, 2011; Orlikowski, 1992). Consistently, this study seeks insider and outsider views as a complementarism from ER to enhance ADR. Thus, complementarism between ADR and ER offers to trace designs and redesigns and to trace emerging shapes and reshapes of artifact (Gregor and Jones, 2007). Consistently, ADER seeks complementarism from ER approaches.

3.4.4 Triangulation in ADER

Interpretive analysis does not assume to be the specific methodological prescriptions and it believes that no data is objective fact but as products of respondent's interpretations of their situation (Nandhakumar and Jones, 1997). In this regard, Walsham (1995) advocated for triangulating interpretive research with 'thick description' an ethnographic of revealing insights and interpreting facts and contexts.

In line ADR's two significant stages - 'Building intervention and evaluation (BIE)' and 'critical reflection and learning' - seek triangulation between positivist and interpretive epistemologies. During BIE, initial design is done by researcher and it applies positivist epistemology. Conversely, tracing processes of shaping and reshaping of a designed artifact in organizational contexts and practices as well as mutual interaction between practitioners and researcher requires interpretive lens. Similarly, ADR applies critical reflection and learning, a stage which corresponds to the first two stages: problem formulation and BIE through

guided emergence. Guided emergence view of ADR applies both positivist and interpretive approaches.

Further, both positivist and interpretive paradigms are fitted with ‘authentic and concurrent evaluation’ principle where researcher needs to employ outsider view from positivistic paradigm and insider view from interpretive paradigm. Authentic and concurrent evaluation gives opportunity to trace designs and redesigns of artifacts or redesigning process and strategies.

Finally, IS research domain includes people, organization and technology and bringing together behavioral science and design science, two complimentary and distinct paradigms. Besides, multi-disciplinary and applied nature of IS research seeks insights to understand the role of technological and social environments and their multifaceted interface. Consistently, ADER seeks to bring forth reality of a complex situation of a research through triangulation, integration and complementarism.

3.5 Conclusion

This chapter has identified a wider methodological framework -ADER through charting research paradigms and methodological trends. It has identified complementarities, integration and triangulation in AR, DR, ADR and ER. In line, this study argued that ADER as a methodology through conducting ADR in the process of ER. Consistently, it has been traced that ER approaches -ethnographic engagement, participant observation, insider and outsider views and thick description -offer significant complementarities to ADR. Besides, the processes and principles of ADR allow cohabitation with ER. Thus, through applying ER approaches, this study this study has made ADR more comprehensible for researchers and practitioners, enhanced ADR processes and generated valuable insights i.e. ethnographic thick description. In line, this study has framed a wider methodology called action design ethnographic research (ADER) through applying ADR with ethnographic approaches and methods. Consequently, this

study has identified significance and relevance of ADER as a methodological framework in IS research (Alam, Brooks and Abbott, 2012; Alam, Brooks and Khan, 2012).

Since the context of this research was complex, it demands a wider methodology. Consistently, initially ADR was found as suitable methodology. However, whilst conducting ADR, the study faced difficulty to trace reasons of failure to the E-service of land record in Bangladesh. Consequently, the researcher has identified that ER approaches offer potential lens to elicit underlying organizational and technological contexts and networks. In line, ethnographic engagement, participant observation, dual mode of inquiry with insider and outsider views and thick description offered significant to capture problems in the organizational contexts, roles of actors including staff, citizens, land record and technology and to participate in the organizational context through participant observation, playing role of organizational actor, building rapport, applying storytelling and life history techniques. Besides, outsider view of ER helped to build rationalistic model, achievable process and networks based on the practices, contexts and capacities of the organization, citizens and the E-service in all the stages of ADR.

Therefore, applying ADR in the processes of ER provides advantages that are summarized below. **Firstly:** ER provides advantage of reducing cycles between problematisation and implementation. For instance, AR researchers need to go through five cycles: problem diagnosis – action planning- action taking- implementation – evaluation whereas ADER framework provides iterative between problem formulation and action planning- action taking- implementation – evaluation through ‘Building Intervention and Evaluation’ together. **Secondly:** ADER provides concurrent and authentic evaluation through ethnographic mode of inquiry and critical reflection of the researcher. **Thirdly,** concurrent evaluation provides opportunity to redesign artifacts. Therefore, ER can be placed throughout ADR process instead of building any extra stage and ethnographic perspectives show potential complementary with every stages and processes of ADR. Thus, this study seeks a methodological framework of ADER through applying ADR in the process of ER.

Therefore, ADER as a methodological framework has been developed and applied aiming to study the E-service of land record in Bangladesh in a complex and heterogeneous organizational context, a public sector organization in a developing country along with wide ranges of methods, approaches, techniques and tools. Along the line the following chapter has briefly discussed methods and approaches that have been applied for data collection and analyses.

Chapter 4: Research Methods and Approaches

4.1 Introduction

Research methods and approaches play pivotal role in eliciting underlying meanings and contexts from a research setting. How individuals, phenomena, objects or things are viewed; is determined by research methods and approaches (Taylor and Bogdan, 1984). Consistent with these, researchers need to be aware of using suitable research methods and approaches. Further, Burton-Jones (2009) cogently asserts that IS researchers need to be cautious of method bias, because it can lead a researcher to a false conclusion. Consequently, appropriate selection and use of research methods play vital role to ensure rigor and relevance in IS research (Benbasat and Zmud, 1999). This chapter provided a brief discussion on relevant methods and approaches that have been applied for data collection throughout the fieldwork and intervention processes of this research.

IS research applies a wide range of research methods from uncontrolled interventional techniques to controlled observational techniques aiming to analyze intra-actional and constitutive relations in technology and organization. However, choice and application of research methods and approaches depend on research methodology and research contexts. Thus, research methods and approaches for any study need to be coherent with research questions, methodology, theoretical framework and paradigm of that research (Mingers, 2001).

This study has applied relevant research methods and approaches for data collection to capture complex organizational and technological contexts of the E-service of land records in Bangladesh. Additionally, the research was conducted in complex organizational contexts and carried with researcher client agreement and interventional process. It applied wide range of methods, techniques and tools

that deal with a complex organizational context along with qualitative responses. Consistent with the nature and process of this research mainly qualitative methods and approaches were applied. These were observation, participant observation, ethnographic interviews, documents analysis and focus group discussions. These are discussed below.

4.2 Research Methods

Research methods bring forth tentative 'facts' or 'answers' to the research questions that a researcher poses to a research context or researched people (Palys, 1997). A research method comprises tools and techniques for data collection. It refers to a set of instruments for provoking a response from empirical world. Broadly, research methods can be seen into two categories: qualitative and quantitative. Although both the methods are useful and effective; everyone has some advantages and disadvantages. Particularly, quantitative method is effective in large scale research where responses can be easily accessible and quantifiable but it is incapable to elicit underlying contexts and narrate complex phenomena. Thus, quantitative responses suffer from reliability and accessibility.

Moreover, quantitative methods give responses without background of respondents and it does not require researcher's involvement with context. Since the organizational context of this research is very complex and dynamic; it is difficult to rely on and get insights through applying quantitative methods. Thus, qualitative methods are suitable for complex organizational context and offer potential lens to analyze complex organizational processes and the E-service networks in complex organizational contexts. Further, it is significant to uncover underlying contexts. Along the line, this study aimed to apply qualitative research methods. However, there are two major limitations in qualitative research methods: firstly, uncertainty of information, and secondly, complex interaction among variables (Nedevschi *et al.*, 2006).

Keeping these limitations in view, the study applied qualitative research methods. Consistent with, the methodology of this research is ADER, a broader, interactive and interventional methodological framework along with a wide range of

methods and approaches were applied (Laurence and Alam, 2014; Alam, Brooks and Khan, 2012). Aiming to understand the complex and dynamic of the E-service, ADER applies a number of steps and principles – problems formulation, building intervention and evaluation, learning and reflection and formalization of learning – along with ethnographic methods: insider and outsider views and participant observation (Laurence and Alam, 2014; Sein *et al.*, 2011).

Consequently, ADER comprises multidisciplinary and multilevel methods and approaches that are significant to conceptualize research problems and research design in IS research (Holland, 2003). Further, it seeks to unveil detail and precise understanding of complex relationships in technology and organization. Consistent with these, ADER accommodated considerable number of methods and approaches, such as, observation, participant observation, ethnographic techniques and case study (Laurence and Alam, 2014; Alam, Brooks and Khan, 2012). In line, participant observation is inextricably connected with ethnography (Nandhakumar and Jones, 2002; Atkinson and Hammersley, 1994). Thus, ethnographic method and participant observation method complement to each other. Moreover, ethnographic method does not limit any approach to gather data (Barley, 1996).

Thus, this study applied ADER with long term involvement and commitments with the research contexts and clients. Along the line, this study applied significant number of research methods including archival methods, participant observation, focus group discussion, open ended discussion and semi-structured interview, key informant interview and questionnaire survey among service providers, service delivery staff, citizens, organizational registers, land records, E-service networks and actors of the vested interest networks. These are discussed below.

4.2.1 Archival Method

Archival method is an unobtrusive strategy for data collection. ADR and ER can also be conducted without intervening in the research subject because archival

materials are non-reactive to researchers. Archival records are divided into two categories: one is public archival records and the other is private archival records (Denzin, 1978). Although public archive has open access, it is not always easy to access into public archives. Public archive records include library archives, hospital admittance records, motor vehicle registries, arrest records, land survey records and registers and documents in public organization.

The E-service of land record in Bangladesh deals with issuing attested copy of land records from preserved archive at the District Record Room (DRR). The E-service is guided by laws and regulations. Besides, citizens' applications for this service and the official registers are also potential archival documents. In order to understand the nature and processes of the E-service of land record, archival method was significant to analyze archived land record and legal statutes and regulations. Besides, public applications, documents, stamps (fees), office registers, notices and circulars are important sources of data of the study. In the case of the E-service of land record in Bangladesh, legal Acts, rules, regulations have remained unchanged while country wide IT applications and networks have been designed. Analyses of these legal statutes and rules showed how the E-service is entangled and disentangled with the different actors, processes and contexts of the E-service of land record.

Along the line, it is appeared that, office registers, Act, rules, circulars, notices, and citizens' applications processes were remained entangled with traditional processes. Thus, analyses of these documents provide significant evidence of identifying manipulation of service processes, vested interest networks, intra-actions in service providing staff and middlemen and intra-actions in the E-service networks and the middlemen networks.

4.2.2 Observation and Participant Observation Methods

Simple observation is an empirical technique that involves looking for a purpose and gathering relevant data for analysis. Observation follows some structured process e.g. every observation needs specific observation duration, place, people

and situation (Palys, 1997). However, participant observation is less structured but it is important to gain insights and to have real reflection from a research context.

There are four significant grounds for using participant observation method to grasp real life settings, underlying contexts and detailed accounts. *Firstly*, for a researcher, it is difficult to understand actors' behavior and interpretations without their social settings of everyday life and contexts (Nandhakumar and Jones, 1997; Taylor and Bogdan, 1984). *Secondly*, actors' interpretations and accounts may be distorted by the influence of dominant perceptions while a researcher needs to contextualize what happens and what should happen (Nandhakumar and Jones, 1997; Taylor and Bogdan, 1984). *Thirdly*, no social action and process escape from deliberative secrecy on the nature of sensitivity (Goffman, 1990). In this regard, van Maanen (1979) notes that actors may mislead a researcher in a deliberated manner while an actor described a disreputable interests or shameful events; perceived character of defects and collective secrets. *Finally*, actors' ability to say is less than they know because actors may not be able to give account of their actions due to lack of trust (Nandhakumar and Jones, 2002). Thus, participant observation method is potential method to overcome these are main four challenges in a research context.

Moreover, participant observation method advocates for studying people in their virgin environment. A researcher needs to go to the habitation of people and stay in research contexts for a long period and build rapport with research participants so that their way of life and natural and virgin behavior may be perfectly revealed by him. Consequently, participant observation method converts researcher from a stranger to a member or actor of the context.

So, this study has applied participant observation method as a key research method to intervene in the contexts and unearth the underlying processes and networks of the E-service. In line, participant observation has been applied as a core research method of this study through taking part in designing and redesigning organizational processes and structure and the E-service processes and networks that involved with intervention too. In order to capture a holistic picture of the E-service, participant observation played vital role.

Further, participant observation method is powerful to capture diverse responses from wide range of respondents along with variation of time, contexts, place and space. So without participant observation, alone observation is incapable to reach into deeper insights. Thus, the researcher applied participant observation as a main method and strategy for data collection and intervention. Further, participant observation is a very wide method and it is inextricably connected with ethnographic method. So, the researcher applied participant observation method along with ethnographic method and approaches.

4.2.3 Ethnographic Approaches

Ethnographic methods and approaches provide an in-depth understanding of everyday use of technology in organizational contexts and they are valuable in improving processes, designs and methods of use (Sharp, deSouza and Dittrich, 2010). Thus, ethnographic methods and approaches are well suited in IS research to elicit insights from human, social and organizational contexts of information systems. Consistently, Star (1999) asserts that ethnographic approaches offer potential knowledge and tools design and evaluate of information systems in the process of collaborative and co-produced work.

Evidently, ethnographic methods and approaches are essential in AR, DR and ADR. It also brings out thick description as an end product which is vital for analyzing and presenting results of an interpretive and interventional research, such as, AR, DR, ADR and ADER. Along the line, Järvinen (2007) cogently shows that ethnographic methods play significant role in AR through conducting collaborative and interventional research to analyze relationship between researcher and organizational contexts. Consistently, ethnographic methods are not only helpful but also produce insights into system design in organizational and technological contexts (Bentley *et al.*, 1992).

Without participation and intervention in the context, neither action nor design can be done. Thus, AR itself has been moving toward participatory oriented research and its emerging trend is participatory action research that relies on

ethnographic techniques as well as participant observation tools (Chee-Wee Tan, Benbasat and Cenfetelli, 2013). In addition, participant observation is a built in process in ethnographic methods. Remarkably, they are significant for interpretive research in IS.

Ethnographic methods are very wide and they belong to both the areas of science and arts. They enable a researcher to detect problems prescribe solutions. Besides, ethnographic observation is essential to reveal deeper and wider contexts of organizational processes and everyday practices. Thus, it seeks to apply ‘native’ (emic) view to understand practitioners’ problem from their point of view. Evidently, ethnographic methods rely on key informants interviews, observations, oral history, focus group discussions, case study and life history. Consequently, applying ethnographic methods require ability of listening and learning along with sharp reading in the field on what is going on.

For instance, day to day discussions and conversations with the respondents are nothing but ethnographic interviews. In formal interviews, surveys and questionnaires are also ethnographic tools. However, ethnographic approaches seek longer interviews, in-depth questions and probing for facilitating closer interaction and review of points. Notably, informants also have been allowed to put questions for clarification of what researcher needs to know. Moreover, ethnographic approach is also to find views and opinions of people under study. Thus, it does not depend on numerical analysis; rather it explores taxonomic categories of people, process, event, materials, networks and phenomenon as identified by the informants.

Thus, ethnographic methods include wide range tools, techniques and approaches. Keeping consistency with the methodology - ADER, this study applies ethnographic methods along with relevant techniques and approaches to trace dynamic networks, processes, intra-actions and entanglements in the E-service and the organizational process.

4.2.4 Semi-structured Interview

Simply, interview refers to both asking question and listening respondent's answers carefully. Qualitative interview consists of wide varieties of interview from the point of view of flexibility of question structure and flexibility of respondent's responses. Consistent with these, interviews can be categorized into three: structured, semi-structured and open-ended. Amongst these, semi-structured interview gives equal flexibility to a researcher for asking questions to respondents and respondents enjoys flexibility to speak on his or her responses. Thus, it is a mutually interactive interview technique. It goes with most of the qualitative research to explore any complex context.

In line, this study conducted semi-structured interview as a great aid to the research. Informal sittings with the informants helped in establishing a kind of intimacy which in turn helped to encourage discussion. Throughout, semi-structured interview the subject matter of discussion was to be memorized and as soon as possible was noted down after the interview. In some cases, the data so collected were abandoned. In some cases two or three semi-structured interviews with the same person was arranged to achieve reliable information and validated gathered information.

4.2.5 Key Informant Interview

Key informant refers to the person with whom an in-depth interview can be conducted on a particular issue as a knowledgeable informant (Trobia, 2008). It includes selected knowledgeable participants who have been interviewed as key informants to verify and cross check of data gathered from all other methods and sources. Thus, key informant technique helped the researcher increasing data quality and reliability.

Key informant interview technique is significant for assessing problems, intervening through designs and redesigns and evaluating and interpreting of intervention's result. In line, this study applied key informant technique to identify problems, designs and redesigns and evaluate the E-service of land

record. Particularly, key informants have been selected from experienced staff, middlemen and UDCs' operators.

4.2.6 Open Ended Discussion

With the recent trends of qualitative research, interview has become democratized and less structured. Consequently, researchers are committed to allowing the respondents to speak for themselves in their own way (Hoffmann, 2007). In line, open-ended interview has emerged as a potential interview technique. It applies a simple and a few straightforward predetermined questions and hints. Open-ended interview starts with some straightforward question as initial probes and later on, it moves to wide variety of in-depth of inquiry. This interview technique allows a researcher to make the interview fruitful through exploring all the valuable comments given by the participants and increases amount of research data and validity (Hoffmann, 2007; Fontana and Frey, 2005). Further, this technique encourages the interviewees to speak beyond formal account and possibly interested in less official discussion on own opinions or behavior or stories of others (Becker, 1970). Thus, aiming to reveal the underlying settings and network of the E-service, the researcher applied open ended interview technique. A significant number of open ended interviews have been conducted with the organizational managers, staff, middlemen and telecentres' operators involved in this service.

4.2.7 Focus Group Discussion

Focus group discussion emerged from research in social and business research. Recently, it has been widely used in IS research. Focus group refers to small group of people involved in focus discussion of a particular topic (Krueger and Mary, 2000). Usually, it includes 4 to 12 participants and facilitated by a moderator who poses questions for discussion and guides the discussion (Hollander, 2004). Thus, it is also treated as a small group interviews either guided or unguided discussions addressing a relevant topic to the group and the researcher (Edmunds, 1999).

It is an effective technique for qualitative researchers to reveal data from a group discussion on a particular issue about real life experience, biographies and everyday practices. Focus group discussion aims to facilitate an informal, congenial and free and fair atmosphere of discussion among homogenous group. It aims to encourage the participants to speak freely and completely about their behaviors, attitudes, practices and place opinions, interests and arguments with consciously, semi-consciously and unconsciously (Berg, 2004).

However, it has four limitations: associational (not individual), status (e.g. gender or power), conversational (matter expressible or power of expression) and relational (moderator-participant relations) (Hollander, 2004). Due to these contextual problems in a focus group discussion, participants failed express the views properly. To address these limitations, the researcher conducted FGDs initially in homogenous group and later on in a mixed group FGDs. Thus, this study seeks FGD as a means to identify solutions or evaluation results.

4.2.8 Online Blog

There have emerged wide ranges of methods and tools for gathering data from the field organization and technology. Blog is one of them and it has emerged as a potential online culture. It has brought revolution in flow of opinion, information, comments (Hookway, 2008). Usually qualitative research is moved with slow pace but blog provides opportunity of quick data collection process (O'Connor and Madge, 2001). In line, this study used blog to gather data.

Consequently, online blog posting has emerged as a significant tool for gathering data from online community. Thus, blog posting has been widely used in IS research because it provides dynamic interaction between researcher and informant without making any barrier. It is convenient for researchers and informants because, it is less costly, less time consumable, open access and suitable for two way communications in many cycles. Blog is also a community of practice, thus, it is also considered as a solution developing techniques in designing technology in organizational contexts. Therefore, it provides publicly

available substantial amounts of data. It maintains anonymity and trustworthiness of data. Along the line, this study used blog as tool for data collection. The E-service program has launched an online blog that has about ten thousand members who post their opinions on the blog. Thus, the researcher posted a simple questionnaire on the blog of the E-service.

4.2.9 Questionnaire Survey

Questionnaire consists of a set standardized questions and it is the main instrument for gathering data through survey research (Trobia, 2008). It refers to surveying responses of a list of questions and this survey can be conducted by structured interview, sending questionnaire by email or post or by telephone. This method includes close ended and pre-coded questions. Usually receiving responses from a large number of respondents requires questionnaire survey. Thus, this study has conducted a brief questionnaire survey throughout the 64 DRRs of the country to have an overall picture of the E-service and it was conducted on telephone. This survey was helpful to generalize view of the E-service.

4.2.10 Case Study Method

Case study refers to both methodology and method. It has been used in this study as a method. Case study method allows in-depth analysis of a specific 'unit', 'event', or 'individual'. Thus, Yin (2009) suggests that case study empirically investigates contemporary phenomena of individual, community, outcome and event in a real life context. Consequently, case study focuses on in-depth understanding of phenomena and its contexts (Cavaye, 1996). Along the line, case study method presents systematically and analytically complexity of a single case and multiple cases. In line, case study method was applied to characterize the E-service a single case as a whole. It maintains balance between describing of complexity and identifying causes of complexity in the E-service. Thus, in order to analyze, the complex contexts and processes of the E-service, case study method has been used as a potential method.

4.3 The Fieldwork

The fieldwork of the research was conducted in the District Record Room (DRR), a public sector organization, located at Khulna District in Bangladesh with a particular focus on E-service of land record. The organization is about 200 year old. Thus, the service delivery of land record was developed in the British Colonial Regime of the country. However, recently in 2011, the government has devised IT network to deliver this service to the citizens. The E-service of land record, the core issue of this research, consists of IT networks comprising a web portal called District Web Portal (DWP), E-service desk known as E-service Center (ESC) and country wide about 4501 telecentres, known as Union Digital Centre (UDC). Since the organizational contexts and processes are complicated, informal and invisible, the actors play dual and hidden roles. To trace their roles, the researcher conducted an intensive and interventional fieldwork. Aiming to trace different networks, roles, processes, structures and relations in technology and organization, the researcher outlined the case of the research, interacted and engaged with number of participants and events, set his roles along with ethical guidelines. These are discussed below.

4.3.1 The Case

Every qualitative research is by and large a case study. To discover underlying contexts, it is inevitable to identify an appropriate research case. The researcher selected the case of E-service of land record in Bangladesh aiming to analyze entanglements and disentanglements in technology and organization. The E-service is delivered from the DRR, a section of Deputy Commissioner's Office. Thus, the DRR of Khulna and centering on its UDCs of two Upzillas, its DWP and the ESC were primarily focused as the case of this research.

The DRR of Khulna was purposively selected as the case organization. It has been ensured that the DRR carried common features of other DRRs in Bangladesh. Selecting a case as well the field for conducting any research is determined by considering a number of factors. Thus, the researcher needs to clarify why these

particular groups of people or organization have been selected as the organization and field under study. The organization and the case were selected because the organization, the people, the case and the location of the organization exposed to the researcher and had obtained easy access to field and data and research client agreement. Further, the case selection relied on criteria-based selection. It was a case of theoretical and conceptual consideration. It was not an extreme features or reputational features. Moreover, it was an ideal case and a case of comparable features.

This study selected the case of E-service in the DRR of Khulna on the basis of ideal features that it represents the general features of the E-service of land record in Bangladesh. Since is the study was a pioneer study in the field of E-service of land record in Bangladesh. Thus, it was an ideal case that represents features of the whole. As a result, to generalize research findings, an ideal case is suitable. Secondly, the study considered theoretical and conceptual grounds. To understand entanglement and disentanglement features between materiality (technology, land record) and organizational context from a sociomaterial lens, the case has dynamic features because the IT design and record management was ongoing and the organizational context was also shifting dynamically. Thus, the case showed potential features for applying and testing theoretical lens - sociomateriality. Thus, this case offered opportunity to develop theoretical understanding. With a view to developing insights and exploring details, the study avoided comparing cases. It was neither extreme case nor reputational case.

4.3.2 The Participants

Research participants are also known as research population. Selection of research participants influenced on research findings. Thus, they need to be selected carefully. Inclusion and exclusion of participants in any study require operational justification. For instance, studying drug addiction problem of a community includes participants who are involved in the process of drug selling, carrying, buying and regulating. Along the line, since this study focused on relations in technology and organization; its selected participants were involved in the E-

service in various strata. They were policy makers, senior managers, mid-level officers, staff, middlemen, telecentres operators, technical experts and citizens (table 4-1).

The participants were also selected with the following categories and numbers:

Category	Number
Policy Makers	5
Senior Managers	5
Technical Experts	5
Officers	5
DRR Staff	5
Telecentres operators	5
Middleman	5
Key Informants	6
Citizens	10
Total	51

Table 4-1: Research Participants

Policy Makers

Policy makers included Minister or State Minister, Secretary and Additional Secretary of the government and Project Director. A total of five policy makers were included in semi-structured interview. They were the Law Minister, the Secretary of the Ministry of Land, the National Project Director of A2I program, Additional Secretary of Ministry of Land and the Project Director of A2I Program. Being thoroughly exposed to the phenomena of land record service regulations, they were policy making actors of the E-service.

Senior Manager

Senior managers were selected from head of the directorate, joint secretary, divisional commissioner and deputy commissioner. They were Director General of Bangladesh Computer Council, Divisional Commissioner of Khulna Division, Deputy Commissioner of Khulna District, Deputy Commissioner of Gopalganj District and Deputy Commissioner of Moulavibazaar District. They were senior managers involved in the E-service.

Mid-level Officers

Mid-level officers were selected from the office of the Deputy Commissioner, Khulna. They were Additional Deputy Commissioner (Revenue), Additional Deputy Commissioner ICT, Additional Deputy Commissioner General, Record Room Deputy Collector and Assistant Commissioner of Establishment Section. They were directly involved with the E-service and the DRR Staff of the E-service in the Khulna District.

Staff

A total of five DRR staff were selected from the DRR of Khulna. They were the Record Keeper, two Copyists, one staff from the ESC and one Sorting Staff. They were directly involved in processing the E-service of land record the DRR of Khulna.

Telecentres Operators

12 entrepreneurs of telecentres were selected from two Upzillas (sub-district) namely Rupsha and Koyra where intervention and evaluation have been conducted.

Key Informants

A total of six key informants were selected. They were the Deputy Commissioner of Khulna, the RRDC Khulna, a senior DRR staff, an experienced staff from other office, an experienced operator of UDC and a traditional and experienced middleman.

Citizens

On the basis of experience, age and location of residence, a total of ten citizens who had the recent experience of receiving land record service were selected. Open ended interview and a focus group discussion were conducted with them.

Middlemen

On the basis of experience, age and nature of involvement, there are a total of five types of middlemen who were regularly involved in mediating of the service were selected. Semi-structured interview, open ended interview, focus group discussion and key informant techniques were applied with them.

Technical Experts

Technical experts had a vital role in designing technological network of the E-service. They were involved with from the A2I program. Amongst them, there were a programmer, an E-service expert, a web portal expert, a domain expert and a monitoring and evaluation expert. Mainly, semi-structured interviews were conducted with them.

Besides, this study also has taken into consideration of on non-human participants. They are land record, IT for E-service of land records, organizational processes, registers, structures and regulations.

4.3.3 The Chronological Events

The research involved with a number of events and procedure that have been followed by the researcher accordingly. The researcher placed an initial proposal of his Ph.D. research on 'E-service and Network Governance in Bangladesh'. After enrollment and initial coursework and supervisory meetings, the proposal was revised as 'Actor Network Theory and Network Governance in E-service of Bangladesh' (appendix-1). However, after conducting first phase of fieldwork and further literature review, the researcher found sociomaterial entanglements and disentanglements as significant lens for this study. Thus, finally the research topic

was settled with the little 'entanglements and disentanglements in the E-service of land record in Bangladesh'.

Chronological Events	Date or Period	Days
Proposal Presentation	25 January 2012	
Permission from the client Organization	12 February 2012	
Submission of Research Ethics	17 February 2012	
Approval of Research Ethics	28 February 2012	
1st Phase Fieldwork	19 February-13 May 2012	85
2nd Phase Fieldwork	05 July -22 August 2012	49
Revised Research Ethics Approval	14 August 2013	
3rd Phase Fieldwork	28 November 2012 - 03 April 2013	127

Table 4-2: Chronological Events of the Research

Due to the several shifts of the research focus, the researcher presented and defended his research proposal two times and sought ethical approval as well twice (Table 4-2). As the study followed interventional approach, the researcher obtained permission from the client organization to conduct this research activity. Further, consistent with broader theoretical and methodological lens, the researcher conducted its fieldwork into three phases aiming to trace constitutive entanglements and disentanglements in technology and organization through cyclical designs, redesigns and evaluation of the E-service. Thus, all these events were interrelated and cyclical.

4.3.4 The Fieldwork Phases and Intervention

With the nature and objectives of this research, a longitudinal, interventional and intensive fieldwork was conducted to identify problems and to design solutions

that was designed and redesigned and tested and evaluated in service cycles to identify learning and reflection. The fieldwork was conducted into three interrelated phases. The researcher engaged with the process of problem identification, designs, redesigns and evaluation of the E-service in every phase of the fieldwork. Major events, intervention and designs involved with the E-service are mentioned below (table 4-3).

Phase	Problem Formulation, Building Intervention and Evaluation
Phase -1 Feb-March 2012	<p>The researcher intervened in designing process for receiving only online applications and remaining traditional process i.e., the paper based applications.</p> <p>Further, the study identified, redesigned and removed parallel and dual process of paper based application submission.</p> <p>The study designed and redesigned organizational and technological network between the UDCs and the DRR for paying fees through crediting fees from advance deposit instead of sending fees through postal or manual process.</p>
Phase -2 March-May 2012	<p>The study designed and unified access point of the E-service.</p> <p>The study designed citizens' easy access to the E-service of land record through only the UDCs instead of middlemen's mediated access points.</p> <p>The study redesigned the organizational process through removing numbers of paper based registers of this E-service.</p>
Phase -3 July-August 2012	<p>The study designed and redesigned the organizational structure involved with the E-service of land record. It has united the record Store room and copyists' room.</p>

Table 4-3: Phases of the Fieldwork

4.3.5 The Role of the Researcher

The role of a researcher is vital in any interventional study. The researcher played dual role in this study. He worked as a practitioner manager in the field for more than five years as an employee. Later on, he left the field for this Ph.D. study on educational leave. However, after completing the course work and necessary requirements of the University, he went back to the field as a researcher. Although he went back as a researcher, his role was advisory to the organization, particularly in the matter of the E-service instead of an on duty officer.

Since the study was of a researcher-client nature, the researcher formed a team to conduct the fieldwork and intervention in the E-service processes. The team comprises three members combining IS professionals and practitioners. One was the researcher who played dual role: formerly an employee in this service delivery and currently a doctoral student. From rest of the two members, one was practitioner working in the E-service and the other was IS professional. Since the research had opportunity to work in the organizational processes, organizational managers, service delivery staff and telecentres; the researcher suggested necessary recommendation to design and redesign this service delivery process and implement and evaluate it. Thus, the researcher's dual role and team work intervention helped to identify problems in organizational settings and design and redesign of the E-service process.

4.3.6 The Research Ethics

For IS practitioners, ethics prescribes set of codes and practices to study human behavioral aspects in relation with technology (van Maanen, 1983). There are three main principles of IS research ethics: known consent, safeguarding from harm and guaranteeing privacy and confidentiality. A transparent choice of participants may be obtained from learned consent (Davies, 1999). The subject, group, organization and participants need to be guaranteed confidentiality and ensured anonymous identities. These can be ensured by establishing right to privacy and confidentiality (Bell and Bryman, 2006; Adler and Adler, 1994).

Along the line, the researcher ensured protection of the research subject and settings from being destroyed or distorted during the study. He also ensured the research subject protection from harm.

The researcher maintained principle of anonymity and confidentiality of the participants including staff, officers, operators and citizens. He has maintained privacy of the staff and organizational policy. Moreover, the researcher avoided intervention in any aspect of the E-service designs and redesigns that can be legally harmful for the any actor involved in the research. However, throughout the research, the E-service process has been improved a lot. Consequently, there have been some adversaries for those who were the beneficiaries of the wicked process of the E-service.

This study was conducted in a public sector organization which operated under highly regulated bureaucratic norms and culture. Consequently, putting signature on any research documents by any staff or officer was difficult tasks. They perceived signing on the consent form could go against them and it could be harmful for one's personal and professional careers.

Further, the telecentres operators are recruited newly. They are worried about their job continuation and they think that the DRR staff are harmful for them. As they believe that their statements are against the DRR staff, they also declined to sign on the consent form. Finally the rural citizens and the service recipients were mostly unaware and illiterate and a few of them can sign on document. However, since the discussion was on land record, they were afraid of putting down their signatures, on any document, because they faced many forgery cases through signing on documents relating to land sale and purchase. Similarly middlemen were afraid of losing their position with signing on the research related document. Consequently, the researcher refrained from taking signatures on written consent form. However, the consent was read out and explained before the research participants.

4.4 Data Collection Methods and Techniques

4.4.1 Techniques of Note Taking

Recording and managing data from interventional and ethnographic site is significant because it generate ample data. The researcher, thus, used three types of notes to capture data from the researched site. They were observational notes, methodological notes and personal notes. An observational note was accompanied always so that every observational event, phenomena and case was noted down. Notes of conversation and raw data were jotted down in the observational note from the field during the day time. Thereafter, returning from the field, data were categorized and analyzed. Besides, a methodological notebook was maintained regularly to note analytical description of the E-service processes and how and why they took place. The results of the intensive and fruitful interviews with the important participants were recorded carefully in methodological notebook. Further, the researcher used a personal diary that was used to record the researcher's feelings, perception, comments and opinions during day to day interaction with different actors in the field. It was used to record personal and confidential notes from the research field.

Since the researcher applied interventional and ethnographic approaches, the study had been conducted into three phases. Every phase of the study had applied particular methods and approaches. The following sections described the applications of methods and approaches.

4.4.2 Rapport Building and Observation

During the first phase of the fieldwork, the researcher built rapport with participants of this research and conducted observation. Thus, an inception meeting was conducted with the relevant actors. In line, the researcher explained the objectives and purpose of this research to the organizational managers and staff, middlemen, telecentres operators and citizens. This is how, the researcher gained trust and confidence of the participants. Thus, a rapport building with the

research participants helped to acquire data within short time. It was as an aid to be familiarized with people and the environment and also as a strategy for in-depth observation.

The researcher built rapport with the staff, officers, middlemen, telecentres operators and citizens. The utmost endeavor has exerted to become intimate with the citizens, middlemen and UDCs' operators through gossiping, exchanging greetings and attending on the organizational meetings. The researcher clarified his research objectives and role and his expectation from them. Although he was an officer previously, he clarified his position that throughout the research period he is purely a research student. Besides, frequent informal sittings with the informants helped to develop intimacy with them and realizing data through discussion on the E-service of land record. These discussions were noted down at the same time and on some occasions the subject of discussion memorized to jot down later on. Moreover, it was ensured that all data would be used for research purpose only. Thus, the researcher built a good rapport with the actors and participants of the research field. Consequently, it helped to apply a wide range of methods, approaches, intervention and observation to gather data from the E-service processes, organizational contexts, networks and the E-service networks.

4.4.3 Questionnaire Survey

A questionnaire survey had been conducted to reveal basic information and current status of the organizational contexts and the E-service (Box: 4-1). The following pieces of information were gathered on the basis of the survey: number of access points

Core Questions of Questionnaire Survey

- Which one is the most used access point for E-service of land record?
- Which one is the least used access points for E-service of land record?
- What are the reasons behind of less use of UISCs as an access point of E-service of land record?
- Which process do you think the most useful access point in the E-service?

to receive the E-service, steps of processing the

Box 4-1: Core Questions of Questionnaire Survey

E-service, number of staff members involved in processing this service and their role, structure of the organization, duration and cost of this service, the types of

middlemen involved in this service and the role of the technological networks in this service.

4.4.4 Key Informant Technique

The researcher applied key informant interview technique to interview the key personnel involved in the E-service process to uncover information on the organizational contexts and processes and usages of the E-service (Box 4-2). Six key informants were selected from six categories of informants one from each category. They were from the DRR staff, middlemen, officers, and staff of other office, telecentres operators and experienced citizens. Reflective, interpretative and decisional questions on land record systems, service delivery processes, organizational processes and technological networks were discussed with the key informants.

Issues discussed with the Key

Informants

- What are the challenges and strategies in implementing online application for land record service delivery in the district?
- What are the dimensions of interests of copyists and middlemen for paper-based applications and what are the networks between copyists and middlemen?
- How do the DRR staff managed long time posting there and how do they influence the Officers not to implement the E-service?
- What are the problems in delivering of the E-service of land record from the DRR?
- What are the problems of the E-service of land record from UDCs? What are the problems between the UDCs and the DRR relations?
- How do the E-service influence middlemen involved in the service delivery of land record?

Box 4-2: Issues discussed with the Key

Informants

The key informants were selected carefully. They were impartial, knowledgeable and experienced and they had good reputation in the organizational contexts. They also discussed with the researcher voluntarily and with a selfless motive. It seemed that they had intellectual ability, keen observation and had ability to

interpret the organizational processes and contexts and technological networks involved in the E-service.

The key informant technique also focused on obtaining factual information, cross checked with the data gathered from other sources. The researcher, thus, discussed the research issues with them several times and several occasions. Particularly, hidden and underlying intra-actions in the DRR staff and the middlemen and processes of the diffraction between the E-service and the various natures of vested interest actors in the E-service were traced through the key informants' interview techniques.

4.4.5 Archival Method – Document Analysis

The researcher used archival document as a potential source of data collection. The land record system and service delivery of land record were driven by organizational rules and regulations. Thus, in order to understand the organizational contexts and the organizational rules and regulations were valuable archival data. Categories of this service, fees and processes of this service and duration of this service delivery were stated in black and white in the laws, regulations and rules of the organization. So, analyzing these archival documents provide understanding on *dejure* process of the organizational contexts and relate it to the practice of this service delivery process. However, later on, the participant observation method identified the *defacto* processes of this service.

Land record service related laws, regulation and rules were analyzed as archival document. These were 'the Bengal Record Manual 1943', the Stamp Act 1891', 'the Evidence Act 1861', 'Circulars of National Board of Revenue on Stamps and Fees' and relevant circulars of Ministry Land'. Besides, registers of the DRR and preserved old application forms were also analyzed.

More importantly, analyses of the organizational registers, forms, old applications and documents helped to elicit the process of manipulation of this service.

Particularly, it had specifically identified the process of violating chronological order in delivery of this service and process of tampering paper based applications through inserting or adding land record ID number in chronologically advanced applications. Further, archival analyses also traced that online submitted applications took longer duration to process this service compared to applications submitted by the middlemen.

Questions on Regulatory Issues

- What are the laws and legal acts related to the E-service of land record?
- How do they influence the E-service of land record?
- What are the steps taken to revise the laws and acts for adapting the E-service of land record?
- What are the problems in revising the laws and acts process of E-service of land record?

Issues relating to the tampering of applications and land records

- What are the forms and stamps required to submit application for the E-service?
- What are the differences in submitting applications in different access points?
- Why do the E-service centers receive paper applications and thereafter put them the E-service network?
- Why do the intermediaries prefer to access the E-service through paper based applications?
- How do the intermediaries and staff manipulate the E-service through submitting paper based applications at the E-service center?
- How do the intermediaries and staff manipulate E-service through submitting paper based applications using Web Portal?

Thus, archival method was significant to understand

Box 4-3: Questions on Regulatory Issues

the organizational and the E-service process.

4.4.6 Online Blog Postings

The researcher applied the online blog of the E-service the actors involved in the E-service. The E-service program has posted a brief questionnaire on the blog for the officers, staff and telecentres operators involved in this service. Membership of that blog was through invitation only. The researcher joined in the blog as a member. The blog had 20,000 members and it was used as a community of practice to address problems faced by the DRR staff and telecentres operators of the E-service. There were about 300,000 blog posts whereby the researcher filtered them on the issue

Blog Post by the Researcher

Posted by M. Shahanoor Alam, Ph.D. student on June 10, 2012 at 20:19

I am Muhammad Shahanoor Alam, a Senior Assistant Secretary, currently a Ph.D. student at Brunel University, London.

My research aims to identify the problems in the E-service of land record and address the problems. Especially, my study focuses on what the problems have been currently facing by the UDCs to mediate citizens' access into land record service to the DRR. In the meantime, I have conducted intensive study in Khulna, Jessore and Gopalganj Districts. Already I have found valuable insights that have been presented at the office of the A2I Program. The NPD of A2I requested me to present the problems faced by the UDCs to mediate citizens' access to the land record service at the Annual Conference of Deputy Commissioners' at Prime Minister's Office. Therefore, my research would be highly beneficial if you please put your valuable opinion on the blog relating to the following points but not limited with the few points:

- What are the problems for UDCs to mediate citizens' access to the land record service?
- What the problems with the DRR to deliver this E-service?
- What are the problems for sending fees from UDCs to DRR?
- What are the problems to receive quick service delivery of land record?
- What are the ways to solve these problems?
- Do you have any other opinion or comments or experience on the issue?

You could send your response and comments by email also: snoor15@yahoo.com

Thanks

Shahanoor Alam

Senior Asst Secretary, Ministry of Public Administration, Bangladesh & Ph.D. Student, Brunel University London.

Box 4-4: Blog Post by the Researcher

of E-service of land record. Thus, the E-service blog provide live experience and issues emerged from the E-service.

Besides, the researcher posted a questionnaire on the blog and gathered responses from the blog members involved in the E-service. It has received comments and responses approximately from 200 respondents. About 200 respondents commented on the researcher blog post and they expressed their views on their everyday problems were facing in the E-service and suggested on the designs and redesigns of the E-service. Thus, the blog of the E-service had been used as a significant and dynamic source of data. Extracts responses and comments on the researcher's blog post were given below.

Selected Comments on Blog Post of the Researcher

Comment -1

It is not possible to trace UDC's and DWP's submitted applications to the ESC for this E-service. This is how middlemen are applying for land record through directly the ESC. It needs to be traced by the name of UDC submitting applications for land record and needs to collect fees accordingly. Besides, sending court fee through manually is costly and time consuming. Thus, it is important to develop a system for online fee submission through mobile banking. Therefore, sending fees through online would save both time and money for this E-service.

Comment -2

The ESC and the DRR staff have not changed their attitude to UDCs. They think that if the E-service succeeds, their vested interest or private gains would be under threat. Fees for applications of land record could be sent through mobile banking or any prepaid card like mobile phone top up. Now, citizens need to submit applications to the ESC, the district headquarters from UDCs, the rural area. Further, they also need to collect services from the ESC. Thus, land record should be delivered through online or UDCs. Moreover, if this service can be delivered within five working days, citizens world rely on the E-service from UDC.

Comment -3

In my district, mediating land record service from UDC did not yet start and so the potential problems could not be foreseen.

Comment -4

Thank you for selecting this important topic for your research. These blog posts would be helpful for improving land record service from UDCs.

Comment - 5

This service has not been started yet from UDC in my district but I personally applied online for land record service but I have not received better service.

Comment - 6

Many thanks to the researcher. If you stay beside us, this service would be speeded up.

Comment - 7

I cannot deliver this service yet. I believe that if this service can be delivered online, citizens would get relief from middlemen and citizens suffering would be reduced.

In my district, this service is not delivered from UDCs but it is delivered from the DRR. Poor citizens have lot of sufferings to receive this service from the DRR. If this service can be delivered through UDCs, the poor citizens would receive this service within short time and less cost.

Comment - 11

I have applied for land record service from my UDC; the DRR replied that the record is damaged. While a citizen applied for the same through middlemen record, received land record service very quickly. Surprisingly, it has been found that attestation signature was not genuine though information was accurate. The DRR staff are involved with the fraudulent process. On the other hand, to mediate this service from UDCs take 15 - 20 days, though the Deputy Commissioner promised to deliver this service within five days. Thus, we failed to keep our promise to our clients. We recommend delivering this service within five working days. In my opinion, if we (UDCs) could deliver land record service within five days, the trust of citizens on UDCs would increase and their sufferings would be decreased.

Comment -12

The main problem is delaying in the service delivery after applying from UDC. Consequently citizens lose their interest in UDCs. It would be better if this service could be delivered within five working days.

Comment - 13

Lack of skill and traditional attitude of the DRR staff toward the E-service are the main problems. Thus, they are needed to be thoroughly monitored and trained to deliver the service to the citizens.

There are problems in record keeping in the DRR; record are disorganized and mismanaged in the DRR. The staff took longer time to find specific record. Thus, records should be digitized. Besides, a system of money transfer or mobile banking should be introduced for the payment of fees for online applications. Finally, online delivery of record should be introduced instead of manual or postal delivery with a view to giving quick service delivery.

Comment -14

My suggestion is that this service should be delivered through only UDCs are not through any other doors and this service should be delivered within three working days. There should have a unique rate of service charge. I am hopeful that your research would be successful and would bring benefit for citizens.

Comment - 15

While I have applied for land record for citizens from the UDCs; the DRR responded that record is damaged. Besides, I have applied for next time for other citizen; it took 15-20 days to receive service delivery. Thus, we failed to keep promise with our clients. We expect to deliver this service by five working days and very smoothly.

Comment - 16

Main problem of this service is delaying in the delivery of record. Consequently, citizens lost their interest in the UDCs. Besides, citizens know only plot number

but they do not know the holding number. Thus, we could not submit citizens' applications.

Comment - 17

I have submitted three applications for land record but the record are not delivered by due date. I have pursued for 7-8 days. Thereafter, I have received service delivery for one only out of the three applications. After many days and persuasion, I have received the second one and third one has not been delivered as yet. I cannot mediate for citizens land record applications because I am not confident on the process of E-service delivery of land record.

Comment - 18

In my district this service has not been started from UDCs yet. I believe it would be beneficial for UDCs' entrepreneurs.

Comment - 19

I have submitted applications for this E-service several times but I failed to receive service delivery ever. I want to see the solutions.

Comment - 20

From my point of view, there are two main problems in the E-service:

- a. the DRR staff discouraged to apply for this service through UDCs;
- b. the service charge is not fixed;

My suggestion is that all applications for this service should be received through UDCs and delivers this service through UDCs with a fixed service charge and within certain duration.

Comment -21

DRR needs to be re-organized and the middlemen who create problems in the E-service of land record, need to be removed from the surrounding of DRR.

Comment -22

While I sent application by post (the printed copy of on line application for land record), the DRR responded that they have not received any application. Missing of printed copy of online application is common.

Comment - 23

I would request for developing a system for delivering service of attested copy of land registration deeds from UDCs like the E-service of land record.

4.4.7 Organizational Meeting, Consultations and Workshops

Organizational meetings, consultations with organizational managers and policy makers and workshops with organizational staff and officers were potential interventional techniques to gather data and design and redesign the E-service. Since this study has been conducted in a public sector organization, it was not easy to make any change through intervention of the research. It was required consulting, taking opinions and approving the designs and redesigns in the organizational meeting with policy makers, decision making managers, officers, staff. The tables below outlined major meetings, consultation and workshops have been conducted in the organization throughout the research process.

Sl	Subject	Main Issues	Place and Date
1	1 st Meeting with Officers, Staff and UDC Entrepreneurs	What are the problems in implementing of the E-service of land record? What are the ways to overcome the problems?	Office of the Deputy Commissioner, Khulna District 12 March 2012
2	Monthly Staff Meeting April/2012	What are the problems of separation between the record Store and the Copyist Room? How could it be solved?	Office of the Deputy Commissioner, Khulna District 08 April 2012
3	Meeting with Executive Director, Bangladesh Computer Council	What is the significance of inter-organizational coordination in implementing E-service of land record?	Office of the Deputy Commissioner, Gopalganj District 21 April 2012
4	Meeting the Officials of Ministry of Land	What are the legal obstacles for implementing E-service of land record? What are the legal amendments required for E-service?	Ministry of Land, Dhaka 25 April 2012

5	A2I, Presentation & Consultation	What are the problems of multiple channels of access to this E-service?	A2I Conference Room, Prime Minister's Office, Dhaka 26 April 2012
6	Open ended discussion and Consultation with Deputy Commissioners at Conference	How do the DRR staff and paper based process obstacle for this E-service?	Prime Minister's Office, Dhaka 13 July 2012
7	Presentation and Consultation in Monthly Revenue Meeting	What is the significance of implementing this E-service?	Divisional Commissioner Office, Khulna District 18 July 2012
8	Meeting and Open Ended Discussion with UDC Entrepreneurs and Officers of	What are the ways to implement E-service for this Upazilla and how it could be done?	Upazilla Nirbahi Office, Koyra Upazilla, Khulna District 25 July 2012
9	Workshop Additional Deputy Commissioners (Revenue)	What are the issues relating to digitize land record? How is digitization significant for this E-service?	Bangladesh Institute of Administration and Management, Dhaka 07 August 2012
10	Meeting with the Deputy Commissioner, Jessore	What are obstacles in receiving payment from UDC and their solutions?	Office of the Deputy Commissioner, Jessore, District 31 December 2012
11	Meeting with the Deputy Commissioner Moulavibazaar	What challenges have been facing after implementing 100% online application for land record?	Office of the Deputy Commissioner, Moulavi Bazaar District 15 Feb 2013
12	Meeting the Deputy Commissioner Noakhali	What are problem with calculating fees for this service delivery?	Office of the Deputy Commissioner, Noakhali District 24 February 2013
13	2 nd Meeting with Officers, Staff and UDC Entrepreneurs	What are the issues that need to be taken into consideration for implementing online application throughout the district?	Office of the Deputy Commissioner, Khulna District 12 March 2012

Table 4-3: Organizational Meeting, Consultations and Workshops

Since the research aimed to address the problems of the E-service of the organization at the outset, an inception workshop was organized for the officers and staff of the organization to inform the purpose and procedure of the research. The researcher also sought support from the relevant officers and staff of the

organization. Thereafter, during problem formulation a workshop and three workshop and consultation were held throughout building intervention evaluation stage. Finally, during the closing period of the research another workshop was organized to identify and disseminate learning of the research. Thus, altogether five workshops were organized throughout the study. In every workshop there were both way interactions between the researcher and the organizational actors including the E-service policy making managers, organizational managers and implementers of the E-service and the staff of the DRR. So the workshops were potential techniques and source of data collection of the study.

Consultative meeting was target oriented or a topic centric loosely formal or informal meeting between a homogeneous group and the researcher. Particularly, in order to trace any complex problem or any designs and redesigns involved in complicated process, the researcher organized consultation with the officers, staff, middlemen and operators of the UDCs. Consultative meeting was usually conducted with those participants who were knowledgeable and interested in improving this E-service.

The organizational meetings were routine process of the organization. The researcher regularly attended in the monthly meetings: revenue meeting, staff meeting, ICT meeting and law and order meeting of the organization. All these four types of meetings were involved in the E-service. Actors of the E-service were members of any of the four meetings. Thus, attending of these meetings were important source of data for this study. More importantly, these meetings were authorizing process of the problem identification and designs and redesigns. Particularly, decisions of designs and redesigns relating to the organizational processes were authorized from these meetings. The researcher attended about 16 organizational meetings.

In line, the researcher has conducted a total 13 consultation meetings with policy makers, decision making managers, organizational staff and telecentre operators (Table 4-3). Approximately, 15-25 participants attended in each of the consultation meetings. By these consultation meetings, the researcher identified the problems in the E-service of land record, particularly the problems of paper

applications; stamps for fees submission, provision of maximum five records by one application and dual process of application submission e.g., paper based and online applications. Further, these consultation and meetings helped to implement designs and redesigns of the E-service.

4.4.8 Case Study

Case study was adopted as an aid to reflect the nature of the problem in the E-service of land record in a nutshell. This was also applied for eliciting in-depth data of the issue. Case studies were strategies for scaling down the study to be as brief as possible. Thus, individual cases of this study helped to capture the total picture of this study. Consistently, a number of cases were conducted to reveal insights. Consequently, case study method was applied as a significant method for this study. Extracts from a few cases on the UDCs have been given below. Due to space limit, description of all cases was not included here but extracts of the cases have been presented throughout the study findings.

Case-1:

Four online applications submitted for attested land record through a UDC to the DRR. Accordingly the UDC operator submitted fees and printed copies of the applications to the ESC. After a few weeks, the entrepreneur received no response from the DRR regarding his applications, his clients compelled him to go to the ESC and know the status their applications. He asked the ESC staff about the status of his applications submitted long ago for the attested copy of land records. Unfortunately, the staff failed to locate his applications and his fees (the court fee stamps) were lost. However, the operator did not lose his hope, since he had ID numbers of submitted applications which he had submitted for land record service. He submitted fees once again to the ESC. Afterwards, he physically communicated with the DRR staff and came to a contact with an amount of bribe for two applications out of his total four applications. Finally, he successfully managed for these two applications and the other two were still left pending.

Case -2:

An UDC operator's father needed his own attested land record. On learning this, the operator asked his father that his own office has the opportunity to file applications for land record to the DRR. Surprisingly that the father, did not agree with the proposal of his son because the father knew that the *Muhuris* (*middlemen*) are much experienced in this matter and they had network with the DRR staff. So, they could manage it shortly and effectively. Therefore, the father went to a *Muhuri* and collected his service much quicker than the UDCs' service delivery period.

Case-3:

After the first phase of this research and during the period of intervention in the E-service, an operator submitted one of his client's applications for this service to the ESC. Accordingly, he has also submitted required fees stamp. Afterwards, he was replied that the original records of those applications were damaged. So, the attested records could not be delivered. Therefore, the applications were rejected.

Case-4:

Another operator of an UDC submitted application for his client but he failed to receive service delivery from the DRR within two weeks. Resultantly, the client went to a middleman who filed a new hand written application and managed to collect this service within two working days. Thus, that client mentioned that speedy service would not be possible by UDC.

Case-5:

An online application reached to the ESC and the ESC staff found that the fees pasted on the application did not cover total fee because an application required minimum BDT 8.00 amount of stamp fees. However, that application was contained an amount of stamp fees which is BDT 4.00. It was revealed that the operator found that according to printed out of application which required stamp an amount of BDT 4.00. Surprisingly, Bengali digit 4 and English digit 8 are same. Since the application's language was Bengali and the fees figure was in English, this error took place. However, for this error the ESC staff immediately rejected that application though the E-service system was responsible for this error.

4.4.9 Participant Observation

Participant observation was conducted to trace inaccessible and confidential data, the hidden processes and the underlying reasons. Thus, it helped to reveal the anatomy of the problems of the E-service.

Besides, it was facilitating to apply other methods, approaches and techniques.

Consequently, in order to create a suitable environment, participant observation was used as a favorable strategy and it was

applied in all phases of the research. In this

case, depending on organizational contexts, different methods were used. Further, depending on actors, activities and place, the researcher applied participant observation. Thus, participant observation method played pivotal role in data collection for this research.

Issues of Participant Observation

- To be acquainted with the E-service Process, Organization Structure, Staff and Surroundings;
- Application receiving process in the E-service of land record;
- Processes of this service;
- Organizational process and structure involved in this service;
- Channels for submitting applications for land record by citizens;
- Citizens access to the land record service;
- Vested interest networks involved in mediating this service;
- Citizens access to IT Networks to receive the land record service;
- Role of UDC's in mediating this service delivery process;
- Citizens' engagement with the E-service of land record;
- The role of A2I in this E-service;
- Interests and attitude of Copyists towards E-service of land record;
- Networks and interests of record Bearers and the E-service of land record;
- Networks and interests of Record Keeper and the E-service;
- Role of Record Room Deputy Collector (RRDC) and the E-service;
- Role of Additional Deputy Commissioner Revenue (1) and the E-service;
- Role of Additional Deputy Commissioner Revenue (2) and the E-service;
- The Role of Deputy Commissioner (1) and the E-service;
- The Role of Deputy Commissioner (2) and the E-service;
- Staff of the other sections of the Deputy Commissioner Office and the E-service of land record;

Box 4-5: Issues of Participant Observation

4.4.10 Focus Group Discussions

Focus group discussions (FGDs) were conducted to verify the accuracy of data and to identify processes of designs and redesigns of the E-service. The participants were selected among actors and users involved in the E-service. Thus, the FGDs provided opportunity to apply other tools for identifying problems of the E-service and designing of the E-service. In order to identify intra-actions in technological process and the organizational contexts, FGDs generated valuable data. Usually, FGDs were conducted with 8-10 selected participants with homogenous background and were selected carefully considering their age, experience and gender. The facilitation was done by following a guideline of discussion and a record keeper was to note comments and observations. A total 6 FGDs were organized with citizens, staff, UDCs' operators and middlemen involved in this service to ensure in-depth opinions of different actors.

4.4.11 Semi-structured and In-depth Interviews

To elicit the views and opinions of the staff, middlemen, operators and the citizens involved in the organizational contexts and the E-service, this study has conducted semi-structured and in-depth interview. With the semi-structured interviews, the researcher aimed to listen more from the participants instead of asking a list of structured questions. These interviews took place in several times and in various situations to capture the real picture. Semi-structured interviews, in-depth and open-ended discussions were conducted in the study areas with the following selected respondents.

An E-Service Expert, A2I, Office of the Prime Minister's, Dhaka,
The National Project Director, A2I, Office of the Prime Minister's, Dhaka,
A Web Portal and Land Record Service Expert, A2I, Office of the Prime Minister's, Dhaka
An Additional Secretary of Ministry of Land,
The Director General, Directorate of Land Record and Survey, Dhaka

Table 4-4: Participants of Semi-structured and in-depth Interviews

These interviews were conducted to collect qualitative data to identify obstacles, interests, processes, policies and goals of the E-service. The semi-structured and in-depth interviews collected information on service delivery processes, middlemen networks, intra-actions in citizens and middlemen networks and intra-actions in middlemen and DRR staff. The table (4-4) presented the respondents and their positions and relations with the E-service along with date of interviews.

The technical experts and vendors of the E-service were interviewed and consulted. Technical experts of this E-service refer to both the IT personnel of the A2I Program and the organizational experts in the E-service. They were based in the A2I Program. The technical experts mainly emphasized on expansion of IT networks and online monitoring tools. Rarely did they understand to underlying reality of the organizational processes. They focused more

on new IT networks and technologies, rather than eliciting the organizational processes and networks. Consequently, the A2I was designing IT networks one after another in the public sector organization in Bangladesh instead of succeeding of particular one. The technical experts were engaged with wide number of responsibilities. Thus, none of the designs and networks was helpful to succeed the E-service of land record. They did not realize the problem with the multiple

Questions relating to Consultation with Technical Experts

- What are the reasons behind designing multiple channels to access into the E-service of land record?
- How do you monitor citizens' access to the E-service system?
- Do you have any mechanism to monitor how many applications have been coming from which channel to the E-service?
- Have you given any training to the Union Information Service Centers' entrepreneurs on filing and processing applications for E-service of land record?
- What is the role of A2I (Access to Information Program) with the E-service of land record?
- What are the technical problems in A2I to implement this E-service?

Box 4-6: Questions for Technical Experts

access points of the E-service of land record. Conversely, the technical experts considered that devising multiple access points are success of the A2I program to deliver this service at the door step of citizens. Unfortunately, the technical expert team failed to assess the intra-actions and networks among the citizens, organizational processes and contexts. Although there were very low rate literacy, digital literacy and low internet connectivity, the experts of the A2I Program designed the DWP such a highly electronic literacy and internet connectivity dependent access point to submit citizens' application for the E-service of land record. However, it was almost useless to citizens. Surprisingly, it was found that the DWP was used by the middlemen.

As a part of data collection of this research, the researcher made presentation of his findings to the A2I technical experts and policy makers. It was found that they were not aware about the problems of the E-service of land record. Contrary to this, they relied on some online monitoring tools that how many applications were received for this service and how many were delivered to citizens. Interestingly, though applications were coming through middlemen and paper based applications, the E-service system showed 100% applications were coming through online.

4.4.12 Intervention

The researcher intervened in the organizational and technological processes and involved with designs and redesigns of the E-service. On identification of the problems, the most probable solutions were tried through interventions in the E-service. In order to understand continuous intra-actions and entanglements, these designs and redesigns were really valuable method for generating and gathering data. Thus, they helped to generate research findings of this study. A few interventions on designs and redesigns are mentioned below (table 4-5).

SL	Design and Action
1	Designing Systems for Receiving Online Applications only: The study designed organizational and technological processes to receive only online applications for E-service of land record instead of parallel paper based application submission systems.
2	Designing Organizational Network: The study designed network between Union Information Service Center (UDC), the telecentres and the DRR, the organization processed E-service of land record for paying fees in advance instead of sending fees through postal service.
3	Designing Single Channel of E-service: The study designed single channel for access into the E-service of land record i.e. the UDCs instead of multiple channels.
4	Redesigning the organizational process: The study redesigned the organizational process through removing numbers of paper based registers involved in this service delivery management.
5	Designing the Organizational Structure: The study designed and redesigned the organizational structure involved with the E-service of land record. It united the Record Store room and copyists' room.
6	Cataloguing and arranging registers of land record: The study catalogued and arranged the record registers toward the end easy sorting and collecting.
7	Redesigning the Processes involved with E- Service: The study removed a number of steps involved in processing this service
8	Designing network for online payment of fees One of the sites of the study intervened online payment of fees as an interim basis.
9	Digitizing land records The study expedited the digitization process of land record.

Table 4-5: Interventions through Designs and Redesigns

4.4.13 Data Analyses and Presentation

Qualitative data analysis does not mean lack of rigor; rather qualitative research follows systematic data analysis methods and processes. Consequently, data

analysis is a significant process in qualitative research. This study applied two techniques in data analysis: thematic analysis and ethnographic analysis.

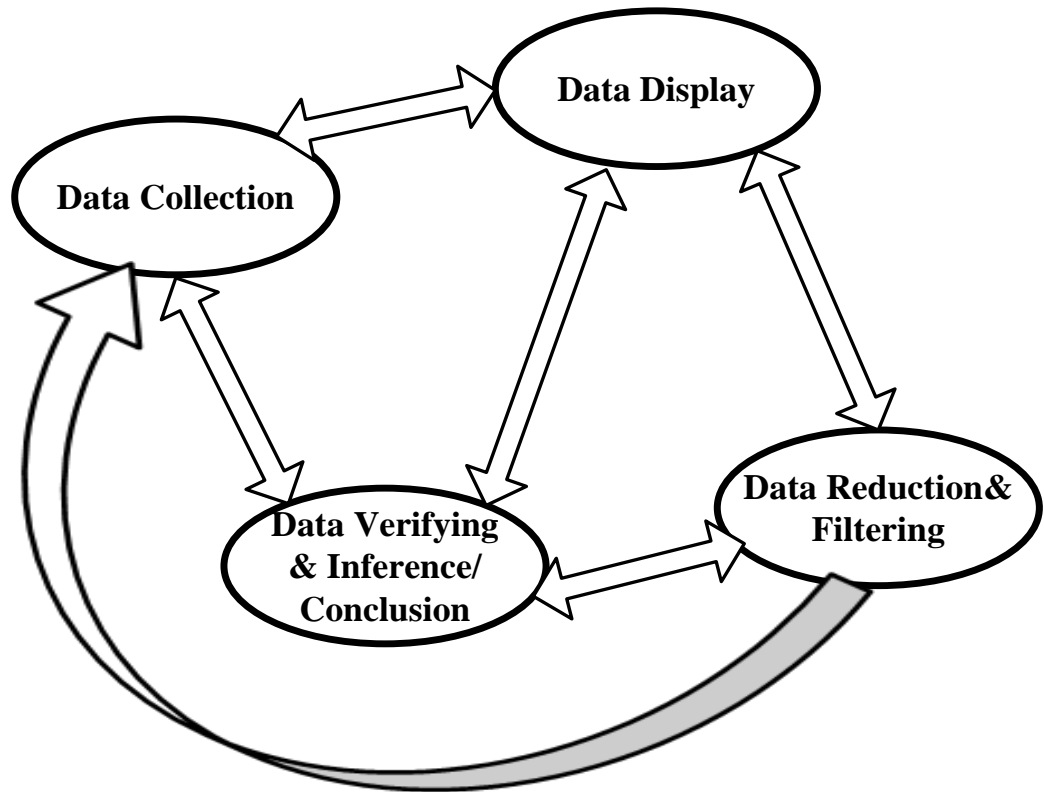


Figure 4-1: Data Analyses and Presentation

Thematic Analyses

Thematic analysis is a method as well as a process for identifying, analyzing, interpreting and presenting themes within data (Braun and Clarke, 2006; Boyatzis, 1998). It is a widely used method for analyzing qualitative data. It applies five tools: seeing, finding relationship, analyzing, systematically observing of case(s) and quantifying qualitative data (Boyatzis, 1998). The main strategy of thematic analysis is a coding process that seeks closely filtering and inspecting scripts, texts, evidence, notes, documents, memos and pictures to identify and generate themes.

There are two ways of developing codes: one is inductive and the other is, deductive. Inductive process of coding inspects text, scripts and evidence minutely and identifies different nodes, labels and categories. Constantly and cyclically, it compares data against codes and categories and revises codes into different cycles (Fereday and Muir-Cochrane, 2006). On the other hand, deductive coding processes identify a fixed set of themes and interpret and analyze data according to those themes. Thus, deductive coding follows a rigid process because it cannot go beyond pre-set themes.

This study mainly follows inductive coding process. Themes are emerged from data and they have revised and refined into different cycles. However, there have been taken a few codes from theoretical framework that has been applied in gathering data collection. Since, the study aims to apply and test sociomaterial lens in the field. So, it has taken a few deductive themes too. Consequently, the study applied both inductive and deductive processes of coding. It can be seen as a hybrid coding process which includes both the data-driven inductive approach (Boyatzis, 1998) and theory driven a priori list of codes (Crabtree and Miller, 1992). In addition, pluralistic epistemology, a wider theoretical lens and broader methodology provided advantage of applying hybrid coding process. Applying inductive coding process alone is challenging in IS research in such a complex organizational context in a developing country because it is difficult to generalize theoretical discussion. Thus, this research seeks both a hybrid process of coding and thematic analyses.

Ethnographic Analyses

The study has applied a wide range of ethnographic methods and techniques to gather data. A total of six steps consecutively were followed for analyzing the observation of units of data. They are chronological event analysis, key events analysis, analyzing events in various settings, analyzing role of various actors, organizational and service delivery processes and analyzing issues involved in the E-service of land record.

The chronological description of observation represents the study from the beginning to end over time. By the presentation of data with critical major events

or incidents were important of describing various places, sites, settings or locations and cross-setting pattern. Every setting is unique and differs from others. Ethnographic case is always varied from people to people by arranging the data to describe important processes (e.g. segregation, decision makings communication, etc.). The observations were made together highlighting key issues, such as how did participants change their behavior and group formation etc.

Data Processing, Presentation and Dissemination

Unit of analysis is important to understand data analyses, data presentation and results of a study. Unit of analysis of this study includes human actors, processes and material things. Researcher needs to define unit of analysis in operational terms for their observation, questioning and measuring. Units of analysis entail some characteristics that they are: identifiable, countable, locatable, measureable and traceable of beginnings and endings (Lecompte and Schensul, 2010).

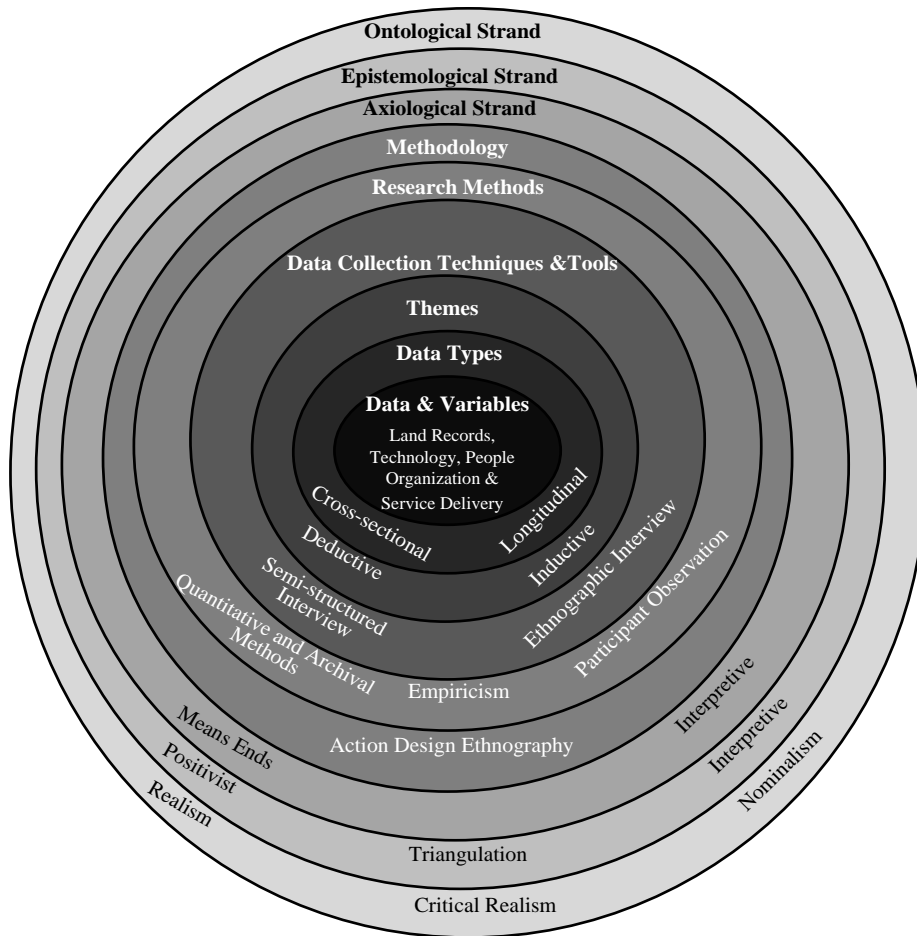


Figure 4-2: The Research as a Whole

The study has conducted an uncontrolled interventional and qualitative research where unit of analysis is interactive and multilevel. Thus, it is difficult to define units of analysis. Fundamentally, every application for land record service is a unit. This unit includes cost, time, visits, quality, supports and obstacles in submitting application for this service and receiving of this service. Resultantly, there are multilevel, interactive and non-discrete unit of analysis. There are many units embedded within the e-service of land record because E-service of land record includes paper based register of land record, information technologies for filing application for land record and processing the record, medium of citizens' access to this service, duration of service delivery, process of service delivery and cost of the service.

Since the study focused on the E-service of land record including its organizational contexts, structure and processes and technological networks; the data of this research is qualitative. Consequently, for tracing intra-actions and entanglements in technology and organization qualitative data were analyzed. The qualitative inquiry was applied for producing findings through analyses, interpretation and presentation. Thus, it was difficult for the researcher to reduce the large volume data to a sizeable form, identify their significance, extract the essence and construct a framework for communication.

4.5 Conclusion

This study was conducted in the E-service land record in Bangladesh with a researcher-client arrangement for a three years period at the DRR Khulna, a public sector organization. This study has closely observed, intervened, designed and redesigned the organizational contexts and technological processes of the E-service. The researcher is a former practitioner who served in a similar organization for about five years. Consistently, this study engaged in designing, managing and mediating access to the E-service. Consequently, main methods and techniques were participant observation, semi-structured and in-depth interviews, open ended discussions, focus group discussion, archival method, consultations and meetings and interventions. In addition, the initial findings have been

presented and consulted with practitioners in number of workshops at national level, monthly review meetings, and open ended consultation meetings with the staff, citizens and officers of the organization involved with this service. Besides, separately focus group discussions have been conducted with the staff and the middlemen. Further, open ended interviews have been conducted among citizens, staff and middlemen. Furthermore, since land record service is a complex process, the study applied longitudinal, interventional and ethnographic approach in data collection from the DRR and five telecentres of the district located in the rural areas. Finally it has applied both top down and bottom up thematic analysis to analyze and present findings along with a narrative approach.

Chapter 5: The Organizational Contexts

5.1 Introduction

IT in service delivery of land record has received importance to disciplines and practitioners because IT has unveiled significant opportunities for public service through reducing cost and time of service delivery, enabling citizens' easy access to service and ensuring transparency and accountability of service (Thomas, 2009; Proenza, 2007). Since the late 1980s, development partners and governments in developing countries have been experimenting on a number of projects on IT in service delivery of land record while a few projects succeeded (Cook *et al.*, 2008; Barnes, 2007). Significant numbers of projects and initiatives on IT in land related services have drastically failed in both developed and developing countries (World Bank, 2006). Thus, till now using IT in land record service remains a complex field to practitioners and academics (Cook *et al.*, 2008; Barnes, 2007; USAID, 1995; Holstein, 1993).

The land record service in Bangladesh has been identified as a problematic, outdated, corrupted and litigated matter by the government itself, the development partners, practitioners and the civil society (Imran and Gregor, 2011; Khan, 2011; Aziz, 2003). Rampant corruption in this sector is seen as a barrier of economic growth of such agrarian country (Toaha and Khan, 2008). Further, the World Bank finds that most of the crimes and corruption involved with land record matters in Bangladesh (Chowdhury, 2011).

There are four core components of the service delivery of land record in Bangladesh: registering deed of land ownership transfer known as *land registration*; updating record for changing ownership known as *mutation*; updating cadaster known as survey and receiving officially attested exact duplicate copy of land ownership record (Record of Rights). Amongst attested

copy of land record is widely used and it is basis of all other land related services and requisite of many public and private services in the country. This service locally known as different names: *Khatiyan, Nokol, Porcha, Soi Muhuri Nokol and so on*. This study has termed it as the 'land record service'. On an average, per day 20,000 - 30,000 applications were received from citizens for this service in the country. There is no other public service that receives such amount of applications from citizens. Along the line, the government designed E-service for the land record service. Since this service newly designed, widely used and so far as virgin field, this study has selected the E-service of land record as a case of this study. Two main concepts are involved with this case: 'attested copy of land ownership record' and 'service delivery of attested copy of land ownership record'. They have been referred as 'land record' and 'land record service' respectively.

Land record and land record service are inextricably connected with life and livelihoods of the people in the country. Land record is pertinent document for receiving loans from banks and financial institutions; buying, selling and donating of land; determining ownership and size of land; managing land litigations and civil suits of land; applying for basic services including electricity, gas, water; receiving subsidized rate of fertilizers, pesticides, fuels and other agricultural services (Aziz, 2003; Kulkarni, 2003). Aiming to ensure citizens' easy access, the government and development partners across of the world have taken numbers of initiatives. However, a few projects have been succeeded. Consistently, this chapter comprised using IT in land record, land record service, land record service in Bangladesh and IT in land record in Bangladesh.

5.2 Using IT in Land Record Service

5.2.1 A Cross Cultural Scenario

IT offers quick service delivery, citizens' easy access and lesser cost of land record service (Cook *et al.*, 2008). However, IT is not a matter of hardware or software alone; rather it includes organizational processes, practices and actors

including registers, clerks, archivist, courts, lawyers, banks and intermediaries (Cook *et al.*, 2008). Although development partners and governments launched IT in land record services to improve processes of service delivery, transparency, accountability and reducing poverty; very few projects have been succeeded (Barnes, 2007; USAID, 1995; Holstein, 1993). Thus, although IT is effective in land record service to reduce costs of recording, updating, administering, publishing and securing (Proenza, 2007); Many IT driven projects have utterly failed throughout Latin America to Africa and in Asia (Burns *et al.*, 2006).

IS research in developing countries focuses on development, implementation and usage of IT artifact. Besides, it also traces underlying political, economic and cultural and behavior contexts and processes that are obstacles in IT implementation (Avgerou and Madon, 2004; Walsham, 2001; Avgerou and Walsham, 2000). IT in service delivery in developing country is challenging due to complex interrelationships with socioeconomic factors (Nedevschi *et al.*, 2006). Moreover, land record services are strongly influenced by social, cultural and bureaucratic processes. Thus, ignoring existing practices, capacity and socio-cultural contexts resulted to failure of IT in land record service (Acharya, 2009). In line, Sahay and Avgerou (2002) identified that domination of existing organizational networks hindered IT in land record services in developing countries. Consequently, IT in land record service is challenging due to various forms of interests, networks and actors involved in land record service (Sinha, 2003). Thus, success of IT in land record service rests on and organizational contexts, designing and redesigning of IT along with organizational context.

In line, Heeks (2002) asserts that IT in public sector organization needs to be aligned with data resources, economic resources, social resources and action resources (Heeks, 2002). Consequently, successful integration of IT in organizational contexts relies on data capturing, storing, updating, manipulating, mining, analyzing and displaying (Van House, 2004; Heeks, 2002). Thus, IT in public sector organizations are intermediated, interconnected, indigenized intelligently with organizational contexts instead technical one (Heeks, 2002).

Nowadays, governments, no matter how big or small, are embarking on IT leveraging to improve their performance. Evidently, there is significant investment in IT in land information systems to enhance citizens' easy access, reduce cost and improve process of service delivery, reduce corruption and achieve good governance. However, about 85% of IT projects have been failed in developing countries (Heeks, 2003). Surprisingly, most of the IT projects were failed due to technology driven designs (McGrath and Maiye, 2010).

Land record service is such a process which is connected with many actors, processes and networks within and beyond of public sector organizations. Thus, innovation and improvement of land record service through IT depends on successful collaboration, interaction and networks (Kain and Baigent, 1993). Consequently, the E-service of land record is involved with organizational practices, rules, structures, actors and networks. As a result, domesticating IT in organizational context require interaction between IT and organizational actors and users because to change organizational practices it needs good reasons , time and training (Kling and Lamb, 1999). In addition, incentives, rewards and compliance are significant. As a result, only computerization of land record cannot reduce malpractices, non-coordination, mismanagement and vested interests (Sinha, 2003).

Consistently, IT alone cannot change existing organizational practices, network and settings; rather they have potential capacity to reshape of IT in organizational context (Orlikowski, 1992). Evidently, users do not accept IT as it is designed but they reshape it through practices and contexts. Thus, designing IT in land record service is challenging due to its complex interrelationships with its users and organizational contexts. Moreover, land record service in developing countries is surrounded by various interests (Sinha, 2003). Evidently, IT in land record service failed if its surrounded networks and contexts are ignored (Acharya, 2009). Along the line, the following section focused on IT in land record related services in developing countries.

5.2.2 Scenario of Developing Countries

IT is widely used in developing countries for land related services, land management and land administration. Consistently, application of IT in land related services are wide and diverse. These are land information systems (LIS), Geographic Information Systems (GIS) and Special Data Infrastructure (SDI) and digitization of land record. Though they seem synonymous but there are significant variations in their meanings (Zhao, 2010). Implementation of IT in land record and providing E-service of land record demand a well-managed data infrastructure (Acharya, 2009). Thus, digitized land record, digital cadastral survey, GIS, SDI and LIS are inevitably connected with E-service of land record. Implementation of IT in management and service delivery of land record are inter-related.

However, land related data and information, digitization, integration and dissemination are really challenging (Proenza, 2007). This scenario is highly prevalent in the context of land record management in the developing countries. IT in land record management is linked organizational context. Norway is notably a successful case for integrating land registries and cadaster in a single online database under the Norwegian Mapping and Cadaster Authority beginning in 2003 (Barnes, 2007). Similarly, Bhoomi is a successful integration in land ownership record, cultivation record and land transfer record. Thus, successful implementation of IT in land record related service and land information systems. In line, the following section gives an overview of usages of IT in land related services.

An LIS is a database connected with land administration, land record, GIS and SDI. GISL International Consultants (2012) defines LIS as a tool for legal, administrative and economic decision making, and an aid for planning and development and follows systematic collection, updating, processing and distribution of that data. Consistently, LIS is the backbone of using IT in land record as well as E-service land record.

GIS is a way of doing work with technology for viewing map, database and spatial analysis relating to geographic information for social and organizational purposes. It is an organized activity to measure and represent geographic phenomena then transform these representations into other forms while interacting with social structures (Chrisman, 1999). However, applying GIS is challenging. Consistently, Yeh (1991) analyzed 20 projects of GIS application in Asian Countries including India, China and Hong Kong and showed that organizational structure and practices were not ready accept the implementation of GIS technology in land management. Similarly, Nkwambe (1991) finds organizational hierarchy is problem for implementing technology in land management in the case of Botswana. Similarly, Walsham and Sahay (1999) assert that lack of aligned interest among the key actors was the main reason for failure of implementation of GIS technology at district administration in India. Evidently, GIS applications in developing countries are involved with organizational integration and management process.

Spatial Data Infrastructure (SDI) aims to provide a holistic platform for users to interact with technical and nontechnical data relating to location, infrastructural, social and economic aspects (Mohammadi, Rajabifard and Williamson, 2010). Thus, SDI refers to a particular type of information infrastructure drawn upon various technologies, including remote sensing, spatial modeling, database technology, computer networking and GIS (Georgiadou, Bernard and Sahay, 2007). With a view to a better management and service delivery in land record, India launched land data infrastructure in Karnataka state in 2001 which attracted academicians, practitioners and stakeholders initially as a pioneer step in the Indian Sub-continent (Georgiadou, Bernard and Sahay, 2007). Thus, SDI directly interacts with land administration, land record and land information system.

More specifically, GIS is one of the components of SDI and basis of LIS. While LIS is top down and policy driven, GIS is bottom up and practice driven (Karikari, Stillwell and Carver, 2003). Thus, land records are core of GIS, SDI and LIS because their starting point is land record. Besides, digitizing of land

record is involved with GIS, SDI and LIS whereby land record serves multi-purpose needs of land information and making effective land administration (Wallace and Williamson, 2006). Evidently, digitization of land record and E-service of land record are inevitably connected with GIS, SDI and LIS. Consequently, integration in organizational processes and technological network is significant to design and implement of E-service and technology.

In line, land information and land record in Bangladesh belongs to at least four organizations: conducting cadastral survey to the Directorate of the Survey and Settlement; updating registries (record) to Upazilla (sub-district) land office; land record archiving, updating, registration of land transfer deed by Sub-Registrar of Upazilla and delivering official attested copy of land record (land record service) from the District Record Room (DRR). The latter was the determinant for the rest of them. Moreover, the land record service is involved with a number of organizational processes, laws, regulations and statutes. Further, the land record carries contained significant data and information for LIS, GIS and SDI. However, coordination among organizational processes and services rarely takes place. Consequently, due to the fragmentation land related information and organization, effective LIS, GIS and SDI have not been developed in Bangladesh. However, it has started the automation of existing paper based land record registers aiming to ensure citizens' easy access to land record service. Thus, Bangladesh has devised IT network to ensure citizens' easy access to land record service and launched digitization of land record.

The driving force of using IT is to ensure citizens' easy access to land record service in the country because its citizens have been facing obstacles, complicity, bribery, forgery and exploitation. To address these, the government launched the E-service for citizens. However, using IT for land related services in developing country with high illiteracy and limited access to technology and internet required bridge, mediator, infomediary and technology mediated service provider (e.g. kiosks, telecentre). They are imperative to facilitate E-service of land record between the service provider and the citizens. However, mediating services from

public sector organization to citizens have already been prevailed in many services in developing countries. Evidently, different types of middlemen have involved and inscribed land related services in developing countries as well as Bangladesh. In many cases, it has appeared that the traditional middlemen are significant obstacles in using IT as well as infomediaries for citizens' easy access to the land public services. Consistently, following section focused on IT and intermediaries (middlemen) and infomediaries (telecentre or kiosk) in mediating citizens' access to public service.

5.2.3 Land Record Service and Intermediaries in Developing Countries

The concept of 'intermediary' and 'infomediary' are widely used in information systems (IS) literature especially in the context of developing countries. Notably, there are various forms of intermediaries in developing countries to mediate public service between citizens and organization. They are formal, informal, hidden, floating and so on. Both the concepts 'intermediary' and 'infomediary' are presented in IS literature as 'third party', 'bridgers' and 'brokers' (Sein and Furuholt, 2012; Sein, 2011; Bailey, 2009; Madon and Sahay, 2002; Provan and Human, 1999; Bailey and Bakos, 1997; Bessant and Rush, 1995). Although the concept of intermediary is heavily studied in IS research, the role of informal intermediaries has not yet received attention. Informal intermediaries are known as middlemen who engage themselves in brokering through using their knowledge, skill and networks that have been developed over a long period of time in developing countries.

Conversely, infomediaries are also service mediators between citizens and service provider. Their distinct feature is that they mediate service through using IT. They can be seen as formal intermediaries who harness advantage of IT and mediate citizens' easy access to information and service. Evidently, infomediaries are mostly involved in bridging the digital divide, connecting between service providers and citizens and facilitating citizens' access to services and information

through employing IT (Sein and Furuholt, 2012; Díaz Andrade and Urquhart, 2010). With the expansion of IT, the role of the infomediaries is emerging in developing countries.

To enhance citizens' access to public services and information, the role of infomediaries has received attention in developing countries where the rate of literacy and internet penetration is very low (Sein, 2011). Thus, infomediaries have become important in reducing digital, social and economic divides. Consequently governments, development partners, practitioners and professionals strive to set up infomediaries i.e. 'telecentres', 'kiosks', 'cybercafés' and 'community information centers', in order to enhance citizens' access to services and information (Becker *et al.*, 2010; Delgadillo, Gomez and Stoll, 2002). So, they play trivial role in mediating access to information and services with the aid of IT. With this regard, Professor J.R. Choudhury, head of the taskforce for ICT Policy in Bangladesh asserts: "...[F]or any public access facility to be successful in catering to the needs of the majority of population, there has to be a person in between the end user and the computer, the so-called 'infomediary' or 'information worker' " (cited in, Sein and Furuholt, 2012). Consequently, the role of infomediaries is expanding through delivering services from public sector organizations in developing countries e.g., '*Bhoomi*', in India (Prakash and De, 2007) and 'Union Digital Center (UDC)' in Bangladesh (Alam, Brooks and Khan, 2012).

Mediating services from public sector organization to citizens is not a new phenomenon. Especially in the context of developing countries, there are diverse forms of intermediaries. They are known as different names and identities. In the case of land record service in Bangladesh, intermediaries are prevailed as middlemen. They are locally known as *dalal*, *moddhyoshotthovogi*, *tout* and *so on*. The middlemen have strong networks with service providers and citizens and they become potential threat for infomediaries involved in mediating land record services in Bangladesh. There is a strong influence of informal sectors on the context of developing countries' information systems, organizational processes

and networks that are shaped and reshaped than the formal process and sector (Marjit, 2010; Ciborra and Navarra, 2005). So, informal intermediaries (middlemen) are not isolated, rather they are entangled with formal processes and dynamically interact with complex situations (Chaudhuri and Mukhopadhyay, 2010).

Similarly, Webb et al. (2009) show that institutional incongruence and weak enforcement of formal institutions generate informal processes, actors and networks. Thus, informal intermediaries can easily exploit better opportunities and privileges through loopholes of the formal processes. Both ‘informal intermediaries’ and ‘infomediaries’ portray some common and distinctive features. For example, both of them mediate citizens’ access to services with a service charge or profit. However, infomediaries are formal and visible entities and they are authorized for mediating citizens’ access to services using IT and with a prescribed service charge. The role of infomediaries has been expanded after widespread application of IT in public sector organizations. Conversely, middlemen are not always visible and they work as hidden actors as well. They have vested interest network with the actors of the organizational process. However, middlemen are common and visible in public sector organization in Bangladesh. Consequently, middlemen are the potential threat for the infomediaries who involves in formal intermediating.

With this regard, the potential threats of IT in public sector are derived from informal intermediaries, invisible and hidden actors, in developing countries. IS research focuses on the sustainability threats of infomediaries. While the threat from the informal intermediaries significant. There are diverse forms of middlemen have been prevailed in the organizational context of land record in Bangladesh. An empirical study showed that middlemen (informal intermediaries) have strong networks with service providers and citizens and they are potential threat for infomediaries involved in mediating land record services in Bangladesh (Alam, Brooks and Khan, 2012). Consistently, middlemen are visible, invisible and hidden in developing countries and they always break formal and

technological processes in public service with their skills and power. Thus, they are potential threats for IT and infomediaries in developing countries.

More importantly, different entities, individuals and actors are involved as middlemen in land record service in Bangladesh (Alam, Brooks and Khan, 2012). They are known as *dalal* (broker), *modhoysotthobhugi* (middleman), *muhuri* (application writer or personal assistant to lawyers), lawyers and so on. Consequently, citizens pay speed money (or bribe) which is 10 to 100 times than the normal service fee to the middlemen. To redress these problems, the government launched an E-service of land record in 2011 with 4501 telecentres, 64 District Web Portals (DWPs) and 64 E-service Centers (ESC). Along the line, the following sections provided an overview of land, record, land record, land record in Bangladesh and use IT in land record in Bangladesh.

5.3 Record and Land Record and Its Service in Bangladesh

The land record service in Bangladesh is an archaic in nature. Land records are preserved in dilapidated condition and they are difficult to understand by common people and managed by strong bureaucratic process. Consequently, its land record service has given rise of rampant rent seeking, created network of vested interests, caused deprivation of weaker sections of the society, expanded intentional damage of record and induced fraud and forgery of land record (Imran and Gregor, 2011; Qazi, 2006). In line, Transparency International Bangladesh (TIB) ranked land record related service as highly corrupt service and according to the World Bank its problematic land record system is responsible for 80% of the total litigations in the country. Consistently, aiming to understand land record and land record service, this section has focused on land record and land record system in Bangladesh.

The land record system was first introduced in the country at the time of Hindu Rulers in ancient India. Thereafter, in medieval period, the Mughal emperor Sher

Shah introduced a regular system of land measurement together with the assessment and collection of revenue. He worked on land record survey from 1540 to 1545. Then Akbar, the great Mughal Emperor introduced a universal and standard way of land record and survey. Later on, in 1973, the Permanent Settlement Act vested rights to own land to a class of Zaminders. From 1888 to 1940, a Cadastral Survey (CS) created the first modern land record in the country. Thereafter, in 1950, the Zamindari system was abolished and conducted a revised survey from 1956 to 1962 known as State Acquisition Survey (in short SA).

5.3.1 Land, Record and Land Record

Simply land refers to a piece of land with defined boundaries, on which a property right of an individual person or a legal entity applies (Kaufmann, 2002). Kaufmann added “a land object is a piece of land conditions exist within its outlines and legal objects are described by the legal content of a right or restriction and the boundaries which demarcate where the right or restriction applies” (Kaufmann, 2002). Land, people and society are inextricably inseparable, for instance, in 'England'- the land of English people; in 'Finland' - the land of Finnish People; and the same thing goes in 'Bangladesh' - the land of the Bengali people. However, in the micro context, every parcel of land has its owner (Bentsi-Enchill, 1965). In the modern state systems there are various stakeholders involved in management and service delivery of land. Thus, land records have posed versatile vested interests, especially in a developing country like Bangladesh.

Generally, a 'record' is any documented (recorded) information, regardless of format (Fitzgerald, n.d.). Precisely, a record is “a thing constituting a piece of evidence about the past, especially an account kept in writing or some other permanent form” (Oxford Dictionaries, 2012). More elaborately, a record is an information construct as an object and subject which has administrative, judicial, cultural and historical dimensions (Gilliland-Swetland, 2005). However, all

documents or information cannot be treated as record. There are certain criteria to be fulfilled by any document, information and thing or object to be treated as record. Firstly, the record is to be time bounded, because it is created for time-bounded specific action (Gilliland-Swetland and Eppard, 2000).

After a certain time, a record may lose its significance and can be treated as any other object or thing. So, 'time and action' bounded together is the first and foremost criterion for anything to be treated as record. Secondly, to be a record any document or thing or information must somehow be 'set aside' which refers to record management (MacNeil, 2002; MacNeil, 2000a; MacNeil, 2000b).

Besides, a record must carry information systems and business processes that provide unique identification of record; authentication of record; persistence of record contents; structure and context (representing the meaning); tracking and documenting use history; including record keeping and archiving processes; enabling discovery; retrieval and delivery for authorized users, restricting unauthorized use and assuring inter-operability in network environments (Duff and McKemmish, 2000). Thus, a record is always associated with an action or an event, as an agent and product, or by product and includes a minimum definable set of metadata that serves to provide evidence about that action or event (Gilliland-Swetland, 2005). Notably, electronic records or e-records are being created either 'converting' the existing record into electronic form or being by 'born' electronically and to be e-record legal and business conduct support inevitable (UNPAN, n.d.).

Land record is a wider concept that includes spatial, legal, cadastral and geographical information. It includes cadaster along with legal and financial information which is significant for local governments as well as public sector organizations (Ventura, 1998). In general, land record includes three major components: land titles, land deeds and chains of land titles. Land titles includes – a description of a land parcel's – legal rights and interests, location, boundaries, public land reference or holding number, plot number and size and type of land. Land record is significant to trace chains of land titles that include a fully

supported claim of titling traced back through transfer of title due to land transfer notice, deeds or inheritance or decree (Aziz, 2003; Ventura, 1998). Thus, land record contains substantial information on legal, communal and cadastral. In the case of Bangladesh, land record is the basis of land titles or land ownership.

Further, land record in Bangladesh is prepared through cadaster. It is the root of land information and land info-structure. It refers to the description of legal and fiscal interests in land properties. Generically, cadastral data relates to real estate (as object), person (as subject) and right or restriction.

The wider meaning of cadaster refers to ‘a methodically arranged public inventory of data concerning all legal land objects in a certain country or district based on a survey of their boundaries’. There are broadly three types of cadastral surveys: multipurpose cadaster (German Style); title or deed tenure style cadaster (English Style) and taxation driven cadaster (French or Latin or USA style) (Williamson *et al.*, 2009). Land record cadaster of Bangladesh contains taxation, geographic and ownership information. Therefore, land records in Bangladesh are significantly informative and complex at the same time.

Land record and legal statutes are inextricably connected. Every country makes laws through parliamentary process, implements laws through executive organs i.e., public sector organizations and enforces laws through judicial systems, while laws have direct impact throughout the processes of record and E-service of land record (Millar, 2009). Similarly, land record management and land record services in Bangladesh are strongly guided laws, Acts and regulations of which most them are enacted by the British Colonial government. Thus, DFID has assert that for changing stamp rules in land record is a small solution but it could bring a big success in governance process (DFID, 2007). At present most of laws and Acts outdated and have become obsolete. Notably payment of fees for land record service requires stamps which are very much complicated and obsolete systems.

5.3.2 Bangladesh and Its Land Record

Bangladesh is a frontier land of south Asia which is located between the semi-arid plains of north –west India and tropical rain forests of South East Asia. It is an agro based and the most populous country with a total population of 160 million within an area of 148,000 Sq. Km. Land available per head is 0.22 acre only. However, its agriculture contributes to 60% of total GDP and about 80% of people depend on agriculture. More than 60% of total labor force is deployed in agriculture which constitutes about 55 % of national GDP (Moore, 2008).

Land is the main capital and highly valuable economic possession for majority people of the country. Thus, land is very scarce and most valuable resource for its citizens. Consequently, land sale and purchase, mortgage and transfer of inheritance take place frequently. Taken them together, the land record (issuing exact duplicate copy of ownership) services are core public service in the country. The citizens, farmers, land owners, organizations including public and private sector organization need land record for a number of purposes including legal, financial, welfare service delivery, development planning.

However, the land record system in BD has been evolved in complicated processes and number of political regimes. Consequently, there are three versions of land record in the country. Following the British and Pakistan regimes 1757 to 1947 and 1947 to 1971 respectively, Bangladesh gained independence in 1971. Consistently, there are three types of land record: Cadastral Survey (CS) in 1920s, State Acquisition Survey (SA) in 1960s, and Bangladesh Revised Survey (BRS) since 1970s. Besides, there is also held City Land Survey in Dhaka.

Individual land ownership has been introduced by the British colonial government in this subcontinent through Permanent Settlement Act 1791. This is the Act which first acknowledges land ownership of the cultivators. In line, in 1888 first land record survey was conducted and known as Cadastral Survey (CS). The land record contained: the name of land cultivator(s), number of land plots owned by the cultivators, size of every plots of land and total amount of land, type of land

and physical location of land. Hence from the origin of land record, the service delivery of land record has been introduced.

CS Survey	1888-1940
SA Survey	1958-1963
RS Survey	1972- ongoing

Table 5-1: Type of Land Survey in Bangladesh

The second version of land record is known as State Acquisition (SA) record that was prepared under the Pakistan regime in the 1950s. It contains lots of tampering. The latest version is known as Bangladesh Revised Survey (BRS) record that has been started in the process in Bangladesh period since 1972 and still it is on-going.

There are mainly three types of record that are functioning. So, citizens need to collect all the three types of record to ensure accuracy and authenticity aiming to buy, sell and mortgage of land. As a result, land records have become essential for document and land record service has become a core service.

Directorate of Land Record	1
District Record Room	64
Total Jurisdiction Unit (Mouza)	61410
Total Land Record	1100,00,000

Table 5-2: Organizational Set up of Land Record Survey in Bangladesh

The land record service is the common and widely used. Further, it is the precondition of performing the other three services and many other public services. In line, this study has focused on land record service. This service is prepared and delivered from the DRR, a section of the Office of the Deputy Commissioner. Land record is inevitable for determining legal basis of ownership

of a parcel of land; registering land for the purpose of sale or will and using as collateral evidence of mortgage and requirement. Approximately, the country receives daily about 20,000-30,000 applications for land record service per day and the researched district receives about 300-400 applications per day.

5.3.3 Land Record Service in Bangladesh

Land record in Bangladesh refers to a record of rights which is prepared through cadastral survey and preserved in cadaster registers. Land record contains information relating to land ownership, ownership ratio between owners (in the case of multiple owners), number of plots owned by the multiple owners, total amount of land, type of land and amount of land tax.

Land records are recorded through cadastral survey conducted by the Directorate of Land Record and Survey (DLRS) is responsible for cadastral survey of land and printing land record. After preparation and printing of land record, the DLRS handed over the land record registers to the DRR for the public service. There are 64 DRRs in the country and they are responsible for delivering land record service (attested exact duplicate copy) (figure 5-1). Thus attested land record inevitable for authenticating and determining land ownership and it is used for various purposes in public offices, private sectors, banks, financial institutions, selling and buying land, civil and criminal courts etc.

Consistently, in order to determine the ownership of land, attested record is the prime determinant. Citizens need attested land record for buying and selling of a piece of land, registering deed of land and granting an order of land mutation. Furthermore, attested land record is essential for processing land mortgage from banks and credit organizations, taking constructions and development activities on land, acquiring private land by the government, releasing of acquired land by the government, leasing or allocating permanently or temporarily any land owner by the government land to the citizens.

Land record is the basis of land ownership and the compulsory element of land registration and updating the existing land record. It is prepared at the field level through cadastral survey and contains information of every plot of land including ownership, size, type, boundary, location, tax and legal detail. The cadastral survey is a complicated process and includes numbers of stages.

Consequently, printed land record preserved at the DRR, a section of the Office of the Deputy Commissioner and they are to be used for the purpose of service delivery to the citizens as well as the owners through issuing attested land record. Thus, DRR is responsible for preserving and delivering land record to service citizens. Three major services on land record are delivered from public sector organization: issuing attested land record, registering land deeds and updating land record due to change of ownership of land or types of land. For all these services, land record is the core element. Land records are preserved in cadaster registers. DRR is responsible for preserving cadaster registers and issuing attested copy of land record from the preserved cadaster registers on the basis of citizens' application.

Citizens' access to this service is complicated due to complex processes of filing applications, arranging support documents and calculating fees. Notably, although literate people are about 50% of total population, active literacy having reading and writing ability is about 20%. Consequently, various forms of informal intermediaries have developed over time to mediate this service for citizens. This informal intermediating has become inextricably inseparable part of this service. Without the middlemen networks, access to this service is difficult because the middlemen and the service providing staff generated vested interests and private gains from this service. Thus, access to this service without informal intermediary is resulted in delaying or rejection of service. The organizational staff receives vested interests from the informal intermediaries. As a result, the middlemen expedite this service for bribe or 'speed money', to ensure a secure and quick service delivery. However, the flow of the speed money or bribe is connected with the formal organizational process. This service, thus, has ranked top in corruption

and public sufferings know no bounds. The government has introduced E-service for land record to address these problems and to ease citizens' access to this service. Aiming to address these problems the government initiated number IT project to digitize land and deliver E-service of land record. Following section has given an overview on a past initiative of digitizing of land record in Bangladesh and the present initiative and the case for this study - the E-service of land record in Bangladesh along with state of IT in Bangladesh.

5.4 IT in Land Record Service in Bangladesh

5.4.1 Current State of IT in Bangladesh

Since 1996, Bangladesh has connected with Internet Service through VSAT (Roknuzzaman, 2006). However, the rate of internet penetration is very low i.e., 0.35%. Even lower than the neighboring countries, such as: Bhutan (5.8%), Maldives (18.1%), India (7.0%), Sri Lanka (5.4%), and Pakistan (10.6%) (International Telecommunication Union, 2009). Bangladesh has been striving to implement IT in public sector organizations to enhance the capacity of the government and to ensure better service delivery since its independence in 1971. In order to modernize public sector organization through the use of IT numbers of steps have been taken in Bangladesh: emphasizing on 'progress in science and technology for decision-making' (GoB, 1973); 'modernizing government administration through use of computers, IT trainings for its public officials'(GoB, 1989); 'increased use of computers for efficiency and transparency in public sector, and 'introducing e-government for better governance'(GoB, 2000). Finally, the government of the date, in 2009, vowed with political manifesto 'Vision 2021 – Digital Bangladesh' (GoB, 2011).

With the Vision 2021 – Digital Bangladesh the government has emphasized on using IT for public service. In line, every government office has developed its website, help desk and citizen charter. Besides, officers and staff have even been receiving trainings on technology. However, there were lack of electronic literacy,

lack of internet users and lack of network between citizens and the public sector organization to mediate citizens' easy access to public service. Thus, the government of Bangladesh has been striving to digitize land record and to deliver land service electronic means and access points. The government of the day has launched a flagship program A2I and E-service of land record has been designed as program to ensure citizens' easy access to this service. Consistently, this study used this E-service of land record as a case this study and provided an overview the past and the present initiatives using IT in land record as well as E-service of land record.

5.4.2 Past Initiatives of Using IT in Land Record Service

In 2001 the then elected government launched an ambitious IT project namely, 'Support to Information and Communication Technology (SICT)' with a promise of e-governance for ensuring citizens easy access to public service, reducing corruption, ensuring law and orders and enhancing economic prosperity. It was a mega project that comprises of 30 components to modernize public sector organization as well as public service delivery through digitization and IT. It was the Government of Bangladesh funded project with a budget of BDT 8316.20 Lac (USD11.8 Million). The project was initiated in 2002 and lasted up to 2008.

A component of the SICT project was introducing digitizing land record that preserved in the District Record Room (DRR). It had piloted this digitization project in two districts. However, it failed to achieve any result. The project was mainly reliant upon hired technical consultants and personnel but they failed realize the organizational context and reality. The main problem was that it was difficult to retrieve the digitized land record. This project built an online digital repository through scanning the existing record. The technicians gave such a high resolution of the scanned files and built online repository, it was really time consuming to retrieve. Consequently, this digitization failed to attract the organizational managers and staff. More importantly, it failed to ensure quick service delivery and citizens' access to this service. Further, this project was failed

to meet the need of the organization and citizens and ultimately it failed interact with them.

Moreover, it was a top down and ambitious e-governance project that was launched without setting any vision, targets, policy supports or legal basis, the government launched. Consequently, the SICT failed assess e-readiness of the organization and the citizens.



Figure 5-1: Support to ICT Task Force

By characteristics SICT Project was like a highly vertically managed silo. This project was individualized within the Ministry of Planning, because it failed to engage other departments and the people of different sectors. Its Steering Committee was formed of high ranking bureaucrats, a galaxy of ornamental personnel. So it failed to occupy the top priority list of the government due to the inactive committee. Besides the Technical Committees of the SICT project was formed completely of the out-sourced personnel comprising of consultants and representatives of various institutions who utterly failed to engage them as a proactive group of managers.

Moreover, the SICT was a gigantic but a bogus-boo type of project in funding and in management. Heterogeneous 34 sub-projects were embodying many public sectors in a single packet for establishing e-governance for National Security

Intelligence, Land record management and service delivery, IT system for River Research Institute (RRI) and so on. The framing of the project displayed the ignorance of organizational contexts, actors, rules and regulations. In practice this was an example of victimizing the ignorant the organizational staff and managers involved with the land record service by the technological frauds in a developing country. Resultantly, the project was destined to be a failure.

5.4.3 Current Initiative of Using IT in Land Record Service

The general election of 2008 in Bangladesh got momentum to the political activities. The major parties floated their manifestos to be implemented when in power. Of them, the Awami League came up with the ‘Vision 2021: Digital Bangladesh’ program. With people’s mandate Awami League gained political power with absolute majority in the parliament. Thus, in order to implement its manifesto, the elected government launched the ‘Access to Information (A2I) Program’ as a flagship project to implement IT in public sector organization aiming to ensure citizens’ easy access to public service. The project is being implemented with the technical assistance from UNDP under the direct supervision of the Office of the Prime Minister.

The project aims to bring public service to citizens' door steps through employing IT. The A2I sets three access points in the service delivery through IT network: Union Digital Centers (UDC) – as telecentres in the rural areas at every Union Council, a District Web-Portal (DWP) and an E-Service Center (ESC) in each district of the country. They have online network with the service providing point of the DRR at the district headquarters. Since the inception, the A2I have been facing problems in implementing IT network in the service delivery of land record. In the beginning of 2012, the researcher motivated to address the problems collaborating with the DRR through designing and redesigning the processes and networks of the E-service of land record in Bangladesh.

The E-service of land record consists of IT networks with 4501 UDCs, 64 DWPs and 64 ESCs under a national flagship program. The E-service for land record refers to an online application submission process for land record using IT networks that have been designed in such a way that citizens can access to this service through any of the three access points: telecentres (known as Union Digital Center) –the access point for rural citizens; district web-portal –for urban areas and E-Service Center (ESC) – a front desk at the DRR, an access point located at district headquarters.

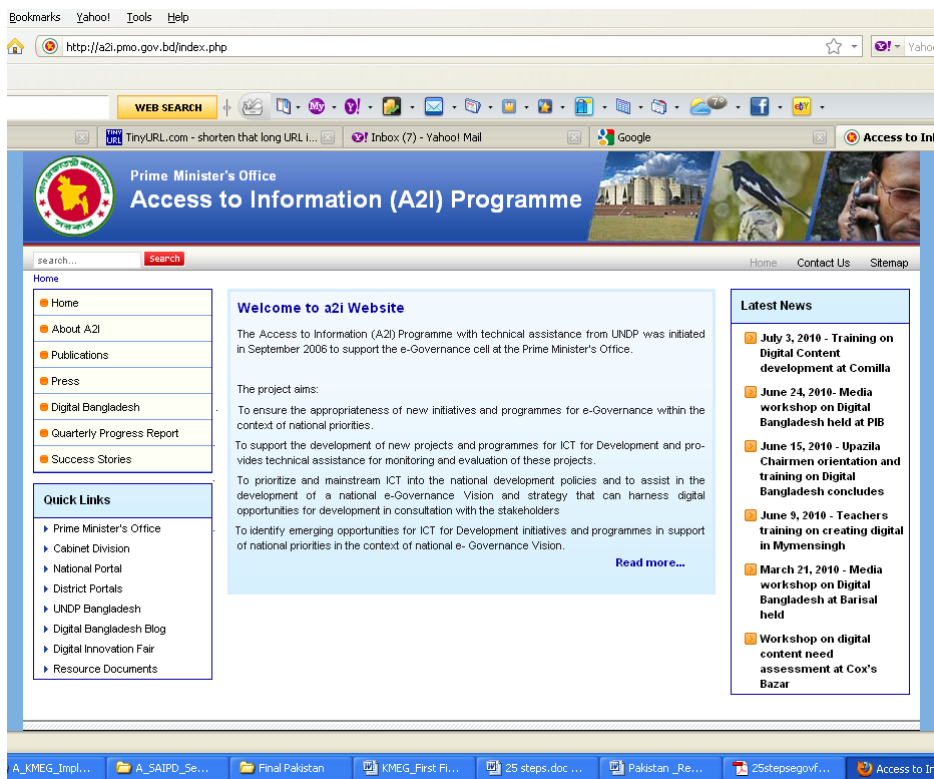


Figure 5-2: Web Portal of A2I Program

Three major services on land record are delivered from public sector organization: issuing attested land record, registering land deeds and updating land record due to change of ownership of land or types of land. For all these services, land record is the core element. Land record are preserved at the District Record Room (DRR) which is responsible issuing official attested copy (exact duplicate) of land record from the preserved cadaster registers on the basis of citizens' application. This is called land record service delivery from the DRR.

In 2009, the A2I Program has piloted the E-service through ‘Information Service Center’ and the Office of the Deputy Commissioner. It had built 1100 ‘Information Service Center’ at the selected Union Councils at the rural areas. They were successfully mediating citizens’ access to information and public service. Having good results from the pilot project, thereafter on 06 January 2010, the A2I Program launched District Web Portal (DWP) in each district, a total 64 DWPs for the whole country. DWPs are designed in such a way that it has option for submitting citizens’ applications for land record to the DRR through online. Since, after setting the DWP, the ‘Help Desk’ has turned as E-Service Center (ESC). The ESC has become point of receiving applications from citizens and it is connected with DWP.

ESCs are located at district headquarters at the same compound of the DRR and at the office of the Deputy Commissioner. This is a centralized access point to submit applications for and receive service delivery of land record. In order to receive the E-service of land record from the ESC, citizens require travelling from the rural areas to the district headquarters. Thus, aiming to bring public service at citizens' door step, the government designed country wide telecentre network with a total 4501 telecentres known as Union Digital Center (UDC) in November 2010. Thereafter, DWP, the ESC, UDCs were connected with the DRR in November 2011. Consequently, E-service of land record comprises a network between the DWP, the ESC, UDCs and the DRR.

Since there were no UDCs at cities and district headquarters, the ESC has been connected with the DRR to receive applications for land record from citizens living at district headquarters and coming to the Office of the Deputy Commissioner for submitting online application for land record. Thus, the ESC works as a front desk of the office of the Deputy Commissioner where citizens submit application for E- service of land record. Previously, citizens used to submit applications and receive delivery of land record from DRR. After introducing E-service center, citizens receive delivery of land record from the

ESC. It aims to reduce citizens' engagement with the middlemen and the DRR staff who are involved in corruption and rent seeking.

With this E-service, citizens could easily submit online applications from any of the three points: UDCs, DWP and ESC. However, online applications for land record were less than one quarter of the total applications. Conversely, there was high volume of paper-based applications by different middlemen at the ESC. Consistently, the E-service initially faced problems to involve citizens and organizational staff with this service and to remove middlemen and vested interests from this service. Consequently, the researcher involved in a DRR to address these problems. Consistently, the following sections provided an overview of UDCs, DWP and ESC.

The government has set up a total of 4501 UDCs in the country, a UDC in every Union Council (Union *Parishad*), aiming to mediate citizens' easy access to information and public service and deliver service from public sector organization to citizens. There are two operators in each UDC: one male and one female. They are recruited by the local Union Council on contract basis to provide a list of service deliveries to the citizens with certain service charge. Since the government has provided office and technological devices including Computer, Modem, Printer, Photocopier machine, the service charge is nominal and competitive. There is an initial contract between the operators and the Union Council that the operators would run UDC from the profit of their service delivery. Neither the operators would give any profit to the Union Council nor would the Union Council give any salary or financial support to the UDC operators. They provide a list of service delivery to the citizen leveraging ICTs for interacting with public sector organizations e.g., filling online application form for birth registration and delivering birth certificates, filling online application for retirement benefits of teachers, applying for attested copy of land record, application for passport, verification of visa, Mobile banking, payment of utility bills, dissemination of agriculture related information and services.

UDCs are located in the rural areas mainly involved with mediating citizens' access to information, ICT, and public services. They provide the list of services with a certain amount of service charge. In November 2011 the government has launched country wide network of UDCs through setting a UDC at every Union Council. The UDCs are run as public-private partnership. UDCs are connected with DRR through E-service network. Every UDC can submit online application for land record at DRR. It has opened a new avenue for citizens' access into land record service from DRR. However, it has been observed that although the UDCs can submit online application for E-service of land record to the DRR but they have been facing problems mediating from this service between citizens and the DRR from both the service provider and the E-service network too.

The District web portal (DWP) is a website whereby the Office of the Deputy Commissioner (in short DC Office) has put basic information on service delivery and citizen charter on service delivery. Besides, the DWP has option for submitting applications for a list of services to the DC Office. Particularly, it has devised to submit online application for land record service to the DRR. After submitting online application for land record service from the DWP, citizens need to send printed copy of the line submitted application along with fees and necessary folio papers to the DRR either physically or by post. Until and unless the DRR receive the printed copy of online application along with fees and folio papers, online application from the DWP has not been taken into consideration for service delivery. Consequently, access to land record service through DWP does rarely give any advantage to the citizens.

Problems with the E-service Center (ESC) Staff

The ESC is set up at the office of Deputy Commissioner (DC) as a front desk; located at the same compound of the DRR. It has been designed as the access point for receiving all the letters and citizens' applications that are addressed the DC office. Thus, it maintains a central registers and afterward it distributes letters to concern wings and sections. Since the DRR is a section of the DC office, all the

applications for land record are destined for the DRR. Only for the DRR, the ESC receives applications for the land record and delivers land record to citizens. Therefore, the ESC plays significant role for this land record services.

The ESC enrolls all the applications submitted for land record service into the general entry register. So, application submitted through UDCs and the DWP also come through the ESC. Besides, the ESC has option to receive online applications for the land record service from citizens. However, vested interests and organizational process have turned the ESC to receive traditional paper based applications for land record from middlemen. Since, the ESC is located at the district headquarters and continued with receiving paper based applications for land record service; it has become an easy access point for middlemen to enter into the E-service of land record. As a result, the ESC has rarely addressed citizens' problems of access to the land record service.

5.5 Conclusion

Historically land record systems in most of the developing countries are very complex. In addition, the complex nature of ownership systems, land title, cadastral processes, organizational processes and structures, laws, tradition added further complicacy. Bangladesh as a developing country goes with all these features of complicacies in land record systems and land record related services. Consequently, in the case of land related service in developing countries middlemen has been emerged since its inception. Although the government has been striving to address the problems in land record service since its independence, it is unresolved yet.

Citizens' access to land record service is complicated due to complicacy in land record system, rigid and complex organizational processes and presence of middlemen. Notably, although literate people are about 50% of total population, active literacy having reading and writing ability is about 20%. Consequently, various forms of middlemen have developed over time to mediate this service for

citizens. They became inextricably inseparable part of this service. Without the middlemen access to this service is difficult because the informal intermediaries and the service providing staff are networked with vested interests and private gains. Further, access to this service without middlemen is resulted in delaying or rejection of service. The organizational staff receives interests from the informal intermediaries. As a result, to ensure a quick service delivery depends on speed money.

The government has introduced E-service for land record to address these problems and to ease citizens' access to this service. The E-service has been designed with multiple access points aiming to remove middlemen from this service and to provide citizens' easy access to this service from their convenient locations without travelling to the district headquarters, the DRR. From any of the access points of E-service networks citizens have options to submit online applications to the DRR for this service. Consequently, the E-service network has been designed throughout country with a total of 4501 telecentres –one telecentre at a Union Council, 64 district web portals (DWP) –a web portal in a district and 64 E-service center (ESC) –an ESC at a Deputy Commissioner office. Along the line, the following chapter has discussed on issues and problems emerged after introduction of the E-service of land record in Bangladesh.

Chapter 6: Problems in the E-service of Land Record in Bangladesh

6.1 Introduction

With the inherent nature of an agro-based, post-colonial and developing country, Bangladesh's land record service is inextricably connected with organizational processes, structure, statutes, practice, staff, technology and intermediaries. Moreover, this service was complicated, centralized, middlemen oriented, vested interest driven and bribable. Consequently, access to this service without middlemen and intermediaries was difficult for citizens. Thus, this service was middlemen dependent. Since the inception this service, there have been evolutions of different types of middlemen who have networks with the organizational processes. As a result, citizens need to pay bribe from ten times to hundred times than the actual fees to receive this service. Further, since this service delivery was centralized; they needed to travel several times from home (rural areas) to the DRR (district headquarters) for applications submission and receiving land record.

The problematic contexts of land record service delivery were realized by the government, senior managers, the policy makers, the development agencies and citizens as well. To address these problems, E-service of land record has been developed in 2011 under a flagship program called A2I. The E-service network has been designed with three online access points for citizens' easy access to land record service. They are: Union Digital Center (UDC) - a telecentre at every rural union council; E-Service Center (ESC) a front desk in each district headquarters and a District Web Portal (DWP) – a website for each district. They are electronically connected to the DRR, the service provider of land record. Along the line, the E-service of land record aimed to ensure citizens' easy and direct

access to this service through the E-service networks (UDCs, DWP and ESC) instead of middlemen networks.

However, various forms of middlemen networks have been strongly rooted in this service from long ago. Thus, after introducing the E-service of land record the IT networks and the middlemen networks intra-act dynamically and continuously with organizational processes, staff and citizens. Consistently, the problems of the E-service of land record have been formulated from the diverse forms of intra-actions and entanglements in organizational and technological contexts. The problems can be categorized into three interrelated areas: organizational contexts, technological networks and intra-acting aspects of organizational contexts and technological networks.

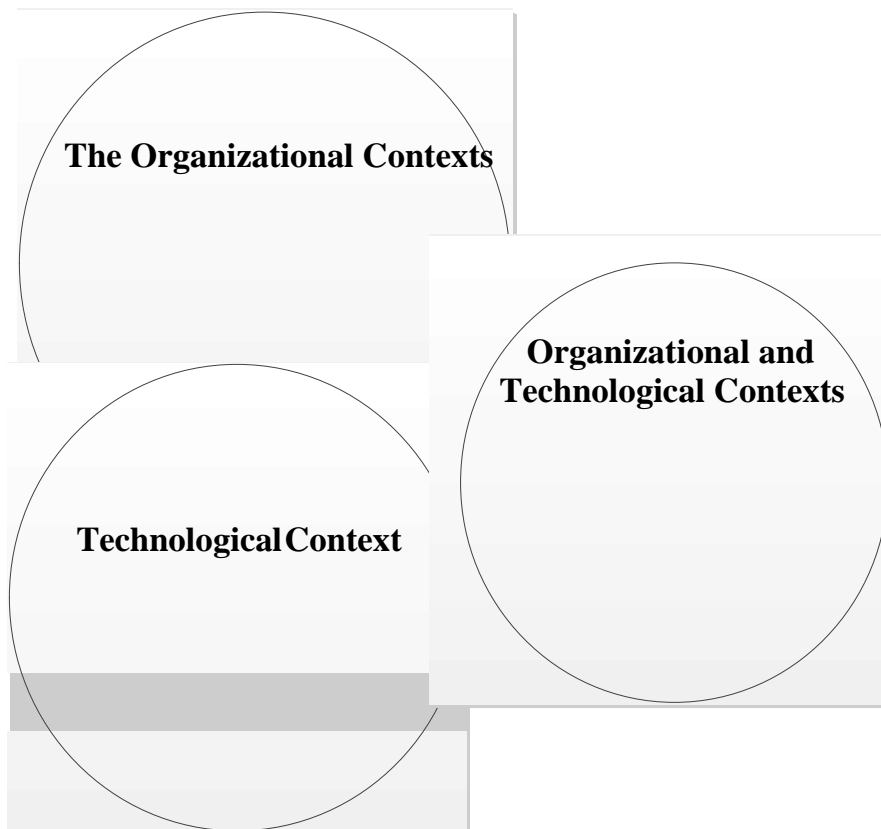


Figure 6-1: Tracing Underlying Problems in the E-service

Although problems of the E-service have been formulated into three broader areas; it is difficult to separate one from others. However, every problem is rooted

in the organizational context that continuously intra-act with technological network and vested interest networks. Thus, there are continuous intra-actions, entanglements and disentanglements in middlemen networks and E- service networks. Remained of this chapter discussed problems of the E-service into three inseparable areas, problems in organizational contexts, problems in technological contexts and problems in both the organizational and technological contexts.

6.2 Problems in the Organizational Contexts

The land record system in Bangladesh is a complex matter. It is originated from age-old complicated cadastral survey findings that comprise ownership, geographic, legal and revenue information for every plot of land. Simply printed cadastral survey reports are called land record. Usually cadastral survey reports are preserved in printed register called a land record register. The DRR is entrusted with the responsibility of preserving land record registers and issuing attested copy of land record on the basis of citizens' applications. Further, the service delivery of land record is so complicated that citizens must rely on different types of intermediaries and middlemen to access to this service. Most of the citizens do not have knowledge on land record system. Thus, problems in organizational contexts can be framed into two major areas: problems with land record systems and problems with land record service delivery processes. These are discussed below.

6.2.1 Problems in the Land Record System in Bangladesh

The land record is very popularly known as 'Porcha' (a word coined from Arabic language during Mughal Rule) clearly indicates the description of a piece of land, easily understandable to land owners. However, from the legal point of view the country, land record in Bangladesh is known as Record of Rights (RoR) that contains geographic, legal and revenue information of every plot of land. Thus, it includes the name and details of land owner(s) along with ratio of ownership in the case of multiple owners, plot(s) size and total number of plots, type of land,

taxes and geographic boundary of land plot(s) and the name of the jurisdiction where land plots are located.

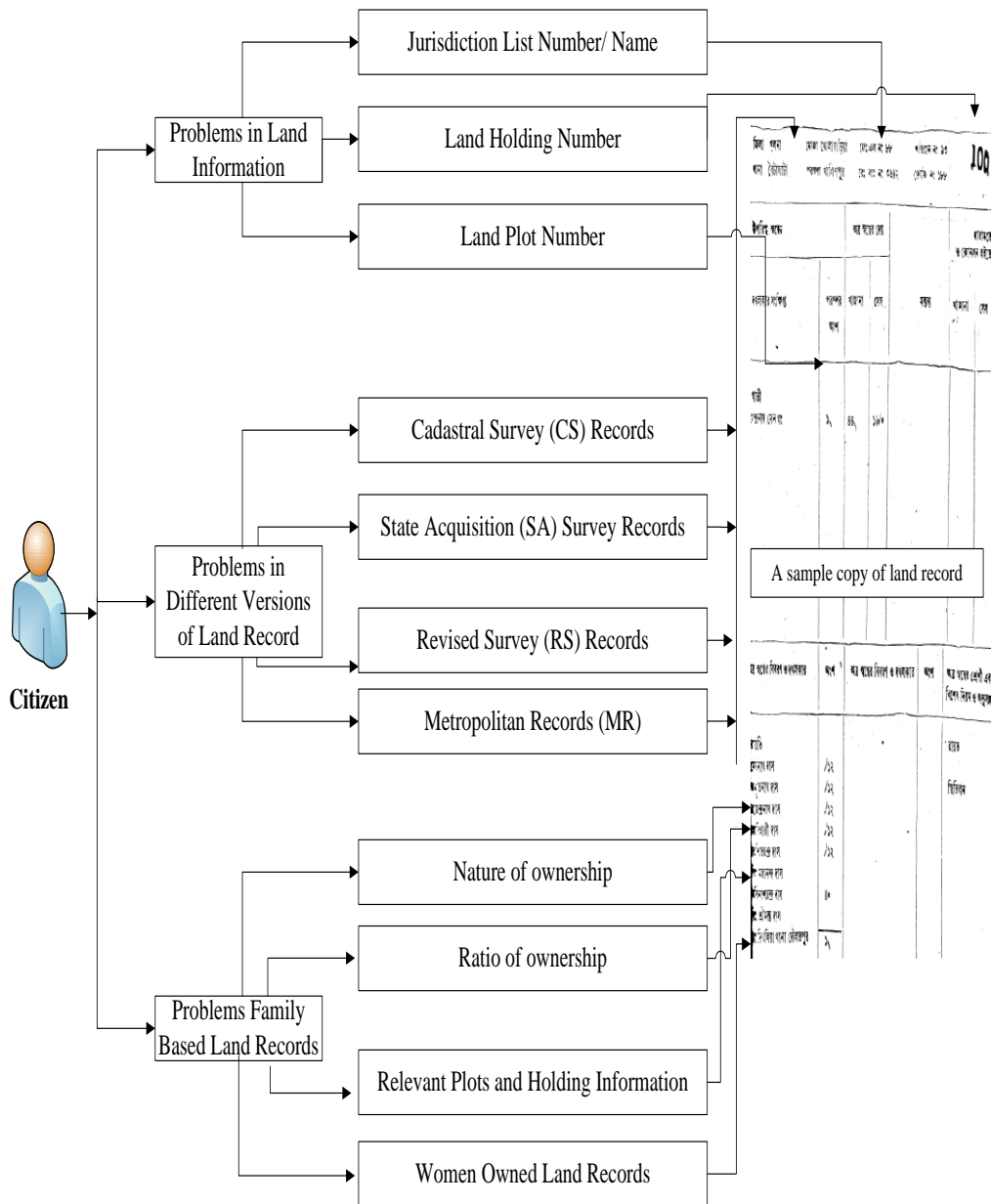


Figure 6-2: Problems in the Land Record Systems in Bangladesh

Thereafter, information of land plots aggregated into a holding according to family based ownership. Besides, every plot has three to four versions of land

records. Consistent with these, the researcher and the managers of the organization have identified three main problems in the land record systems: problems with complex land information, problems with multiple versions of land record and problems with aggregated land holding systems (figure: 6-2). They are discussed below.

The Complicated Land Information System

Although cadastral survey system collects land information through plot to plot survey; the land record system of the country follows a top down and complicated process. The country is divided into 64 districts. Every district, an administrative unit, is again divided into a number of cadastral survey blocks called jurisdictions. Jurisdiction has a certain geographic and cadastral survey boundary. Each jurisdiction has a name and ID number called Jurisdiction List number (J.L. No). For example, the researched district, Khulna, comprises a total of 796 jurisdictions. A jurisdiction comprises of many thousands of land holdings (land record) that are also known as RoR. A land record comprises information of several of land plots within a jurisdiction. Consequently, in order to trace land record of a plot of land requires knowing its plot ID numbers, holding ID number or RoR number, J.L. number (name) or name of the owner and name of the district.

A plot is the smallest unit of land record and several plots grouped into a holding called land record or RoR. Cadastral survey findings recorded as family based land ownership. Land plots owned by family members within a jurisdiction are recorded into a land holding. So, a land record comprises of land information of several plots of land in a jurisdiction and land records are prepared as a family based aggregated land holding system. Thus, if someone requires land record for a plot, she or he needs to apply for the information of whole holding of land record. Evidently, the land record system of Bangladesh is top down, aggregated and complicated. Consequently, citizens need to know plot identity number, holding (RoR) identity number and jurisdiction list (J.L.) number to apply for a land record from the DRR.

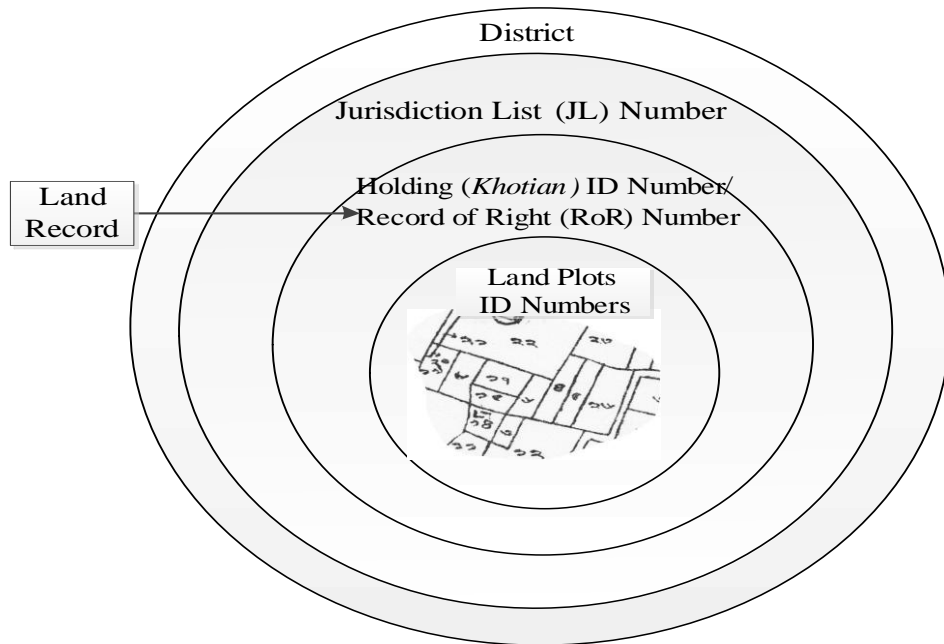


Figure 6-3: Complicacy in the Land Record Systems

So, in order to access to land record of a plot of land, it requires information on its jurisdiction number or name, holding number and plot number (figure: 6-3). Thus, if someone needs land record for a plot only; he or she needs to apply for the whole holding because attested copy of land record is issued as a whole of the holding. Besides, within a holding there are number of owners and their ratio of ownership is also varied from plot to plot of the holding. Consequently, it is difficult for the citizens to understand both the land record system and its service delivery too.

Problems with the Different Versions of Land Record

The country was under the British India (1757 -1947), Pakistan (1947-1971) and gained independence as Bangladesh in 1971. With these three political regimes, three distinct versions of land records have been evolved in the country. Surprisingly, all the three versions of land records are treated as active records. The first version is known as Cadaster Survey Record (CS) that was developed by the British Colonial government during 1888-1920. The second version is called

State Acquisition survey (in short SA) that has been prepared in 1955. Final version is called Bangladesh Revised Survey record (BRS or RS) which was started in 1972 and it is on-going. Therefore, every plot of land has two to three versions of land records. In some cases, there were four versions land records for a plot of land.

The multiple versions of active land record have made the system more complex. Thus, tracing ownership of a land plot requires attested copy of all versions of land records of a plot of land. Since all versions of land records are active, citizens need attested copy of land record for all versions. For example, if a citizen is aiming to receive mortgage loan on land, bank needs attested copy of every version of land record. Same requirement is to buy or sell of a plot of land.

Since a piece of land has three different versions of land record and all of them are active; every plot has three to four ID numbers for a land plot and a holding (record) numbers due to various versions of active land records. Thus, it is difficult to remember and maintain three types of holding ID numbers and plot ID numbers by the land owners who are mostly illiterate people. Consequently, citizens need to rely on middlemen to collect accurate land holding ID and land plot ID for filing applications for land record service. Besides, many citizens do not know jurisdiction list (J.L.) number or name too. Evidently, three different versions of land records along with three types of land plots and holding ID numbers have become a confusing matter and vexatious problem for citizens to access to the E-service of land record. To avoid these complicity citizens relied on the middlemen to access to this service. Consequently, the E-service hardly made citizens' access to this service without any middlemen.

Family Based Aggregated Land Record System

The land record system follows aggregated and top down method. Several land plots of a jurisdiction are grouped into a holding that is called land record or Record of Rights (RoR). Thus, a land record comprises numbers plots that are owned family members or clan members. Accordingly, it was top down, aggregated and revenue centered land record system. As a result, land records are

prepared on the basis of family ownership of land as an aggregated system. For instance, a land record may contain information of 10 or 50 land plots. Consequently, with this land record system a citizen need to know the name of J.L. number or name then its land record number and finally the plot number. A cadastral jurisdiction consists of approximately 2000 to 5000 thousand family based land plots and on the basis of family based ownership land plots are grouped into a land record and jurisdiction contains approximately 200 to 500 of land records. On an average a land record contains 10-50 land plots.

Since land record is an aggregated system, it contains name(s) of land owners against each of the land plots along with different ratio of ownership. So, land owners need to know ID numbers of their land records and plots along with versions of land records. As a result, if any citizen needs attested copy of land record for a land plot from a holding which contains 30 plots and names of many owners, it is not possible to issue him an attested copy of land record for the particular plot of land rather he required attested copy of the whole land record (holding).

Due to this aggregated system, over the period, various middleman networks have been developed for mediating this service to the citizens. If citizens go to them for mediating this service, they know techniques how to find ID number of a land plot, a land record, jurisdiction list number and name of owners. For example, name of jurisdiction is usually given after the name of the village where the land is located. So, middlemen need only the name of owner and jurisdiction only. With these detailed, a middleman is able to identify all relevant information of that land record with the help of the Sorting Staff of the DRR.

Rarely citizens could have full information to submit an application for their land records. With the incomplete information, a citizen cannot submit application for land records. Since middlemen have vested interest network with the Sorting staff who have access to every page of land record of the DRR's Store, the Sorting Staff provide relevant information is required by middlemen. Thus, the complicated

land record system is an obstacle to citizens' access to this E-service and pushed the citizens to the middlemen. They cannot submit application with the incomplete information from either UDCs or DWP because none of them have vested interest networks with the Sorting Staff. Consequently, even after introduction of the E-service citizens' continued to access to this service through middlemen who submit applications and mediate this service efficiently. Thus, the top down, complex and family based aggregated land record system were barriers to citizens' access to the E-service of land record and citizens were dependent on middlemen for this service.

6.2.2 Problems in the Application Submission Process

Access to land record service requires submission of application to the DRR. However, the forms and processes of application submission remained complicated. The prescribed paper based applications form was full of jargons. Consequently, it was not easily understood by citizens because application forms, fees and folios were full of jargons. Further submission of an application required a complete set of documents: a filled in application form or a written application paper with necessary information of required record, certain amount of stamps pasted on application as fees of this service and appropriate number of folio papers for copying land record. None of the elements were available to the DRR; rather they were available to the middlemen. So citizens requiring this service at first they needed to go to a middleman. Such a complicated process of application submission was avoided by both literate and illiterate people.

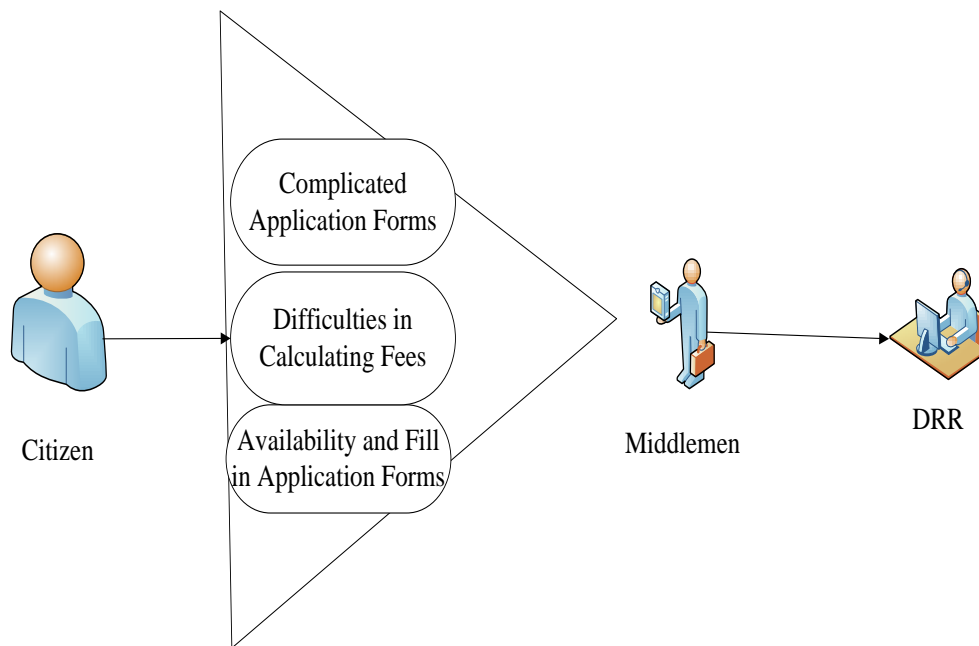


Figure 6-4: Problems in Application Submission for Land Record Service

Thus, various types of middlemen have evolved to mediate this service namely, Stamp Vendors, Lawyers' Assistant (*Muhuri*), Lawyers, mobile middlemen, staff of land related Sections and offices and staff of other offices. They mediated this service between the citizens and the DRR staff. So citizens need to initiate this service through any of the middleman. A citizen must need to go to middlemen for filling in or writing application or to buy the printed application format. Similarly calculating fees and folio papers are not easily understandable to citizens. Therefore, citizens need to rely on middlemen to access to land record service.

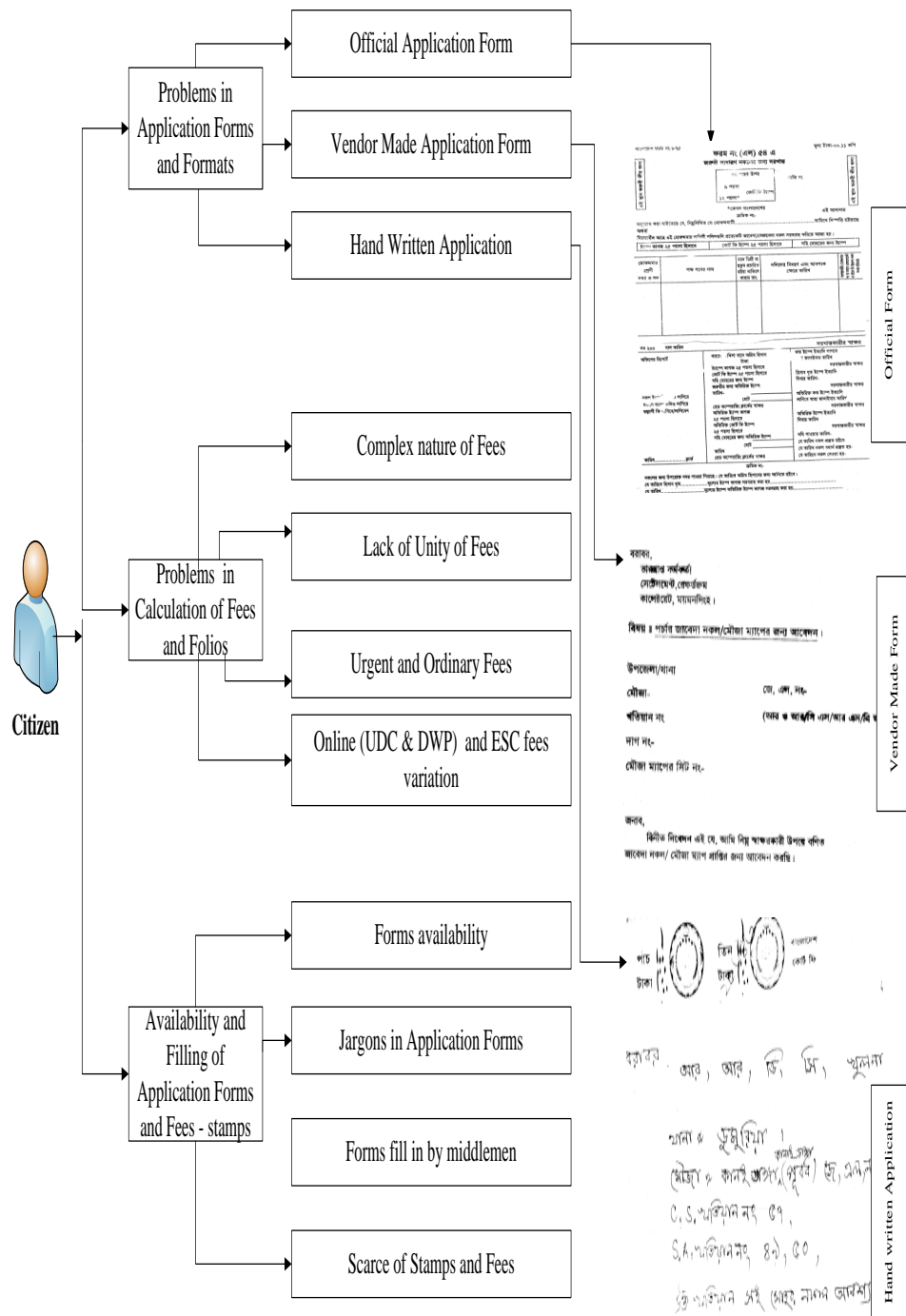


Figure 6-4: Various Dimensions of Problems in Application Submission

Complex Application Forms, Folio Papers and Court Fee Stamps

Issuing attested copy of land record required a prescribed form which is called folio. It is the provision of this service that citizens need to provide necessary

number of folio(s) along with their applications to copy the requiring record from the original registers. Thus, in order to submit an application for land record service, citizens need to submit folio papers along with their application. In one hand, citizens do not have knowledge about size of the land record to estimate exact folio numbers and on the other hand, depending on hand written or computer composed process folio numbers may be varied.

Remarkably, submitting folio papers with the applications was a legacy of the organizational process. Folio is no longer required if land record is delivered through computer composed process. After introducing the E-service of land record the folio papers are not needed at all because attested copy of land record are being delivered by computer composed process.

Besides, submission of application requires adhesive stamps as fees. The adhesive stamps need to be pasted on the application. None of these necessities are available at the DRR; rather they are available with the middlemen. Thus, for completing all of the preparatory requirements for submission of application for this service, citizens are bound to go to middlemen. Further, submitting folios and stamp fees have become obstacle for online applications submitted through the E-service access points particularly from UDCs and DWP.

Complex Nature of Fee Calculation

Fee calculation process for this service is very complex for citizens. Though the amount is very small; it includes at least four types of fees: fees for application, fees for each record, fees for copyist and fees for each folio paper (figure: 6-1). Besides, there are urgent and ordinary categories of fees. Consequently, it is difficult for citizens to calculate accurate amount of fees for this service.

Type of Fees	Ordinary Application	Urgent Application	Remarks
Application Fee	8.00	16.00	
Record Fee (per record BDT 1.00)	1.00	2.00	
Copyist Fee (per record BDT 0.25)	0.25	0.25	
Folio Fee (per folio BDT 0.06)	0.06	0.06	
Total	9.31	18.31	

Table 6-5: Various Types of Fees for Land Record Service

Application fee is BDT 8.00 for ordinary applications and BDT 16.00 for urgent applications. Record fee for copying of each record (RoR) is BDT 1.00 for ordinary applications and BDT 2.00 for urgent applications. Copyist fees and folio fees are varied with number of records and volume of folios. For each record copyist fee is BDT 0.25. Since there is provision of providing folio paper to the DRR, fee for each folio is BDT 0.06. However, the exact number of folios and fees cannot be determined by citizens during application submission. Issuing attested copy of a land record may take ten folios, whereas for other case it may take one folio. Therefore, it is difficult for citizens to calculate all the fees correctly while submitting applications. The DRR staff reject applications of land record service, if there is any lacking of fees, folios or information. Thus, to avoid the risk of rejection and complicity of fees calculation; citizens prefer to go to middlemen to process their application rather than submitting by themselves at any of the E-service access points.

6.2.3 Problems in the Organizational Structures

Attested copy of land record is issued by the DRR where all the land records registers are preserved. In Khulna District for a total 10,00000 (ten hundred thousand) records are preserved with 5000 (five thousand) record registers. These registers are stored in a dilapidated, mismanaged and disorganized condition.

Further, the Store Room was high humid and its temperature was very high. In addition there was no ventilation.

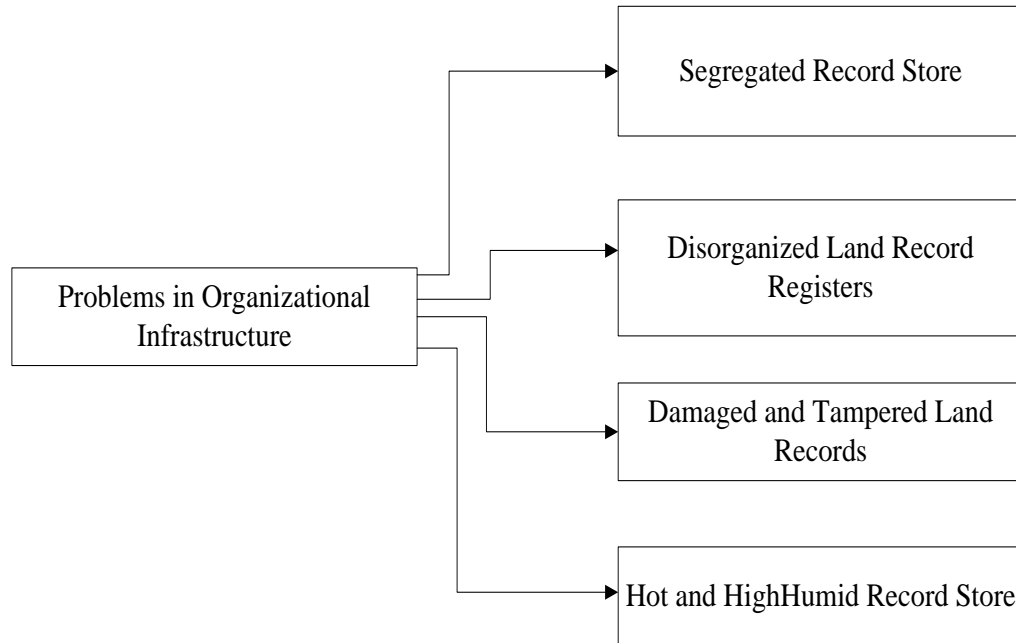


Figure 6-6: Problems in Organizational Structure

Along the line, problems in the organizational structure can be categorized into four areas: Fragmentation between the Record Store and the Copyists' Room, disorganized land record registers, damaged tampered record and hot and high humid Record Store.

Fragmentation between the Copyists' Room and the Store Room

The figure (6-7) portrayed that the organizational processes and structures were unplanned, segregated and disorganized. The Record Store and the Copyists' Room were fragmented. The Store lies at about 300 feet away and beyond many other rooms. So supervision is not in sight, which encourages the middlemen, copyists and sorting staff to do malpractices.

Consequently, it was difficult to sort register for processing this service. Due to high humid temperature many records were damaged. Besides, in order to process this service, it is required to carry about more than hundred registers every day

from the Store to the Copyist's Room and vice-versa. Thus, the copyists were dependent on the Sorting Staff who sort and carry record registers from the Record Store to the Copyists' Room.

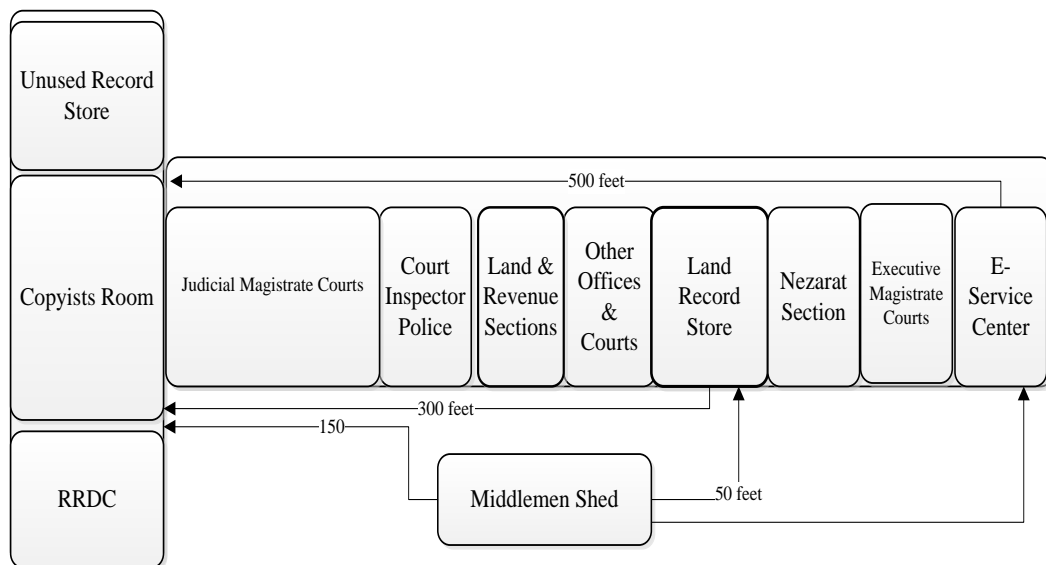


Figure 6-7: Segregation between the Copyist Room and the Store Room

This unplanned organizational structure of the DRR caused problems in the E-service. Due to this unplanned structure, middlemen got opportunity to communicate with the Copyists and the Sorting Staff. Thus, it was also harmful for the E-service while citizens were receiving quick service delivery through middlemen; citizens lost their interest in the E-service. Moreover, this unplanned organizational structure caused delayed to process this service.

High Temperature in the Land Record Store

The land record Store Room was dilapidated and there is no ventilation and light. Consequently the temperature of the Record Store is always higher than the surrounding environment. Due to high humid temperature, the record papers were losing their temper. As a result, the rate of damaged record was continuously increasing. The researcher has identified that there is an underutilized Record Store which is properly planned with much ventilation. A typical temperature

differences in the current Record Store and the underutilized Store are shown below.

Date & Time	Temperature in unplanned and currently used record Store	Temperature in properly planned Store
24 April 2012		
10:00	31.2°C	30.8 °C
12:00	31.8°C	30.5 °C
14:00	31.9°C	30.5 °C
16:00	32.2°C	30.0 °C

Table 6-2: Temperature in Land Record Store

Average outside temperature of day was 32.01° Celsius. So, the currently used Record Store's temperature was almost equal to outside temperature. Contrary to, average temperature of the underutilized record Store is much lower than the current Record Store. Moreover, the underutilized Store was properly planned and designed Record Store along with enough ventilation and light. The organization was never expressed its interest in shifting the records from the unplanned Record Store to the planned record Store. Further, the well panned and well-designed record Store was adjacent to the Copyists' room. Thus, shifting the segregated Record Store could easily be expedited the processes of service delivery. However, the DRR staff was never interested in making this shift of the segregated record Store.

Consequently, high temperature and humidity of the currently used Record Store resulted in damaging the documents and loosing of tempered and torn out of paper. The damage and lack of tempered conditions of land records made uncertainty of this service. On the grounds of records being damaged or lost, the DRR staff could easily manipulate this service liable to reject and delay. Thus, the high temperature and unplanned condition of the record Store caused obstacle to citizens' easy access to the E-service and to ensure certainty of this service.

Problems with Disorganized Land Record Registers

There are about 1 million land records in the DRR at the Khulna District. All these records are put into about 5000 registers, which are kept in the Store of the DRR. This district comprises of 10 Upzillas (sub-districts) and 796 jurisdictions. Besides, there are three different versions of land record. Consequently, classification and cataloguing of land record registers are vital tasks for better service delivery. However, the staff members are not interested in organizing, cataloguing and classifying land record registers according to the versions of land record, Upazilla name and jurisdiction number. Anomalous condition of the Store of the land record registers caused delaying in delivering this service. Thus, sorting registers from such a disorganized Store takes longer hours. Thereafter carrying of registers between the Store and Copyists' room was further time consuming and Sorting Staff dependent matter. It was difficult for copyists to sort any land record register without the Sorting Staff. Resultantly, the Copyists were dependent on the sorting staff.

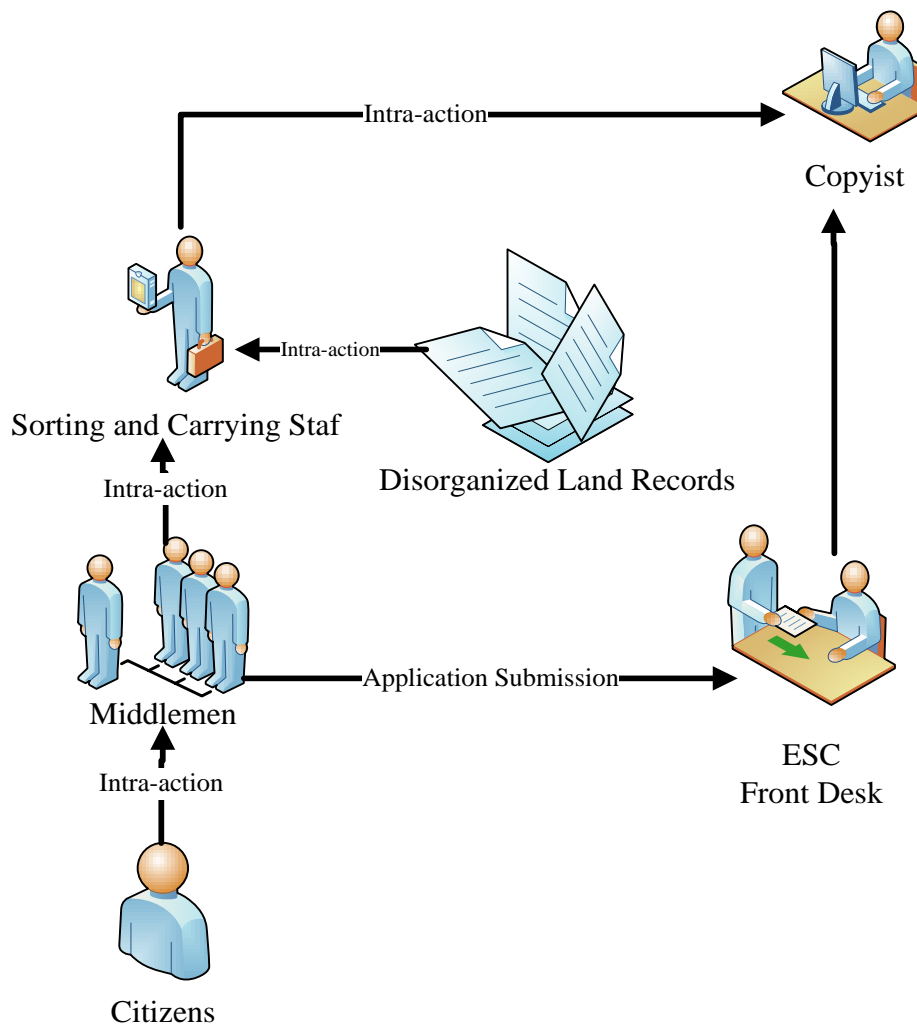


Figure 6-8: Organizing Land Record

Since the land records were disorganized, it is only the Sorting Staff who know where lie which record register. Even, no register was labeled with identification number of jurisdiction list or Upazilla name. Thus, Sorting Staff sort quickly only those registers which they have vested interest. Since the middlemen provide vested interests or speed money, the Sorting Staff expedite sorting process of register for applications submitted by middlemen. Contrary to, the Sorting Staff were not interested to sort registers for the applications submitted by the UDCs and DWP because they do not carry any vested interest or speed money.

With this disorganized condition of the Record Store and segregated organizational structure, processing of this service relied on the sorting staff. Since citizens require quick service delivery, it is important to sort register from the DRR quickly. Thus, citizen relied on the middlemen for expediting their service delivery. Therefore, the disorganized condition of land record registers was a potential cause to citizens' access to this service through middlemen instead of the E-service.

Damaged and Tempered less Record

There are age old record registers in the Record Store. The first land survey known as Cadastral Survey (CS) held about 100 years ago. Thereafter, State Acquisition (SA) survey was held about 65 years ago and the Revised Survey (RS) started about 40 years ago. Since these records (CS, SA and RS) have been in use for this service for a long period, they are in decaying condition. There were significant numbers of records that were damaged in the Store (table 6-3).

Type of Record	Damages
CS	15%
SA	25%
RS	5%

Table 6-3: Percentage of Damaged Record

Though CS record registers were the oldest records but they were comparatively less damaged considering their age, because they were printed on good quality of paper and printing and binding works was well. However, the SA records were hand written and quality of printing and binding were not well. Since the RS record registers are recently printed and they were less damaged. Due to damages of records, about 10%-15% of total applications are being rejected by the DRR staff. About 25%-30% of total records are damaged and about 2%-3% of records are tampered and illegible. Thus, it was not possible to copy any record from

damaged or tampered records. Surprisingly, there was also no list of damaged and tampered records. Consequently, the citizens do not know the status (well or damaged) of records for which they were being applied for.

Further, the records were not well preserved in the Record Store. As a result, the master volumes of the old record registers were highly vulnerable and dilapidated conditions. Due to humid condition of the Store Room, the papers of land records were damaged. Consequently, record papers became very weak and vulnerable to break with a simple touch of the sorting staff. Surprisingly, it was very easy to reject any application for this service delivery due to the ground of damaged or tampered condition of records. These conditions of record make the land record service is completely discretionary matter of the DRR staff. Easily they can reject any applications on the ground of damaged records.

Since there was no list of the damaged and tampered records, there is a chance of rejection of about 27% of the total applications submitted for this service delivery. However, it was observed that the rate of application rejection is about 1% or 2% of the total applications, while applications were submitted by middlemen. The middlemen, who submit application to the ESC, have networked with the Sorting Staff. Consequently, before applying for any record, they confirmed the status of the record with the help of the Sorting Staff.

On the other hand, while applications are submitted through UDCs, the rate of rejection is higher than the real percentage of damaged and tampered records. Since the rate of rejection from the UDCs submitted applications was about 40% of the total applications, which was much higher than the total percentage of record actually damaged and tampered. Since the DRR staff do not have vested interest in the UDCs submitted applications, they prefer to reject them. Further, lack of network with the sorting staff and lack of experience of UDCs' operators caused rejection and delaying of application processing.

Besides, during submission of applications for land record, the UDCs operators do not have opportunity or network to know the status of records they have been applied for, because they do not have network within the Sorting Staff. In addition, the UDC operators were not well experienced in the matter of land record service delivery; rather they were very new. Consequently, the information or fees, they submitted with applications were often inaccurate in the eye of the DRR staff. Moreover, the DRR staff simply avoid delivering service for applications from UDCs due to lack of vested interest in them. Thus, the rejection rate was very high for the case applications submitted by the UDCs for this service. Therefore, citizens avoid access to this service through the E-service.

6.2.4 Middlemen Networks in the E-service

Since there is high volume of applications for land record and hence there is high volume of backlog. Besides, citizens need land records for urgent purposes. Thus, mediating quick service delivery has become a core function for middlemen. Since expediting this service delivery is discretionary matter and manipulating power of the DRR staff, the middlemen offer speed money to the DRR staff to expedite this service for their clients' applications.

However, the middlemen sell adhesive stamps, folio papers and application form, so every citizen needed to go to them. While citizens go to buy stamp, folio and application form, the middlemen offer other supports including filling in application forms, submitting applications and expediting service delivery. As the process was complicated, it was difficult for citizens to submit applications and to know even the fate of their applications without any middlemen. Thus, middlemen collect speed money from citizens and provide a portion of the speed money to the DRR staff who ensured priority service for middlemen's submitted applications rather than applications are submitted by the UDCs. Consequently, there have been developed various forms of middlemen in this service (figure 6-9).

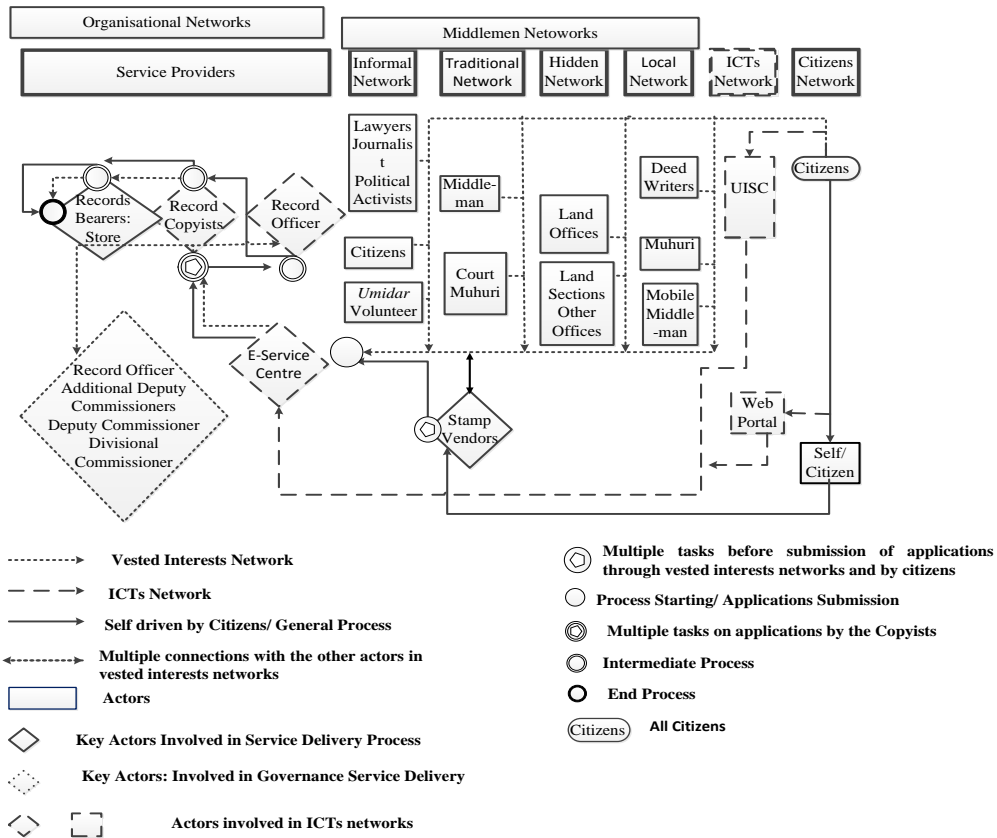


Figure 6-9: Middlemen Networks Involved in the E-service

Since the inception, the middlemen and intermediaries have been involved in mediating this service to the citizens. During the British Colonial regime, the Copyists were unpaid workers. While citizens required any land record, they need to pay a certain fee to the copying staff for copyists the record. For copying record from original volumes, a copyist was given a portion of fees that were received from citizens and the other portion was deposited to the government revenue. During the Colonial period the copyists were some sort of middlemen. However, after the Colonial period the copyists became permanent employees of the government. However, they followed practice of receiving money from citizens for copying record in the name speed money which beyond fees.

Further, the land record service follows a rigid bureaucratic process and involves with numbers of actors and processes whereby every actor has its own vested interest and private gain from this service instead of achieving the organizational interests and providing better service to citizens. To provide a quicker and a more secure service of land record from the DRR, various actors, networks and practices have been developed over the period. They can be termed as middlemen who have networks with the DRR staff. Primarily the middlemen come into contact with citizen for mediating and expediting this service in exchange of speed money.

Consequently, middlemen's' and the DRR staff's own interests and private gains can be termed as a vested interest which is even wider than corruption because it is surrounded by organizational process and service delivery networks. The vested interest networks, in other words the middlemen networks, have numbers of dimensions and every dimension contains different actors. Mr. Kobir, a staff has been working in this service for the last 10 years. He says, "This service is so sweet and juicy that everyone would like to have tasted it".

The middlemen networks have been developed for three reasons: a) assisting to access into the complex service delivery process; b) expediting the service delivery period and c) making this service confirm. Since land record service is a complex process, assisting to access to this service is the first and the common ground for the middlemen to involve in this service. Whenever, a citizen comes to receive this service, he or she needs to go to a middleman for filling in an application form. Besides, expediting service delivery is the important ground for the middlemen involvement in this service. Day by day, land transactions and land litigations have been increasing gradually. For these purposes citizens need urgent and quicker service. Finally, citizens want confirm service delivery without any rejection of their applications. There are numbers of grounds (record damage, tampered, illegible) whereby a DRR staff can reject an application for this service. Usually applications are not having any vested interests turned to rejection and delayed in processing. Thus, citizens prefer to make this service confirm while

submitting applications. Therefore, citizens access this service through middlemen to receive assistance, to secure and expedite service.

While the practice of vested interests and middlemen inscribed the organizational contexts, this E-service of land record initiative was launched to ensure citizens' easy access to this service. The E-service developed IT network through connecting their access point (the ESC, the DWP and UDC) with the DRR. However, the practice of vested interest and middlemen remained predominant in the organizational processes. The following sections presented various forms of middlemen and their vested interest networks in the service delivery process.

A. Traditional Middlemen Networks

Traditional middlemen include Stamp Vendors, Court Muhuris and Floating Middlemen. They have been involved in mediating citizens' applications of land record for long period of time and are known as traditional middlemen. Stamp Vendor is licensed to sell stamps to citizens. Muhuris has license from Lawyer's Bar to assist the lawyers. Floating Middleman has either belonged to any political activists or has the strong connection with the DRR staff. They usually sit with a table and a wooden box containing stamps, application papers or forms and folio papers at a nearer location to the DRR except the floating middlemen. They have vested interests network with the DRR staff except the floating middlemen. Since half of the citizens are illiterate. Even, the literate people are also not aware of land record related information.

While citizens intend to apply for land record of a parcel of land, they need to specify the type of record (three types of cadaster registers), Jurisdiction List number or name of *mouza* and holding number. It is difficult for rural citizens to keep accurate information relating to land records. As a result, most of the citizens need to go to traditional intermediaries to get mediated their applications for land records. If citizens fail to give full information, the traditional middlemen collect all the relevant information before submitting an application from the Record Store through the Sorting Staff of the DRR.

Contrary to this, it has been found that a good number of citizens come to UDCs to submit the applications for land records through UDCs but they know only partial information of their land records, for example, either type of record or jurisdiction list number. Consequently UDCs were not capable of mediating or submitting citizens' applications with incomplete information of land record. Thus, citizens with incomplete information prefer to go to traditional middlemen to fill in application and being mediated for this service.

A.1 Muhuri

A *Muhuri* is an assistant to a lawyer and they are involved in assisting lawyers in collecting clients and arranging papers and documents relating to cases for their clients and concern lawyers. Irrespective of civil and criminal nature of cases, most of the cases are originated from or involved in the disputes of land record and ownership. Consequently, land record is an essential document in managing cases, if they relate anyway to land matters.

Muhuris also have vested interest networks with the DRR staff and they have skill to process land record from the DRR. Consequently, if any client need land record for his case, he negotiates with concern *Muhuri* of his case to collect land record, instead of applying personally at the DRR. Thus, *Muhuris* are involved in mediating the land record service for their clients for a long period. Besides citizens prefer go to *Muhuris* to mediate their applications as they are efficient in mediating this service with skill and vested interest networks with the DRR staff. *Muhuris* submit paper based applications to the ESC and receive manual ID numbers of applications issued by the ESC. Thereafter, they forward the applications' ID to the DRR staff along with the vested interests.

A.2 Lawyers

Lawyers are the legal practitioners in courts and they also need land record for cases of their clients. Clients usually go on package contract with the lawyers and avoid applying and collecting land records by themselves from the DRR. Thus, if it is a package contract between a client and a lawyer to manage a case along with

the collecting relevant documents and land records, the lawyer applies for land record to the DRR. They also have some clients only to get mediated the land records from the DRR. Lawyers have both power and networks with the DRR staff. As lawyers are potentially powerful, they could pressurize the staff for quick service delivery and often provide tips to the staff. Lawyers are not interested in submitting online applications through E-service access points because it could lose their direct influence on the DRR staff and could harm their vested interest networks. Thus, they continued with submitting paper based applications at the ESC and continued with speed money.

A.3 Stamp Vendors

Stamp vendors are licensed to sell adhesive revenue stamps, stamps, folio papers; official forms and judicial and non-judicial stamps that are used in public offices. Citizens need one or many of these items to receive public services. Usually submitting applications for land record needs a complex set of adhesive stamps, folio papers and application form. So, to submit an application for land record, a citizen needs to go to a stamp vendor to buy the necessary adhesive stamps and folio papers. The stamp vendors are the most experienced middlemen in mediating the whole process of this service. Citizens are obviously happy to accept the stamp vendors' offer. Thus, they offer a package deal which ensures much quicker service through submitting paper based applications at the ESC instead of applying from UDCs or the DWP.

About 30 vendors were sitting in front of the DRR of Khulna and selling adhesive stamps, court fee, folio and legal forms and papers to the citizens. They were mainly involved in mediating land record service from the DRR. Historically, the stamp vendors and the DRR staff members are closely connected. From the inception of this service, they have been working closely the DRR staff. The stamp vendors are usually sat at the outside of the DRR and the DRR staff sit at the inside of the DRR. Thus, the DRR staff consider that the Stamp Vendors are reliable source of receiving them vested interests. Consequently, the stamp

vendors' skill and proximity with the DRR Staff made them efficient in mediating citizens' access to this service.

A.4 Floating Middlemen

The floating middlemen are such intermediaries who do not belong to any of the above categories. They have neither designated identity nor any specific job. They do not have permanent stall but their main location of work is centering on the DRR, courts at district headquarters and office of the Deputy Commissioner. Consequently, they work as floating middlemen to mediate services at the DRR and courts.

They work in a floating situation aiming to have a position either as *Muhuri* or stamp vendors. About 10-20 floating middlemen are involved in mediating land record service. They keep liaison with the DRR staff to mediate land record service. While citizens come to apply for record they offer them delivery this service by the quickest possible time. Consequently, they also submit paper based applications for their clients and expedite with help of the DRR staff. Thus, they also found that the online applications for land records are also not serve their purpose to maintain vested interest network.

B. Local Network

Since 80 % of people live in the rural areas of the country and they need land records frequently because land is their potential capital and land record is the core means to receive many other services, for instance, receiving loans from credit institutions, performing mortgage of land deeds, determining ownership and size of land and buying-selling of land plots. Thus, to mediate this service of the rural people, local middlemen have been developed; they are known as 'Deed Writers' and 'Mobile Middleman'. 'Deed Writers' are involved in writing land registration deed i.e., transfer of ownership. Beside, 'Mobile middlemen' are recently emerged in this service. They use cell phone technology and network with the DRR staff. As a result, citizens also prefer access to this service through local middlemen instead of E-service access points.

B.1: Deed Writers in Village

The 'deed writers' prepare deeds of land registration for the purpose of purchase, sale or donate of a piece of land. They work at land registration office know as Sub-Registrar Office at every Upazilla (Sub-District) and receive a certain percentage of commission on the value of each land registration deed which they prepare. Land record is the compulsory component for preparing land registration deeds. Since deed writers deal with land record for the purpose of land registration; they are well acquainted with filing applications and processing land record from the DRR. They maintain a vested interest network with the DRR staff. In every village or in the neighboring villages deed writers are available. Citizens, thus, living in the rural areas primarily prefer to go to deed writers since they are at hand.

B.2: Mobile Middleman

Recently 'mobile middlemen' have emerged as local middlemen through leveraging mobile phone network. They use mobile phone communication with the Copyists and they get the Copyists submit their applications for this service by using the DWP. Since the Copyists have internet connection, they could submit online application for land record on behalf of the mobile middleman by using the DWP. Thereafter, the Copyists submit the printed copy of the online application to the ESC along with fees and folio papers and process this service quickly process the record for the mobile middlemen. Thus, mobile middlemen are the newly developed actors in the vested networks and they too have been manipulating the E-service networks.

C. Hidden middlemen Networks

The staff of Union Land Office (ULO), Upazilla Land Office (UZLO), Land Acquisition Section, Revenue Section, Civil Suits Section and other sections and offices have hidden relations with the DRR staff. Thus, they also involved in mediating of this service from the DRR. They can be seen as hidden middlemen because it is difficult to trace their involvement in mediating this service. They do their routine work in their offices. If citizens need to submit land record from their

offices, they request the staff of the concern office to process their land record or the staff of concern office offer citizens package deal that is expediting service of that office and along with processing land record. Thus, apparently the mediating role of the staff of land related offices and sections cannot be traced; rather they work as hidden process with the DRR staff. The researcher observed that on an average daily 10 to 20 hidden middlemen visit to the DRR to mediate this service.

The UZLO is responsible to update land record while any citizen gains ownership of a parcel land. Citizens need to update the land record for securing entitlement usually after purchase or inheritance. Attested copy of land record is the basis of updating the newly gained land ownership. Updating land record through UZLO is really a complex and bureaucratic task. The staff of UZLO or middlemen offer package of speed money for updating land record along with collecting attested copy of land record from the DRR. Thus, the citizens find that accepting the package offer of the UZLO staff is convenient for them.

Similarly, the ULO is responsible for collecting land tax and sending investigation report of updating land record to the UZLO. It works as a subordinate office of the UZLO. Land record is the basis of the collection of land tax and sending the recommendation report to the UZLO for updating land record (mutation of ownership). For both the tasks, citizens require land record from the DRR. Thus, citizens visiting to the ULO prefer to get mediated land record by the staff of ULO. The staff of the ULO have vested interest network with the staff of the DRR. Even some of them have experience of working at the DRR previously, because the staff members of ULOs and the DRR are regulated by the DC.

Besides, functions of Land Acquisition (LA) Section, Revenue Section and Civil Suits Section of the Deputy Commissioner Office are closely connected to land record. Thus, the staff of these sections have networks with the DRR staff to get mediated land record service for their clients. The LA section deals with land acquisition and compensation for acquired land. After acquiring private land for the public purpose, the LA Section provides compensation to the owner of the acquired land. However, receiving compensation for acquired land from the LA

section is not an easy task due to bureaucratic complexity and vested interests too. Citizens need to submit supporting documents of land ownership to receive compensation while land record is the first and foremost requirement. Thus, citizens prefer to go with a package deal with the staff of the LA Section for mediating the whole compensation process including collection of land record from the DRR.

Further, the Revenue Section is responsible for management of government owned land and land resources including wet land and water bodies. It is also responsible for allocating government owned land (*Khas land*) to the landless citizens. Besides, this section monitors the activities of ULOs and UZLOs of the district. Moreover, many staff of the Revenue Section have previously worked as the staff of ULOs and UZLO including the DRR. Consequently, they have well network with the DRR staff. Therefore, staff of the Revenue Section sometimes mediate land record service for their relatives, friend and clients.

Furthermore, the Civil Suit section is entrusted with management of land litigations that are involved with government owned land. There is Government Pleaders (GP) and lawyers involve with the cases related to the government owned land. Thus, staff of this section provides supports to the GPs with land record and other documents. Consequently, they need to collect land record from the DRR for the cases that are involved with the government owned land. However, records of litigated land are equally important to the opposite party of the case. Even citizens or lawyer of opponent parties of the government owned litigated land get mediated land records by the Staff of Civil Suit section.

In addition, there are also the Deputy Commissioner's (DC) confidential assistants, orderly, *peons* and messengers who exercised more power than the other staff. Thus, a few of the subordinate staff involve in mediating this service. Consequently, they have also vested interest in this service.

Also staff from other offices work as hidden middlemen in this service. Since the DRR is surrounded by courts, police and other offices, the staff of these offices

have their vested interest in this service. During fieldwork, it has been found that one judge of the court situating in the next door of the DRR bought a plot of land in the district and needed the land record of that land. He just sent one of his supporting staff to the DRR with the request to make his service faster than all others. Similarly, the court police sometimes take the opportunity since they too work in the same compound; they also expedite this service for their vested interests.

Thus, police, court clerks and staff of other offices have vested interest network with the DRR staff to mediate the land record service to their relatives, friends and sometimes with vested interests. Even the employees of autonomous bodies and non-government office, bank, insurance offices located in the surrounding areas take opportunity of mediating the process of this service.

D. Umider (Volunteer) Network

Umider is a volunteer staff who works in the DC office on full time basis without any salary. S/he works with the lower level staff of the DRR to assist in carrying files, typing or making tea in the office. *Umider* system has a long tradition in the DC Office. Approximately 10 to 50 *Umiders* work in a DC Office and almost each and every section of a DC office has one or more in numbers. After rendering free services about 5 to 10 years some of them get appointment as permanent staff. The DRR needs *Umider* due to its wide volume of work by the less number of Staff.

An *Umider*, who has been found in the DRR at Khulna, was involved in sorting and carrying registers from the Record Store to Copyists' desks, calculating fees of the applications and working as gateman of the DRR. Besides, he serves biscuits and tea for the DRR Staff and the officer. Moreover, he works between the Copyists and the traditional middlemen as a messenger to carry the vested interests of the parties. As the *Umider* has no salary for his job, he receives tips from both the parties. Besides, sometimes the *Umider* directly mediates citizens' applications and very often he provides status of land records.

E. Informal Network

Journalists and political activists are powerful actors in the vested interest network. They use their professional identity to mediate the service delivery either for themselves or for their clients. The DRR staff members are also loyal to them, because they are capable enough to harm their vested interests. The journalists can report in the newspaper or electronic media about the corruption of the DRR staff and the political activists are capable to request the Deputy Commissioner for transferring the DRR staff to somewhere else. Therefore, the DRR staff members provide faster service to the actors of the informal network

Thus, the problems presented in the organizational contexts have posed significant barriers to the E-service. The land record system, the condition of the land record, the process of application submission, the problems with organizational structure and the problems of various networks of middlemen are entangled with the traditional process of this service delivery. Consequently, the E-service was suppressed in the organizational contexts and citizens' access to the E-service was remained unutilized. It has been found that 95% of the total applications come through traditional paper based process and middlemen networks and only 5% of the total applications come through E-service network: UDCs and the DWP. Since the DRR staff seek their vested interest from the traditional process of this service delivery; they do not intra-act with the newly designed E-service processes.

6.3 Problems in the Technological Contexts

Problems relating to technological contexts can be categorized into two broad areas: problems in the E-service networks and problems in the E-service processes. The E-service networks include all the steps from online application submission to receiving land record by citizens. Similarly, the E-service processes include organizational and technological processes involved with application receiving to deliver land record to the citizens. However, it is difficult to separate between E-service processes and networks. The E-service networks have focused

on steps and coordinating matters involved in the E-service and processes have been discussed below.

6.3.1 Problems in the E- Service Network

Aiming to make citizens' access easy to the land record service, the E-service develops a network that comprises of UDC, DWP, ESC and DRR. The UDC, DWP and ESC are the three access points that are damaged to submit online applications by citizens for this service. So, the UDCs, the DWP and the ESC are connected to the DRR.

However, there are multiple points to access to the E-service; there are numbers of problems in submitting citizens' applications through the E-service access points and receiving delivery of this service too. The following sections focused on the problems of the E-service networks that are involved in and emerged from the E-service of the E-service of land record.

Complications in Submitting Online Applications

Since the DRR is entrusted with land record service, applications for land record must reach at the DRR. However, the E-service has designed online applications submission process such a complicated way that involves many steps and processes to receive applications by the DRR and to deliver this service to citizens (figure 6-10). Although the UDCs and the DWP are designed to submit applications, citizens need to send print out copy of application along with fees and folios to the ESC located at the district headquarters. Thus, the ESC was designed to receive applications from both citizens and the UDCs and the DWP.

Consistently, citizens faced problems in submitting online application from the UDCs or the DWP to the DRR via the ESC. It had become complicated process for submitting fees and folios papers from the UDCs to the DRR. Citizens needed to take print out of the online submitted applications, attach necessary fees and folio and send them to the ESC. Thereafter, the ESC staff makes entry all the

applications to the general registers after checking fees and other details. Finally, the ESC forwards the applications to the DRR.

Afterward, before starting any process on applications, the DRR staff place the applications to the RRDC for signing on them applications. However, this signature is functionally quite irrelevant and meaningless. The copyists argue that this step is mandatory to them. The copyists could not start copying any record without RRDC's signature on the applications.

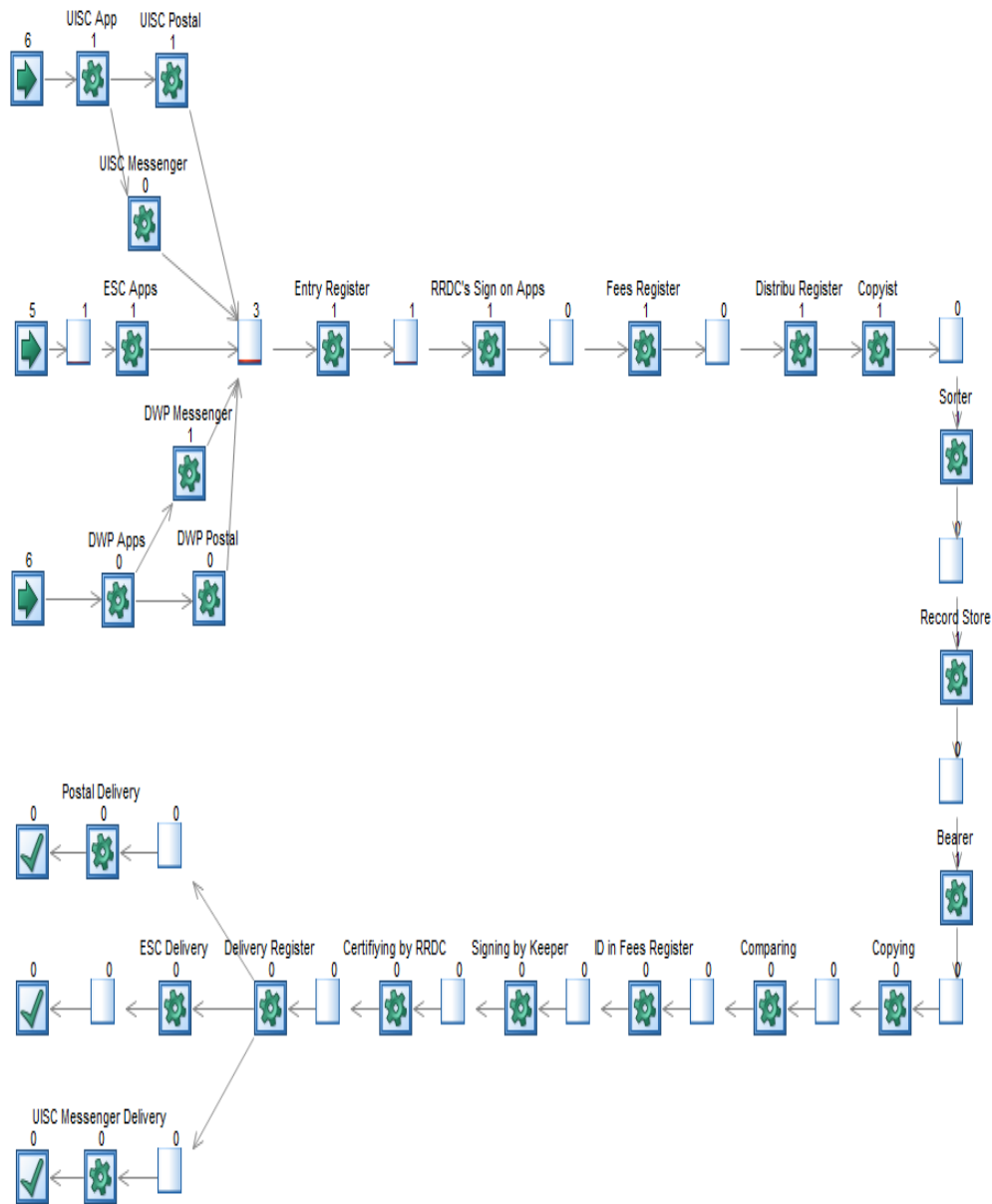


Figure 6-10: Stages of Applications Reaching from Citizens to the DRR

After signing by the RRDC, applications are put into the distribution register whereby applications are allocated to copyists for copying record from registers. Thereafter, Copyists send the applications to the Sorting Staff to sort concern land record registers from the Store and after sorting they carry the registers to the Copyists' Room. Afterward, Copyists copy relevant record and send it to

Comparer and Record Keeper for comparing and checking. Finally, the RRDC attests the land record. After that, the attested land records are sent to the ESC to deliver to citizens. Thus, through the E-service process it takes more than a week to reach an application from citizens to a copyist at the DRR and at least another week to reach from the DRR to the Record Store and the other week to deliver land records to citizens by the ESC. So the complicated processes discouraged the citizens to access to this service through the E-service. Consequently, they found that the middlemen are efficient to mediate this service because they took less than half time of the ordinary process of the E-service.

Legacy of Traditional Process: Meaningless Signature

In the process of the E-service, an application submitted through online reaches instantly to the DRR including the ESC, DRR, RRDC, copyists and record keeper. However, the ESC continued to receive paper based applications from middlemen. Consequently, it required hard copy of applications to maintain its organizational process. Thus, the ESC sought hard copy of application for online submitted applications submitted by UDCs. Surprisingly, the middlemen got the opportunity to submit paper based applications for their clients at the ESC. Resultantly, the ESC turned as constraint to the E-service to introduce online applications and enabler to the middlemen to continue with paper based applications. Thus, organizational contexts and processes continued with receiving paper based applications. Moreover, the ESC was engaged in putting the paper based applications into the E-service network only for satisfying the monitoring purpose of the A2I because they were not used for any other purpose. However, it was possible for the DRR staff and the RRDC to receive and process the online submitted applications without making via process of the ESC. Consequently, the E-service was rather continuing to abide by the legacy of the traditional process which has made the E-service useless and suppressed.

Complex Copying Process

After being signed by the RRDC and putting application into work distribution register, applications are allocated against each copyist. After that, a copyist

distributes his applications to a sorting staff to sort and bring required registers from the Record Store. Thereafter, Sorting Staff required one or two days to search and bring specific record registers and place them at the copyists' tables. After copying records from the original registers, the Copyists sent the exact duplicate copy to the Comparers. Afterward, the Comparer checked and sent the registers to the Record Keepers for further check. Finally, the RRDC put attestation signature on the exact duplicate copy of land records. Besides, it needs to put application details into the court fee register and dispatch register. Thereafter, the land records are sent to the ESC for delivering to the applicants. Thus, the ESC delivered the land records to the citizens or the ESC sent the land records by postal service, if applicant provides envelope along with address and postal fees. Consequently, the E-service remained complicated and isolated. The organizational process was not redesigned accordingly with the E-service.

Copying by Hand Writing

Land record service required exact duplicate copy from the record preserved at the Store of the DRR. However, it is not mentioned whether it needs to be written by hand or composed or photocopied or scanned. During the Colonial regime, this service started with writing of the exact duplicate copy; however, the copyists keep practicing on writing the exact duplicate copy. Nowadays, although photo copying and scanning options are available, the DRR staff are not interested in using technology for copying record. Issuing hand written exact duplicate copy is time consuming matter. To write an exact duplicate copy of a land record takes about 30- 50 minutes or even more; whereas, to take photo copy or scan a record takes less than two minutes. Besides, handwritten attested copy is not easily legible for others. Further, comparing hand written record by comparer is really difficult to go line by line and word by word. Furthermore, it is easy to produce fake or tampered copy of attested record from hand written copy. Consequently, using hand written method for copying record gave more backlogs in the E-service and developed complicacy. Thus, the E-service was facing problems due to existence of traditional processes of this service.

High Volume Backlog of Applications

There is a high volume of backlog of applications in the DRR. Although there is provision for service delivery within three working days for the urgent applications and seven working days for ordinary applications. Rarely the DRR staff deliver this service on time. The main reason of backlog is the hand written method of copying land record. Thus, there was no step to reduce the backlog. Contrary to, continuing with the backlog is positively connected with the speed money. If there is no backlog, there would not be any persuasion by the middlemen. The high volume of backlog provides high amount of speed money to the copyist. Evidently, the copyists are not interested in using photocopier or scanner to copy land record quickly. If this service is delivered quickly and there is no backlog, the speed money would be lower. Since there is high volume of backlog, citizens are bound to pay higher amount of speed money to receive this service quickly. Resultantly, the E-service failed to expedite process of this service.

Consequently, it was found that 2-3 weeks' time was needed to deliver this service. Surprisingly, the DRR staff treat applications of urgent and ordinary fees equally but they put priority on middlemen submitted applications. Contrary to, though the UDCs submitted applications with the urgent fees, they deliver them even after the ordinary applications submitted by the middlemen. The staff are not interested in UDCs submitted applications because those applications do carry any vested interests for them.

Incomplete Application through the E-service Network

Although the E-Service network has been designed with the E-service access points –ESC, UDC and DWP –to submit online applications for this service; there are no options for submitting fees online for this service. Consequently, the E-service does not comply with legal systems of fees submission. According to legal provision, submitting application for this service requires fees in the form of adhesive stamps. It is technologically possible to submit online applications to the DRR for this service but functionally the DRR does not take any actions on the

applications without fees. Thus, the E-service develops an incomplete system for online application submission.

The provision of fees as adhesive stamps is involved with the traditional and manual process. Since, the adhesive stamps could not be sent with the online application, it is not possible to send fees online while applications come from UDC or DWP. Consequently, until and unless the DRR receive fees against application, none of the applications can be processed. Thus, in the case of the online applications from the UDC and the DWP, citizens do not get any advantage of submitting online application. Since they need to send the appropriate fees either by postal service or they need to travel to the DRR to submit fees for their online submitted applications.

Besides, since the fees for this service is adhesive stamps, it is required to print the online application and paste appropriate amount of stamps on the applications. Therefore, if anyone submits an online application for this service, he needs to print the online application; goes to stamp vendor to buy stamps; paste the right amount of stamps on the printed application and send by postal service to the ESC or submit directly to the ESC. Consequently, the multiple access points and layers made this service complicated.

Although an UDC can submit an online application for his clients by the E-service access point but he needs to follow complicated procedures that include printing the online application, buying stamps from vendors, pasting stamps on the printed application and send the application by post or by a bearer to the ESC. Afterward the ESC forwards the printed application to the DRR for processing this service. Thereafter copying, comparing and attesting the record, the DRR sent back to the ESC. Finally citizens need to come to the ESC to receive the land record, though it is possible to send attested land record to the address of the applicant. These physical travels for submission of application with adhesive stamps to the ESC and receiving land record from the ESC made the E-service utility meaningless.

Higher Cost in the E-Service

E-Service of land record is not cheaper than the traditional paper-based application. It has become costlier because submission of online application for this service requires computer, internet connection, print out of the online application, postal fees or travel cost of sending application and receiving land record. Obviously all these cost are more than filling in forms or writing a paper based application for this service. Thus, it is difficult to access into this E-service by the rural people who neither have computer and internet and nor even electricity. More importantly, people who have all facilities as mentioned, even majority of them, do not have electronic literacy and land related knowledge and experience to submit an application by using the DWP. Therefore rural citizens need to access to this service through any of the E-service access point: UDC, ESC and DWP.

However, the E-Service network has increased complexity, costs and time in submitting applications and receiving this service. Online application submission requires computer and internet. Rural citizens need to go to a UDC to submit online applications. Besides, after submitting online application, it requires to take print out of the online submitted application. According to the organizational process, online submitted application need to be submitted at the ESC along with necessary fees and folios. Thus, either citizens' need to go to the ESC along with the printed copy of online submitted application or sends the application by post to the ESC. Consequently, the E-service failed to reduce time, cost and visits.

Delaying in the E-service

While anyone submits online application for land record, it automatically reaches the ESC and the DRR through the E-Service Network. Due to the lack of online payment options, the applications submitted through the E-service cannot be taken into action by the ESC and the DRR. Thus, the UDC needs to print out of online submitted applications and paste on them necessary adhesive stamps. Afterwards, the print-out of applications needs to be sent to the ESC either by post or by travelling to the district headquarters. Thereafter, the ESC checks fees and detail

information of the applications and enrolled the applications into the general entry register. Thus, the E-Service has increased stages in processing of this service. Consequently, submitting applications through the E-service network took longer period to reach the DRR comparing to the previous process and the E-service caused delay in this service.

Less Reliability in the E-Service

The higher rate of application rejection and delaying in processing of this service turned the E-Service as unreliable means to the citizens. Surprisingly, while a father of an UDC entrepreneur needed land record for his land, he did not rely on his son, because he knew that a middleman can provide faster and secure service than a UDC entrepreneur. Thus, he went to a middleman at the district headquarters to mediate his application for land record. This case reflects that citizens did not rely on the E-service due to time consuming and complicated process. Moreover, the UDC operators are not well networked and well experienced with the DRR. This also has increased citizens' unreliability on the UDCs for this service.

Unnecessary Stages of the E-Service

Without abandoning the paper based process, the E-service was introduced. Thus, it has created overlapping and double layers. There are two layers of the E-service. Citizens' required to access to the decentralized layer (UDC or DWP). Thereafter, they need to access to the centralized layer, the ESC. If citizens submit applications through the decentralized access points, their applications are not taken into action until and unless the applications arrived at the ESC. Besides, in previous system, citizens can submit applications direct to the DRR. However, after introducing this E-Service, citizens who submit application at the district headquarters, they also need to submit application to the ESC. Consequently, the ESC has become an extra stage in this E-service and made it double layers.

Although the ESC was designed as a front desk, it is not properly connected to the DRR. Thus, it was unable to give update status of citizens' applications.

Consequently, citizens required to run between the ESC and the DRR for knowing the status of their submitted applications. So in no way, this E-service has reduced citizens suffering, rather it has increased stages and complexity too.

High Rate of Application Rejection

Since the technological intermediaries, the operators of UDCs are not well acquainted with the land record service and with the DRR staff; they do not know details of application fees and folios. The complex break down of the fees and folios are often varied. Thus, due to error in amount of fee or folios, the ESC cancelled online applications at a high rate rather giving any opportunity of supplementing of fees or correcting of information. Evidently, the UDCs submitted applications are rejected even for little errors because those applications do not have vested interest for the DRR staff. By rejecting the online applications, they escape from speed moneyless tasks and more concentrated on their vested interest cases i.e., paper-based applications submitted by the middlemen. The copyists reported that they do not have option to communicate with the applicant in the case of the online application. Thus, they cannot communicate with the applicant if any minor error was in the online application. However, for middlemen submitted paper based applications, the copyists themselves rectify those applications with adding fees or folio as these applications have their vested interests. As a result, the paper-based applications have rarely been rejected by the DRR staff.

Moreover, since the technological intermediaries or the online applicants do not have networks with the DRR staff, they do not know whether the specific record is available or not with the DRR. Contrary to this, the middlemen have vested interest networks with the DRR staff. So, before applying they verify through the DRR staff whether the records are available for this service or not. So, applications submitted by middlemen were rejected in less but applications submitted by the UDCs reject was much.

Since the ESC is the hub of receiving applications whether submitted through UDCs and the DWP or paper based applications at the ESC, it conducts initial

screening of all the applications for fees and other details. During this screening the ESC staff picks out the interested ones and kick out the uninterested ones. As the online submitted applications do not have any vested interests for the ESC staff; thus they always find fault with the online submitted applications. Further, the DRR staff do not find their vested interests in the online submitted applications; so, the applications coming from E-service networks are sure to face the fate of rejection.

6.3.2 Problems with the Dual and Parallel Processes of the E-Service

The E-service aims to bring service delivery of land record to citizen's door step through setting up E-service access points between citizens and the service provider, the DRR. Thus, it has designed both centralized and decentralized service points to access this service. The ESC was located at the district headquarters nearby the DRR. It was centralized access points. Contrary, the UDCs were located at the rural areas and can be seen as decentralized access point to access to this service. Further, the DWP was hybrid because citizens living in district headquarters can use it and equally it can be used from anywhere to access into this service. Though, the aim was to easy access through setting multiple access points to access into this service, the organizational processes and actors have interpreted in other way. Rather, they created dual and processes with the multiple access points. In line, the following sections have discussed the problems emerged from the dual and parallel processes of this E-service.

Multiple Layers in the E-service

The E-service has designed country wide network that comprises a total of 4501 UDCs, one UDC for each rural Union Council and 64 DWPs and 64 ESCs. There was a DWP and an ESC at every DC Office, the district of headquarters. UDCs, ESC and DWP were designed to submit citizens' application to DRR. However, the organizational processes have redesigned them as these multiple layers that ultimately generated significant problems in this service. Consequently, although

the E-service access points were for citizens' easy access, the multiple layers of this E-service made this service more complicated. Due to the multiple layers in the E-service, citizens submit online applications for this service at the UDCs located in rural areas and thereafter travel to the district headquarters to submit printed applications along with fees and folios at the ESC and afterward the DRR process this service. So, there are at least three layers emerged in this E-service and increase cost, time, visits and middlemen in this service.

Due to multiple and parallel access points as well as centralized and decentralized access points, number of problems have emerged in this E-service. Three access points have been designed to receive online applications for land record from citizens. The first one is the ESC, a front desk, at the office of the Deputy Commissioner, at the district headquarters. It has online network with the DRR and has option to receive citizens' applications for the E-service from the district headquarters. The second one is the DWP, a website, for submitting online application for land record to the DRR. The final one is the telecentre known as UDC. A UDC has been set up in each rural Union Council and it is networked with the DRR. Thus, citizens can submit online applications for this service to the DRR through any of the access points.

To submit application through ESC, citizens need to travel from rural areas to the district headquarters. Further, UDCs are decentralized access points for this service. It is located at rural areas and connected with the DRR. Further, the DWP has its virtual presence everywhere through online connection with the DRR. Although online application for land record service reaches instantly to the DRR from the ESC, UDCs and the DWP, the DRR cannot take action on online submitted applications immediately. The organizational networks require fees and folios along with the application. According to the legal provision, application fees need to be submitted by revenue stamps that usually pasted on application. Besides, according to this service regulation copying record for this service requires folio papers. Consequently, the DRR needs a printed copy of the online submitted application along with the appropriate fees and folios. With these

grounds, the organizational process has redesigned the E-service process that hardcopy of every application needs to be submitted at the ESC along with appropriate fees and folio-papers.

Since there is no option to submit fee-stamps and folio-papers with online applications to the DRR, the ESC emerged as a layer between the UDCs and the DRR to receive applications with fees and folio. Surprisingly, the E-service has added another layer with the existing organizational process, but it has failed to remove the previous paper based process. As the DRR unable to process online submitted applications until and unless it received hardcopy of applications with necessary fees and folio papers. Thus, there have emerged three layers in the E-service: submitting online applications through the UDCs is the first layer; submitting hard copy of online submitted applications at the ESC is second layer and processing of the service by the DRR for applications forwarded by the ESC.

Besides, the E-service has increased the problem of this service in three times because it has made three in process this service while previously there was one layer only. Thus, it took about a week to reach the printed copy of applications with fees to the ESC, another week to process this service by the DRR and the other week to go from the DRR to the citizens after the service is prepared. Consequently, the E-service has merely addressed the citizens' problems; it increased cost, time, visits and middlemen involvements in this service.

Further, the organizational process turned the ESC as a traditional access point, that is, application dropping point or application dropping box at the DRR. Before introducing the E-service, all applications were submitted in the box kept in front of the DRR. Middlemen was used to write or filled in citizens' applications along with necessary fees and folio papers and dropped it into the box kept in front of the DRR. It was possible to deliver service to the citizens the same day of application submission. However, the system of dropping application to the box at the DRR was so corruptive and unmanageable process that was stopped.

Along the line, to remove the influence of middlemen on this service a front desk was setup at the office of the Deputy Commissioner to replace the application dropping box at the DRR. Later on, the E-service named the front desk ESC. The ESC has been set up with two computers that are connected with the DRR through the E-service network. Thus, the ESC also has options to receive online applications from citizens for this service and the applications received by the ESC instantly reach to the DRR through the E-service network. However, the DRR staff and RRDC none were following and tracking online applications. Consequently, they were bound to receive hard copy of every application irrespective of access points.

Thus, in practice, the ESC received only paper based applications from middlemen and made them entry into the E-service network. Thereafter, it forward all the paper based applications and hardcopy of online submitted applications to the DRR. As a result, the organizational processes turned ESC a point that was used by the middlemen to submit their clients' applications. Evidently, the ESC was nothing more than the previous application dropping box of this service.

Besides, the ESC has become a new hub for receiving hardcopy of online applications from the DWP and the UDCs and forwarded them to the DRR. Although after submitting applications from the DWP and UDCs; they instantly reach the DRR through the E-service network. The organizational processes and the networks made the ESC as additional layer for receiving fees for all the applications and entering all the applications into the paper based general registers. Consequently, the role of the ESC has become dominant on the DWP and UDCs. The ESC has become gatekeeper for receiving printed copy of online submitted application and verifying fees and requirements of online submitted applications, from the DWP and the UDCs.

These multiple layers of submitting applications for this service have become potential challenge for the E-service. Since the ESC was turned as the centralized

and replacement of traditional access point to the DRR, it has become a threat to the UDCs and the DWP. Contrary to, it was enabler for the middlemen to access to this service. Thus, the ESC has become middlemen's access point to this service. Consistently the middlemen used the ESC for continuing with writing applications, filling in forms, arranging fees and folios for submitting applications and expediting and manipulating delivery process of the E-service. The middlemen have vested interest networks with the DRR staff who process the service delivery of land record. Thus, applications come from the ESC through middlemen network receive faster service delivery than applications from the UDCs and the DWP.

Thus, citizens found that coming to the district headquarters and submitting applications at the ESC with the help of middlemen is able to provide much quicker service delivery than the UDCs and the DWP. Consequently the ESC has become an obstacle to the DWP and the UDCs. Therefore, the E-service has not reduced service delivery time, visits and cost for citizens rather it has increased the amount of bribes due to creating multiple layers in this service.

Dual Applications: Online and Printed

After introducing the E-service, application submission process for this service was dual. Although it aimed to receive every application in online process, the process of paper based applications remained dominant. Consequently, the organizational process has further redesigned the E-service process for receiving application in the E-service. It followed two types of dual processes. Firstly, citizens submit online applications through the UDCs and the DWP, then submit hardcopy of the online applications to the ESC. Secondly, the ESC receives at first paper based and thereafter the paper based applications' details are put into E-service network as online applications.

The ESC has been designed to receive online applications from citizens. It has the option to receive online applications from citizens. However, the ESC staff have redesigned process and continued with traditional process of receiving paper

based applications also that are mainly from middlemen. Since the DRR staff receive all the applications in paper based format through the ESC, they do not have interest to go to the E-service network and check the online submitted applications. Thus, citizens were pushed to middlemen for filling in paper based applications form.

Further, in the E-service process the ESC scrutinized accuracy of applications, fees and other details the hard copy of online submitted applications by the UDCs and the DWP. Thereafter, the ESC staff put details of online applications into the general register. Thus, although applications from the UDCs and the DWP are submitted through online, they are required to enroll to paper based registers by the ESC staff. Although there was has online register for managing fees and other details, the DRR was staff was not shifting from the paper based registers to the online registers (figure 6-11). There were two reasons for continuing with paper based or printed applications and paper based registers: one was pasting of adhesive stamp on applications as application fees and the other is the organizational processes of preserving printed copy applications for auditing. However, continuing with the traditional process, served the interest of the middlemen and the DRR staff.

Although the E-service of land record was introduced a system for online application submission, it failed to remove the paper based applications and registers from the organizational processes. Consequently, online applications for this service were remained suppressed in the organizational process. Contrary to, the DRR staff continued with paper based applications and they processed service according to paper based applications. Therefore, due to the dual method of applications submission and organizational processes made the E-service more complicated, costly, time consuming and middlemen dependent.

Dual Registers

The parallel access points and dual methods of application submission have developed dual organizational registers. Before introducing the E-service, there

are five paper based registers at the DRR to manage land record service delivery. The registers are known as: General Entry Register, Court Fee Registers, Work Distribution (*hawla*) Register, Dispatch Register and Application Cancellation Register. They were used to manage paper based applications for this service.

For instance, this register record application ID number makes applicant's name, address and details of record(s) asked for service (number and type of record and the jurisdiction list number of record), amount of fees, number of folio papers, dates of application receipt and delivering services. Thus, it is a detailed register for managing this service.

নং	আবেদন নম্বর	আবেদন কর্তার নাম	উপজেলার নাম	মৌজার নাম	ফ্রে এল নং	নকলের ধরন	খতিয়ান নং	প্রাপ্তির তারিখ	প্রদানের মাধ্যম	প্রদানের তারিখ	অবস্থান কাল	প্রদান
৪২৪	৪৭৩২০১১১১১১২২	শাকিলুল ইসলাম	শাংকগাছা	কালিদাসপুর	৮০	এল এ খতিয়ান	৬৯	২২-১১-২০১১		০৭-১২-২০১১	১৩১ দিন	
৪২৫	৪৭৩২০১১১১১০৭	হাফিজুল ইসলাম	পাইকগাছা	কালিদাসপুর	৮০	এল এ খতিয়ান	৮	০৭-১১-২০১১		০৭-১২-২০১১	১১৬ দিন	
৮	473201201014	karim khan	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৩৪২		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
৯	473201201014	karim khan	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৩৪২		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
১০	473201201015	karim khan	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৩৪২		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
১১	473201201015	karim khan	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৩৪৬		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
১৩	473201201017	sabina yesmin	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৫১০		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
১৪	473201201017	sabina yesmin	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৫১০		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
১২	473201201019	sabina yesmin	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৫১০		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
১৫	473201201019	sabina yesmin	বাতিয়াঘাটা	কৃষ্ণপার	৮৪	বি আর এল খতিয়ান ৫১০		০১-০১-২০১২		০৫-০১-২০১২	৯১ দিন	
৩	47320120104	করিম বেগম	বাতিয়াঘাটা	রাঙ্গেশ্বরী	১৪	বি আর এল খতিয়ান ৩৫		০৫-০১-২০১২		১১-০১-২০১২	৮৭ দিন	
৪৯৮	৪৭৩২০১২০১০০৪	মোঃ হুমায়ুন গাজী	কুলতলা	দামোদর	১৮	এল এ খতিয়ান	৬৯৩	০৪-০১-২০১২		০৪-০১-২০১২	৮৮ দিন	
৪৬৭	৪৭৩২০১২০১০১১১	সুকুমার শাহা	পাইকগাছা	পশ্চিম কামনুদী	১০৯	সি এল খতিয়ান	১৮,৩২	২০-০৩-২০১২		০৪-০৪-২০১২	১২ দিন	
৫৬৯	৪৭৩২০১২০১০১১১	মোঃ কামাল শেখ	কুপা	আলাই পুর	৪৯	এল এ খতিয়ান	১১৩	১৯-০৩-২০১২		০৩-০৪-২০১২	১৩ দিন	

Figure 6-11: Online Register for the E-service

The court fee register is used to keep accounts of total revenue income from this service. This register maintains details of breakdown of the fees received with applications: copyist fees, folio fees and fees application for the service. It has been maintained for the purpose of auditing. The work distribution register is known as *hawla register*. This register is used to distribute tasks among the staff members. For instance, a total of 150 applications have been received at the end of a day for this service. So these applications need to be distributed to the copyists. There were six copyists and these applications were distributed as 25 applications for each. This register is important to track applications that which

application was assigned to whom. The dispatch register is used for managing delivery of this service to the citizens.

Further, application cancellation register is used to keep record of cancelled applications detailing cancellation grounds: record damaged, restricted to issuing attested copy, inaccurate application information and inappropriate fees or folio papers. Besides, after introducing the E-service, another register has been introduced known as ESC dispatch register that has been maintained at the ESC. After introducing the E-service, the ESC delivered the attested copy of land record. So, a total of six registers are being used for managing this service. Although, the E-service was designed to remove all paper based registers, it has failed to remove paper based registers rather it added another paper based register.

Although the E-service gives opportunities to manage this service without any paper based registers, the staff members prefer to maintain paper based registers for three reasons. Firstly, for maintaining regulatory and auditing provisions for continuing the paper based registers. Secondly, the DRR staff habituated with paper based traditional process instead of organizational process of this service. Thirdly, the DRR staff cannot rely on the E-service process due to frequent server problems, low speed internet connection and power failure.

Moreover, paper based registers and process remained dominant in land record service delivery. Therefore, the E-service network of land record service has been kept passive and out of the mainstream of the organizational process. Even if, applications for this service have been submitted into the online process through the UDCs and the DWP, they required putting into the paper based registers. Consequently, submitting applications through online process was not advantageous rather it was disadvantageous for the DRR staff and the citizens. Therefore, managing dual registers (the paper based registers and the online entry) has increased the volume of work almost twice and equally increased cost and time of processing of this service.

Dual Application ID Number

Every application for this service receives an ID number for tracking and managing chronological order and managing organizational processes and functions. Before introducing E-service ID number is to issue from the general register. Currently with the E-service, every application receives an ID number after online submission. The E-service of land record introduces a unique ID number for each application of land record service. The E-service network gives a fifteen digit application ID number: the first two digits are district code, following four digits for year of the application, thereafter two digits for months of the application and two digits for the date of the month and the final four digits for the chronological number of an application. Instead of the 15 digit application ID number system, the DRR staff continued with the 5 digits manual ID number for each of the application.

The DRR staff need to maintain a manual ID number of applications through general entry register. The 5 digits application ID was used for managing registers for fees, job distribution and so on. Usually the manual ID number starts at the first January of the first application with e.g., 00001 and ends with the last application of the 31st December in the manual general entry registers. Since the paper based registers exist in the organizational process, the staff prefer using manual ID number for each application during entry the application into the general entry registers. The manual ID number was shorter than the digital one, the staff, citizens and middlemen prefer to use manual ID number for tracking, mediating, pursuing and managing organizational process.

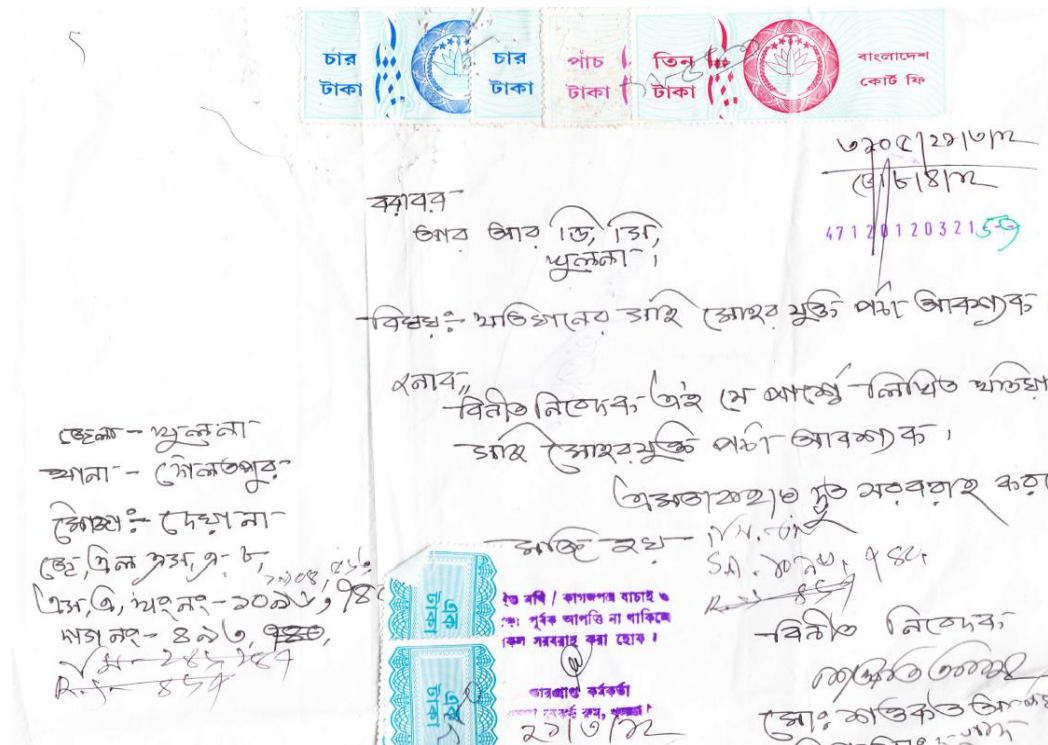


Figure 7-13: Hand Written Tampered Application with Dual ID Number

The main reason behind that the manual application ID was easy to identify middlemen submitted applications and giving priority them. Before E-service of land record, the middlemen had easy access to the DRR for mediating their clients' applications. Thus, they could directly intervene with the application and the staff. The E-service puts restriction of middlemen entrance to the DRR and influencing on the chronological process of this service delivery. Consequently, application ID has become the vital means of tracking, mediating and persuading applications by the middlemen through the DRR staff.

Since the E-service generated ID number is complicated and very long; the staff, citizens, and middlemen prefer to continue with the manual ID number. Small manual ID number is easy to remember and track. On the other hand, since the middlemen cannot enter into the DRR; they pursue and mediate through mobile phone communication with the Copyists. Therefore, the manual ID number was obstacle for the E-service and suitable with the vested interests of the middlemen and the copying staff.

Parallel Delivery Processes of the E-service

The E-service has been designed with numbers of parallel options for delivering this service from the DRR to the citizens. These are: first is to deliver from the ESC; next is to deliver the service by Post Office to applicant's home address and the other is delivering this service through the concern UDC. Thus, an applicant has three options to receive this service. Citizens can choose any option of receiving the service from the DRR.

The service delivery points can be divided into two categories such as centralized and decentralized. The ESC is the centralized delivery point because it is located at the same office compound of the DRR. Besides, the ESC processes service delivery of all applications. The other two delivery points are decentralized: one is postal service and the other is the UDC. Consequently, the ESC provides faster service delivery than the other delivery points. The ESC usually receives all the prepared record from the DRR. Thereafter, it made delivered to the citizens. Resultantly, citizens prefer to receive this service from the ESC because the ESC is able to deliver at the same day of receiving from the DRR. However, for the other two delivery points it is not possible. Rather, the ESC usually posts the prepared record for the citizens and the UDCs on the following day. Thereafter, it took a minimum of one week to a maximum of two weeks to deliver this service by postal method. As a result, if applicants wish to receive this service from the concerned UDC or through post office, it takes longer time.

For receiving this service through post office, it requires a return envelope with address along with postal fees. Besides, if the applicant submits application from a UDC and agrees on receiving record from the UDC, it is the responsibility of the UDC to collect the prepared record from the ESC either by messenger or by postal process. Since the delivery mode of this service through Post and the UDC is time consuming, citizens prefer to receive the service from the ESC.

Besides, applications come from the DWP and the UDCs merely receive attention of the DRR staff because these applications do not have any vested interests among the staff. As a result, service delivery through postal system for the

applications submitted through the UDCs and the DWP receive longer time than the given date. Even in the case of postal service missing is a common problem. Thus, citizens who submit applications through UDCs and the DWP, prefer to receive service through the ESC in order to save time to expedite and ensure this service through mediating the middlemen.

Receiving this service from the ESC, gave opportunity to pursue for a quicker service delivery through middlemen. Contrary to, while citizens submit applications with the option of receiving service through post office at home address or through the UDCs, they do not have opportunity for mediating their applications by middlemen networks. Thus, the parallel service delivery process gave opportunity to the middlemen and the DRR staff to keep continue their vested interests in this service. Therefore, the parallel service delivery process suppressed the E-service.

Dual Date of Service Delivery

Every application submitted for the land record through this E-service receives an automatic date of service delivery from the E-service systems. Although according to the rules of this service, there are two types of service deliveries: urgent and ordinary. Urgent applications require three working days and ordinary applications take seven working days. Functionally, the DRR merely categorizes applications into urgent and ordinary. Usually, all applications considered as ordinary status that come beyond the vested interested networks, even if, the applications are submitted with the urgent fees.

However, this date of service delivery is varied between the automatically generated date and the actual date of delivery. It has been observed that none of applications could deliver record accordingly date generated by the E-service. For example, automatically, generating time period is seven working days. They prepare attested copy of land record by ten to fifteen working days. These delaying take place without informing the applicants. As a result citizens need to travel twice or more to the ESC to receive this service because most of the

applicants receive this service from the ESC, if there is any change of the date of service delivery. It has been observed as a common problem of this E-service. Therefore, to avoid this problem, citizens prefer to go to the middlemen networks to mediate their applications for this service.

Citizens enter into this service process through the middlemen; they receive delivery of their services in many cases before the date delivery. Consequently, this problem is acute in the case of applications submitted from the UDCs and the DWP because the DRR staff merely take care of the applications coming from the UDCs and the DWP since there are no vested interest behind the applications. As a result, the date of delivery of this service is frequently deviated from the given date of the E-service network. If the date of delivery is deferred in the case of applications submitted by middlemen, citizens receive information of the changes in the date service delivery because most of these applications are mediated by middlemen networks. The middlemen provide update status to their clients about date of delivery. Since the middlemen networks have connection with the DRR staff who provide delivery beforehand.

Consequently, these irregularities of the date of delivery of service have compelled citizens to receive land record through the middlemen at the ESC rather than postal or the UDC delivery. Since the ESC and the DRR are connected with vested interests of the middlemen, citizens prefer to mediate their applications by the middlemen. Thus, if citizens expect to receive this service from the UDCs and Post, it is not possible to receive status of the application. So they are to mediate this service delivery through middlemen.

The cost of deferring of the date of delivery is very high. About 80% of people live in the rural areas. About 90% applicants for this service come from rural areas. While the date of delivery of this service is deferred without informing the applicant its cost is very high because it adds up travelling cost, wages of a labor and launch at midday. As a result, travelling once to the ESC from rural areas may cost BDT 200 to BDT 500. Thus, delay in this service caused loss of time and

money. Therefore the citizens prefer to contact middlemen with the same cost BDT 200 to BDT 500 to ensure accurate date of this service and even if possible making quicker. This is how, citizens took the E-service as the source of suffering with increased the delay in delivery process. So they need to rely more on the middlemen and pay more charges to the middlemen.

Dual Fees for this Service

According to the provision of this service, there are two types of applications on the basis of fees: urgent and ordinary. Urgent application fee is BDT 16.00 and service delivery period is three working days, while ordinary application fee is BDT 8.00 and service delivery period is seven working days. Notably, they do not treat all the applications equally. Surprisingly, the middlemen submit all applications with ordinary fees and in majority cases receive urgent delivery. On the other hand, citizens submit applications through the UDCs and the DWP with urgent fees and receive service delivery even later than the ordinary service delivery requested.

Citizens apply with urgent fees for quicker service through the UDCs and the DWP. Since the applications of the UDCs and the DWP do not have any vested interests for the DRR staff; they receive less priority. On the other hand, the middlemen submit applications through the ESC with only ordinary fees. Since the DRR staff have vested interests with the middlemen's applications submitted by the ESC; they ignore the matter of fees with the cases of their vested interests. As a result, the government loses its due revenue and citizens lose their interest of submitting applications through the UDCs and the DWP.

Duality with Number of Record in Application

The option of applying for multiple records has become a great loophole in this service. This provision gave multiple advantages to the middlemen. Firstly, the middlemen can submit five clients' application at a time with one application whereas he has received speed money for five applications because citizens or do not know it five record can be submitted by one application. Secondly, during submission of application middlemen can mention only for one or two record.

After application submission he might find two clients while he can add other two records with the previously submitted application through collaboration with the copyists. Adding record in application after submission is great advantageous for clients because through adding with previously submitted application provides chronological advantage and quick service delivery.

For example, a middleman submitted an application seven days before for three records. On the basis of his application, the following day (tomorrow) is the date for his service delivery. Today he sees a client who needs attested copy of land record urgently by the next day. Since the staff and the middlemen had mutual interests, the staff would incorporate new record ID number on the previously submitted applications. This adding would provide the service delivery by following day. Thirdly, if one application was rejected due to damage of original record, the middleman could add another. Fourthly, it appeared that the middlemen misused this option of applying for up to five records with the DRR staff. Thus, the duality in number of records in each application provides significant advantages to middlemen and the DRR staff.

According to the Rules of this service, an application can be submitted for five records (five records of rights) in one jurisdiction. Contrary to it has been instructed to submit one application for only one record. As a result, applications that are coming from the UDCs and the DWP contain one record per application. On the other hand, applications that are submitted by the middlemen at the ESC contain five records in majority applications. Even it has been found that in many cases, middlemen submit applications with more than five records through violating the Rules of this service (figure:7-13). Further, the ESC and the DRR staff neither scrutinized nor cancelled any applications if it was with more than five records or any other lacking.

In this case, a DRR staff needs to do five times work with the applications submitted by the middlemen compared to the application submitted by a citizen. However, the DRR staff never bothers about the applications submitted by middlemen. Although the application submitted by a citizen through a UDCs or a

DWP for one record having one fifth task of the application submitted by the middlemen; the DRR staff are not interested with the UDCs and the DWP applications. Surprisingly, the citizen's application would not receive any attention of the staff, since it does not carry any interests of the staff.

More precise equation is that if a citizen needs five records and he submits applications from a UDC, it requires submitting five applications along with fees for five applications and charges for the UDC operator for submitting application using internet and sending the printed copy to the DRR via the ESC. Usually a UDC operator charges BDT 60 to BDT 100 for submission of an application for land record using the E-service network. Thus, if a citizen need five record and apply from a UDC or the DWP, his cost will come up about BDT 500.00 However, if he goes to a middleman, he will receive offer of the same cost, BDT 500.00 in order to process the five records. The middlemen would apply for five records in one paper based application which would cost less than BDT 20.00. Thus, from the rest amount BDT 480.00; the middlemen would spend a portion for the vested interests of the DRR staff. Besides, the middlemen will arrange certainly for a much quicker and more secure service delivery. Rationally, the citizen will accept the offer of the middlemen.

The middleman is able to mediate and perform for this citizen's application for this service through the advantage of duality in paper based and online application. With this vested interest, the DRR staff become happy to serve the applications from middlemen or any request come from middlemen. Mr. Keramat, a DRR staff, says, "If there is vested interest with any application, we apply magnifying reading glass to recover the record and if there is no vested interests with any application, we have hundreds of legal and valid excuses to delay or reject it."

Manual Processes of Work Distribution

Since all the applications are entered into a general register and given manual ID number, thereafter, the staff divide the applications by themselves according to the interest of the office staff in the submitted applications. For example, certain application must be allocated to certain Copyist. In this regard, the DRR staff have mutual agreement. Thus, they maintain manual work distribution register instead of managing the work distribution through the online process. Therefore, the copying staff serve the applications that carry vested interests only and others are not. Especially the applications submitted by the middlemen receive top priority because the middlemen serve first vested interests of the Copyists.

On the other hand, since the applications from UDCs and the DWP have no such vested interest for the staff do not receive any attention of the staff and are generally rejected at high rate due to minor mistakes in application or minor damage in original record. Since the middlemen have strong network with staff, so after receiving application ID number, a middle men communicate with the staff through cell phone or any other media to expedite his application. This is how the manual work distribution process is an obstacle for the E-service of land record. Therefore, it is strikingly visible that advantage of this duality goes to the middlemen and the adversity goes to the citizens and the UDC.

Therefore, the multiple layers in the E-service, dual and parallel systems applications submission and receiving delivery of this service, dual and multiple paper based registers, duality in number of record in applications, dual ID number of applications and manual work distribution have made potential constraints to citizens' access to the E-service and enabled the middlemen to continue interference to the E-service. Consistently, citizens were relied on the middlemen to receive this. Thus, the middlemen received speed money from the citizens for mediating and expediting of this service in the E-service processes. In line the middlemen also shared the speed money with the DRR staff and the ESC staff. Evidently, they provided quicker service and better treatment to all the applications came from middlemen. Contrary to, citizens' access to this E-service

access points -UDCs and the DWP -was disadvantageous, time consuming and costly.

6.4 The Organizational and Technological Contexts

Wide range of problems emerged from the E-service and they belong to both organizational and technological contexts. These are: problems with the DRR staff, the vested interested networks and problems with the citizens. Following sections have focused on the issues.

6.4.1 Problems with the DRR Staff

The core task of this service is to copy land records from land record registers preserved at the DRR Store. Thus, the role of the Copyists is imperative to provide better service to the citizens and to implement this E-service. However, number of problems evolved with Copyists including origin of their profession, posting and transfer, salary and skills. These problems were involved with organizational and technological contexts.

Legacies of the Copyists

The Copyists are the key organizational actors in land record service. They play vital role to deliver land record service to the citizens. However, there are underlying problems with the Copyists. From their legacies to usages of technologies, a good number of problems involved with the Copyists after introducing the E-service.

During the British Colonial regime, the Copyists were recruited as contractual staff with the provision of collecting certain fees for copying land records known as copyist fees. Thus, Copyists had worked as on the basis of ‘wages for copying’ and ‘no copying no pay’. Till there is a fee called copyist fee which is BDT 0.06 for each record. Consequently, the citizens know that the copyists receive a fee for

this service. During the Colonial period, they work as middlemen alongside copyists because they were not employees of the government at that time. Thus, citizens were used to go to the copyists and pay fees along with a satisfactory amount of bribe to receive this service from the DRR. Because of, receiving land record service through middlemen and paying fees along with an amount of bribe for Copyists has a long tradition with the service and the Copyists.

However, after the Colonial period, the Copyists have become permanent employees of the government. As the Copyists are now the paid staff of the government and they have monthly salary for their job, the total fee for land record service is going to the government treasury. Although the Copyists have been transformed from middlemen to employees of the government, they did not stop receiving bribes from this service. The tradition of receiving bribe by the Copyists' staff is an organizational legacy. Currently, they receive bribe in the name of speed money, the only difference. More importantly the Copyists receive bribes from different types of middlemen instead of citizens. They felt receiving bribe through middlemen is safer as citizens commonly go to middlemen to get mediated their service. After introducing the E-service for citizens are also submitting their applications through UDCs. However, the UDC operators are not networked with the Copyists. Thus, the Copyists have not given any attention on the applications submitted by the UDCs. Consequently, applications submitted by the UDCs failed to receive quick service delivery.

Low Salary and Speed Money

The Copyists justified their claims for speed money as their salary is not sufficient for their living cost. So they expect that if any one gives them speed money for speedy service would be helpful for their livelihoods. According to their term – “*Amra chakurir jonno pai bethon; aar sheba prodaner jonno pai boksis*” (We receive salary for being the government employees and we receive tips from people for the service delivery). Evidently, it has become an open secret to citizens and has been justified by middlemen and the DRR staff that quick service delivery of land record required speed money. However, the Copyists did not

receive speed money from every one because it could be harmful for them. Thus, citizens need to go to particular middlemen network to receive quick service delivery by the cost of speed money.

Lack of IT Skill

Since this service has been started about a hundred years ago, the Copyists are skilled in copying records by hand written process. Although the instruction of this E-service is that copyists should follow computerized process in copying records for this service, the copyists are keenly interested to continue with the hand writing process. Although there are four computers in the DRR at Khulna for six copyists, they hardly use any computer for this service, rather they prefer hand written process of copying for two reasons.

There were two reasons to avoid computerized process of copying records. Firstly, the E-service has been designed with such a keyboard layout that is not familiar to the Copyists for copying records through computerized process. The E-service has been designed with the Unicode supported Bengali keyboard layout and the copyists were familiar with the layouts other than the Unicode supported layout. Secondly, the Copyists feel that putting all the records into the repository by computer composing is a significant threat for their vested interests in future. If all the records would computer composed and preserve in the E-service repository, copyist will no longer be required. Consequently, they are also not interested in learning typing with the new layout designed by this E-service. Thus, blaming the keyboard layout, the Copyists followed the hand written copying process.

Further, the hand written process of copying was caused delaying of this service and it caused backlog in the service delivery process. The Copyists were not unhappy with the backlog of this service delivery. The more backlog generates more speed money. Consequently, the Copyists were not interested in developing IT skills.

Posting and Transfer of Copyist

After introducing the E-service, the volume of applications for this service have been increased tremendously at the DRR but the numbers of copyists have not been increased in the organogram of the organization. According to the organogram, there are two posts for copyists, whereas practically there have been working six Copyists. If there were sufficient number of copyists, at least citizens would get service more quickly and the amount of vested interests would also come down. Currently, there is a high demand of records on urgent basis but the capacity of supply of this service delivery is much less. As a result, the amount of speed money has gone up and duration of service delivery has also been increased (figure: 7-11). In a similar vein, after introducing this E-service, the steps and tasks have been increased. However, the staff are not increased. Consequently, service delivery period and amount of speed money have been increased by three to four times.

Besides, appointment and transfer of copyists are regulated by the head of the organization, the Deputy Commissioner, who has authority to bring staff from other sections to the DRR and similarly, send the DRR staff to the other section. As a result, every staff working under the Deputy Commissioner is interested for coming to the DRR as record keeper, copyists or sorting staff. Surprisingly, to get a posting in the DRR, a few staff were ready with an amount of bribe more than BDT 100,000.00 (hundred thousand). There is a provision that no staff should serve in one section more than three years or after every three years the Deputy Commissioner should change the staff from one section to the other. If any staff intends to stay in the DRR after his three years, it depends on vested interests. The Deputy Commissioner, Additional Deputy Commissioner (General) and Section Officer of Establishment Section are responsible for posting and transfer process of the DRR staff. If someone wants to enter into or continue in the DRR as a staff, s/he needs to maintain vested interest with all or some of the leading ones.

An existing staff is more interested in retaining his posting even after passing as usual three years. On the other hand, staff from other sections are always

interested in getting transferred to the DRR section. The Deputy Commissioner reported that there was a high pressure on him to make transfer order as copyist from the other sections to the DRR. The current DRR staff's total working period has been given below (table:6-4).

Designation	Year of Service in the DRR
Record Keeper	8
Copying staff 1	6
Copying staff 2	5
Copying staff 3	5
Copying staff 4	4
Copying staff 5	2
Peskar	6
Carrying staff	7
Carrying staff	6

Table 6-4: Length of Service of the Staff in the DRR

The table (6-4) showed that except one staff, all other have been working in the DRR for more than three years and most of them are 6-8 years. There is a provision that after every three years, a staff should be transferred from one section to the other, but in the case of the DRR staff it has not been applied, whereas every staff of the organization is interested in getting posted in the DRR. Moreover, the Record Keeper is officially appointed for other section but he has been working in the DRR for the last eight years. The existing staff told to the researcher that working in the DRR is really hard work. However, no one would like to move to the other sections where work load is very less. As a result, with this organizational condition, it is difficult for a DRR staff providing service delivery without vested interests, because at least to keep his position sustainable in the competitive post s/he needs to provide speed money to relevant actors to secure his position. Thus, the process of posting and transfer of the DRR staff involved with vested interest or speed money. Consequently, the flow of speed money in this service goes to the different channels and networks of the

organization. Therefore, introducing only E-service network cannot remove the flow of the vested interest from the organizational process and networks.

Copyists' Cell Phone Network

Every copyist maintains cell phone networks with the middlemen. On an average a copyist receive 20-100 phone calls from different middlemen connected with him. Middlemen maintain this cell phone network with the copyists for a number of purposes: knowing availability of record, settling the amount of vested interests, expediting the process of service delivery and receiving status of applications. However, they do not offer similar supports to the UDCs; rather try to avoid receiving phone calls of the UDCs. It has been observed very closely that this cell phone network between the Copyists and the middlemen significantly has suppressed the E-Service. Thus, Copyists' cell phone network was harmful for online applications and also obstacle to the service for the common people.

Working after the Office Hours

The DRR staff work longer hours than the usual office hours. The office hour is 9:00-17:00 hours but they work regularly two or more hours beyond the office time and weekend too. It is positive that they work more and beyond the office hours without any overtime pay; however, they are not doing the extra hours and weekend work without their vested interests. The DRR staff found that during office hour it is difficult to communicate with the actors of the vested interests networks. Since the DRR is restricted area for entry of any outsider during extra hour, it is not possible for middlemen to enter into the DRR or communicate with the DRR staff.

More importantly, the DRR staff communicated with middlemen during extra hours and weekend work. The RRDC also sometimes attests the prepared records after the office hours. Thus, during the extra hours the transaction of vested interests takes place. Consequently, these extra hours are dedicated to the middlemen rather than UDCs. Resultantly, working beyond office hours by the staff was harmful for the E-service.

Load Shedding of Electricity

This E-service requires ceaseless computing in the DRR and the ESC during the office hour to receive applications and process records. However, electricity load shedding is a countrywide severe problem. Every day 2 to 3 hours load shedding take place during the office hour. Especially in the case of the ESC and the DRR, the service processing is delayed due to load shedding. For example, there is a load shedding for two hours but the ESC needs to receive applications constantly during office hours. It cannot say any citizens to come after two hours or the DRR cannot stop composing of records for two hours. Thus load shedding was an obstacle to implement this E-service. Moreover, due to excuse of the load shedding of the DRR staff was continuing with paper based applications.

Besides, since the DRR has only desktop computers without power backup; the copyists avoid composing records through computer rather they prefers to copy records by hand written to avoid risk of losing the compose works due to frequent power interruptions. Thus, DRR staff were not interested in the E-service due to the load shedding of electricity and it gave them reasonable excuse to avoid using the computer as well as this E-service.

Lack of Computers

This E-Service has a long term aim to build a digital repository of land records through processing regular service delivery by online compose in the E-service network. Everyday 200 to 300 records are delivered from the paper registers of land record. If everyday service delivery of record can be delivered through composing the paper based records, it gives an opportunity to build digital repository of land record. Thus, it requires computer for every copyists of the DRR to process everyday service by computer compose. However, there were lack of computers and the existing computers are neither updated nor they have power backup or virus protection. Besides, there was no local area network (LAN) and the existing computers were not connected with printers. This DRR has six copyists; thus, at least six computers were required for them along with a LAN

and printer. The DRR is not allocated sufficient number of computers and has lack of LAN.

In the study district, was observed that the DRR had insufficient computers for its staff. However, this office had idle computers and almost underutilized computers. Notably, the RRDC, the section officer of the DRR, has a new computer but that has been never used. Similarly, a few other sections of the DC office also have computers that remain unused or underutilized. Thus, a LAN was essential for the DRR. Although there were LAS in the office for other sections, it was not in the DRR. Many computers were used once in a week. The officers have not been using their desktops computer for a long time, the researcher placed a proposal that since the copyists do not have sufficient computers, the underutilized computers for the officer's desk can be allocated for the Copyists.

If the computer could be given to the copyist for composing of records, the E-service could be implemented properly. The officers directly oppose to give the computers to the DRR staff. Indirectly, the officers meant that the computers at their desks are as symbols of power and authority. The perception of the officer is that officer's desk should have a computer whether officers used it or not. Therefore, insufficient number of computers to the DRR poses vested interest of officers and DRR staff as well. Officers' vested interest is power and personal usage of computers and the vested interest of the DRR staff is copying by hand writing.

Problems with the Sorting and Carrying Staff

Sorting of the land record registers from the Store and carrying of land record registers between the Copyists' Room and the Store are difficult tasks. The Sorting Staff are responsible for these tasks. They have also vested interests. They sort and carry land record register quickly for those applications which have their vested interest. Consequently, the copyists were dependents on the Sorting Staff to get concern record registers for copying records. There have been four Sorting Staff who daily sort and carry more than one hundred land record registers from the Store to the Copyists' room. Further if they do not have vested interests they

do not easily sort and carry it. In such cases, sometimes they even reported that the records are not available in the Store or missing of. Particularly, the middlemen expedite this service for their clients through the Sorting Staff. More importantly, the Sorting Staff have vital role to expedite this service through quick sorting and carrying.

6.4.2 Vested Interest of the Officers and Other Offices

Officers also had vested interest in land record service. They are: the RRDC - the section of the DRR, Additional Deputy Commissioner Revenue (ADCR) - involved in over sighting the DRR staff and the RRDC, Additional Commissioner General (ADCG) -involved in posting and transfers of the DRR staff, the Deputy Commissioner -involved in overall management and control of the DRR and the Divisional Commissioner - involved in inspection of the DRR. The flow of the vested interest moved vertically from the DRR staff to the Divisional Commissioner in the organizational process. While existence of this vertical networks of vested interests in the organizational processes, it was difficult to ensure citizens' easy access to this service through the E-service. Particularly, the UDCs and the DWP failed to ensure vested interests for the organizational contexts.

Since the DRR staff members are involved in receiving vested interests from this service and it is open secret to all upper level officers; thus, either the officers make them bound or the staff pushed to the officers to receive the benefit of the vested interests from this service. So, every staff of the Deputy Commissioner office has a keen desire to have a posting at the DRR. So, either for a posting or after joining they offer or need to provide the vested interests to the upper chains of this organization. During the yearly audit of the DRR staff need to provide a portion of vested interest to the inspection team of the Divisional Commissioner Office.

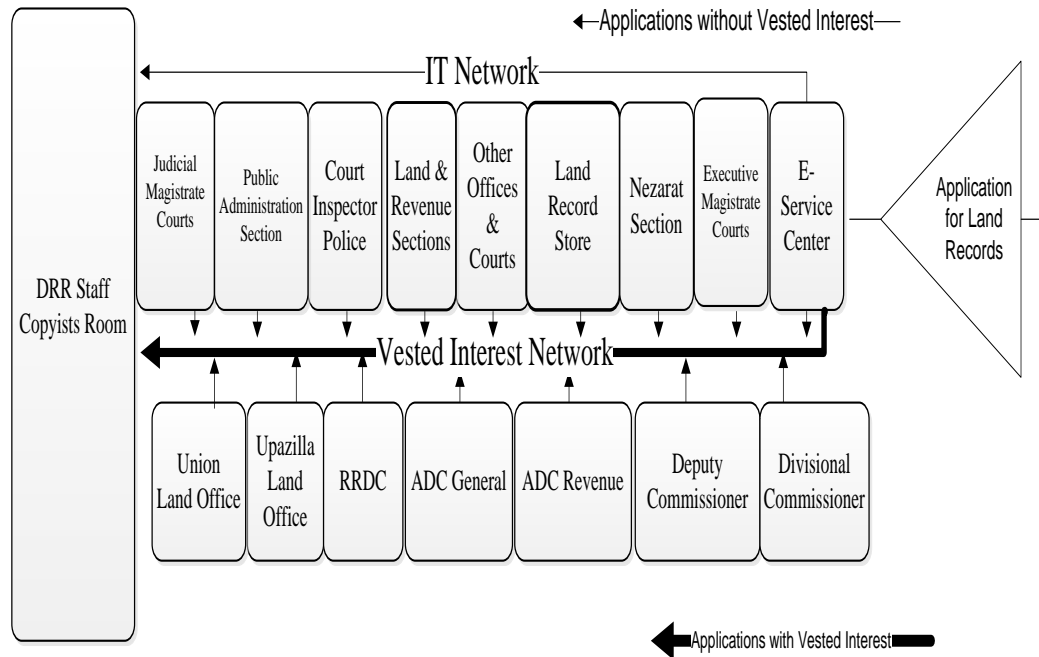


Figure 6-13: Vested Interest Network in the Land Record Service

As the organizational processes and actors continued with their vested interests; it was not possible to remove the flow of vested interest over night from this service through setting some E-service access points. So, alone the DRR staff cannot be made liable. If every actor is concerned about removing the vested interests of this service, the DRR staff never dare to take such suicidal step on speed money. Evidently, implementation of the E-service of land record has become challenging because it does not serve any vested interests. Consequently, it is appeared that removing vested interests from the vertical networks of the organizational process could play role in the E-service.

The Deputy Commissioner (DC) is the head of the office and is responsible for overall public service delivered from this office. He has been supported by five ADCs and about seventeen section officers about one hundred staff at various levels. All the staff members and officers of this office are accountable to him. However, the DC is supervised by the Divisional Commissioner as the chief officer of the field administration. The DC is also accountable to concern ministries, for example, for the E-Service of land record the DC is accountable to the Ministry of Land and the A2I program, the Prime Minister Office.

The DC is the controlling officer of the ADCR, RRDC and the DRR staff. Better service delivery largely depends on the leadership and management capacity of a DC, because the DC approves the work distribution among the Additional Deputy Commissioners and the section officers. Thus, the assignment of RRDC and ADC (R) are decided by the DC. In any time, the DC can change responsibilities of the DRR Staff, RRDC and ADCR. A senior official of A2I program commented that a few DCs also have vested interest in this service. In the case of the district under study, during the research period two DCs have been found. However, both of them have reputation of honesty. Both, one was disinterested in executing or improving this service with a view to passing his tenure without any risks. It is also another kind of vested interest. He argued that he heard and observed that transfer and appointment process at the DRR staff have blames of corruption. Thus, the DC was also inclined to pass his regime without any risks i.e., avoiding any disappointment from the staff and supporting officers.

Further, he found that if the staff members were more powerful it would be difficult to run a peaceful environment in his office because the staff working in the DRR process poses significant power and networks. It is the rule that after every three years staff member need to be transferred from one section to the other. Though the DC knew that the staff members are involved in corruption, he did not take any action against like transferring them from the DRR to the other sections. The former DC had good reputation of honesty among his staff, officers and general public of the district but it was his vested interest to pass his tenure

peacefully without any crisis among staff though they were engaged in corruption. Thus, this type of tone from the DC augmented the nature of vested interests of the DRR staff and barred implementation of the E-service of land record.

6.4.3 Problems in the Citizens

Half of the vast population of the country is illiterate and unaware about land record service. Even the literate people are also not aware about land record matter due to its complex process. It is, thus, difficult for the rural illiterate citizens to keep accurate information of a record for a particular land. Consequently, there are number of problems with the citizens to access to this service. These are: illiteracy, lack of knowledge on land record, women land owners, absentee land owners and lack of awareness. These problems compelled them to enter into this service through middlemen. These problems are discussed below.

Illiteracy and Lack of E-literacy

Although the average literacy rate is more than 50%, it is about 10% among the rural farmers. About 80% of applicants for this service are rural farmers and merely have literacy. Thus, an illiterate citizen needs to get mediate this service by middlemen involved with this service. As a result, whenever a citizen needs land record, he comes to the particular middleman who knows details about his particular land record. So, illiteracy among farmers is one of the biggest obstacles to bring the citizens in the process of this E-service.

Consistently, it has been reported by the UDCs that a good number of citizens who come to the UDCs to apply for this service, do not know requiring information to submit their applications. These are: ID number of land record, version of the record and jurisdiction number or name. With incomplete information, an UDC operator cannot submit online application for this service or if it is submitted with the wrong or incomplete information, the application would be rejected by the DRR staff. Contrary to, citizens go to middlemen with only a little information or clue of their land records and the middlemen collect the rest

of the detailed with the help of the DRR staff. Thus, the high rate of illiteracy was an obstacle to citizens' access to this E-service.

Lack of Knowledge on Land Record

Although a group of applicants are literate and have detailed information; they do not have knowledge of processing this service. In the case of new land owners who have inherited or bought land newly; have the detailed information but do not have knowledge of processing this service. Thus, they seek access to this service through middlemen. Since they need this service on urgent basis for buying, selling and processing mortgage, they want to quick service delivery through middlemen.

Women Owned Land Records

According to legal provision of the country as well as the Muslim law, a daughter obtains half of the property of a son in *dejure*; however, in *defacto* sons become owner of total property of parents. Usually the due portion of land property of daughters as well as women has rarely been given in this male dominant society in the past. For the last few years, women have become cautious about their parental land property. As a result, while a woman argues her due portion of property to her male counterpart often she does not receive cordial help, so she needs to collect record to get her right share. While her representative either husband or son intends to collect land record for filing suite or calculation of the actual portion, they face the problem of lacking of detail information on the particular land. In this case, the woman does not know the detail information of her land record. In this regard, land records for women owned land require mediating through middlemen who only could provide this support.

Absentee Land Owners

Land owners other than farmers are mainly absentee land owners, because they mainly live in town and involve in other profession. Consequently, they are also do not have detailed information of their land records and they are not familiar with the process of land record service. Besides, they have very less connection

with land as they live in town. So, this category of land owners also depend on mediating this service through middlemen because they neither have time to loiter after this service, nor they have detail information and experience for applying for land records.

Lack of awareness of citizens

There is a lack of awareness and knowledge among the citizens about land record. Due to complex systems of land record and land ownership systems, vast majority of people do not have appropriate knowledge about land record. During the fieldwork, it has been observed that a professor of a public university came to apply for land record at the DRR while he sought help of a middleman how to write the application for this service because the professor does not know the application writing format and amount of fees. Consequently, lack of citizens' awareness, lack of information of land records, absentee land owners, women land owners, high rate of illiteracy and lack of e-literacy are main problems with the citizens to access to this service and the middlemen to access to this service.

6.5 Conclusion

The problems identified in the E-service are very wide, dynamic, multi-dimensional, contextual and underlying. Remarkably, no problems are isolated either from the organizational contexts or technological processes. The problems of the E-service have been presented into three broader areas organizational contexts, technological processes and both organizational and technological processes. However, it is strikingly visible that every problem is dynamically connected with the organizational contexts and the technological processes. Further, no problems and designs were constant; rather every problem was shifting dynamically and entangling with both intended and unintended actors and consequences.

Besides, every problem is embedded with organizational contexts and technological processes equally. This chapter has presented problems that have been formulated from both the organizational and technological contexts. With a

view to addressing these problems, it needs to be designed and redesigned the organizational contexts and the technological processes with an equal emphasis. Focusing alone on technology cannot be addressed the problems of the E-service; rather it needs to be focused on both the organizational contexts and technological processes.

Therefore, the problems in the E-service are dynamic, continuously changing, ceaselessly shaped and being shaped, intra-acting with diverse actors, processes and contexts continuously entangling and disentangling. This chapter, thus, has unfolded large number of problems that are apparently independently and invisible but this study has revealed that these problems are actively intra-acting with the organizational contexts and technological processes and they are changing their shapes, nature, directions and entanglements. Consequently, nature and processes of problems and the actors are continuously changing their forms, processes, networks and dimensions. Along the line, following chapter has presented designs and redesigns of the E-service to address these problems.

Chapter 7: Tracing Constitutive Entanglements in the E-service: Building Intervention Evaluation

7.1 Introduction

This chapter focused on the ways, processes and nature of constitutive entanglements in the E-service of land record through tracing intra-actions, diffractions, entanglements and disentanglements in organizational contexts and technological processes. However, tracing constitutive entanglements is not straight and simple; rather, it requires continuous efforts, designs, redesigns, interventions and evaluation. In line, this study has dealt with continuous designs and redesigns i.e. building intervention and evaluation (BIE) of the organizational contexts and the technological processes of the E-service. As the E-service had been facing number of challenges since its inception, the BIE has intervened in the organizational processes whereby it has identified and analyzed constraints, intra-actions, diffraction, entanglements and disentanglements in the E-service. Thus, the BIE involved in tracing constitutive entanglements.

The organizational contexts of the E-service have not accepted any designs of the E-service without modifying and reshaping. Evidently, every design and redesign of the E-service were shaped and reshaped through ceaseless intra-actions, diffraction, entanglements and disentanglements in the organizational contexts and technological processes. Consequently, the BIE has put an equal attention on the organizational contexts and the technological network of the E-service and traced constraints, diffractions, intra-actions, entanglements and disentanglements in every design and redesign. Consistently, the BIE has focused on both human and nonhuman actors: the nonhuman actors include structures, process, statutes,

citizens, rules, regulation, catalogue and organization of records, listing up the damaged records, digitization of records and human actors including the DRR staff, different types of middlemen, the organizational managers, the DRR staff and the researcher.

Since the problems of the E-service are also not fixed, every intra-action, diffraction, entanglement and disentanglement shifts constantly along with the designs and redesigns of the E-service. Thus, the BIE has analyzed designs and redesigns into number of cycles. Along the line, it has found that the designs and redesigns were continuously entangling and disentangling in the organizational contexts and technological processes of this E-service.

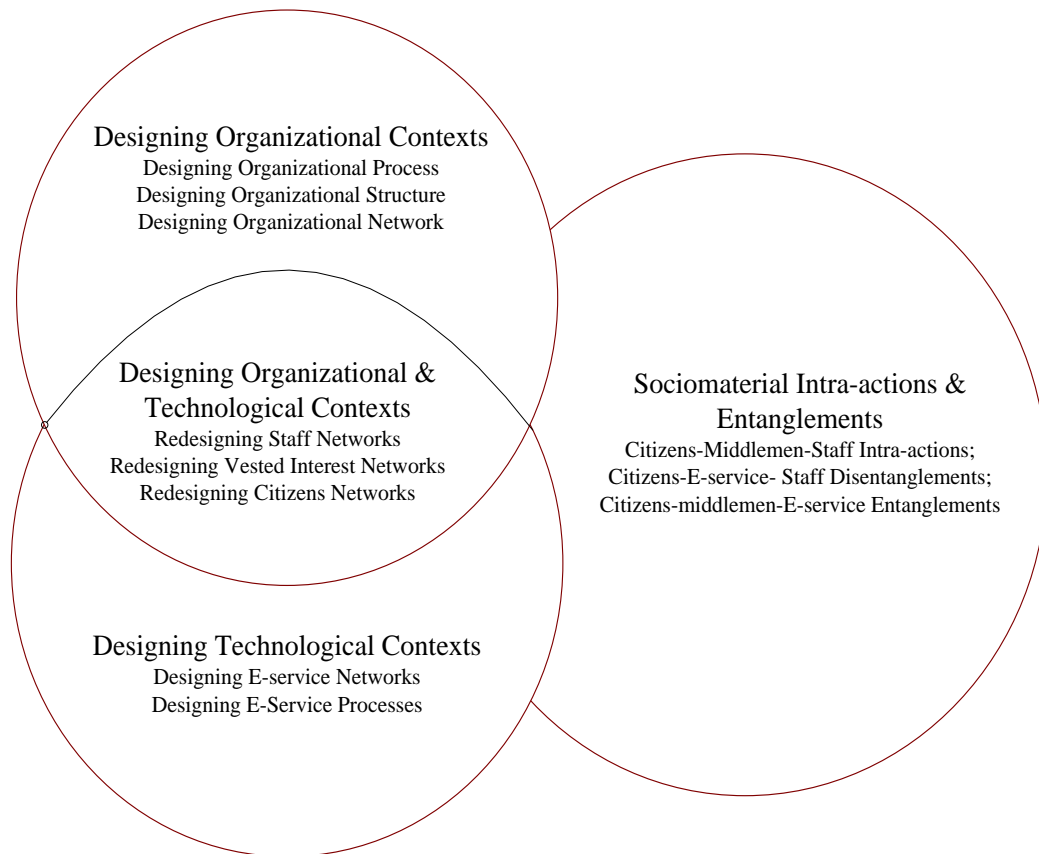


Figure 7-1: Designs and Redesigns in the E-service

Although the researcher identified problems in the E-service in a wide range; the purview of this study and opportunity of designs and redesigns were not allowed

to conduct BIE on every problem of this E-service. Particularly, in the context of public sector organization, organizational processes are bounded by statutes, authorities, practices and legacies. This study has been conducted in a rigidly regulated public sector organization, the DRR because the land record service is inscribed and guided by legal provisions, rules and regulations. Consequently, every BIE need to take approval from the organization, the DC Office Khulna. Further, the BIE has avoided these interventions and designs that are constrained by legal statutes, rules, regulations and organizational practice. Admittedly, it was also really difficult to capture and present every entanglements and disentanglements of this E-service.

The remainder of this chapter is presented into three interrelated areas: sociomaterial intra-actions in the E-service, constitutive entanglements in the organizational contexts and constitutive entanglements in both the organizational contexts and technological processes.

7.2 Sociomaterial Intra-actions in the E-Service

Various forms of intra-actions have been developed in technological networks i.e., the E-service and in the organizational contexts i.e., the organizational contexts, structures, process, statutes, citizens, middlemen and the DRR staff. However, there also have been developed constraints of intra-actions in the E-service networks and organizational contexts of land record. These are discussed below.

7.2.1 Intra-actions in Citizens -Middlemen-Staff of Land Record Service

To mediate citizens' access to land record service, many different types of middlemen have developed over the period. The DRR Staff and the middlemen are mutually dependent on one another since the inception of this service. The middlemen mediate and expedite this service for their clients very efficiently because they are entangled with the DRR staff. Further, the middlemen have

knowledge and skills in filing citizens' applications along with mediating and expediting their land record service. Consequently, plethora of illiteracy and land record related jargons push citizens toward the middlemen to submit their applications and receive this service. Given the complexity of land record service; without middlemen citizens cannot usually access to this service. Moreover, the DRR staff do not receive speed money from citizens for this service. Thus, middlemen receive speed money from citizens. In turn, the DRR staff receive speed money from middlemen. So, intra-actions have emerged in citizens-middlemen-the DRR staff. These intra-actions have entangled with the flow of speed money from citizens to middlemen to the DRR staff and the higher official and networks. Thus, middlemen's intra-actions with DRR staff ultimately expedite this service for their clients. However, these intra-actions developed public sufferings, harassment and corruptions because the middlemen and the DRR staff are entangled and they exploit citizens through speed money.

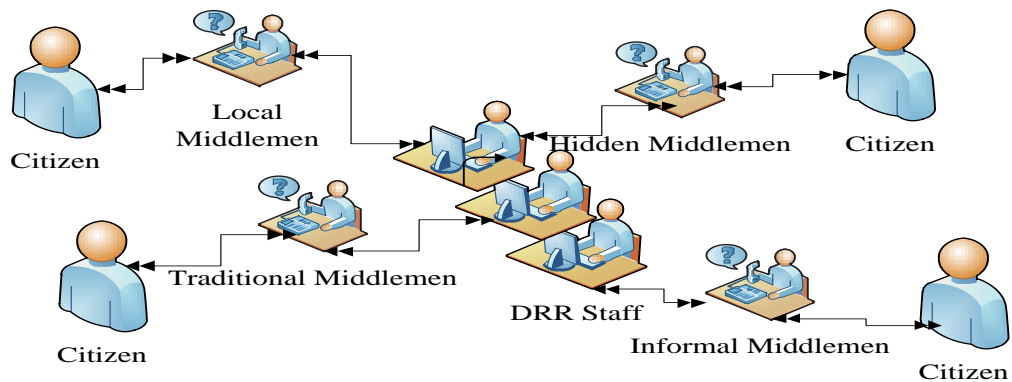


Figure 7-2: Intra-action in Citizens-Middlemen-Staff

Consequently, the DRR staff provide a faster service only to those applications which came through the middlemen. If citizens enter into this service without middlemen, they receive non-cooperation from the DRR staff and ultimately their applications are either delayed or rejected by the DRR staff. Thus, the DRR staff act to make the intra-action in citizens and middlemen. Over the period, different types of middlemen have been developed and they have developed different forms

of intra-actions with citizens and the DRR staff. These intra-actions can be broadly categorized into four: i) citizens-local middlemen-DRR staff ii) citizens-traditional middlemen- DRR staff iii) citizens-hidden middlemen-DRR staff and iv) Citizens-informal middlemen-DRR staff.

Intra-actions in Citizens-Local Middlemen-Staff

Deed-writers, Muhuris and Mobile Middlemen are local middlemen who have intra-actions with citizens of their locality, particularly in rural areas. *Deed-writers* are practitioners involved in writing deeds of land registration whereby as land record is inevitable to complete land registration deeds. So they are involved in mediating this service delivery of their clients and villagers required selling and purchasing of land. Besides, '*Muhuris*' are also assistants to lawyers. Since 90% of land related suits or cases involve with land record, they mediate land record for their clients and local citizens too. Further, *Mobile Middlemen* are newly developed and hybrid of '*Muhuris*' and '*Deed-writers*'. They mediate service delivery through intra-acting with the DRR staff and they use mobile phone to intra-act with the DRR staff. The DRR staff receive information from these types of middlemen by mobile phone and submit applications and process applications on behalf of them. Thus, citizens' intra-act with the local middlemen to avoid complex processes and travel costs. Consequently, the middlemen continue intra-act with DRR staff through their vested interest networks and 'speed money'.

Intra-actions in Citizens-Traditional Middlemen- Staff

Stamp-vendors, *Court-Muhuris* and 'floating middlemen' are traditional middlemen. They are involved in this profession for long time and they take it as a profession. Stamp-vendors are licensed to sell revenue stamps that are required to pay fees for this service delivery. Besides, *Court-Muhuris*, a section of *Muhuris*, are licensed lawyers' assistants but many of them work full-time to mediate this service delivery. Further, 'floating middlemen' are either connected with political networks or with the DRR staff. They work around the DRR and run after clients i.e., citizens who come to the DRR to receive land record. They offer to the

citizens to mediate and expedite this service. Remarkably, they have the closest intra-actions with the DRR staff and they are very efficient to mediate and expedite this service. They are capable enough and they know many techniques to expedite this service. For example, if any record is damaged at the DRR, they know how to reproduce it either legally or fraudulently. Some of the traditional middlemen also volunteered the DRR staff to prefer this job, such as, managing registers. Thus, they have strong intra-active networks with DRR staff. Similarly, they also work as the last resort to deliver this service either legally or fraudulently.

Intra-actions in Citizens-Hidden Middlemen- Staff

There are land related some other offices located at the district headquarters, Upazilla (sub-district) and local union council (the lowest tier of local government). Besides, there are land related sections at the Deputy Commissioner office. The staff of these offices and sections work as 'hidden middlemen' to mediate and expedite this service. Clients of these offices and sections also require land record. Since it is complicated matter, they rely on the staff of these offices and sections. On behalf of their clients, the staff of land related offices and sections process and expedite this service. They are not easily visible and they intra-act with citizens and DRR staff from organizational hidden networks.

Intra-actions in Citizens-Informal Middlemen-DRR Staff

Volunteer workers of DRR (*Umider*), lawyers, journalists and political activists can be seen as informal middlemen. They are occasional middlemen and work as middlemen only for their relatives and friends. They use their identity to mediate and expedite this service delivery. The DRR staff are also loyal to them because actors of these networks belong to or connected to the powerful sections of the society or administration of the office. Besides, *Umiders* are unpaid volunteers at the DRR and they mediate vested interests between the traditional middlemen and the DRR staff. Sometime, they also have their clients. Consequently, it has been found that the organizational contexts of land related sections and offices rooted

in developing and sustaining citizens-informal middlemen-DRR staff intra-actions in this service. Thus, they are also obstacles to ensure citizens' easy access to this land record service and remove the various forms of middlemen networks which mediate this service from the DRR to the citizens. As a result, there have been emerged different forms of entanglement and disentanglements in this E-service.

7.2.2 Entanglements and Disentanglements in Citizens-E-service- Staff

Aiming to ensure citizens' easy access to land record service, the E-service has designed three access points - UDC, DWP and ESC. These access points were not capable to remove the middlemen networks. Further, the middlemen networks have become constraints to develop intra-active networks in citizens and the E-service. Rather, intra-actions in the middlemen and the DRR staff reconfigure the E-service networks. Moreover, the middlemen intra-act with the E-service networks to expedite this service for their clients. Consistently, citizens' access to this E-service remained middlemen dependent

Entanglements and Disentanglements in Citizens-UDC-DRR staff

UDCs, country wide telecentre network, are the citizens' closest access point to receive land record service. However, they have no intra-actions with the DRR staff who are ultimately responsible for processing this service. Additionally, citizens can submit their applications to the DRR through the UDCs. It is technologically true but practically every application requires adhesive stamps as fees along with printed copy of online submitted application. So, after submitting an application electronically from a UDC, citizens need to print it and send it to the ESC along with appropriate fees. Besides, there is the core problem of 'speed money', because the DRR staff do not receive 'speed money' except from the middlemen networks. Thus, without 'speed money' citizens' applications rarely receive any attention to the DRR staff. Rather, UDCs' submitted applications are being delayed in processing of this service.

Although citizens have option to submit applications to the DRR and receive land record from the DRR through UDCs network (figure 7-3), the existing organizational processes were not redesigned. There are at least two steps in the ESC and RRDC to reach citizens application to the DRR staff. Thus, the existing organizational processes and presence of various middlemen networks have become constraints in citizens-E-service-DRR staff intra-actions.

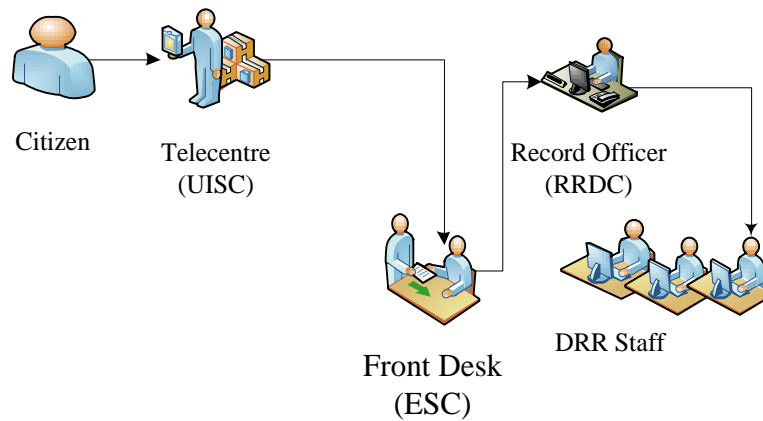


Figure 7-3: Interaction in Citizens – DRR-UDC

Consequently, the UDCs network failed to intra-act with the organizational processes and the DRR staff. Therefore, the UDC-citizens-DRR staff rarely intra-act and bring any change and improvement in the E-service.

Entanglements and Disentanglements in Citizens- DWP- DRR staff

District Web Portal (DWP) has been designed as an access point to enable citizens' easy access to the service (figure 7-4). Consequently, citizens can submit their applications from DWP to the DRR at any time. Although technologically it is possible, practically it has no option of submitting fees and other requirements through DWP to the DRR.

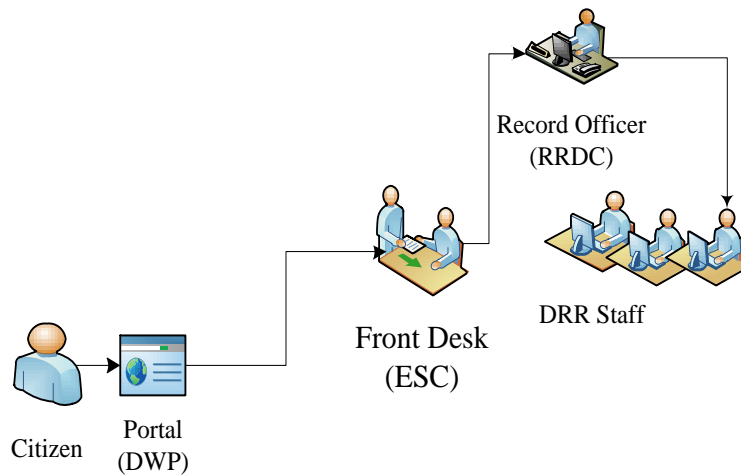


Figure 7-4: Entanglements in Citizens-DWP -ESC Network

In addition, the low literacy and electronic illiteracy, limited connectivity and lack of accessibility to computers and internet are also the constraints to this E-service. Consequently, intra-actions in the DWP - citizens- DRR staff have remained only as technological network; rather than the practice in the organizational processes. Notably, the DWP has been rarely used by citizens. Therefore, the E-service has failed to create intra-action in citizens-DWP- DRR staff.

Entanglements and Disentanglements in Citizens- ESC - DRR staff

The ESC has been designed for citizens' to access this service from district headquarters. Citizens have option to submit their applications from the ESC to the DRR (figure 7-5). However, the ESC has been preferable access point to the citizens who come to the district headquarters and intra-act with middlemen to submit their applications through the ESC.

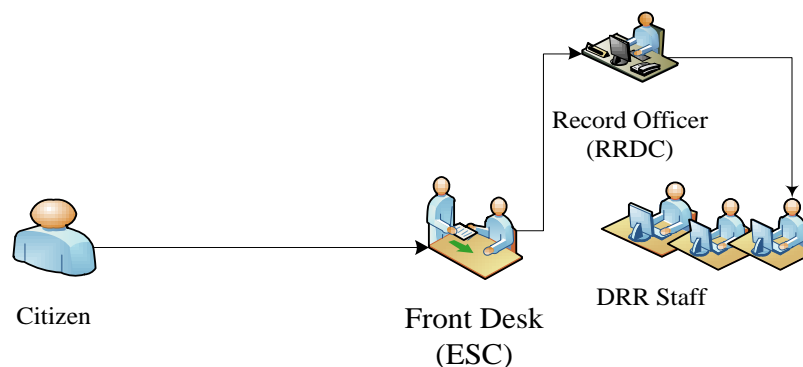


Figure 7-5: Entanglements in Citizens-ESC-DRR Networks

Although citizens can submit their applications to the DRR through the ESC, they prefer to use middlemen to submit their applications at the ESC. Citizens require submitting their applications through paper based application format at the ESC. It is difficult for citizens to fill up the paper based application format. Further, submission of application does not guarantee service delivery from the DRR. Thus, citizens need to rely on middlemen to mediate their service from the DRR. Therefore, intra-actions does not take place in citizens- ESC- DRR staff, rather intra-action takes place in citizens-middlemen-ESC-DRR staff.

7.2.3 Underlying Intra-acting Contexts in the E-service of Land Record

The E-service networks have been designed with a view to creating multiple access points for citizens' easy access to this service and to remove middlemen. However, the E-service networks have merely focused on the underlying contexts, processes and practices and their interactions. Consequently, the E-service has failed to remove the middlemen. Rather, the middlemen networks intra-act with the E-service access points through existing organizational processes and contexts. Thus, the middlemen networks entangled with this service to expedite citizens' service delivery. They provided 'speed money' to the DRR staff to expedite their clients' service quickly. Besides, the DRR staff declined to receive speed money from citizens and they received speed money from middlemen to receive from middlemen. Consequently, applications submitted by middlemen through the ESC received quicker service delivery than the applications submitted by the UDCs and the DWP. Thus, the DRR staff have developed intra-actions with the middlemen and they entangled with the middlemen instead of the UDCs and the DWP.

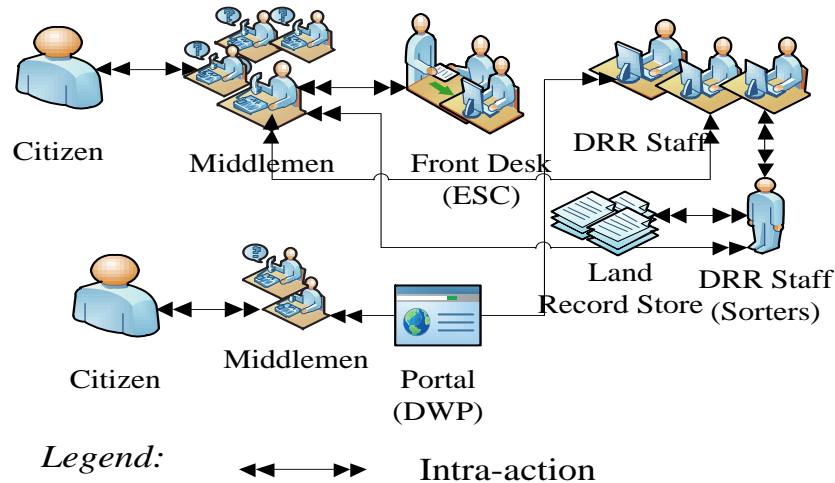


Figure 7-6: Intra-actions among Citizens-Middlemen-Staff

With the E-service networks, the middlemen have emerged in the process of citizens' applications submission at the ESC (figure 7-6). While citizens come to submit applications to the ESC; they require intra-actions with through middlemen to access to the middlemen. With the designed process of the E-service, citizens' required intra-action with the middlemen instead of UDC or DWP to receive quick service delivery because the E-service networks intra-act with the existing processes i.e., middlemen, paper based applications and the centralized access point, the ESC. Consequently, citizens need to intra-act with middlemen; middlemen intra-act with DRR staff and DRR staff intra-act with the traditional organizational processes.

Underlying Contexts of Citizens-Middlemen Intra-actions

There are two main underlying grounds for citizens' intra-actions with the middlemen. Firstly, without removing the traditional organizational processes, introducing the E-service turned as a complex service delivery process and the service providing staff try to make it more complex in order to seek 'speed money' from this service. Secondly, the low literacy rate and limited internet connectivity made the middlemen inevitable for citizens.

Consistently, filling in the application forms for land record remained complicated and contained much jargon. Even literate people avoid writing or filling in applications for land record. Similarly, calculating fees and folio papers for land

record are not easily understandable by citizens. Thus citizens are compelled to intra-act with middlemen to submit and mediate their applications. After submitting an application to the ESC, the middlemen intra-act with the DRR staff to expedite their clients' cases.

Underlying Contexts in Middlemen-ESC Intra-actions

The ESC has designed as a one stop service point and online application submission point for citizens living at the district headquarters where there is no telecentre. However, the middlemen find it is an opportunity to intra-act with this E-service. Thus, they have reconfigured the original notion of the ESC. They turned the ESC as a means of middlemen's intra-action with the citizens and the DRR staff. Since the middlemen are based at the district headquarters and close to the ESC, they continued submitting their clients' applications to the ESC and mediating them through intra-action with the DRR staff. This is how intra-actions in the ESC and middlemen lead to further intra-actions i.e. 'intra-actions in middlemen and citizens' and 'intra-actions in middlemen and the DRR staff'. Consequently, these emergent intra-actions reconfigure the E-service network.

Underlying Contexts of Middlemen –DWP Intra-actions

Although the District Web Portal (DWP) has been designed as an access point for this E-service, it was using DWP for citizens' is unrealistic because the country has very low internet connectivity. Only 3.5 people per thousand are connected to internet. As a result, the DWP has also been reconfigured by the middlemen. Since the DRR staff have a good Internet connection and printing facility at their desks, the middlemen has found the DWP as a unique opportunity for submitting online applications for their clients with the help of the DRR staff. Thus, this access point also developed a new and emergent form of middlemen called 'Mobile Middleman' who use their cell phone to send information to the DRR staff for submitting and processing their clients' applications. Consequently, the DWP has developed new dimensions of intra-actions in the middlemen and the

DRR staff. Therefore, the intra-actions take place in the middlemen and the DWP in of intra-actions between citizens and the DWP.

Underlying Contexts of Intra-actions of DRR Staff and Land Record

The DRR staff include the Sorting Staff, Copyists and the Record Keeper. Sorting staff sort and carry the land record registers from the Store to the Copyists' tables. The Copyists write and compare with original record and the Record Keeper signs as the preliminary authentication. Finally, the Record Officer (Record Room Deputy Collector –RRDC) attests the copied and compared records. Throughout this process, the Sorting Staff and Copyists are closely involved with the land record registers. Their intra-actions with the land record have significant influence on this service delivery i.e. they are capable to expedite, delay and reject any application.

The Sorting Staff are closely connected with land record registers that are preserved at the DRR's Store room. They sort and carry record registers from the Store to the copyists and after completion of copying the records; they return them to the Store. There are about five thousand record registers that are Stored about 300 feet away from the copyists' room. However, the registers are not in well order or well preserved. Consequently, the Sorting Staff use their expertise to find the specific record register from the Store and take it to be copied for this service. Without the Sorting Staff it is not possible to find any land record registers from the Store. Therefore, the intra-actions in Sorting Staff and the land registers have made enabling and constraining for this service because they have intra-actions with middlemen but they do not have intra-actions with the UDCs, the DWP or citizens.

Consequently, the middlemen maintain close relations with the Sorting Staff because after submitting an application to the ESC, the middlemen receive the application ID number from the ESC and with this information they contact the Sorting Staff to sort their record registers from the Store and put it onto the copyist table quickly. This is how intra-actions in middlemen-Sorting Staff - record registers reconfigured the E-service network.

Although, the Copyists are responsible for copying records from land registers to process this service, the land record registers are dilapidated because they are not well preserved and about half of the registers are over 100 years old. Besides, about 30% of total records are damaged and 2%-3% of total records are fraudulently tampered and/or illegible. Surprisingly, there is no list of damaged, tampered and illegible records. Thus, Copyists decide whether the specific record is available and in good condition for copying or damaged or tampered. The other way around, it is the Copyist who could recover the land information even from a damaged land record register. Since there is no list of damaged and tampered records, the Copyists can reject any application on the grounds that the records are damaged or tampered.

Notably, Mr. Karim (not the actual name), a Copyist, says “if we have speed money for any application, we try our best to recover information even through applying magnifying glass if the record is even partially damaged. On the other hand, if we do not have speed money on any application, we know how to reject the application on the ground of damaged or tampered”. This shows that an application is either processed or rejected by the Copyists on the grounds of damaged record is an outcome of the intra-actions in the Copyists and the record registers. The middlemen speed money to have intra-actions with the DRR staff by paying ‘speed money’ to expedite this service, applications come through middlemen receive guaranteed service rather than applications coming from E-service access points. This is how multiple intra-actions in the DRR staff-land record-middlemen-citizens have reconfigured the E-service network.

Underlying Contexts of Intra-actions in the Middlemen-Land Records- the ESC and the DRR Staff

After introducing The E-service to this service, the middlemen mediate this service for their clients through intra-acting with land records the-ESC- the DRR staff. Consequently Citizens are compelled to intra-act with the middlemen to receive a quick and confirmed service delivery. Since the middlemen have been

working as mediators in this service for a longtime; they have knowledge and skills in mediating this service for citizens' from filing applications to delivering this service.

Most of the applicants do not know the Jurisdiction List (J.L.) number and/or ID number of their land records. Besides, some applicants need quite urgent service delivery while others need confirmed service delivery without any rejection. To handle all these cases, the middlemen are skillful and experienced. They know jurisdiction numbers and they know how to manage or verify ID numbers of land records with the help of the Sorting Staff who have access to every record preserved at the Store. Even, the middlemen know the status of records whether good or damaged. Therefore, there are intra-actions in the middlemen and the land records.

In contrast, the UDCs operators who intra-act in the E-service network has little knowledge about land records. They cannot submit citizens' applications if an applicant do not have all the required information (jurisdiction list number, type of record and land record ID number). Thus, UDCs do not have skills, experience and networks in mediating this service. Additionally, they are also incapable to provide speed money to the DRR Staff. Consequently, further, they do not have intra-actions with the land records, the DRR staff and lack of speed money to the DRR staff. Resultantly, during the initial design of the E-service, the UDCs failed to entangle with this E-service, the land record, the DRR staff and the citizens. So, the BIE has involved to designs and redesigns of the E-service aiming to build intra-actions and entanglements in the E-service and the citizens, the E-service and the UDCs, the E-service and the DRR staff, the E-service and the organizational processes and so on. Ultimately, it aimed to build intra-actions and entanglements in the organizational contexts and technological processes of this service.

7.3 Constitutive Entanglements in Organizational Contexts

Evidently, the organizational contexts played significant role in shaping and reshaping of the E-service. However, this E-service was launched without designing the existing organizational processes and structure. Although the E-service was introduced, the organizational contexts including processes, structure and networks were not designs and redesigns accordingly. Thus, the existing organizational processes have become obstacles for the E-service. Moreover, the existing traditional organizational processes have brought extra stages in this E-service instead of simplifying this service. Consequently the complicated organizational processes, networks and structure were constraints to the initial design of the E-service and they caused delaying in delivering of land record service to the citizens. Therefore, to harness the advantage of the E-service of the land record, this study has designed and redesigned the organizational processes, networks and structure aiming to make intra-actions and entanglements in the E-service in the organizational processes.

7.3.1 Entanglements in Organizational Processes

The organizational processes that have been designed and redesigned in this study for organizing land record, designing the process of application submission, designing integrated general registers for this E-service, designing organizational steps for processing the E-service and removing unnecessary signatures on the applications. Following sections have presented the designs and redesigns of the organizational process.

Entangling the Land Records with the E-service: Organizing Land Record

The land record system of Bangladesh itself is very complicated. Moreover, its organizational processes and structures are further complicated. Land records are being prepared through a complex cadastral survey and preserved as printed documents in registers format at the DRR for the purpose of issuing attested copy of land record as a service delivery of land record. Issuing attested copy of land

record known as service delivery of land record and it is to be issued from the preserved registers at the DRR. Thus, the organizational processes and management of land record at the DRR play vital role in land record service. However, the land record registers were very old, dilapidated, disorganized and mismanaged. Besides, significant number of land records were damaged, tampered and missed. Further, there was no list of damaged, tampered and missed records.

Consistently, citizens do not know the status of their land records and rarely do they know the ID number of their records and they also do not know whether their land records are damaged or well. Thus, they do not know whether they would receive this service or their application would be rejected. Consequently, preparing attested copy of land records and delivering of this service from the existing organizational processes developed complicity, dependency, discrepancy and uncertainty. Evidently, the DRR staff exercised unlimited discretionary power. Thus, the staff were not interested in organizing and classifying land records rather they were running after their vested interests, private gains, speed money and bribes from this service through keeping the record disorganized and mismanaged. As a result, citizens' easy access to the land record service was really difficult. Therefore, the disorganized condition of record provided opportunity of intra-actions primarily in the middlemen and the DRR staff and intra-actions in citizens-middlemen-the DRR staff.

Henceforth, complicated, disorganized, mismanaged, missed, tampered and damaged condition of the preserved land records in the DRR developed uncertainty in this service delivery. In turn, this condition developed middlemen dependency and delaying and rejection of this service delivery. With the disorganized conditions of records, expediting, rejecting or delaying of citizens' applications were matters of discretion and vested interests of the DRR staff. However, citizens require this service quickly because land record is involved with many public services: sale and purchase of land, updating of land record, land survey, land mortgage, land litigation and many others. Consequently, to

avoid delaying and rejection of application citizens intra-act on the middlemen networks to mediate and expedite this service.

Further, this disorganized and mismanaged condition of record entailed network of dependency in this service from citizens to middlemen to Sorting Staff to Copying Staff. This is why, citizens do not approach to submit their applications by themselves; rather they relied on the middlemen. Although the UDCs are as part of the E-service network, they have been designed to submit citizens' applications for this service without relying on the middlemen. However, it has been found that citizens prefer to go to middlemen to receive this service delivery. Evidently, citizens do not rely on the UDCs, because two thirds of the total applications were rejected due to the grounds that the record were missed, damaged or tampered, while the applications for this service came from the UDCs. As a result, neither the citizens nor the UDCs operators were interested in submitting applications for this service through the UDCs.

To address these problems, proper organization of land record was inevitable. Surprisingly, the DRR did not know the total number of records, number of record registers, number of damaged records and number of tampered and missed records. Consequently, the researcher has intervened in counting total records and total record registers. This facilitated the identification of damaged records and tampered records as well as vulnerable record registers. This simple but important design involved in organizational processes. The DRR staff should have done at their own initiative but they put lame excuses for not being done.

However, at last the researcher was able to convince the organizational managers about the significance of the design and intervention of organizing and counting of the records and record registers. So through implementation of this design, total records and registers were counted and categorized into 3 classes, such as undamaged, partially damaged and severely damaged. If there is no damaged record in any register that is categorized as undamaged register, whereas 1%-15% of damage record registers are categorized as partially damaged registers and above 15% of damages registers are considered as severely damaged. After

counting and identifying vulnerability of the registers, it has been found that from the three types of record –Cadastral Survey (CS), State Acquisition (SA), and Revised Survey (RS). However, most of the SA record registers were vulnerable and about 30% of SA records were damaged. Thus, the list of damaged records was disseminated to the UDC operators and they were acquainted through. Consequently, the UDC operators and citizens became careful in submitting applications for the damaged record. More importantly, identifying of the lists of damaged and undamaged of records reduced discretionary power of the DRR Staff. Resultantly, the DRR staff failed to reject UDCs submitted applications due to ground of damage records.

Besides, an organizational network between the DRR staff and the UDC operators has been built. This network has been used for submitting any application for vulnerable types of records and it was also used by the UDCs to communicate with the DRR staff. A UDC operator can make a telephone enquiry to a Copyist whether the record is available or not. This is how organizing record and building networks between the Copyists and the UDC operators have reduced rejection or delaying of applications by the DRR staff. So designing of these organizational process and networks has entangled the citizens with the UDCs to access into the E-service of land record.

This organizational design has increased citizens' applications submission through UDCs because it assured the status of their record at the DRR along certainty in the service delivery. Further, it has reduced discrepancy and discretionary power of the DRR staff to reject any application intentionally or without any ground.

Entanglements of Citizens with the Processes of Application Submission

Submitting application is the first condition to access to the land record service but it was complicated. Citizens irrespective of literacy were dependent on the middlemen to submit their applications for this service. In order to address this problem, the E-service has been designed with three online access points e.g. UDC, ESC, and DWP. Consequently, after introduction of this E-service of land record, no paper based application is required. Although no paper based

application form was required for submitting or receiving applications for land record service, the applications for this service were being received in various types of paper based application forms. However, the organizational process continued with the paper based application submission for this service.

Since there are intra-actions in the middlemen and the DRR staff, they prefer to keep continued submission of paper based applications, because it was rooted in the intra-actions in citizens and middlemen and intra-actions in middlemen and the DRR staff. Without intra-actions in citizens and middlemen, intra-actions cannot take place in middlemen and DRR staff. As middlemen received bribe from citizens; they shared a portion of it with the DRR staff. So continuing with paper based applications pushed the citizens to intra-act with the middlemen to fill in or write a paper based applications for this service. Ultimately, access to this service through middlemen, citizens pay speed money to the middlemen and middlemen pay a portion to the DRR staff.

Aiming to address these problems, the organizational process has been redesigned for removing paper based applications and receiving only online applications. Thus, receiving only online applications, citizens' intra-actions with the middlemen have been reduced. As a result, middlemen were deprived of speed money from the citizens. In turn, the middlemen could not provide expected bribe to the DRR staff. Gradually the redesigned process has reduced intra-actions in citizens and middlemen and intra-actions in the middlemen and the DRR Staff. Consequently, this redesign has disentangled the citizens from the middlemen. Contrary to this, the redesigned made entanglements the citizens with the E-service.

Entanglements in Online Applications and Integrated Register for E-service

Since the E-service was designed without redesigning the organizational process; there were several official registers used in the organizational processes, such as, 'General Registers' for entry of applications, 'Fees Register' for calculating fees, 'Work Distribution Register' for distributing citizens' applications to the copyists and 'Delivery Register' for delivering land records to the citizens. Consequently,

the E-service had been kept outside the organizational process. In turn, the traditional processes remained dominated. The ESC was receiving paper based applications from different types of middlemen and maintaining the traditional organizational processes with the different number of paper based registers. Usually the ESC receives applications in the General Register and sent the applications to the DRR. Thereafter the DRR put the applications' information into other registers. Thus, on the basis of paper based applications, the staff need to fill in the registers and manage the organizational processes. As a result, the E-service failed to reduce steps in the service delivery process rather added some extra stages.

The image displays two pages of a handwritten register titled 'ইউনিয়ন তথা ও সেবা কেন্দ্র থেকে সরাসরি গ্রাণ্ড খতিয়ান/নকলের আবেদন গ্রহন ও বিতরণ বেজিষ্টার' (Union and Service Center Grand Register for Direct Application and Distribution). The register is organized into columns for application number, date, and status. The right page features official stamps and signatures, indicating the processing of applications.

Figure 7-7: Integrated General Register for the DRR

Applica- tion ID No	Applicant's Name and Postal Address	Application Type (CS/SA/RS Record)	JL No/ Name of Mouza	Kothian/ Land Record No No	Fee	Submission Medium (UDC/ DWP/ ESC	Name of UDC	Date of Submissio n	Assigne d Copyist	Date of Delivery	Cause If Rejected

Table 7-1: Columns in the Integrated General Register

However, it has been redesigned to receive only online applications and designed an integrated general register provided opportunity to put all the information relating to fees, application information details, organizational processes and purposes. Thus, the intervention of this study has designed and redesigned an ‘Integrated General Register’ for receiving only online applications for this service. Further, this integrated general register was designed in such way that it has replaced all other registers. Consequently, the intervention of receiving only online applications and putting all information in the newly designed integrated general register have removed various types of paper based applications and various forms of paper based register.

Further, the integrated general register has been designed in such a way that it has integrated tasks of the ESC and the DRR. Besides, calculating fees and distributing work among the copyists were also incorporated in the integrated general register. Consequently, according to the online submitted applications, the ESC staff members are to fill in the registers' columns: name of applicant, land record details – name of Upazilla, name and number of jurisdiction list and ID number(s) of land holding. From morning to noon the integrated general register remained at the ESC for putting information of online submitted applications; thereafter, at the afternoon the register is to be sent to at the DRR, where the DRR staff fill in job distribution column, fees categories’ columns and relevant

information. Therefore, the designed integrated general register has reduced overlapping tasks between the DRR and the ESC.

Disentangling RRDC's Signature from Applications

After receiving applications, the DRR and the RRDC are required signing on all the applications. It was an organizational legacy to put the RRDC's signature on the applications. The DRR staff explained that before starting any process on citizens' applications, it was mandatory duty to get them signed by the desk officer. No work could be started on the applications except being signed by the RRDC. However, the researcher's intervention and consultation with the organization managers have identified that it was an unnecessary step in this service and it was not meaningful; rather, it caused delaying to process of this service.

Although this problem has been identified at the very beginning of this study, it was not possible to redesign the process due to organizational resistance. However, after redesigning the processes on receiving only online applications, the signature of RRDC's on applications easily been removed. Evidently, through removing RRDC's signature on applications reduced one step in processing of this service. More importantly, it has become possible to start processing the applications by the DRR staff instantly after receiving applications from the UDCs and the ESC. Consequently, removing RRDC's signature on the applications has expedited processing of this service thereby it has decreased duration of this service processing. Since application processing time has been reduced, citizens and middlemen intra-actions have been decreased. Further, citizens have entangled with the ESC through submitting online applications to the DRR. Thus, intra-actions in citizens and the ESC have been increased through citizens' direct applications submission from the UDCs to the DRR. Contrary to this, intra-actions in middlemen and DRR staff decreased.

Constitutive Entanglements in the Stages of the E-service

There were about 20 steps in the E-service of land record from receipt of applications to delivery of this service to the citizens. However, this study has identified that there were many steps easily reducible or eliminable. These are: putting signature of the RRDC on the applications, filling in court fee register, filling in job distribution register and checking of fees. Court fee register and job distribution register have been removed through designing integrated general register. Besides, previously checking of court fees responsibilities were laid upon the DRR staff. It has also been shifted to the ESC staff. During receiving applications, the ESC staff has been checking fees.

Moreover, after receiving applications, the ESC forward those to the DRR and thereafter DRR staff verify application information and fees. Afterwards, the applications are to be distributed among the copyists. Through redesigning the processes, the ESC staff put detail information on the integrated general register and checks the application information and fees. Thereafter, applications are being distributed among the copyists and the sorting staff receive applications to sort registers and put registers on the copyists' tables. Previously, it took almost one week to distribute applications among the copyists for copying from receiving of applications by the ESC to distribute applications among the copyists for copying. Thereafter, it would take another three days to reach to the Sorting Staff and they took another three days to sort registers from the Store. Consequently, redesigning the steps of this service processing has been significantly reduced application processing period. This reduction of the steps in processing of the service has reduced intra-actions in citizens and the middlemen.

7.3.2 Entanglements in Organizational Structure

Entangling Land Record Store and Copyist Room

The DRR section consists of two basic units: one is the Copyists' Room and the other is the Store Room. The Store Room contains all the land record registers. The Copyists' Room is used for preparing attested copy of land records from the

preserved land record registers. The land record Store of the DRR was located 300 feet away from the Copyists' Room. Since record registers were kept in the Store, the Sorting Staff need to carry record registers from the Store to the Copyists' Room. Thus, carrying of the record registers between the Store Room to the Copyists' Room was time consuming and laborious. Additionally, it has accelerated damage of land record and land record registers. Due to difficulties in sorting of registers, copyists were solely dependent on the Sorting Staff to get registers on their table from the Store. Consequently, copyists were not able to produce expected number of attested copies of land record in time. Besides, the Sorting Staff also complained that carrying registers from the Copyist Room to the Store Room was tiresome. Moreover, it was health injurious task to carry the registers that were full of dust. As a result, the Sorting Staff need to wear masks to protect them from dust. Thus, the Sorting Staff were frequently suffered with cough and other diseases.

Moreover, the record Store did not have proper ventilation. Thus, the Sorting Staff could not work in the Store Room longer hour using masks due to high temperature. So, it has been observed that on an average the Sorting Staff could sort and carry 70-100 registers between the Store and the Copyists' Room. They also need to keep them on shelves. However, number of application submission was always higher than the number sorted. On an average everyday 150-200 applications are received for this service. However, supply of registers from the Record Store was insufficient according to the demand of the Copyists. Frequently, the Copyists complained that they were not being supplied with sufficient number of land record registers. So, segregation of the Copyists' Room from the land record Store and afar location of the land Record Store were main causes of delaying the processing of this service. Therefore, delaying in processing of this service pushed the citizens' intra-act with middlemen to expedite this service.

Besides, the middleman shed was located in between the Store Room and the Copyists' Room. While the Sorting Staff entered into the record Store or carry

registers from the Store to the Copyists' Room, the middlemen got opportunity to intra-act with the Sorting Staff. Moreover, the land record registers were accessible by middlemen with this intra-actions take place among the Sorting Staff and the registers. Thus, the middlemen intra-act with the Sorting Staff to collect information on the status of particular land records whether the record is damaged or available. So, these intra-actions work as enabling for middlemen and constraining for UDCs. Consequently, citizens were relied on middlemen to expedite this service.

Due to these problems in organizational structure, neither citizens nor the organization were receiving advantage from the E-service. It was citizens' expectation and an aim to the E-service to ensure quick service delivery to the citizens through the E-service. However, problems in the organizational structures and processes ultimately caused delaying in the service delivery process. This delay compelled citizens to intra-act with the middlemen. Thus, citizens who submitted applications for this service directly through the ESC and without middlemen do not have opportunity to intra-act with the sorting staff and copyists to expedite this service. So, their applications took longer period to reach to the Sorting Staff from the ESC because these applications have no vested interest for sorting staff. Consequently, citizens were away from the ESC to access to this service; rather, they did ultimately intra-act with the middlemen to mediate their service.

Besides, the registers were dilapidated. Thus, carrying of these registers between Store and the Copyist Room caused further delay. The researcher and the organizational managers identified the problems emerged in the E-service due to segregation between the Copyist Room and the Store. Since uniting and relocating the Store of the DRR is a significant matter, the head of the organization made Committee to give report on the issue. However, it took several months to get the report of the Committee.

Finally, on the basis of the recommendations provided by the Committee, the Store Room and the Copyists' Room have been relocated and united. This

unification significantly reduced service delivery period and diffracted the intra-actions in the land record registers and the Sorting Staff primarily. Thereafter, it diffracts intra-actions in the middlemen and the Sorting Staff and diffractions took place in middlemen and citizens. Consequently, it also diffracted the intra-action in the middlemen and the Sorting Staff. Contrary to this, the unification of record Store and the Copyist Room has created intra-actions in the Copyists and the land record registers. Since this redesigned decreased intra-actions in middlemen and the citizens; the intra-actions took place in the UDCs and the citizens through the process of online applications submission and the process of crediting fees for the applications submitted by the UDCs. Thus, the organizational redesigned and intervention expedited the land record service delivery process. This is how, unification of the Copyists' Room and the Store has expedited the service delivery and eliminated the dependency on Sorting Staff and the middlemen.

Entangling the Copyists with Record: Cataloguing of Land Record Registers

The land record registers were in anomalous and disorganized conditions. They were not catalogued and labeled appropriately. Since there are about 5000 registers in the Record Store and there were three versions of land records, it was difficult to sort registers from the Store. So, it was difficult to sort specific register for the purpose of copying land record for the purpose of this service. More importantly, the land record registers were not accessible to anyone other than the Sorting Staff. Thus, the Copyists were dependent on the Sorting Staff. For each application, sorting staff need to sort and carry a register from the Store Room to Copyists' Room. Resultantly, sorting of a register was time consuming matter, because of the record registers were not catalogued and organized. Consequently, it took on an average 30 minutes to one hour to sort and carry a register from the land Record Store. As a result, the Sorting Staff took 2-3 working days to deliver registers on the Copyists' table after receiving applications at their hand.

Due to these problems, middlemen were needed to mediate or expedite the sorting processes of registers from the land Record Store. Thus, citizens relied on middlemen to expedite the sorting process. To expedite the sorting process,

citizens paid bribe to the sorting staff through the middlemen. This is how intra-actions take place among the citizens, middlemen and the sorting staff. To address this problem, the land record registers were catalogued and labeled according to the version of record, name of sub-district and name of jurisdiction. Besides, record registers were organized in the shelves with appropriate markings along with ensuring easy accessibility and sufficient light and ventilation.

Organizing and cataloguing of records made easy accessible and brought close to the Copyists; the Copyists' Room was enabled to sort any register within couple of minutes from the newly designed Record Store. It takes only 1-5 minutes to sort a register from the Record Store while previously it took several hours. Thus, the Copyists sort their required registers directly by themselves. Consequently, relocating of the store and cataloguing and labeling of the record registers diffract the intra-actions of the middlemen and the Sorting Staff, because sorting of record registers has become very easy and quicker for every copyist and sorting staff. So, no intermediary was required for expediting the sorting process. Further, citizens were also not required to intra-act with the middlemen. As a result, diffraction took place in the citizens and the middlemen and it makes further diffraction between the middlemen and the sorting staff.

Resultantly, the service delivery period has come down from three weeks to three working days after unification of the Record Store and Copyist Room and the cataloguing of the record registers. Consequently these designs and redesigns have diffracted the intra-actions in the middlemen and the DRR staff because citizens mainly intra-acted with the middlemen for expediting this service. As service delivery has been expedited, citizens were not required intra-acting with the middlemen.

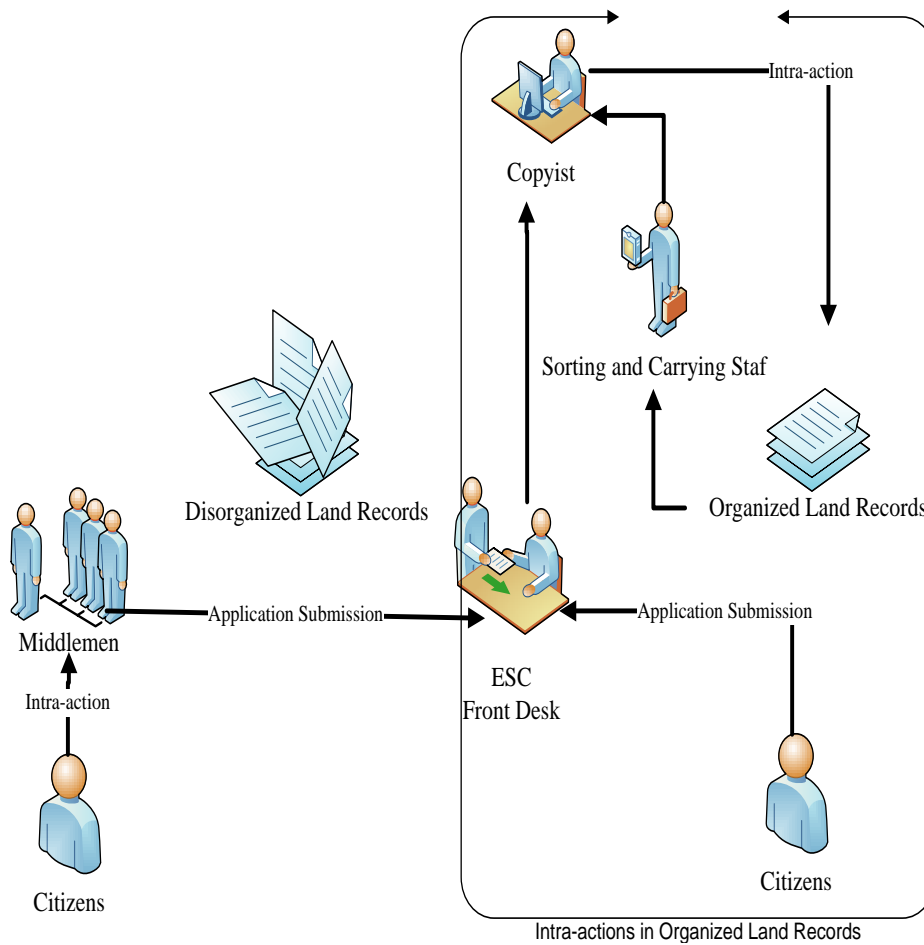


Figure 7-8: Unification of Copyist Room and Store Room

These designs and interventions in the E-service –organizing of record, unifying of Record Room and Copyists’ Room and classifying, cataloguing and labeling of record –have significantly reduced duration of service delivery period. Previously, it took 2-3 working days to sort and carry registers from the Store of the DRR by the Sorting Staff. After organizing land record registers, it takes few minutes to sort a register from the DRR Store. However, after organizing land record registers, now land record service delivery period drastically come down from three weeks to less than one week. Since citizens observed that the service delivery time has become decreased; gradually middlemen dependency has been reduced. During the beginning of the study, it was found that every citizen submit his application for this service through middlemen. As the service delivery period has been reduced by the designs and redesigns; it is appeared that about one

quarter of total applications have been submitted by citizens directly without any middlemen. Expediting of this service delivery increased intra-actions in citizens and the E-service and diffracted the intra-actions in middlemen and citizens. Thus, organizing of land record has been reduced service delivery period and diffracted dependency network between citizen-middlemen-DRR Staff.

Further, it was instructed that other than the DRR staff, no one is allowed to enter into the DRR to prevent the vested interest networks. Secondly, after designs and redesigns of this E-service only one access point have been kept open to receive citizens' applications for this service i.e., UDCs (telecentres). Thus, middlemen and the various forms of vested interest networks have been disentangled from mediation of this service. Simultaneously, the citizens were also disentangled from the vested interest networks. While all applications are coming from telecentres, there has been no opportunity of interaction between the vested interest networks and the citizens. Thirdly, to stop any interference in expediting service delivery by the vested interest networks, it has been designed chronological order in service delivery, that is, first in first out rule. Fourthly, to disentangle the DRR staff from citizens and the vested interest network, it has been designed that the processed land records have been delivered to the home address of the applicant by the postal service. This is how, from application submission to deliver of this service at citizens' home addresses. There were not left any opportunity for middlemen intra-actions with this service as well as with the citizens.

Disentangling the Middlemen from the DRR: Setting CCTV

Although organizational contexts and processes have been designed and redesigned to diffract the intra-action in citizens and the middlemen as well as intra-actions in the middlemen and the DRR staff. However, the middlemen were continuing intra-actions with citizens, the Sorting Staff and the Copyists through facilitating citizens and expediting the service delivery. Thus, citizens relied on the middlemen to expedite this service and the Copyists because the Sorting Staff and the Copyists were not helpful to the citizens. Evidently, citizens were

compelled to intra-act with the middlemen to expedite and mediate this service. Since the Copyists and Sorting Staff engaged with the middlemen, it developed intra-actions in middlemen and the Copyists and the Sorting Staff.

After the unification of the Record Store and Copyists Room, neither the Sorting Staff nor the Copyists were not required going out from the DRR. Rather, intra-actions in the Copyists and the Sorting Staff influenced on this service. So it has been found that middlemen's entrance to the DRR had become frequent and visible. Besides, officially it was ordered that no middlemen could enter into the DRR. To stop middlemen's entrance into the DRR, an official notice was hung on the entrance gate of the DRR. However, since the Copyists and the Sorting Staff was also expecting their entrance, middlemen entrance to the DRR could not stop and on this and that excuse.

In order to expedite service delivery and gather information for their clients, the middlemen needed to enter into the DRR. Thus, middlemen's entry into the DRR made middlemen's further intra-action with citizens and the Copyists' and the Sorting Staff. Consequently, although the Record Store and Copyist Room were unified and the registers were catalogued and organized, it was not possible to disentangle the middlemen from the Copyists and Sorting Staff without stopping the middlemen's entry into the DRR.

To address these problems, it was important to stop middlemen's entrance into the DRR. Further, it was instructed that without permission of the Deputy Commissioner, no visitor can enter into the DRR. However, there are intra-actions in Copyists and Sorting Staff and middlemen. Consequently, it was not possible to diffract the middlemen from the DRR, the Copyists and the Sorting Staff. However, aiming to disentangle the middlemen from the DRR, the Copyists and the Sorting Staff a close circuit television (CCTV) has been designed and installed in front of the DRR. So, anyone is coming in or going out from the DRR are now being constantly recorded and monitored with the CCTV. Thus, setting of the CCTV has diffracted the intra-actions in the middlemen and the Copyists and Sorting Staff. This diffraction has expedited further diffraction in middlemen and

citizens. As a result, the disentanglements of middlemen from the DRR, the Copyists and Sorting Staff made citizens' easy access to the land record service the DRR has become open and free from middlemen's inscription.

7.3.3 Entanglements with Organizational Network

Since it is not possible to redesign the behavior of the DRR staff by overnight; this study applied continuous design and redesign of organizational contexts and networks to remove their vested interests and redesign their behavior. With the existing organizational network and processes, the staff have processed power and discretion that have influenced on the E-service processes. The existing organizational networks play vital role in expediting, delaying and rejecting applications in this service.

There are several grounds of delaying and rejection of citizens' applications for this service. In one hand, there are damaged records, tampered records, disorganized records and missing record registers. On the other hand, inappropriate amount of application fees and folios and inaccurate information on applications may cause of delaying and cancellation of applications. These grounds gave discretionary power to the DRR staff. Thus, it was difficult to remove vested interests from this service. Besides, knowledge and skills that have been acquired by the DRR Staff over the period are also potential sources of manipulating this service. There have been developed discretionary power and manipulating power through intra-actions in the vested interest networks and the DRR staff. Besides, the DRR staff need to maintain the flow of vested interests in the organizational upper chains. Additionally, the staff are low paid. So, to meet of their livelihood expense, they need some extra income besides their salary. As they work some extra hours in the DRR, they morally considered that receiving vested interests or bribe from this service is somehow inevitable for their livelihood. Therefore, the contexts of the vested interests in this service have a long tradition and complex dimensions. The following sections have presented the designs and intervention in the E-service to address these problems.

Entangling the Citizens-ESC Network

Citizens' access to land record service through the ESC was a dual process. Firstly, they need to fill in application by middlemen and secondly, they need to submit their applications to the ESC. This duality pushed the citizens to the middlemen. Consequently, after introducing the E-service, citizens required paying higher amount of bribe to the middlemen due to this duality because the E-service has increased the tasks of the middlemen too. In line, it also developed intra-actions and entanglements in the DRR staff and the middlemen through the ESC. Thus, intra-actions take place in middlemen and the ESC instead of citizens and the ESC.

The process of paper based applications was main obstacle in intra-acting between citizens and the ESC. The BIE has designed the E-service network for receiving only online applications to the ESC without any paper based applications. Consistent with these, the organizational process has been designed in such a process that removed submission of paper based applications. Moreover, the organizational network has been designed to receive only online applications directly from citizens without any middlemen. Thus, removal of paper based applications and receiving only online applications from citizens have diffracted the network between the middlemen and the ESC.

This E-service network has been designed in such a way that the citizens would come to the desk of the ESC and the ESC staff would fill in online applications. Thereafter, the staff would put the information as application for the land record service into the E-service system. This redesigned process of receiving only online applications has removed the middlemen from the process of application submission. Thus, discarding the paper based applications and for receiving the same through online applications from citizens developed network between citizens and the E-service as well as the ESC and stopped the network between middlemen and the ESC.

Entangling the ESC-DRR Network

Although the ESC is the front desk of the DRR; the network between the DRR and the ESC was absent. Before the E-service, the DRR directly received paper based applications from citizens. Thereafter these applications were sent to the Copyists to put details into their respective registers and copying the record. However in the initially designed process of the E-service, the ESC has become an extra step in the organizational process. It has not reduced any tasks in the process of preparing this service.

Before this intervention in the E-service, the ESC was receiving paper based applications from middlemen and filling in application details in E-service network for the purpose of monitoring of the A2I only. The DRR was continuing the service delivery under the previous organizational process. Moreover, the ESC was receiving citizens' applications to put information into the E-service network. Thereafter at the end of the day, the ESC sent the applications to the DRR. Thus, the DRR received paper based applications after a day of submission to the ESC. As a result, service delivery time increased after introducing the ESC and the process this service traditional in the DRR.

The BIE has redesigned the process of applications at the ESC. With the redesigned process, the ESC staff are to receive only online applications and put the applications into the E-service network with details of information along with calculating fees, folios, record ID and jurisdiction list number. Thereafter, the ESC staff put detailed information of every application into the newly designed integrated general register. Thus, the DRR staff can work copying land records without any delay. Consequently, intra-actions take place in the ESC and the DRR. Filling in details information by the ESC has reduced the tasks of the DRR. Moreover, while the ESC received online applications from the citizens and submit them to the E-service network, the Copyists could start process of copying land records immediately after receiving applications from the E-service.

Entangling the UDC-DRR Network

The E-service set up a UDC at every Union Council office, the lowest tier of the local government. Thus, the UDCs are located at the rural areas and work as telecentres to provide services to citizens by using IT and E-service networks. Consequently, the UDCs are connected with the DRR through the E-service network and they have network to submit citizens' applications for the land records. Although the UDCs were connected with the DRR electronically, they do not have any intra-actions in organizational contexts functionally.

Although the UDCs can submit online applications but there was no option to send fees and folios through online. Further, the DRR staff continued with paper based applications inherently paper based applications were submitted by the middlemen. Along the line, the DRR staff have continued intra-actions with the middlemen. Thus, UDCs have failed to develop intra-actions with the DRR either through organizational processor in the E-service process. As a result, if any application of land record comes from a UDC, it takes much longer time than an application comes from the middlemen. So, the problem lies with sending fees along with online application from the UDCs to the DRR. Consequently, intra-actions did not take place in the UDCs and the DRR.

To address these problems, the researcher has redesigned a process of advance depositing and crediting of fees for applications submitted by the UDCs. With the redesigned system, every UDC has deposited certain amount of fees in advanced to the DRR for the purpose of crediting fees and folios for online submitted applications. It has given the opportunity to process UDCs' submitted applications instantly by the DRR staff. Previously the DRR staff need to wait for fees and folios for the applications received from UDCs. Consequently, this network has resolved the problem of waiting time for receiving fees from the UDCs.

Moreover, out of the six copyists one has been deployed for handling application coming from UDCs and crediting fees and folios from their advanced deposit. Besides, he has also assigned to respond to any query of the UDCs. It has reduced gap between the UDCs and the DRR staff. Previously, the UDCs staff was

requesting to the researcher that they need network with the DRR staff like the middlemen. However, after designing and redesigning of these networks, intra-actions took place in the UDCs and the DRR staff.

As a result of these intra-actions in the UDCs and the DRR Staff, processing time of this service fell down from three weeks to three days. The researcher started this intervention with only four UDCs of the district. After few months, out of 68 UDCs, 22 UDCs followed the designed network for processing this E-service. Thus, building of this network has made intra-actions in the UDCs and the DRR and diffracted the networks between middlemen and citizens and middlemen and DRR staff.

Disentangling the Middlemen and the ESC Network

Since the E-service has been designed with multiple access points, the middlemen find access to the E-service through submitting paper based applications to the ESC. Consequently, citizens prefer to submit their applications to the ESC through the middlemen. So the E-service failed to diffract the intra-actions in the citizens and the middlemen. As a result, bribery and public suffering were increased.

Further, it has been identified that multiple access points of the E-service and paper based applications were ways of intra-actions in middlemen and citizens. At this stage, it was not possible to stop middlemen access to this service through due to the multiple points: DWP, UDC and ESC. However, in order to address these problems, the process of application submission and delivery of this service has been redesigned. Firstly, it has been designed that the ESC would receive applications for this service from citizens only. Secondly, no paper based applications would be received by the ESC. Citizens would come to the ESC and accordingly citizens' information the ESC staff is to fill online application. Finally, the operators of UDCs are to submit online applications or citizens can submit online applications directly using the DWP. Through these designs and redesigns of the processes and networks, intra-actions have been established and increased in citizens and the ESC; the middlemen and the DRR staff intra-actions were not stopped. However, there was diffraction in the ESC and the middlemen as well as middlemen and the citizens.

7.4 Constitutive Entanglements in Organizational Contexts and Technological Processes

7.4.1 Entanglements and Disentanglements in the E-service Network

The E-service network for land record consists of three access points: UDCs, ESC and DWP. They are technologically networked with the DRR. However, the technological network of the E-service consists of both centralized and decentralized access points. The UDCs and the DWP are the decentralized access points and citizens can submit their applications without coming to the DRR at the district headquarters. Contrary to, the ESC is the centralized access point located at the DC Office near to the DRR. Although there are decentralized access points, citizens need to can to the district headquarters-due to the reasons of submitting fees (stamps) and hard copy of applications. Consequently, citizens need to travel from rural areas to the district headquarters with the initial designs of this E-service. As a result, initially the ESC was entangled with middlemen to submit and expedite their clients' applications and service delivery from the DRR. Thus, the ESC failed to ensure citizens' easy access to this service.

Although the E-service network comprises of UDCs and DWP as the decentralized access points, citizens prefer to submit applications for land record service. The E-service failed to entangle with the DRR. Functionally, there were no intra-actions in the decentralized access points (UDCs and DWP) and the DRR through the UDCs and the DWP. Since there was no process of sending fees, folios and supporting documents through online from the DWP and UDCs to the DRR, the citizens were not entangled with the DRR. Although UDCs and DWP were decentralized access points but they were constrained by the legal statutes and organizational processes. Consequently, the E-service network was entangled with the middlemen who intra-act with the E-service through the ESC, the centralized access point. Since there is no network of sending fees to the DRR through online process from the UDCs and DWP; thus, application submission

through them remained incomplete. Moreover, the DRR cannot take any action on the online submitted applications without receiving appropriate fees and folios. Further, submitting application from UDCs and the DWP online requires sending fees and folios manually to the ESC. As a result, receiving service delivery through UDCs and DWP requires higher cost and longer duration to process this service.

Submission of adhesive stamps and folio papers along with application was inevitable due to the legal and organizational processes. To introduce fees submission through online process requires amendment of the legal provision which needs to be passed in the Parliament. So it was beyond the scope of this research. Consequently, the researcher designed a pre-paid payment network for sending fees to the DRR for online applications within the legal provision and it gave complementary to the E-service network. This redesigned network focused on the limitations in legal provisions and the E-service network, thereafter the solution has been built through making necessary amendments either in the organizational processes and the E-service network according to the identified problems. Thus, this pre-paid fee depositing process has built network between the UDCs and the DRR. With this designed network, the UDCs were deposited certain amount of fees and the folios to the DRR in advance. Thereafter when a UDC submit application for this service to the DRR, the fees and folios for the online application instantly was credited from the deposited fees and folios.

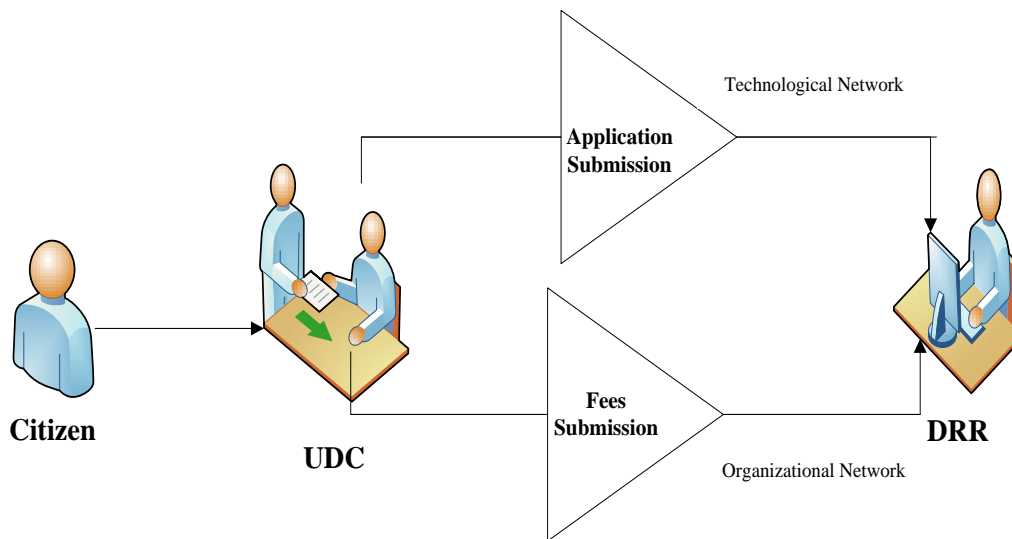


Figure 7-9: The Redesigned Process of the E-service Network

Thus, setting of this prepaid payment network between the UDCs and the DRR helped submission applications from the UDCs to the DRR directly along with all the requiring fees and folios, that is, online submission of applications along with the confirmation of fees and folio papers. Firstly, this network has cut costs of sending fees and folios and travelling to the DRR, the district headquarters. Secondly, it has reduced duration of service delivery for the online submitted applications. Now, the DRR does not need to wait for receiving fees and folios for the online submitted applications because the fees and folios can be credited from the advance deposit; just after receiving the application from the UDCs. Thirdly, it has also stopped missing online applications or fees either from post office or the DRR and the ESC. Fourthly, this network has reduced the extra stage, that is, receiving UDC submitted applications by the ESC. Therefore, this design in E-service network ensures intra-actions in citizens-UDCs-the DRR.

7.4.2 Entanglements and Disentanglements in the E-service Processes

The process of application submission for this E-service was problematic. Citizens require submitting paper based applications to the ESC and thereafter, the

ESC staff put the applications into the E-service network. Further, citizens require submitting online applications through UDCs or the DWP and thereafter they need to send printed copy of the online applications along with fees and folios to the ESC. Consequently, it was a dual method of application submission. Thus, designs and redesigns for receiving only online applications is one of the best solutions to address the problem of dual process of the E-service. Furthermore, the organizational and technological processes have been redesigned to receive only online applications instead of receiving paper based applications or receiving printed copy of the online applications as a dual process.

Even from all of the access points – UDC, DWP and ESC – there were dual processes of applications submission. For the UDCs and the DWP, citizens require submitting online application first and thereafter they required printing online submitted applications and sending them to the DRR along with fees stamps and folio papers. On the other hand, for the case of the ESC, citizens require submitting paper based applications first and thereafter the ESC staff is to put into the E-service network.

Figure 7-10: Online Application Form for the E-service

With the existence of the process of paper based applications in the service, the vested interest network remained dominated in organizational processes. Both the middlemen and the DRR staff have their vested interests with paper based applications. The paper based applications gave opportunity of intra-actions in middlemen and DRR staff. Consequently, the advantage of the E-service as well

as online application submission failed to bring advantage of citizens and the organization. The BIE has identified that removing the dual method submission and introducing only online application submission could be disentangled the middlemen from this service.

Along the line, the BIE has redesigned every access point to receive only online applications. Thereafter, the DRR received and credited fees and folios for online submitted applications. Submission of fees and folios from the online applications has been simplified with advance depositing and crediting fees and folios. Besides, citizens can submit online applications through the DWP and can send fees and folios to the DRR mentioning only the application number.

Through intervening the organizational processes and the E-service network, it has been found that parallel access points and dual systems of applications submission are overlapping tasks that increased work load, stages of service delivery, period of service delivery, increase of cost and increase of networks of vested interests. Thus, the BIE has been identified that the E-service process neither requires submission of paper based applications nor printed copy of online submitted applications.

However, receiving only online applications also requires redesigning of the organizational processes and the E-service network. After introducing the E-service network in land record service, paper based applications were no longer required, because all requiring information of this service were available in online applications. However, the organizational process was not redesigned; because to a great extent the existing organizational contexts and processes remained the same with the previous process and contradictory to the E-service network. There are at least three contradicting factors. Firstly, the DRR staff argue that receiving only online applications would be problematic for collecting fees and adhesive stamps. With the current practice, citizens need to paste adhesive stamps on the applications either on the printed copy or the paper based applications. Secondly, the auditing and inspection systems required to verifying adhesive stamps against each application and the general entry register of the applications. Thirdly, since

there is frequent load shedding of electricity, disruption of connections of internet and server; the DRR staff and citizens cannot rely on only online applications submission method because paper based applications submission requested during disruption of electricity, internet and server.

Aiming to resolve the above discrepancies, technological processes of the E-service have been redesigned in such a way that only online applications can be received for the E-service of land record. Since the DRR needs to maintain a general register to make entry into every application's information and that register is to preserve for auditing and inspection which are relating to rules and regulations. Thus, the researcher and the staff identified that the general entry register is to be remained in organizational process, because removing it from the organizational process requires amendment in the existing rules and regulations. Besides, this register can be used as backup during any disruption in power, internet and server. Further, the general register has also been redesigned with an additional column that the adhesive stamps of every application can be pasted in the general register. Consequently, this general register has allowed keeping account of adhesive stamps along with application details.

Along the line, the redesign of the integrated general register allows incorporating information for all online applications coming from all access points of the E-service. However, the ESC was obstacle to implement this redesign because about 80% to 90% of total applications were submitted in paper based the ESC. Since the ESC is connected with the E-service network, the ESC staff have option to receive online applications from the citizens and paste adhesive stamps in integrated general register against each application ID number.

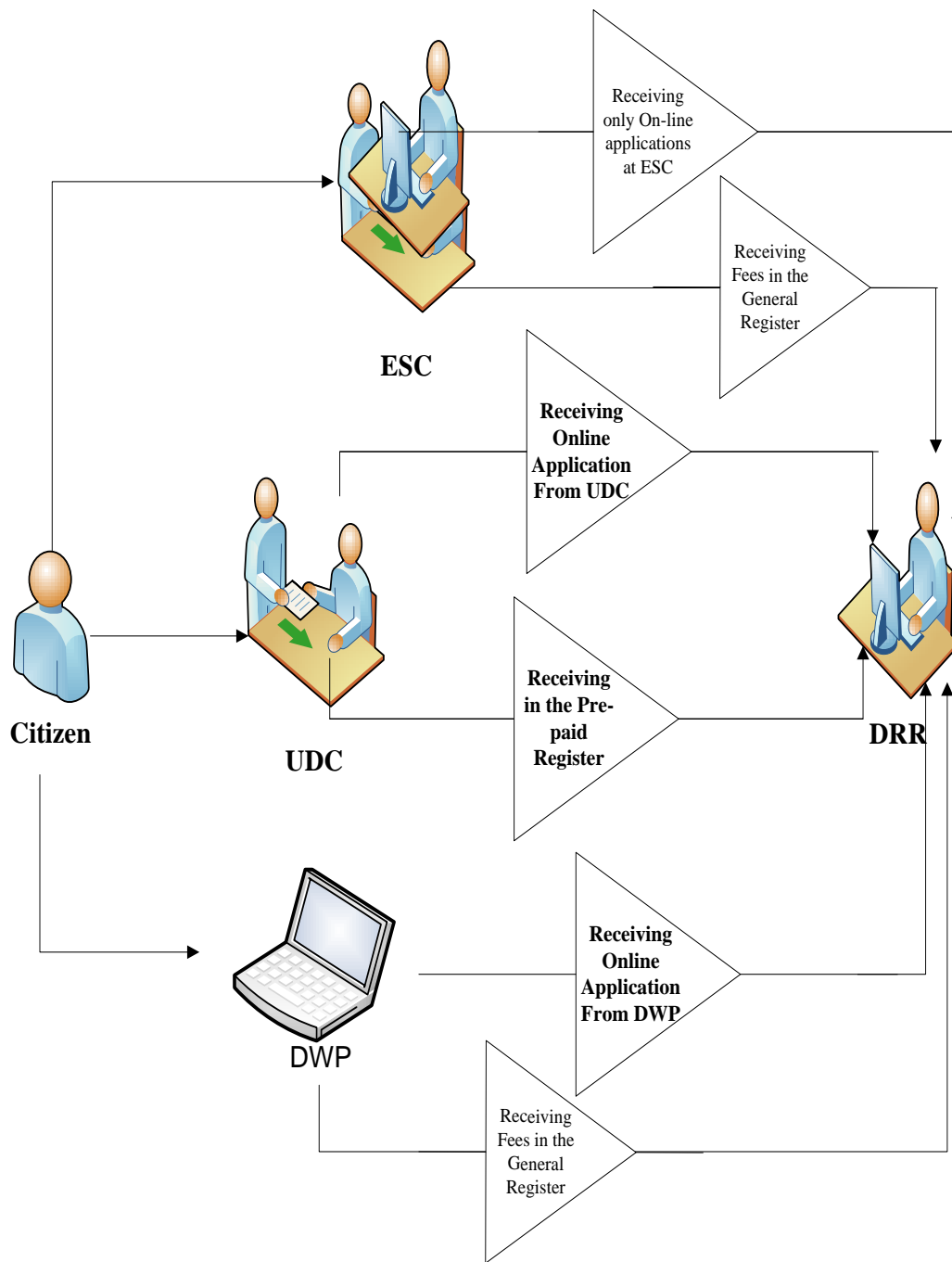


Figure 7-11: The Redesigned System for Receiving only Online Application

Further, the redesigned technological and organizational processes simplified receiving online submitted applications and putting details of those applications along with fees into the General Register for processing this service. Thus, the integrated general register has ensured to receive all the applications of the E-

service. Further, the officers, the DRR staff and the researcher designed the processes to paste adhesive stamps for land record service on the integrated general register against each application's information in the newly added column. The redesigned process has addressed the problems of the organization, the UDCs and the citizens. This is how paper based applications have been disentangled from the E-service process and the process of receiving only online applications has been entangled with the E-service.

7.4.3 Entanglements and Disentanglements in the E-service Actors

Entanglements and disentanglements in the E-service took place dynamically into different cycles along with continuous shifts, intra-actions and diffractions. In order to trace entanglements in the E-service-Middlemen-Citizens, a BIE conducted in five UDCs of a Upazilla (sub-district) namely Koyra along with its DRR, ESC, DWP, middlemen, DRR staff and citizens. The entanglements and disentanglements were traced given an overview along with their detailed analyses.

Initially entanglement took place in the process of submitting paper based applications by middlemen at the ESC and the E-service. Thus, paper based applications submission was stopped. After redesign this process, the middle shifted their position from paper based applications to online applications at the ESC for this service. Consequently, the ESC was stopped to receive applications. In line, the DWP and the UDCs remained open as access points. Thereafter, the middlemen developed ways to entangle with this E-service through submitting online applications for their clients by using DWP with the help of the DRR staff. Consistently, the DWP was stopped to receive applications. As a result, aiming to stop any intra-actions in middlemen and the E-service; only the UDCs remains open to submit citizen's application for this service. Since UDCs are decentralized and located in the rural areas, middlemen were constrained to entangle with the UDCs.

Surprisingly, middlemen bodily shifted from the ESC and the DWP to the UDCs. They moved to UDCs as citizens. The researcher traced that middlemen were using particular UDCs to submit their clients' applications. It was also found that they were submitting more than 50 applications at a time by the name single individual from a particular UDC. It was possible due to middlemen's' intra-actions with the UDCs. Thereafter, this process also has been further redesigned that from a UDC a citizen cannot submit more than three applications at time in a day. Afterwards, middlemen found that it was difficult to involve in mediating the process of submitting citizens' applications. Consequently, they shifted their role from application submission to the mediating quick delivery of this service. Due to the purpose of urgent delivery of this service, citizens moved to the district headquarters after submitting their applications through the UDCs. In line, citizens' intra-act with the middlemen along with the ID numbers of submitted applications. Thus, the middlemen with the application ID number of their clients intra-act with the DRR staff to expedite their service delivery. Finally, aiming to disentangle the middlemen from the delivery this service, the BIE has designed and redesigned the mode of service delivery from the ESC to citizens' home address delivery by postal service. The following sections have provided the enlarged pictures of entanglements and disentanglements in the E-service and the middlemen.

Constitutive Entanglements of Paper Based Applications

Before the E-service, citizens used to submit paper based applications for land record at the DRR and receive delivery of this service from the DRR too. Although the E-service was introduced the paper based application submission process was remained dominant in the organizational processes. Consequently, citizens came to the district headquarters for this service and submitted paper based applications to the ESC. Since the process of paper based applications was continued, they also continued intra-actions with to the middlemen to fill in or write paper based applications and expediting their service. Thus, it has been traced that with process of paper based applications, the middlemen's' intra-act

and entangled the E-service. Moreover, the traditional organizational process remained entangled with receiving paper based applications. Resultantly, citizens continued to intra-act with the middlemen instead of E-service network.

Besides, it has been found that the middlemen had the opportunity of tampering paper based applications through intra-acting with the DRR staff. Thus, they ensured their clients service delivery quickly through tempering the FIFO process. Further, it was possible to tamper the submitted applications by adding in and deducting out application ID numbers with paper based applications process but it was not possible in the case of online submission process to add in and deduct out anything from the submitted application.

Thus, this redesign has stopped receiving paper based applications by the ESC. Along the line, the ESC staff has been trained and guided to receive directly online application from the citizens instead of receiving paper based applications from middlemen and also restricted to put information of paper based applications to E-service network by the staff.

Constitutive Entanglements of the ESC

With this redesigned process citizens submit only online applications through the ESC; thus, after receiving online applications the ESC put applications' details into the integrated general register and the DRR deduct relevant fees and folio papers from the fees and folios deposited by the UDCs. Consequently, receiving online applications allows citizens to get rid of the process of writing applications or filling in applications form, calculation of fees and folio papers.

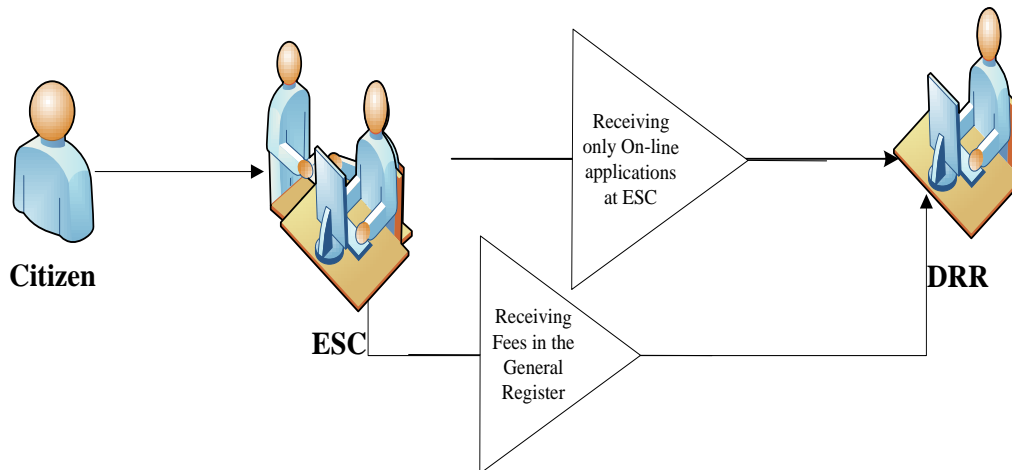


Figure 7-12: The Redesigned Process of the ESC for Receiving Applications

However, after introducing the E-service, the ESC received all applications and deliver service of land record for applications too. Thus, citizens need to submit applications to the ESC and receive service delivery from the ESC instead of the DRR. Previously, the ESC received applications from citizens and the DWP and UDCs all day long. Afterward, it forwarded all the applications to the DRR at the end of the day or in the following day. Similarly, after preparation of the service, the DRR returned applications along with the attested land records to the ESC.

Thus, receiving only online applications by the ESC streamlined the process of the E-service because after this redesigned the ESC engaged in managing fees for the applications into the newly designed integrated general register. This is how this redesigned process contributed to reducing tasks of the DRR through managing fees of this service by the ESC. Evidently, these designs and redesigns helped to expedite the processes of this service.

Further, receiving online applications has removed number of tasks –managing and accounting court fee registers separately, removing signatures on the applications and managing work distribution. Furthermore, it has ensured the process of 'First In First Out' in delivering of this service. Consequently, it has been identified that receiving all the applications through online enhanced transparency and reduce loopholes in this service.

This redesigned process, that is, receiving only online applications by the ESC disentangled the middlemen from this E-service. They were no longer required filling in paper based applications, assisting to calculate fees and folios and mediating their applications. Consistently, citizens do not require any assistance from middlemen. Eventually, middlemen had limited option to mediate citizens' online submitted applications. With this redesigned processes, citizens were assisted by the ESC.

However, middlemen found ways to mediate citizens' applications in the newly designed processes. The middlemen entangled with online application submission through the ESC. They submit online applications at the ESC on behalf of their clients. To prevent intra-actions in the middlemen and the DRR staff, the application submission process has been further redesigned in such a way no applicant cannot submit more than three applications in a day from an ESC.

Thus, it was found that since the middlemen were mediating faster service through the ESC than the UDCs submitted. Consequently, citizens prefer to access to this service through the ESC because the middlemen and the DRR staff intra-act with the ESC. Contrary to, applications coming from UDCs do not have vested interests for the DRR staff. Consistently, UDCs' submitted applications take longer time to deliver this service. Eventually, many of them were missed due to lack of interest of the DRR staff and rejected due to the ground of damaged records.

Consequently, it was traced that the ESC has become an extra stage between citizens and the DRR and delivering land record to the citizens. Thus, it caused delaying in processing of land record. As the ESC was also responsible for receiving printed copy of online applications submitted from the DWP and UDCs, it caused delay in processing online submitted applications. However, according to the E-service network, online submitted applications from the DWP and UDCs automatically and instantly reached at the DRR. As a result, submitting printed copy of the online submitted applications to the ESC made constraints to citizens' access to this E-service by the UDCs and the DWP. Thus, citizens' prefer to come

to the ESC and mediate and expedite their service by the middlemen. Consequently, the middlemen entangled with the E-service through the ESC.

Additionally, with the middlemen dominated process, citizens do not find any reliability to submit applications through the UDCs. In this regard, a UDC operator says, “Even my father does not rely on me for filing his application for land record service delivery even though as a telecentre operator I could submit and process it. He (father) believes that *Muhuris* (middlemen) are the most efficient for processing this service delivery”.

Subsequently, the BIE that identified continuing this service delivery with the traditional and centralized access point -the ESC constrained for the newly designed E-service access points - the UDCs and the DWP. Thus, they remained underutilized and failed to entangle with the E-service and citizens. Consequently, the process has been redesigned through shifting applications submission point from the ESC to the DRR.

Constitutive Entanglements of the DWP

The redesigned removed the ESC in the process of the E-service of land record because the ESC was entangled with middlemen. Thus, the UDCs and the DWP remained open to access to this E-service. With this redesign, applications from the UDCs and the DWP are not required submitting to the ESC; rather, the applications were directly received by the DRR staff. Since there was no way of sending fees online; thus, a prepaid payment network built between the DRR and UDCs. Nevertheless, for the DWP's case, citizens could come to the DRR and pay their applications fees just mentioning its ID number. This is how, this redesigned has decreased stages of this service and service delivery period.

On the other hand, with this redesigned process the staff had lost their speed money. Thus, they reshaped this redesigned process through making further intra-actions with the middlemen. In line, at this stage the middlemen found another

aperture as an access point i.e., the DWP. They collect information of applications from their clients and submit these applications using the DWP. Even as the DRR staff have internet connections at their desks, they used this as an opportunity to submit applications on behalf of the middlemen networked with them.

Furthermore, it has been found that middlemen have been submitting application through the DWP for this sub-district, because everyone has access to the DWP. Thus, it was easy for middlemen to submit their clients' applications through the DWP. However, it has been traced that the middlemen and the DRR staff were further entangled with the DWP. Ultimately citizens remained disentangled from the E-service. It was identified that the DWP was unrealistically designed as an access point for this E-service of land record. The country has low internet penetration which is only 35 people per thousand. Moreover, citizens requiring this hardly had electronic literacy.

Thus, the DWP has become the access point for the middlemen. Since the copyists have good internet connections and printers, they find it as an opportunity for submitting online applications using the DWP on behalf of middlemen. Using the DWP, the DRR staff mediate service delivery to Mobile Middlemen networks. Since the mobile middlemen were based at district headquarters, they could submit online applications using the DWP with the help of the DRR staff. Consequently, the DWP has been stopped to receive applications for this service. In turn, the UDCs remained open as only point to access to this service. Evidently, there were no option of intra-action in the DRR staff and the middlemen.

Nonetheless, at this stage, the applications submitted by UDCs receive quicker service delivery than the previously designed process and the applications rejection rate also have been decreased. However, it was not possible to disentangle the middlemen from the service delivery process. For instance, where the service delivery duration decreased from three weeks to one week through the UDCs, the middlemen are still able to provide the service delivery within one or

two days using the DWP. Thus, in this redesigned process, the middlemen failed to entangle with citizens because still the citizens' receive faster service through the middlemen. Therefore, the citizens do continued to intra-action the middlemen.

Thus, at this stage two problems have been identified in the E-service: one is middlemen's access through the DWP and other is higher cost and time consuming process of sending fees for the applications submitted through the DWP. Consequently, the DWP was removed from the E-service. Further, the organizational managers and the researcher designed processes to reduce time and cost for sending applications from UDC to the DRR.

Consequently, the E-service process has been further redesigned and only the UDCs have been kept open to access to this service. During this redesign, it was debated between the researchers and the managers that if there is only the UDCs as access point to this service, the UDC operators might be engaged in corruption just as the middlemen. Therefore, this redesign focused on building constitutive entanglement between the UDCs and the service delivery process as well as citizens.

Constitutive Entanglements of the UDC

With this redesign, citizens were submitting applications for this service through only UDCs. With this redesigned process applications were submitted through online and fees were sent through the advanced prepaid payment network.

After this redesign, it has been found that UDCs required assisting the citizens in submitting applications. Particularly, citizens were not having full information for submitting applications, e.g., lack of ID number of land record and version of land records. Thus, a group of citizens were facing problems in submitting applications through UDCs. To address this problem, UDCs were supplied contents of registers that helped to assist citizens who were lack of information for submitting applications.

Besides, this redesigned process addressed the problems of rejection applications due to the ground of inaccurate information fees and folios because the DRR staff had opportunity of crediting necessary fees and folios for applications coming from UDCs. Further, a telephone network has been set up with the DRR to respond queries from the UDCs and the citizens as well. Additionally, the redesigned process has reduced chance of rejection due to wrong information in online submitted applications from UDCs. More importantly, this redesigned process provided opportunity to receive status of UDC submitted applications from the DRR through telephone network.

Nevertheless, it has been appeared that one UDC has submitted about 50 applications in the name of one applicant. Normally one applicant does not require 50 land records at a time. It has been discovered that these applications were submitted by middlemen through the UDCs to the DRR. Therefore, to address the bodily shift of middlemen from the ESCs to, the study has suggested further redesigned of the processes through setting a condition that every applicant needs to show authenticated photo or ID evidence in favor of his identity when applying for a specific land record. Further, an applicant cannot submit more than three applications per day.

However, this design has also been reshaped by the DRR staff and the middlemen. Though citizens do not need to send printed copy of the online applications according to this redesigned process; they collect printed copy of online submitted applications from the UDCs. Thereafter, they moved to the district headquarters and intra-act with the middlemen to expedite their service delivery. For that reason, the middlemen found opportunity to intra-act with the DRR staff and the citizens through expediting this service for their clients who submitted application even from the UDCs.

Thereafter, it has been found that although applications were coming from the UDCs, there were remained apertures through delivering this service from the DRR. Thus, the middlemen made diffraction in the redesigned process through expediting delivery of this service from the DRR through intra-acting with the

middlemen. It has been observed that after submitting applications through UDCs' citizens are coming to the DRR to expedite their service delivery by the middlemen and receive their land records quicker than the service delivery applications submitted by the UDCs.

To remove this diffraction, the process of delivery of record has been redesigned. Consequently, delivery of record from the DRR was stopped and designed a network for postal delivery of this service at citizens' home address. With this redesigned process, during submission of applications UDCs provided address of delivery of the record. Henceforth, middlemen and the DRR staff found no ways to intra-act with either in application submitted by UDCs or citizens. Even there were no options to intra-act in the process of delivery of this service. So, citizens also had no option to intra-act with the middlemen and the DRR staff. Therefore, these designs and redesigns help to build constitutive entanglements in the citizens and the E-service as well as constitutive entanglements in citizens and UDCs.

Constitutive Entanglements of the Land Record

Land records are printed paper document and bounded in registers. So issuing attested copy of land records require copying records by hand writing or computer word processing from the original registers. Obviously copying records by hand writing from paper based register is time consuming. A copyist can copy 20-30 records in a day. Since copying records is a time consuming matter, it developed discretionary manipulative power of the copyists to expedite copying records for particular application or delaying for other applications. Usually applications have vested interests or applications come from the middlemen network receive priority to the Copyists. Contrary to, applications come from UDCs do not have vested interests and failed to receive quicker service rather rejected with high rate.

In addition, the rate of application submission was very much higher than the rate of copying land records. Thus, there was backlog in copying records as well as processing of this service. Consequently, citizens need to intra-act with the

middlemen to expedite copying of their records. Resultantly, citizens' interactions with middlemen as well as providing speed money played vital factor in expediting this service.

Thus, the BIE identified that converting the existing paper based records to digitized records and build repository are significant to addressing the problem of backlog. So, issuing attested copy of land record from digital repository would be much easier and quicker because it would not require sorting registers, copying record, comparing and attesting it.

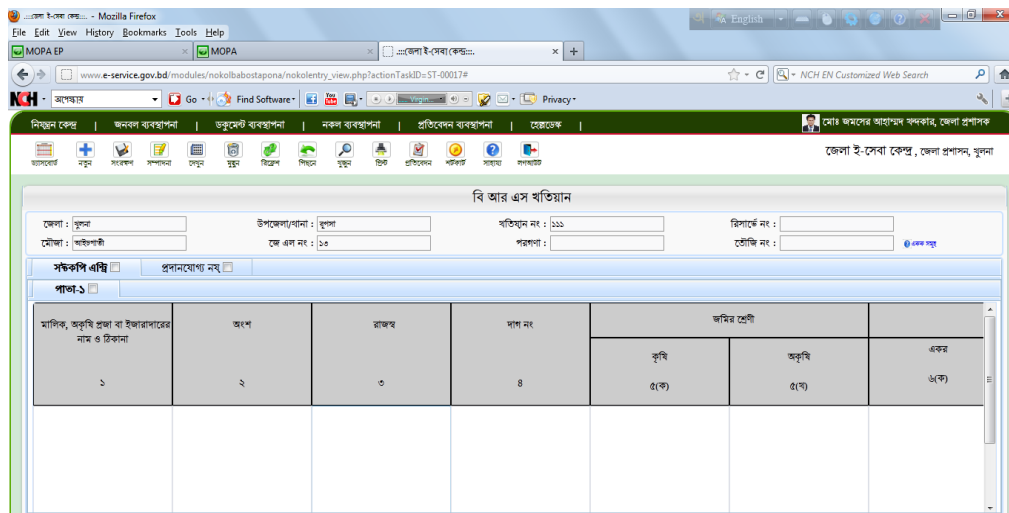


Figure 7-13: Digitizing Format of Land Record

Along the line, the ministry of land and the A2I program has decided to digitize the existing land records through composing them with an E-service software but that process was time consuming and complicated. This process was complicated because there were illegible hand written and damaged records. Further, after composing of record, it needs verification of accuracy. As a result, it takes about two years to finish about one third records. On the other hand, to build a digital repository through scanning process could take only 6 months and very less cost and less errors.

However, after digitizing one third records of the DRR, gradually the backlog of copying has been decreased. It was easier to deliver from the repository of

records. It takes few seconds to copy land record from the digital repository. Thus, about one third applications take only few seconds and service delivery period come down. Consequently backlog of copying has been reduced. This is how service delivery has been expedited. Since service delivery period being shortened, citizens gradually reduced to rely on middlemen for mediating this service. Henceforth digitizing land record is also a significant measure for disentangling middlemen from this service and citizens and entangling citizens with the E-service.

7.4.4 Reflection on the Constitutive Entanglements

Throughout the designs and redesigns of the organizational processes and technological network of this service, the study has revealed that there are no static factors, apertures, intra-actions and entanglements. Even there is no permanent entanglement and disentanglement; rather the apertures, diffractions, entanglements and disentanglements shift dynamically with the designs and redesigns of the organizational and technological processes of this service. Thus, it has found that when one access point was disentangled from the middlemen, the middlemen were entangled with the other access point. When UDCs were only access points, the middlemen bodily shifted from the ESC to the UDCs for submitting their clients' applications. Further, when it was not possible to intra-act with application submission process, the middlemen entangled with the delivery process of this from the DRR.

It can be observed that the designed constitutive entanglement process is a barrier whiles the human actors within the organization and beyond together with the middlemen belong to two sides of the barrier and try to find aperture and make diffraction. Due to constant attempts from the human actors (the middlemen, the DRR staff) and their intra-actions with non-human actors (the land record, E-service) the BIE discovered another aperture that is communication with the DRR staff through cell phone and mediating for their clients. Further, they moved to the UDCs for filing their clients' applications to mediate this service for their clients.

These trends reflected that while continuous designs and redesigns had set barriers to intra-act in the middlemen and the E-service; they seek aperture continuously. So, setting only technological networks, entanglements with technology and the E-service could not be effective, where the role of human actors remains to be dominated, because it is easy to find aperture at least communicating with the human actors, the DRR staff. It is strikingly visible that the DRR staff and middlemen are always mutually dependent; thus, any design would not be lasted long while it goes against of the personal gains and against the vested interests of the DRR staff.

With this regard, for further designs and redesigns of this service, it can be suggested to build a digital record repository to reduce sorting, carrying and copying time and disentangling the DRR staff from the records. In line, it needs to reduce the role of human actors in this service to prevent any diffraction. On the other hand, this study has also identified that it requires entanglement of other organizational actors with the E-service to build the constitutive entanglement in the E-service and the citizens. They are the office of the deputy commissioner, A2I program, Ministry of Land and Ministry of ICT. They need to be entangled with this E-service in the process of continuous monitoring, evaluation and redesigning the E-service, activities of the middlemen, building citizens' awareness and publicize the ongoing process of E-service of land records. Thus, entanglement of relevant actors and processes would strengthen the designed process and reduce the chance of apertures and diffraction.

7.5 Conclusion

At the outset, designs of the E-service faced challenges and resistance from the organizational contexts. Every design was entangled with the organizational contexts and any design hardly achieve desired goal of the E-service. Initially, diffraction took place in the E-service due to dual method of application submission process and multiple access points of application submission. Similarly, intra-actions took place in the E-service and the organizational

processes through entanglements and disentanglements with the middlemen, the DRR staff, paper based applications submission process, manual process of fees submission, complex system of land records, citizens' lack of awareness about land record and lack of literacy and electronic literacy.

Throughout the building intervention evaluation (BIE), the researcher and the organizational managers strived to address the problems of the E-service. In line, a significant number of organizational processes, structure and networks and the E-service network have been designed and redesigned. Organizing land records, removing paper based application submission processes, introducing integrated general register and reducing organizational steps are major BIE activities involved in organizational contexts. Besides, unification of the Record' Store Room and the Copyists' Room, cataloguing of land record registers and installation of CCTV are significant designs involved with organizational processes, structures and contexts. The initial designs of the E-service were those organizational processes, structures and contexts. In the other way around, these designs of organizational processes and structure were inevitable to entangle the citizens with the E-service. Thus, these designs developed intra-actions and entanglements of organizational networks and contexts with E-service network and prevent any diffraction in the E-service and intra-action by the middlemen.

Further, after the initial period of launching the E-service and researcher intervention in the organizational contexts revealed that there are number of apertures in the E-service i.e. multiple points for application submission, multiple stages of application submission and multiple points for service delivery. These apertures caused to continue intra-actions in the middlemen and the E-service. Thus, aiming to address these problems, the BIE involved in designed and redesigned of the E-service network i.e. designing a single access point and only online application submission process, building network among the DRR, UDCs and citizens and building repository of records through digitizing land records. These designs and redesigns help to make intra-actions as well as entanglements

in the E-service and the organizational processes and the E-service and the citizens.

However, the researcher observed that after the redesign of the organizational and technological contexts and networks, further diffraction and intra-actions took place in the middlemen and the E-service took place. Consequently, it required continuous tracing of underlying contexts, apertures, diffractions and intra-actions that developed further entanglements and intra-actions in the E-service and the citizens- the DRR Staff-the land records. Therefore, diffraction and intra-actions in the organizational contexts and the technological networks and the land record are continuous, constitutive, temporal, inseparable and ceaseless.

Chapter 8: Discussion: Learning, Reflection and Thick Description

8.1 Introduction

This study has traced continuous constitutive entanglements and disentanglements in the technological processes and the organizational contexts throughout formulation of problems, design and redesign of solutions and conducting intervention and evaluation of the E-service of land record. Consistently, the study has identified potential learning and reflection through the researcher's interventions with the contexts, engagement and interaction with actors and applying insider and outsider views in problem formulation, initial design, evaluation and further redesign of the E-service in a number of cycles. Most of the designs of the E-service as well as technological processes and the organizational contexts failed to achieve complete perfection because the organizational contexts did not accept any designs, processes and networks as they were designed. Thus, it was challenging to meet organizational goals through any design of technology or any processes in organizational contexts. Consequently, design and redesign of technology and the E-service processes in organizational contexts were continuous and cyclic. Resultantly, every stage and every cycle of design generate significant learning and reflection that played vital role to its next stage or the next cycles of designs and redesigns.

Every design of technological processes or every aspect organizational context was temporal, multidimensional and continuously entangled and disentangled with the social and the material contexts. In line, designs and redesigns of this E-service were shaped and reshaped in the organizational contexts. Consequently both the designs and redesigns and the contexts were also shifting dynamically.

Consistently, the E-service was required continuous designs, evaluation and further redesigns. Throughout the process of designs, evaluation and redesigns, learning and reflection have been emerged iteratively and continuously. Evidently, the initial designs of the E-service of land record were being reshaped and redesigned through intra-actions in the E-service network and organizational contexts as well as middlemen networks. Thus, the main learning of this study is that designs and redesigns of organizational processes and technological applications are iterative, continuous, unpredictable and constitutively entangled.

Consistent with these, ADER as an interventional, intensive, participatory and researcher-client collaborative efforts, offered potential to generate reflection and learning from every problem and every design and redesign. However, due to limitation of space in the dissertation, only major issues of learning and reflection have been discussed in this chapter. Consistent with the problem formulation and BIE, learning and reflection of this study have been emerged from three broad areas: organizational contexts, technological networks and intra-actions in technological and organizational contexts. However, every learning and reflection is inseparable from each other because problems and designs are equally rooted in both technological and organizational contexts. Thus, every learning and reflection is also derived from both organizational contexts and technological processes of this E-service. In order to relate the learning and reflection of this study with the E-service contexts, they have been discussed along with a brief on problem formulation and BIE of respective learning and reflection. The major issues of learning and reflection have been discussed below.

8.2 The Organizational Contexts

Organizational contexts are very wide; so root of every learning and reflection can be traced in organizational context. A total of 6 major issues of learning and reflection have been identified from the organizational context. They are discussed below.

8.2.1 Simplification of Fees for this Service

Fees calculation method for this service was complicated and diverse. There were four components of fees: application fee, copyist fee, record fee and folio fees. Moreover, they were broken figures. Thus, citizens faced difficulties in calculating fees for this service. Since insufficiency of fees caused rejection of application, citizens were relied on middlemen for calculation of fees and mediating of these service.

Besides, although middlemen charged urgent category of fees and speed money from their clients (citizens), they used to submit ordinary category of fees and received this service in urgent category. So, the DRR was deprived of its due revenue. In line, citizens were continued to relied on middlemen. Resultantly, benefits of the E-service were neither reached to citizens nor to the organization. Evidently, it is appeared that intra-actions and entanglements prevailed in citizens and the middlemen and the DRR staff and the middlemen. Thus, although the E-service was designed for the land record service, the organizational staff and process and the citizens continued interaction and entanglements with middlemen. Consequently, the E-service failed to intra-act with the organizational process and the citizens.

The BIE has redesigned and simplified the complicated and fractional amount fees. It has settled with a fees total BDT 10.00 for ordinary service and BDT 20.00 for urgent service. This redesign of fees incorporated all types of fees and it has been notified among the DRR staff, citizens and UDCs. Consequently, this redesigned process of fees for this service disentangled the citizens from relying on middlemen for processing their applications and helps citizens to process their applications by themselves.

Thus, unifying, simplifying and categorizing of amount and types of fees have stopped misuse of fees and exploitation of citizens by the middlemen and the DRR staff. Consequently, this redesign has increased government revenue. More importantly, redesigning and simplifying of the amount and categories of fees for this service have created intra-actions in citizens, the E-service and the

organization. Resultantly, diffraction took place between middlemen and citizens and middlemen and the DRR staff in the E-service.

Thus, the redesign and simplification of fees has entangled the citizens with the E-service and disentangled the citizens from the middlemen. Since the middlemen were failed to manipulate fees, they were unable to serve vested interests of the DRR staff. Consequently, the middlemen were disentangled from the middlemen and the E-service.

8.2.2 The Process of One Application for One Record

The organizational process allowed submitting an application for upto five records (record of rights). It has appeared as an aperture for intra-action between middlemen and the DRR staff and caused of misuse first in first out (FIFO) process and loss of the revenue. With the process of submitting application for multiple records in one application, middlemen were submitting many clients' records in one application and even submitting more than five records in one application collaborating with the DRR staff. More importantly, it gave opportunity to insert land records ID numbers in previously submitted applications that were chronologically in advanced position to deliver this service and even submitted many days ago aiming to receive service quickly. Consequently, it caused tampering of the 'FIFO' process in this service. Resultantly, this aperture genrated vested interest for the middlemen and the DRR staff.

To prevent any tampering in the process of FIFO of this service by middlemen, the organizational process has been redesigned. This problem has been presented in the monthly revenue meeting of the organization and showed evidence of misuse of that organizational process through submission of one application for many records and many clients' records. Thus, the managers agreed to stop the process of submitting one application for many records and to introduce the process of one application for one record.

Due to this aperture, middlemen were receiving advantages of submitting paper based applications at the ESC along with multiple records in an application. In addition, they were able to receive service delivery quicker than the applications submitted by the UDCs because there had not option of manipulation or insertion of land record ID numbers after submitting application. Consequently, the middlemen continued intra-actions and entanglements with the DRR staff for expediting this service for their clients. Due to the entanglements in the middlemen and the DRR staff, the UDCs failed entangled with this E-service.

Along with this, the BIE of this study has made a guided intervention to design a process of 'one application for one record' that has stopped manipulation of FIFO process and insertion of application after submission of application. Besides, it has also increased revenue of the DRR and decreased intra-actions in the middlemen and the DRR staff.

Consequently, middlemen faced difficulties in expediting this service for their clients. Thus, this design has disentangled the middlemen from citizens and the DRR staff. This redesign has implemented 'FIFO' process in the E-service. Henceforth, both the organization and citizens received advantages of the E-service. Consistent with these, entanglement takes place in citizens, UDCs and the E-service.

8.2.3 The Integrated Register

Although the E-service was designed for the land record service, numbers of paper based registers were dominantly prevailed in the organizational process. There were a total five registers that were paper based remained exist in the organizational process. They are: Entry Register, Work Distribution Register, Fees Register, Dispatch Register and Rejection Register.

Due to the existence of these paper based registers, the process of this E-service has remained entangled with the traditional organizational process and paper based registers dependant. Besides, existence of the paper based registers and introduction of the E-service have made dual organizational processes in this

service. Consequently, volume of work has been increased for the DRR staff. Further, these registers were barriers to entanglement in the E-service and the organizational processes as well as the DRR staff. Consequently, intra-actions were continued in the traditional organizational processes and the DRR staff as well as the middlemen. Contrary to this, the online applications and the UDCs failed entangled with this E-service because they were not intra-active with organizational process; rather, the paper based registers remained intra-active and entangled.

Aiming to remove these paper based registers from the organizational process, an integrated general register has been designed for managing information and organizational processes of applications for the land record service. It was designed in such a way that it is able accommodate applicant's name, amount of fees, type application, details of land record, date of receiving application, date of delivery of land record, name of allocated copyist and status of service delivery. Notably, it has also provision of pasting fees-stamps against each of the application's information row in that register.

Consequently, this integrated register served the purpose of putting all information in one register and fulfill the requirements of audit and inspection of the organization. Thus, it has removed all of the paper based registers along with traditional processes from this E-service.

Thus, the integrated general register has removed the overlapping tasks of the DRR staff and it has entangled the organizational processes with the E-service processes, UDCs and citizens. This design, thus, reduces intra-actions in middlemen and the organizational processes because the integrated general register eventually helped to remove the process of paper based applications that were the key instruments or apertures for intra-actions in the middlemen and the E-service.

Also it has removed overlapping of tasks of the DRR staff. Consequently, both the organization and the citizens received advantage of the E-service from the design

of the integrated register. Thereby, citizens were entangled with the E-service and the UDCs as well. Conversely, the traditional organizational processes were disentangled from the E-service as well as the organizational processes.

8.2.4 Redesign of the Work Distribution Process

Citizens' applications for land records were distributed among the copyists (DRR staff) for copying records from the preserved master volume of the records' registers. However, the process of applications distribution among the copyists was vested interest driven. Every copyist was entangled with numbers of middlemen. Thus, a copyist tried to provide priority service for the applications submitted by his or her entangled middlemen. Consistently, the middleman have maintained entanglements with the copyists.

Along the line, after receiving application ID numbers, middlemen communicate with the copyists through cell phone or any other media to expedite their clients' applications. Contrary to this, there were no vested interests for the DRR staff from the applications submitted by UDCs for this service. Thus, during work distribution UDCs submitted applications merely received attention to the copyists; rather, the DRR staff prefer rejecting those applications that come beyond the middlemen network. In the case UDCs submitted applications, the DRR staff used to reject them even for any minor mistakes in applications or minor damage in preserved records. Resultantly, a large number of applications were rejected or cancelled in the ground of process mistake or damaged in preserve records while applications were submitted from UDCs. The underlying reason was those applications did carry any vested interest or speed money for the DRR staff. Thus, citizens preferred to access to this service through middlemen network instead of the E-service network particularly the UDCs and the DWP.

The BIE of this study has removed the paper based registers and the paper based applications from the organizational processes and the work distribution process of this service has been redesigned. Further, the BIE also designed an integrated general register to for receiving applications, work distribution and delivering of

service of this service. After introducing the integrated general register, only online applications were received, the work distribution among the copyists was been managed as blind and random processes and fees calculation and organizational processes were also maintained with this register. Thus, Copyists failed to trace applicant's identity or source of applications whether they are submitted by middlemen or the UDCs. Thus, it was not possible to differentiate between middlemen submitted applications and UDCs submitted applications.

Further, this redesign has become obstacle to provide priority service for middlemen's submitted applications and also removed prefixed or preferential distribution of applications among copyists. Moreover, it has strictly ensured the process of first in first out. Consequently, this redesigned work distribution process has removed vested interests, priority service for middlemen submitted applications and delaying or rejection of UDCs' submitted applications.

This redesign of work distribution process has stopped intra-actions in the DRR staff and middlemen because the blind and random process of work distribution has made disentanglements in the middlemen and the copyists. Besides, the redesign process of this service delivery as first in first out process has ensured equal attention to all applications. Thereby applications submitting and expediting through any vested interest network or middlemen has been decreased.

Further, the BIE has designed a cell phone network between the UDCs and the DRR aiming to make intra-actions in the DRR staff and the UDCs as well citizens. Consequently, middlemen's were gradually disentangled from the DRR staff, citizens and this service as well. Contrary to this, the UDCs, citizens and the copyists were entangled with the E-service.

8.2.5 Unification and Redesign of the Dilapidated Segregated Record Stores

Master copies of preserved land record registers are used for processing land record service. However, they were mismanaged and dilapidated. Thus, sorting and copying of land record for this service were time consumable. Consequently,

this service was sorting staff dependant. Besides, the Record Store room and Copyists' room were segregated. Since the Store was located far, the copyists were dependant on the sorting staff.

Notably, the sorting staff played vital role in expediting of sorting process of land record registers and this sorting is important for expediting this service. Thus, there were developed intra-actions in the middlemen and the sorting staff to expedite sorting process of record registers from the DRR Store. It has developed further intra-actions in sorting staff and middlemen, and sorting staff and copyists. As the preserved land record registers were inevitable to process this service; copyists were entangled with the sorting staff. Copyists were incapable to sort specific register from such a disarrayed and anomalous condition of the Record Store.

Furthermore, since the Sorting Staff had access to every page of record registers in the Store, the middlemen developed intra-actions with record registers through the sorting staff. The middlemen gathered status (well or damaged) of records preserved in the Store before submitting applications for their clients. Thus, there were very few cases of rejection while applications were submitted by the middlemen whereas it was plethora of rejection in the case of UDCs submitted applications.

Consequently, the segregation and dilapidated condition of records developed intra-actions in middlemen and the sorting staff and middlemen and land record registers. Conversely, the UDCs had neither intra-action with the sorting staff nor the land record registers. Consequently, citizens entangled with the middlemen to receive this service quickly instead of the E-service access points e.g. UDCs.

Aiming to address these problems, the record Store and the Copyists' Room were united along with organizing and cataloguing of record registers. These were done on the basis of recommendations of the Committee that was formed to unify and organize the preserved land record registers. Consistently, the research intervened in two aspects: firstly, the Record Store and the Copyists' Room were unified and

secondly, the record registers were organized along with appropriate cataloguing and clear labelling marks.

These designs made easy accessible to the Record Store and quick sorting of record. Besides, land record registers were relocated and brought at less than 5 meter distance from the Copyists' table. Further, the record registers were catalogued and labeled visibly and arranged numerically in ascending order according to Jurisdiction List number and according to versions of land records.

These designs have expedited sorting and carrying process of record registers from the Store to Copyists' table. Resultantly, the rate of copying was accelerated. Thus, these designs have disentangled the Copyists' from the Sorting Staff and have made intra-actions in the Copyists and the land record registers. Resultantly, citizens do not need to entangle with the middlemen to expedite the sorting process as well as expedite this service.

Labeling and organizing of land record and unification of the Record Store and the Copyists' Room entangled the Copyists with the record registers. Further, they have disentangled the middlemen from the Sorting Staff and land records. This unification brought everything of this E-service of land record in one structural unit. Consequently, there were no requirements either of the Copyists or the Sorting Staff to go outside to the DRR. Thus, it had stopped intra-actions with middlemen. As a result, diffraction took place between the sorting staff and middlemen and Sorting Staff and Copyists. Thus, the middlemen were disentangled from land record, Sorting Staff and citizens in the long run.

As a result, citizens found that middlemen were not required to expedite this service and there is also no scope to expedite applications by middlemen. Therefore, gradually citizens were entangled with the E-service.

8.2.6 Entanglements in Receiving Applications and Delivering Records

The E-service devised two main access points for citizens' applications submission for land record service: one was the ESC, the district headquarters and the other was the UDCs, the telecentres. Amongst, the ESC was entangled with the traditional organizational processes and the middlemen. After introducing this E-service, the citizens were receiving this service the ESC via middlemen. Middlemen were submitting citizens applications to the ESC. Evidently, receiving this service from the ESC was costly and troublesome. However, it was possible to expedite this service by the middlemen with option of access into this service and receiving this service from the ESC. Thus, citizens come to the district headquarters to submit their applications and receive this service from the ESC with the help middlemen. As intra-actions in the ESC and the middlemen expedite this service delivery, about 99% of the applications were submitted by the middlemen at the ESC.

Thus, citizens' access to this service through the ESC continued intra-actions and entanglements in the middlemen and the DRR staff as well as the E-service network. It has been identified that the ESC was obstacle to citizens' access to this service through UDCs. Consequently, the UDCs failed to entangle with the E-service. Aiming to disentangle the middlemen from this service, this E-service process has been redesigned. The ESC has been stopped to receive applications for this service and applications were received and records were delivered through only the UDCs. In line, the DRR prepared land records and delivered them through the UDCs whereby citizens received their land records.

However, while it has been found that the middlemen tried to entangle with the UDCs, the service delivery mode has been further redesigned through shifting the delivery mode from UDCs to the citizens' home address delivery. In line, a network has been built between the postal department and the E-service so that citizens can submit their applications through the UDCs and receive their service at their home address by postal service.

Thus, these designs and redesigns of the E-service processes have disentangled the middlemen the E-service and citizens. Consequently, entanglements take place in citizens and the E-service because stopping submission of applications and delivery of this service from the ESC disentangled the middlemen from this E-service, the DRR staff and citizens. Further, the redesigned process - the citizens' home address postal delivery of this service - put middlemen in such a situation that they were no more relevant to this service. Consequently, middlemen do not find a way to intra-act with this E-service.

Thus, this redesigned process has stopped intra-actions in middlemen and staff too. Contrary to this, it has made entanglements in citizens and the UDCs as well as the E-service. Thus, the process of receiving application through only UDCs and delivering this service to home addresses of citizens made entanglements in citizens and the E-service and disentanglements in the middlemen and this service.

8.3 The Technological Contexts

8.3.1 Redesigning the Parallel and Multiple Access Points

There were three parallel access points for submitting applications: ESC, UDCs and DWP. The ESC was a centralized access point and became obstacle for decentralized access points: UDCs and DWP.

Initially, the ESC was turned into a main access point for submitting applications by middlemen. Consequently, the E-service has been redesigned and stopped receiving applications by the ESC. Thereafter, the DWP turned as a alternative and a hidden access point for middlemen to submit their clients' applications to the DRR. Thus, the initial design identified that multiple and parallel access points caused intra-actions in the middlemen and the E-service access points. Consequently, the parallel and multiple access points were identified as obstacle to citizens' direct access to this E-service and citizens entanglement with this service.

Thus, the parallel and centralized access points were redesigned. Consequently, as a guided intervention, the ESC and the DWP were stopped to receive applications respectively. Thereafter, the UDCs have been designed as a decentralized and unique access points to receive citizens' applications and deliver this service. Along with these, the organizational processes were redesigned to receive applications from UDCs and deliver services to citizens' home instead of delivering from the ESC of the district headquarters. Thus, setting unified mode of receiving applications through only UDCs and delivery of this service at citizens' home addresses reduced the chance of diffraction in the E-service. Evidently, these designs have disentanglements the middlemen from this E-service.

These designs and redesigns for receiving applications through ESC have stopped backdoor access to this service by the middlemen through the ESC and the DWP. Further they have ensured to receive every application through the E-service and from the citizens. Besides, this service was delivered to citizens' home address to disentangle the middlemen from citizens.

Thus with the existing organizational and technological capacities both the DRR and the citizens were not ready for using parallel and multiple access points. More importantly, removing of parallel, centralized and multiple access points has ensured citizens' easy access to this service. Thereby ultimately intra-actions and entanglements took place in citizens and the E-service.

8.3.2 Making the ID Numbers of Land Record Available at UDCs

There were three versions of land records. Consequently, nine out of ten citizens do not know accurately their land records ID numbers along with versions of land records. While they go to a UDC to submit online applications for this service, the UDC could not submit their applications due to lack of accurate ID numbers and/or version of land records. Thus, a UDC needs land record ID number along with version of land record to submit their clients' applications for this service.

However, due to lack of ID number of land record, citizens prefer to access this service through middlemen.

It has been found that applications submitted by the UDCs were rejected owing to inaccurate ID number of land record or incorrect version of land record. On the other hand, the middlemen remained entangled with the sorting staff to collect information on accurate ID number and version of land records for their clients. Thus, citizens found that it was easy and reliable to access to this service through middlemen whereas the UDCs were incapable to assist citizens who have incomplete information for submitting their applications for this service.

The BIE has been identified that ID number and version of land record are available at the content of each land record register. Consistently, the contents of relevant land record registers have been digitized and disseminated to respective UDCs to ensure citizen's access to this service. Consequently, citizens have access to their land records information easily and free of cost to identify their land records ID numbers along with the versions of records.

Digitizing and disseminating contents of relevant land record registers to the respective UDCs have made citizens intra-actions with the UDCs and reduced citizens' intra-actions with the middlemen. Further, it has reduced cancellation of applications due to the ground of inaccurate information or application with inaccurate land record ID or inaccurate version of land record. Further, it has also increased skills of the UDC operators on land record service delivery. Thus, this digitization and dissemination of information relating ID number and versions of land records to respective UDCs have made intra-actions and entanglements in citizens, the UDCs and the E-service as well.

8.3.3 Digitizing the Land Records

Since this service requires copying land record from preserved land record registers at the DRR; expediting copying of any record was dependent on the Copyists. Further, the method of copying was hand written by copyists. This method was time consuming. Consequently, the middlemen continue intra-actions with the copyists to expedite their clients' service delivery. Thus, citizens gave speed money to the middlemen and middlemen shared with the copyists to expedite copying of land record for their clients. Consistently, it has been found that middlemen submitted applications were delivered quickly compared to the UDCs submitted applications. Thus, citizens' entangled with the middlemen to expedite their service.

To address this problem, the E-service aimed to build digital repository through digitizing the existing paper based records. Firstly, the E-service devised software whereby day to day attested copies of record were delivered after computer composes and putting them into the repository. However, it has been found that the copyists were less interested in building digital repository and digitizing records with the E-service software; rather, they continued with copying of land records by hand written method. However, with this process, about 2%-5% of total records were digitized and put into the repository.

Secondly, the Ministry of Land launched a project for digitizing all the paper based land records and building a digital repository. However, this Project has digitized another 25%- 30% of the total land record. Thus, building a digital repository with one third of total records has reduced once third copying task for the DRR staff. Consequently, the duration of this service delivery gradually come down from 3 weeks to 1 week.

Thus, building digital repository of land record has disentangled the Copyists from land record and the middlemen as well. Copying records from digital repository take less than a minute. Thus, it was not required any middlemen to expedite it. Consequently, building digital repository made intra-actions and entanglements in copyists and the E-service as well as citizens.

8.4 Contexts of Intra-actions in the Organizational and Technological Processes

8.4.1 Removing the Dual Process of Application Submission

Although the E-service process was launched, the organization continued with traditional paper based process in this service. Consequently, a dual process has been developed in application submission: online application and paper based application. Thus, the dual methods of application submissions increased processes, service delivery cost, time, citizens' visit, tasks and involvement of middlemen. The ESC was centralized access point to submit applications for this service. It followed the traditional processes and received paper based hard copy applications from citizens. Thereafter, the ESC put details into the E-service process. Consequently, the ESC entangled with the middlemen through receiving paper based application though the E-service was design to receive paperless online applications. Consistent with this, the DRR followed dual processes, that is, the ESC received paper based applications and the ESC staff made entry all the paper based applications into the E-service network.

In addition, the UDCs and the DWP used to submit online applications for this service but they required sending printed copy of the online submitted applications to the ESC, alongside with the online applications. There are two reasons: pasting fees stamps on the application and preserving applications for inspection and audit. These underlying reasons caused making entanglements in the middlemen and the DRR staff. They also caused to enliven the vested interests in this service because paper based applications gave speed money from the middlemen and opportunity of intra-actions with the middlemen.

The BIE of this study has redesigned the processes of this E-service to receive only online applications instead of paper-based applications and submitted copy of

online applications to avoid the dual process. To receive only online applications, the BIE has removed paper based applications and paper based registers. Further, it has designed an integrated general register to keep detailed information of applications, fees management, job distribution, monitoring and evaluation. Thus, the redesign of the E-service and the organizational processes removed dual processes of application submission and introduced the process of receiving only online applications.

Consistently, the designs and redesigns of the E-service processes for receiving only online applications removed dual and parallel processes of applications submission. Consequently, receiving only online applications removed middleman from this service and ensured citizens' easy access to this service. Further, it made entanglement in citizens and the E-service. Thus, removing paper based applications submission disentangled the middlemen from the DRR staff, citizens and from the E-service as well.

8.4.2 Removing the Dual ID Number of Applications

After introduction of the E-service, the provision dual application ID numbers were emerged: manual ID numbers and online ID numbers. Consistently, after submitting an online application to the E-service, it receives an automated generated ID number. However, the DRR staff issue another parallel and manual ID number on every application from its traditional general entry register of the DRR. Consequently, the manual ID number was functional and it made intra-actions in the DRR staff and the middlemen. Thus, the paper based application process remained entangled with organizational process and the online application process failed to entangle with this E-service. The manual ID numbers were used to track applications by middlemen and intra-act with DRR staff. Thus, the process of using manual ID number for the application was obstacle to entangle the E-service with organizational processes as well as the E-service.

Along the line, BIE of this study involved with designs and redesigns of the organizational contexts and technological processes and developed an integrated

general register that removed both dual ID number on applications. The integrated general register was used to receive paperless applications and putting applications details along with automated generated ID number into that register. This redesign has stopped intra-actions in the DRR staff and middlemen. Consistently, using only automated generated ID number has made entanglements in the E-service and the organizational processes.

Further, removing dual ID has saved time, tasks and resources. Thus, using online ID number made this service quicker. Existence of dual ID numbers of applications was obstacle for entanglement in the E-service and the organizational processes. Removing of manual ID numbers has brought intra-actions in the E-service and the organizational processes as well as citizens. Thus, removing dual ID numbers of applications has diffracted networks between the middlemen and the DRR staff.

Consistently, the online ID numbers were used for work distribution among copyists with blind and random processes. Therefore, the designs and implementation of only online ID numbers for applications has disentangled the DRR staff from middlemen and simultaneously the middlemen were disentangled from the E-service as well.

8.4.3 Monitoring of the DRR

The DRR was surrounded by middlemen and there were entanglements in the DRR staff and the middlemen. Consequently, middlemen had easy access to the DRR staff to expedite their clients' applications through providing vested interests and speed money to the DRR staff. Thus, the middlemen were capable to expedite their clients' applications and giving update to their clients about their applications. Contrary to this, the UDCs' operators had no access to the DRR, copyists and store. Thus, they had also intra-actions and entanglements with the copyists or the sorting staff. So, after submitting applications from the UDCs, there was no option to expedite citizens' applications and to provide any update on their clients' applications. Thus, UDCs and citizens faced problems of uncertainty and delaying in the case of applications submitting by UDCs.

In line, BIE of this study engaged to address these problems of the organizational and technological processes have been redesigned. Firstly, an entry register was designed to trace visitors access to this DRR. Thus, this entry register helped to trace identity of persons and their purpose of visiting the DRR. Secondly, a CCTV has been installed to monitor middlemen entrance to the DRR. Thirdly, using of mobile phone by the DRR staff during working hour in the DRR has also been monitored.

These designs and redesigns have stopped middlemen's entrance into the DRR. Consistently, restricting, watching and monitoring middlemen's access to the DRR have decreased intra-actions and entanglements in middlemen and the DRR staff. Consequently, these designs have brought equal priority to all the applications. Thus, the UDCs submitted applications received quick service delivery and the UDCs entangled with citizens and the E-service as well.

8.4.4 Listing up the Damaged and Tampered Record

About 25% of total records are damaged and about 3 % of records are tampered and illegible. Consequently, there was chance of rejection of applications for this service was about 28% of the total applications submitted for this service due to the grounds of damaged and tampered records. However, the rate of rejection was more than 50% for the applications submitted by UDCs and it was only 1% or 2% in the case of applications were submitted by middlemen at the ESC. Since middlemen had easy access to the DRR and the DRR's store whereby they gathered status (well or damaged) of records before applying. Consequently, the middlemen avoided submitting their clients' applications if the records were damaged or tampered. Contrary to this, the DRR staff prefer rejecting UDCs submitted application due to minimum damage. Thus, citizens continued entanglements with the middlemen to submit their applications and receive this service. Contrary to this, the high rate rejection of applications disentangled the citizens from UDCs.

To address these problems, the BIE has listed up the damaged, tampered and illegible records and the list was disseminated to the UDCs whereby citizens were able to know status (well or damaged) of their records before applying. Consequently, it has reduced rate of rejection of applications due to the ground of damaged and tampered records, particularly applications were coming from the UDCs.

This design, thus, provided information and status of the land records to the UDCs. In turn, it has decreased rejection of applications submitted by UDCs and increased citizens' trust on the E-service. Consequently, intra-actions and entanglements took place in citizens and the UDCs. In turn, intra-actions in middlemen and citizens and intra-actions in the middlemen and the DRR staff were gradually decreased. Therefore, listing up of the damaged, tampered and illegible records made entanglements in citizens and the E-service.

8.4.5 Removing the High Temperature Record Store

The master volumes of land records registers were stored in such a room where there was no proper ventilation and lighting. Consequently, temperature of the record Store was higher than the surrounding and it was detrimental to the preserved land record registers. Thus, this condition expedited damage of preserved records.

Receiving land record service from damaged or partially damaged records was middlemen dependent. Due to acceleration of damage of the preserved records, citizens entangled with the middlemen to access to this service. Consequently, although the E-service was designed to provide citizens' easy access to this service, it failed to attract citizens. Thus, with this condition of records preserved in the DRR Store, citizens failed to entangle with the E-service.

This study has intervened to address these problems. In line, the Store of the DRR was shifted from the high temperature place and united with the Copyists' Room. It was relocated in such a place where there is better ventilation and air circulation with sufficient light. Thus, the redesigned has stopped the gradual damage of land records. More importantly, this redesign has brought the land record registers adjacent to the Copyists' Room. Thus, it has expedited copying land records due to proximity of land record registers and the Copyists Room. Further, it has accelerated digitizing of land records and building digital repository of records. Therefore, this redesign has accelerated the intra-actions and entanglements in citizens and the E-service and gradually decreased intra-actions in citizens and the middlemen.

8.4.6 Removing the Middlemen from Application Submission Process

Inherently different types of middlemen were involved in mediating the land record service. However, after introduction of the E-service the middlemen remained entangled in mediating this service. It has been found that the ESC was used by the middlemen to mediate their clients' applications after introducing this

E-service. Aiming to address this problem, the ESC was stopped to receive applications for this service.

Thereafter, the DWP and UDCs were remained open for submitting applications for this service. However, at this time, it was revealed that middlemen were using the DWP to submit their clients' applications. Consequently, the ESC and the DWP were stopped receiving any application for this. With these designs, the middlemen were disentangled from the ESC and the DWP. However, the middlemen moved to the UDCs to submit their clients' application.

To address this problem, the process of application submission has been redesigned in such a way that no one can submit more than three applications at a time in a day from a UDC. Besides, this service process has redesigned that citizens' need to show the purpose along his or her relations with the land record during application submission for this service.

In order prevent, middlemen's access to the E-service, the UDCs were also instructed to follow the rules of submitting maximum three applications from a citizen in a day. Thus, with these designs and redesigns middlemen gradually have been disentangled from application submission process. Consequently, there also were no intra-actions in the middlemen and the E-service.

8.4.7 Setting a Network for Sending Fee from UDCs

Although the E-service network has been designed for submitting online applications from the UDCs to the DRR, there was no network to send fees to the DRR along with online submitted applications. Consequently, submitting online applications was meaningless because the DRR staff never process any application until it has relevant fees. Since there was no option to send application fees through online, the UDCs operators need to travel from rural areas to the DRR at the district headquarters to send fees to the DRR. Thus, sending fees manually by travelling was a time consumable and costly matter too.

Aiming to address the problem, a network has been designed between the UDCs and the DRR to deposit fees in advance for the online application submitted by the UDCs. Thus, with the process of advance depositing of fees, the DRR have option to credit requiring fees instantly for online submitted applications by the UDCs and the DRR staff become able to processing those applications immediately.

This BIE, thus, addressed long travelling from rural areas to the district headquarters for manual submission of fees after online application submission. Consequently, this designed network between UDCs and the DRR for sending fees has expedited this service delivery for the online submitted applications from UDCs. Thus, the designed network has made this service easy accessible, cost effective and quick delivery. Along the line, it has made interactions and entanglements in the citizens and the UDCs as well as the E-service.

8.4.8 Removing the Dual Date of Service Delivery

The E-service has developed duality in this service not only in the organizational process but also dual dates of service delivery. After submitting an application for the land record service automatically generates a date of service delivery. However, this automatically generated date was not functional because the DRR staff did not follow that at all; rather, they issue manual date of service delivery and follow it. Thus, it has been found that when citizens came from far off villages to receive this service along with automatically generated date of delivery of this service, they knew that the DRR staff issued another date of service delivery. Moreover, frequently the DRR staff failed to maintain the manual date of service delivery in due time. Even though, the DRR staff change of date of service delivery and delaying of the service without informing the citizens. Thus, citizens were frustrated and lost their interest in the E-service.

The BIE of this study has redesigned the organizational and technological processes. Along the line, the manual process of issuing delivery date of for service has been removed and the automatic generated service delivery date has been maintained duly. There also have been developed applications tracking

systems whereby citizens can easily know the status of their applications through telephone inquiry to the DRR staff.

Thus, citizens do not need to contact with either the DRR staff or middlemen to expedite their service. So, following the automated generated date of the delivery of this service has made entanglements in citizens' and this E-service and diffracted the relations between the citizens and the middlemen.

8.5 Conclusion

The above learning and reflection, insights and thick description show how the organizational context, actors, staff, middlemen and technological networks continuously shape and reshape the E-service networks throughout designs and redesigns of organizational and technological processes. Along the line, the study has generated learning and reflection that carried valuable insights directions and guidelines for the organizational actors, the practitioners, the researcher and the professionals. Due to lack of appropriate designs of organizational process, structure, skilled manpower and lack intra-actions in organizational contexts and technological processes, the initial designs of the E-service have failed to build intra-actions and entanglements in the organizational actors (human actors –the staff and the non-human actors –the land records) and the technological networks (the UDCs, the ESC and online applications. Moreover; constitutively entanglements took place in the middlemen, the DRR staff and the E-service network. Consequently, the learning and reflection of this study traced the dynamic and constitutive entangled relations in organizational contexts, actors and processes along with designs and redesigns of technological processes and networks.

Unswervingly, the BIE of this study strived to ensure citizens' easy access to this service, reduce cost, time and visits of citizens to receive this service, expedite service delivery processes and utilize resources effectively. Thus, numbers of intervention have been conducted–uniting the DRR's Store and the Copyists'

Room; cataloguing and classifying of land records; setting networks between UDCs and the DRR as well as Copyists; redesigning citizens' access points of this E-service and route of delivering points of land record to the citizens; digitizing of land record and redesigning of organizational and technological processes.

However, according to the designs and redesigns, the contexts and the actors, the social and the material and the organizational processes and the technological networks have been shifted dynamically and entangled and disentangled constitutively. Consequently, the core reflection of this study is that no contexts organization and roles of the actors and no designs were static; rather, they have shifted from their roles and positions constantly and dynamically. Thus, the sum of learning and reflection of this study is that the E-service need to be designed and to be built in organizational contexts and its continuous entanglements and disentanglements with human and non-human actors needs to be traced, analyzed, redesigned and evaluated concurrently, objectively and subjectively in real life setting of the organizational contexts. Therefore, learning and reflection emerged from continuous designs and redesigns and they helped understanding of constitutive entanglements in technology and organizational contexts as well as the social and the material.

Chapter 9: Conclusion

9.1 Overview of the Dissertation

This study investigated entanglements and disentanglements in technology and organization illustrating the case of E-service of land record in Bangladesh. In line, it has traced different forms of intra-actions, diffractions, performativity, temporalities and pluralities in technology and organization in the E-service of land record in Bangladesh. Consistently, a conceptual literature review has settled sociomaterial constitutive entanglements as its theoretical lens, a broader and umbrella approach. Consistence with the theoretical lens, this study has developed and applied action design ethnographic research (ADER), a wider methodological framework that investigated constitutive entanglements through designs and redesigns of the E-service of land record in Bangladesh. The study has found ADER has offered potential methodological guidelines to trace continuous shaping, shifting and reconfiguring technological networks and organizational processes. Consistently, applying the wider methodological framework in such a complex case with interventional approach, it has applied wide range of methods, techniques and tools aligned with ethnographic research and participant observation methods and relevant with in-depth and qualitative inquiry in this E-service.

Further, this research has contextualized problems of this E-service in the organizational contexts and technological processes. Thereafter, it has involved in designs and redesigns the problems through 'Building Intervention Evaluation' (BIE). Thereafter, it has traced learning and reflection from the BIE of this E-service. Finally the research has identified its contribution to philosophical, theoretical, methodological and practical contexts along with further direction of this research. Consistent with research findings, the dissertation presented with a

total of ten chapters. Following sections provided a brief overview of the thesis accordingly its chapters.

Chapter -1 provided an outline of the study with three interrelated sections framing the research issues, stating motivations and locating paradigmatic strands of this research. Research issues focused on statement of problems, research questions, objectives and scope and nature of the study. The core issue of this research is tracing dynamism, pluralities, insuperabilities, temporalities, performativity, intra-actions and entanglements in technology and organization. In order to deal with the research issue, sociomaterial lens was applied with the three interrelated questions: what is the significance of sociomateriality in tracing entanglements and disentanglements in organization and technology relations and how and why entanglements and disentanglements occurred in technology and organization. In line, this research carried dual objectives contributing to knowledge and addressing practitioners' problems. Through applying, testing and identifying significance of sociomateriality, this study contributed to knowledge of the discipline. Throughout the research, a broader methodological framework was also built and tested successfully. Besides, the study addressed problems of the E-service of land record in Bangladesh and identified potential learning and reflection for the practitioners and professionals.

Studying the E-service of land record in Bangladesh was challenging and complicated. Further, analyzing intra-actions, diffractions and entanglements in technology and organizations required applying numbers of concepts, approaches, tools and lens. There are number of synonymous and confusing concepts and approach. Consistently, chapter -2 conceptualized relevant concepts and approaches into three interrelated sections. Firstly, it defined basic concepts that included information, information systems, IT, artifact, materiality and sociomateriality. Secondly, it provided an overview of E-government and E-governance, IT in public sector organization in developing countries and IT in E-service of land record to focus on studying IT and organization. Finally, it presented recent trends of tracing dynamism in technology and organization. This

chapter, thus, helped to frame theoretical and methodological framework and analyze the problems of the E-service.

Setting up a theoretical framework is very important for IS research. Thus, aiming to frame a theoretical lens for this study, chapter -3 has provided literature review whereby it drew an overview of taxonomy and trend of different lens in socio-technical study of organization and technology. Thereafter, it discussed features and significance of sociomateriality to trace entanglement and disentanglement in organization and technology. However, there are different views and streams in sociomateriality. Particularly there are two prominent streams in sociomateriality. One is analyzing interaction between technology and organization. The other is analyzing intra-actions in technology and organization. Finally, this chapter has built a framework of sociomaterial lens that has traced on intra-actions and entanglements in technology and organization of the E-service. Thus, the framework of this study sought constitutive entanglements in technological and organizational contexts i.e., how and why the social and the materials are continuously entangled and disentangled along with tracing significance of sociomaterial constitutive entanglements lens.

Methodological framework of this study played pivotal role to apply such a wider theoretical lens and reveal insights from the research contexts. Consistently, chapter -4 has presented its methodological framework namely ADER that was framed through conducting ADR in the processes of ethnographic research (ER). Thus, ADER was applied throughout the research as the methodological guidelines. The researcher argued and showed that there are potential complementarities between ER and ADR. Further, this chapter has also located ontological, epistemological and ethical strands of ADER. Consistent with the methodology, the study involved in designs, redesigns, evaluation and identification of learning and reflection in technological and organizational processes of this E-service in Bangladesh.

Selection and application of relevant methods and approaches were significant to gather data from such a complex research context. Consistent with the wider methodological framework, this research applied wide range of methods and approaches. In line, chapter-5 analyzed the nature, significance and processes of applying research methods and approaches of this study. Thus, throughout the long term interventions and intensive observation, this study applied archival method, participant observation, open ended discussion, semi structured or unstructured interviews, focus group discussion, online blog posting and questionnaire survey. These were conducted simultaneously and separately into different phases. Research participants and subjects for this study were chosen very carefully and accordingly ethical guidelines of this University and the discipline. Further, data gathering, verifying, filtering and displaying steps followed cyclical process to ensure correct way of reading the study results.

This study was conducted in natural settings of a public sector organization, District Record Room (DRR), in Bangladesh with a specific focus on E-service of land record. Consistent with the research's goals -tracing underlying contexts, intra-actions, diffraction and entanglements in the E-service, chapter - 6 provided background of the organizational contexts along with use of IT in land record service across developed and developing countries and involvements of intermediaries and middlemen in land related services. In line, this study has settled its focus on E-service of land record in Bangladesh. Consistently, it has provided an overview of land record service in Bangladesh along with the past and present initiatives of using IT in land record service.

Undoubtedly, land record service is essential for citizens of Bangladesh, a land scarce developing country. However, its land record service delivery was full of dysfunctional, corruptive practices, irregularities and vested interests. In line, chapter -7 has formulated problems in the E-service of land record in Bangladesh. The researcher intervened in the organizational contexts and revealed that there were multifarious problems, such as problems with organizational structure and contexts; problems with submission of applications, problems emerged from the

staff, middlemen and vested interests networks. The researcher has categorized the problems into three broad areas: organizational contexts, technological processes and intra-actions in organizational and technological contexts. It has been revealed that the organizational contexts, structure, processes and land record systems were not ready to intra-act with the E-service. Consequently, the E-service failed to ensure citizens easy access, effective and efficient and transparent service delivery of land record to citizens. Although there was country wide 4501 UDCs, 64 ESCs and 64 DWPs for citizens' easy access to this service, citizens had continued to rely on middlemen to access to this service.

Aiming to address the problems of the E-service, the researcher intervened with designs, redesigns and evaluation of the processes and networks of this E-service. In line, chapter -8 presented building intervention evaluation (BIE) of this E-service. Thus, wide range of interventions removed dual and parallel processes, built networks in organizational and technological processes, unified organizational structures and removed vested interests from this E-service. However, concurrent evaluation revealed that the designs and redesigns of the E-service reshaped through further intra-actions occurred in organizational contexts and technological processes. Consequently, new dimensions of problems emerged along with the newly installed designs and redesigns. For instance, to address the parallel access problem, the ESC was stopped as access point of this service. The researcher aimed to prevent middlemen's entrance to this E-service. However, the middlemen shifted from the ESC to the DWP to access to this service. Further, while the DWP was stopped; the middlemen bodily shifted to the UDCs. Thus, aperture, diffraction and intra-actions in the processes, structure and actors in organizational contexts and technological processes of the E-service were continuous and constitutive. Consequently, humans, materials, social and organizational processes and the technological networks were designed and redesigned in several cycles to identify optimum solution to prevent unexpected apertures and diffractions in the E-service.

Throughout the 'building intervention evaluation', the researcher involved in designs and redesigns of the E-service identified numbers of learning and reflection. In line, chapter - 9 presented major issues of learning and reflection emerged from this study. The main learning and reflection from this study is that no design is stable or static in the organizational contexts; rather every design was shaped by the organizational contexts and y the organizational contexts and technological processes were shaped by designs and redesigns of the E-service. Both the organizational contexts and the technological networks intra-act equally and constitutively in shaping and reshaping of the E-service. Thus, every design of the E-service required continuous evaluation and further redesigns. Consequently, learning and reflection emerged from continuous tracing problems through identifying apertures, diffraction and entanglements is endless and designs and redesigns of the E-service as well as technology and organizational contexts.

Finally this study identified its contributions, strength and limitation and implications in chapter -10. It outlined contributions into four areas of IS research: philosophy, theory, methodology and practice. This study advocated pluralistic epistemology through successful application positivist and interpretivist epistemological lens in this study. Notably, it forwarded sociomaterial lens in IS research along with particular focus on intra-action stream of sociomateriality. Particularly it is valuable in tracing continuous entanglements and disentanglements in technology and organizational in complex context in developing countries.

More importantly, the study has developed a broader methodological framework and applied it successfully throughout this study. Consequently, it is argued that ADER is significant and wider research methodology to trace designs and redesigns of technology and organization. Finally this study has made significant contribution to address practitioners' problem particularly in the E-service of land record in Bangladesh. The study result had been implemented throughout the country. Consistently, results of this study were disseminated among the E-service

practitioners in Bangladesh. Further, a good numbers of articles have been published in the scholarly journals and conferences. Thus, this study has ensured rigor and relevance.

9.2 Research Contributions

9.2.1 Contribution to IS Philosophy: Empirical, Real and Actual Worlds in the E-service

Since IS as a discipline belongs to both natural and social sciences, it is an interface between behavioral and design science paradigms. In line, Lee (2010) claims that IS is moving towards research based disciplines by modeling itself in the professions, such as medicine, engineering, architecture and law. Thus, IS research needs to be built on the paradigms that could handle equally both natural and social sciences phenomena. Consistently, philosophical, theoretical and methodological trends in IS also have been moving toward pluralism to trace ensemble, constituent, mutual dependent and plural relations in technology and organization(Thompson, 2012; Sein *et al.*, 2011; Orlikowski, 2010; Orlikowski and Scott, 2008; Orlikowski, 2007; Rose and Jones, 2005; Brooks and Atkinson, 2004). Thus, pluralism has become emerging trend in IS research and it has brought benefits of wider lens through integrating research paradigms in various levels: ontology, epistemology, axiology, methodology and methods.

Along the line, this study has applied pluralist efforts from ontology to methodology. It applies critical realism as an ontological strand that embraced both realism and constructivism. Applying critical realism, this study has formulated research problems in wide range and revealed significant insights. Thus, within the purview of ensemble, co-constituent, mutually dependent relations in technology and organization required broader lens to formulate problems in organizational contexts and designs and redesigns solutions of that problems along with concurrent evaluation. In line, critical realism offered wider approaches and lens embracing with causal affect analysis, containing scientific

rules and methods and interacting with different worlds and their interpretations and analyses. Thus, critical realism recognized limitation of access to the different worlds of the actors. Consequently, applying a critical realism offered flexibility to go fore and back from data collection to analyses of findings. Evidently, till the potentials of critical realism has remained underexplored. Thus, identifying relevance of critical realism by this study is a significant contribution to understanding IS philosophical trend and potentials.

The recent trend of IS research is moving toward a pluralist epistemology that has attracted the researcher. Consistently, this study applied pluralist epistemology to harness complementarities between positivist and interpretivist. With this regard, positivist epistemology offered advantage with tracing causal effect and data driven problems, objective evaluation, applying researcher skill and knowledge in designs and redesigns and identifying generalized principles in the E-service of land record in Bangladesh. Contrary to, interpretive perspectives offered inductive analyses, context driven problems, organizational actors' knowledge and skills in designs and redesigns, conducting subjective evaluation and identifying learning and reflection from this E-service.

Consequently, applying pluralist epistemology in this study helped to understand the E-service designs and processes in the complex public sector organization in a developing country, Bangladesh. Consistently, to make this research relevant to the practitioners and professionals, pluralist epistemology played vital to capture complex dynamism and reveal underlying from organizational contexts and technological networks and processes.

Since pluralistic epistemology offers potential benefits for applying wider theoretical and methodological lens, this study applied wider and pluralist epistemology that was vital to grasp well the complex reality and multiplicity across technology-organization in the E-service of Bangladesh. The researcher has applied wider sociomateriality as theoretical lens and ADER as methodological lens to trace dynamism and designs of the E-service of land record in Bangladesh. Consistently, this study had successfully employed pluralism from epistemology

to methodology to methods of data collection. Thus, this study has advocated using pluralist epistemology for enhancing rigors of IS research. Consequently, exploring and applying pluralist epistemology in this research could be seen as a significant contribution to the philosophical trend of IS research.

9.2.2 Theoretical Contribution

Recent theoretical debates in IS discipline is centering on practical and material turns in studying technology and organization. Consequently, many theories in IS are incapable to interpret ubiquitous networks and practices around technology and organization. In line, sociomateriality emerged as wider theoretical lens that seeks to analyze pluralities, temporalities, entanglements and mutual dependency in technology and organization (Cecez-Kecmanovic *et al.*, 2012). Thus, it is inferred that technology and organization are constitutively entangled through social, ethical, moral, political and emotional implications and consequences (Ivero, 2011; Bratteteig, 2003). Thus, sociomateriality offered wider umbrella approach to study technology and organization with equal attention on both the social and the material.

While there was a long felt need of wider theoretical lens for studying IS phenomena in developing countries, sociomateriality had offered its wider lens and umbrella approach. However, until now sociomateriality has remained as an abstract concept and contained many jargons. Most of the published articles on sociomateriality have provided conceptual discussion that contains number of vocabularies and approaches. Although sociomateriality develops numbers of lens and approaches to trace complex relations in technology and organization but there is little evidence of their applications in IS research, particularly in developing country contexts. This study, thus, contributed to enhance sociomateriality by applying and testing its lens and approaches in a complex organizational context in Bangladesh, a developing country. Consequently, this study has served at least dual contributions to the theoretical knowledge of IS:

firstly, it has applied sociomateriality in a complex organizational context; and secondly, it has applied sociomateriality in a developing country context.

Besides, sociomateriality has at least two distinct streams in IS research: 'interaction' and 'intra-action'. This study has applied and advocated for intra-action lens. Thus, this study contributed to advancing the 'intra-action' stream of sociomateriality (Barad, 2003, 2007; Orlikowski and Scott, 2010). Notably, it was a pioneering study of applying sociomateriality in IS research, particularly in a context of developing country. Consistently, this study has illustrated sociomaterial lens with a case of E-service of land record in Bangladesh and showed how the social and the material, human and nonhuman and formal and informal are constantly and constitutively entangled and disentangled with ongoing and ceaseless processes. The study has revealed that material or nonhuman (the land record, the registers, application process, IT networks, and institutions) and the social (the informal intermediaries, infomediaries, the staff and organizational managers) are inextricably inseparable and dynamically entangled and disentangled in the process of the E-service. Also it is appeared that middlemen were continuously entangling with the E-service or overcoming the disentanglements designed by the organizational managers and the researcher. Thus, that constitutive entanglement and disentanglements in the E-service were iterative, inevitable and inseparable and continuous.

Throughout tracing the entanglements and disentanglements in the E-service, this study has found that constitutive entanglements could not take place alone entanglements from the material actors (IT networks: the telecentres, web portal and E-center) or only with social actors (organizational processes, staff, managers, land record, rules and regulations). Rather, a constitutive entanglement requires entanglements from the non-human and human actors, social and material actors and organizational and technological actors. Consequently, analyses of ongoing designs and entanglements gave better understanding of constitutive entanglement and disentanglement indifferent actors involved in the E-service of land record in Bangladesh. Thus, illustrating the case of E-service of land in Bangladesh has

identified significance of sociomaterial constitutive entanglement lens. Particularly, this study has advocated and forwarded significance of 'intra-action' lens for tracing constitutive entanglements. Thus, the researcher has argued that the core argument of sociomateriality is entrusted with intra-action lens.

Consistently, this study has applied 'intra-action' lens as a core lens to understand continuous constitutive entanglements and disentanglements in the social and the material of the E-service. Further, analyses of intra-actions have also unveiled relevance and significance of applying sociomateriality in IS phenomena in developing countries' contexts. Thus, it is appeared that throughout the designs and redesigns of the E-service the organizational context and the technological processes were inseparable and constitutively entangled.

Consequently, any apriori separation between the social and the material as well as any separation between organizational contexts and technology failed to trace their dynamic, constitutive and entangled relations. Conversely, applying interaction lens could not put the organizational contexts and technology in one world; rather, it puts one over the other and one is determinant for the other.

Through applying sociomaterial entanglement lens, it has been revealed that every design and redesign aimed to build entanglement in the citizens and the E-service and disentanglement in middlemen and the E-service as well as citizens. However, middlemen and the DRR staff continuously sought apertures and diffraction in every entanglement that was designed in the citizens and the E-service. The other way around is that any entanglement in the E-service and citizens was constraints for the entanglements in the DRR and the middlemen. In turn, they put constraints in the entanglements in the E-service and the citizens through making apertures and diffractions. Consequently, the middlemen always find ways to intra-act with the citizens. Thus, middlemen's intra-actions with the DRR staff and citizens were major constraints in building constitutive entanglements in the E-service and the citizens. Resultantly, every design aimed to disentangle the middlemen from the E-service, the DRR staff and the citizens. In other words, every design strived to entangle the citizens and the DRR staff with the E-service. Henceforth, building

entanglements and disentanglements and striving for settling constitutive entanglements or diffracting of any constitutive entanglements are continuous, endless, unsettled and temporal process.

Consistently with these, this study applied 'intra-action' lens and identified that there was continuous shifting, temporalities, diffractions, and entanglements in the technological networks and organizational contexts of the E-service. It was remarkably visible that when the E-service was designed and redesigned the organizational and technological processes and the role of actors dynamically shifted and disentangled from the newly designed organizational contexts and technological processes. Thus, this study has claimed that the intra-action lens of sociomateriality is important instead of the interaction lens. Therefore, this study has contributed to theoretical knowledge by identifying relevance and significance of sociomateriality with a particular focus on intra-action lens to study dynamism, inseparability and pluralities in technology and organizations.

9.2.3 Practical Contribution

IS research in developing countries carries dual goals: one is to develop, implement and use of information systems in organizational context and the other is to trace root causes of obstacle behavior and processes in social, political, economic and cultural contexts (Avgerou and Madon, 2004; Walsham, 2001; Avgerou and Walsham, 2000). Consistently, this study has focused on both the designs and redesigns of the E-service and obstacle behavior and processes of the organizational context. The E-service of land record is complicated and dominated by vested interests. Further, there are also various dimensions of interests and invisible actors. Consequently, the designs of E-service of land record were not accepted by actors and contexts of the organization. The E-service of land record was launched in such a complex organizational context that was evolved with numbers of processes and actors for about last 200 hundred years. Thus, there have been developed various forms of vested interest actors and obstacle behavior. After introducing this E-service, the organization -the DRR, was facing

challenges from organizational processes and contexts. Consequently, the researcher has conducted this study with a researcher-client agreement and focused equally on the E-service designs and obstacles behavior and processes and contexts of the organization.

This study has revealed that the initial designs of the E-service failed to recognize the role of 'vested interest networks' in the land record service as well as in the organizational processes because it was designed by sitting outside the organizational contexts. Consequently, the practitioners had been facing problems in implementing the E-service of land record. In line, the researcher intervened in the organizational context and identified the problems in the designs of the E-service and obstacle behavior and processes of the organization to address its problem in organizational and technological contexts and processes. Thus, the researcher and the organizational managers have intervened through designs and redesigns in different cycles. Accordingly, this study has made significant improvement in the E-service through designs and redesigns of the technological and organizational processes.

Since the field of the E-service of land record in Bangladesh carried complex problems in organizational processes and contexts, the researcher applied ethnographic approaches and intensive participant observation along with ADR. Consequently, this study has revealed the underlying obstacles and networks in the E-service and these were disseminated to the organizational managers and decision makers. In line, both the researcher and the organizational managers played significant role in designs and redesigns of the E-service. Further, this study was conducted through collaboration with the practitioners and thereby it has applied ADER to address practitioners' problems. Consistently, ADER uncovered insights of the organizational contexts and contributed to address practitioners' problems through intervening in the organizational contexts and designing and redesigning of the E-service processes. Furthermore, applying 'thick description' under the ADER framework, this study has presented its

findings systematically with full of insights that contributed to knowledge and enhances practitioners' understanding on the problems of the E-service.

Thus, applying ADER has made significant improvement in this E-service. Since, the organizational contexts of the E-service was complex, using ethnographic approaches under the ADER framework generated insights to understand the processes, actors and networks involved in the E-service. Therefore, applying ADER has offered significant to analyze and display diverse and dual roles of actors involved in this service and the ways of shifting of their roles and vested interests along with designs and redesigns of the E-service.

9.3 Strength and Limitations of the Study

9.3.1 Validity of the Study

Every scientific research strives to ensure validity of research. Validity refers to the goodness, authenticity, credibility and quality of a research (Guba and Lincoln, 1994). There are two major indicators of measuring validity of a research: theoretical validity and empirical validity. However, theoretical and significant empirical assessments were two broader categories of validity of study results (Recker, 2012). Theoretical validity could be seen as internal validity that measures appropriateness of research design that includes theoretical framework, research methodology, methods of data collection and data analyses. Further, it ensures and coherence between the research elements of the research design. On other hand, empirical validity includes external validity that assesses to what extent the study findings can be generalized; predicted future outcome and ecologically sound with real-life situation (Recker, 2012).

This study has applied significant measures to ensure theoretical and empirical validities. It has traced limitations of existing theories in IS discipline and identified recent trends of theories. Consistently, this study has settled its theoretical strand on sociomaterial lens. However, the researcher was not biased

with sociomateriality; rather, he has also identified limitations of sociomaterial lens and aware of them. Further, although the research has settled sociomateriality as its theoretical lens, it was not fix up with any theoretical framework. Consequently, it has left open its theoretical framework under the broader umbrella of sociomateriality. Thus, this study portrayed validity in identifying and applying of its open ended theoretical lens.

Besides, from methodological point of view, this study has identified and applied a wider methodology - ADER. Thereby, it has strived to avoid rigidity or biasness to the methodological framework. Moreover to ensure rigors and relevance, this research has taken significant challenges to apply ADR along with ER framework. Thus, ADER has formulated problems from both data driven and context driven in real life situation, applied both insider's and outsider's views to brought together knowledge and skills of the researchers and the practitioners aiming to address practitioners' problems and conduct both objective and subjective evaluation to avoid biasness and conflict of interests. Thus, ADER embraced wide range of methods and approaches that have enhanced validity and reliability of this research.

Along the line, the study has strived to ensure empirical validity of this research through a number of measures. Firstly, the research was conducted in practical settings of organizational contexts of this E-service. Secondly, it has intervened in the organizational contexts with research-client agreement. Thus, the findings are also validated by the practitioners' of this organization. Thirdly, it has significantly improved the processes of the E-service. Thus, it has solved the practitioners' problems. Fourthly, significant numbers articles have been published in recognized journals and academic forums in IS discipline from the findings of this research. Fifthly, the study findings have been disseminated among the practitioners and formalized by number similar organizations of this E-service. Finally, the practitioners' of this E-service joined as co-authors in publication of the research findings. Thus, this research has ensured empirical validity.

Moreover, this study has applied rigorous subjectiveness and creativeness to ensure scientific processes of this research and seeks internal and external validities and theoretical and empirical validity of the study. Additionally, this research has examined and synthesized findings from insider and outsider viewpoints and it has ensured credibility, integrity, criticality and authenticity and to achieve validity criteria and vividness, creativity, thoroughness and explicitness.

9.3.2 Strengths and Limitations of the Study

Like all research, it had a few strengths and limitations in its ontological, epistemological, methodological, and practical contexts. Firstly, qualitative methodology and methods of this study ensured in-depth understanding on the research issue but it might not be subjectivity free. Secondly, the researcher was an employee of the government and already had had experience of working in the similar organizations. It could be strength to gather empirical knowledge but it could provoke biasness too. Thirdly, the researcher's engagement with the contexts could influence the research process. However, the researcher strived to address these issues. Consistently, the researcher applied wide ranges of methods and number of techniques together for data collection and analyses to reduce influence the position of the researcher and increasing validity through verification. Further, the selected case as well as the organization was not studied earlier. Thus, the case was virgin and the research participants were undisturbed in their natural settings. Moreover, though the research was funded by the government, no such condition on the research had been laid down as could influence the result of the study in any way whatsoever.

Although this study applied thorough pluralities from ontology to epistemology to methodology and methods, anyone can be triggered on the plurality ground of this study to criticize validity of research findings. However, the researcher has identified and showed vividly that there are significant trends, grounds, reasons and opportunities to apply pluralities. Therefore, pluralities in this study can be

seen as a potential strength of validating of the research findings and addressing problems of the practitioners of the E-service.

9.4 Implications of the Study

9.4.1 Issues of Generalizability

It is challenging to generalize from qualitative research. However, applying ADER offers potentials to identify significant number of generalizable principles from designs and redesigns of this E-service. Many these principles have already been implemented and replicated to the E-service of land record. Consistently, the National Project Director of A2I has officially instructed to all of the Deputy Commissioners of the country implement the UDCs-DRR network that has been designed by the research to receive online applications, fees for online applications and method of service delivery.

Further, the principle of receiving online applications from citizens and delivering services to the citizens through UDCs could be easily replicated and applied to many other public services. They are: driving license, passport, and inheritance certificate and so on. Besides, numbers of land related services are delivered directly from public sector organizations as centralized processes. More importantly, this design principle can be immediately applied to a numbers of land record related services. They are: attested copy of land acquisition cases from office of the Deputy Commissioner, attested copy of land deeds (*doliler nokol*) from the office of the Sub Registrar, attested copy of land survey record (*maat porcha*) from Office of the Zonal Settlement; land ownership mutation (*Namjari*) from Upazilla Land Office, attested copy of case record or attested copy judgment from courts. Thus, the redesign network of E-service through UDCs could be easily applied and replicated for wide range of services.

The incumbent government designed country wide IT networks among public offices, telecentres and citizens. However, the service delivery process was not been designed and redesigned according to the IT networks. Consequently, neither the public sector organizations nor the citizens were able to harness the advantage of the IT network. With the existing centralized process, obsolete bureaucratic systems, archaic laws and regulations and rigid norms and attitudes were main challenges toward harnessing the benefits.

However, applying the generalized design principle helped removing parallel and dual processes. Meanwhile through applying the design principles, the UDCs successfully performed the labors registration which was previously done by middlemen, broker and the Manpower Bureau of the country. Consequently, for the first in the country without any middlemen and brokers, UDCs registered about seven hundred thousand labors for their employment opportunity in Malaysia. Thus, the generalized designed principle helped to remove middlemen through avoiding parallel and dual processes and ensuring citizens' intra-actions with only UDCs. Therefore, the method of this service through UDCs had also been formalized later on with a courier and parcel company. Therefore, this study finding have identified a wide range of generalized principles that were formalized in the E-service of land record service and many other similar areas of the public service.

9.4.2 Reflection of the Researcher

Reflection of the researcher has drawn from tracing continuous intra-actions and diffraction in the E-service. Consistently, throughout the research, it has been found that intra-actions in the DRR staff and the middlemen reshaped every design of this E-service. It was difficult to speculate and predict their intra-actions beforehand. Thus, the researcher changed the initial design of the E-service and followed designs and redesigns into a number of cycles. In order to identify the ways and processes of middlemen's intra-actions in this E-service, the researcher sometime applied both active participation and in other time disguised his identity

too. These double roles of this researcher were helpful to trace intra-actions in middlemen and the DRR staff. In line, to prevent middlemen's' intra-actions with this service, sometime push the organizational managers to change the mode of service and redesign of the organizational structure because there were numbers of loopholes and apertures in the organizational contexts for not intra-actions in this service and the middlemen. However, there was strong resistance to the change of the organizational processes. This could be seen as a significant reflection of this researcher.

Consistently, from the reflection of the researcher, it can be drawn that the initial design of the E-service merely intra-acted with the organizational processes and citizens; rather, the organizational processes have diffracted the E-service network through citizens-middlemen-staff intra-actions. Consequently, the initial design of the E-service failed to trace middlemen's entanglement with this service and their intra-actions with the citizens and the staff. The researcher found that the middlemen and the DRR staff mutually intra-act with the E-service. However, the consultants of the A2I and organizational managers were happy with the E-service system that had made significant improvements in this service and they never acknowledged even the presence of middlemen or they did not make any effort to prevent middlemen's intra-actions. Thus, it was difficult for the researcher to convey and communicate to the organizational managers and consultants on the issues of the problems persisted in the E-service and role of the middlemen.

9.4.3 Research Implications

The purview of this research is very wide that includes both the organizational contexts and technological network. Thus, drawing implications through focusing on standalone technological processes without tracing underlying contexts of technological design and organizational processes; E-service could not improve public service delivery. Consequently, tracing continuous intra-actions in technological processes and organizational contexts are significant for designing effective E-service for citizens' easy access to public service and removing

corruption and middlemen's exploitation from public service. Thus, intra-actions in the E-service were emergent, temporal, ongoing and constitutively continuous processes that reconfigured every design. As it can be seen that designs of technology for this E-service was one thing, but underlying contexts and interests of actors at all levels were stronger than the E-service network. Thus, successful design of any E-service is equally relied on tracing intra-actions in technological processes and organizational contexts.

Working with non-human actors -technology and artifacts and human actors - the staff, managers and consultants; the social and the materials and hardware and software, this study inferred that the material actors or the non-human actors are equally important to the social actors as well as the human actors. Further, they are also equally proactive with the social and human actors. Furthermore, they are able to create constraints and capable to overcome some constraints. Consequently, behaviors of human and non-human actors were unpredictable equally. Thus, it is obvious and inevitable for IS researcher studying technology and organization to put equal attention on the social and the material as well as the human and the non-human actors.

The case implied that dense population, agro-based economy and rapid urbanization have made land record and land record service more significant to citizens, public sector organization, investors and policy makers. However, the historical and organizational contexts of the land record system of this country contained complicacy, segregation, fragmentation, jargons, errors, mismanagement and vested interests in the land record service. Thus, putting attention alone on technology to design the E-service cannot address these problems. Keeping enliven these problems in the land record systems and land record service in this country would easily give intra-actions and diffractions in the E-service. Thus, it is inevitable for the government to develop accurate, unified, authentic land record systems and land information systems (LIS). Further, land records should be integrated with GIS, LIS and GPRS along with other scientific and practical usability. More importantly, land record and the E-

service of the land record in Bangladesh should be made understandable by citizens and must compatible.

9.5 Directions for Further Research on the Issue

This study assessed usefulness, relevance and potentials of sociomateriality as a theoretical lens and ADER as a methodological framework for IS research to design and redesign of technology and organization and trace constitutive entanglements and disentanglements in technology and organization. Consistently, it has conducted a qualitative research on the E-service of land record in Bangladesh and traces its designs and constitutive entanglements. So, a further study could be conducted with the same issues with a quantitative approach to reexamine the study results. Besides, this study has conducted on only one components of the land record service i.e., attested copy of land record. However, this study has inferred that the E-service can be designed for service delivery of attested copy of land registration deeds, draft record of rights during cadastral survey and update land records (mutation of land record) through UDCs. Thus, it is significant to conduct further study implement to the study results into the wider areas of land record service.

Further, this study applied a particular stream of sociomaterial lens i.e. intra-action. Thus, a further study can be conducted with both the streams: intra-actions and interaction and thereby comparative analyses can be generated to foster sociomateriality in IS research. Finally, Bangladeshi diasporas have been living all around the world and they have great fascination in investing in land and they also have problems with their land records in Bangladesh and for them it is a vexatious problem. To address this problem with the help of the generalized principles derived from this study, a study can be conducted to develop an E-service network between the UDCs and the Bangladeshi missions in abroad. Last but not the least, the E-service of land record could serve much such small, local, national or international area through introducing an integrated land information system in Bangladesh along with land data network that would serve all sort

service and information of land from a common platform at the local, national and global contexts for many purposes. Therefore, the E-service of land record in Bangladesh is such an important area where researchers from a wide of range of disciplines and practitioners from various fields may come forward to explore the unexplored potentialities.

References

- Acharya, R.B. (2009) 'Adopting Geo-ICT for land administration: problems and solutions', *7th FIG Conference, 'Spatial Data Serving People: Land Governance and the Environment – Building the Capacity'*, Hanoi, Vietnam, 19-22 October 2009: .
- Adler, P. and Adler, P. (1994) 'Observational Techniques', in Denzin, N. and Lincoln, Y. (eds.) *Handbook of qualitative research*. London: Sage.
- Agar, M.H. (1986) *Speaking of Ethnography*. Newbury Park: Sage.
- Alam, M.S., Brooks, L. and Abbott, P. (2012) 'Action Design Ethnographic Research - In Search of a Rigorous Methodology for IS Research', *Proceedings of SIG GlobDev Fifth Annual Workshop, Orlando, USA December 16, 2012*. AIS.
- Alam, M.S., Brooks, L. and Khan, N.I. (2012) 'Action Design Ethnographic Research (ADER): Vested Interest Networks and ICT Networks in Service Delivery of Land Records in Bangladesh', *Future of ICT Research, IFIP AICT 389, IFIP International Federation for Information Processing 2012*. New York: Springer, 51–67.
- Aldrich, H.E. (1972) 'Technology and Organizational Structure: A Reexamination of the Findings of the Aston Group', *Administrative Science Quarterly*, 17(1), pp. 26-43.
- Alter, S. (2012) 'Exploring the Temporal Nature of Sociomateriality from a Work System Perspective', *AMCIS 2012 Proceedings. Paper 13*. .
- Anderson, R.J. (1994) 'Representations and Requirements: The Value of Ethnography in System Design', *Human-Computer Interaction*, 9(2), pp. 151.
- Andrew, T.N. and Petkov, D. (2003) 'The need for a systems thinking approach to the planning of a rural telecommunications infrastructure', *Telecommunications Policy*, 27(1), pp. 75-93.
- Angelo, H. (2011) 'Hard-wired experience: sociomateriality and the urban everyday', *City*, 15(5), pp. 570-576.

- Archer, M.S., (1995) *Realist Social Theory: The Morphogenetic Approach*. Cambridge, UK: Cambridge University Press.
- Archer, M.S., Bhaskar, R., Collier, A., Lawson, T. and Norrie, A. (1998) *Critical Realism Essential Readings*. London: Routledge.
- Argyris, C., Putnam, R. and Smith, D.M. (1985) 'Action Science: Promoting Learning for Action and Change', in Argyris, C., Putnam, R. and Smith, D.M. (eds.) *Action Science: Concepts, Methods, and Skills for Research and Intervention*. San Francisco: Jossey-Bass Publishers, pp. 36-79.
- Arthur, W.B. (2009) *The Nature of Technology: What It Is and How It Evolves*. New York: Free Press.
- Atkinson, C.J. and Brooks, L.S. (2003) 'StructurANTion: A theoretical framework for integrating human and IS research and development', *AMCIS 2003 Proceedings. Paper 378.* , 2895-2902.
- Atkinson, P. and Hammersley, M. (1994) 'Ethnography and participant observation', in Denzin, N.K. and Lincoln, Y.S. (eds.) *Handbook of Qualitative Research*. London: Sage, pp. 248-261.
- Attewell, P. and Rule, J. (1984) 'Computing and organisations: What we know and what don't know', *Communications of the ACM*, 27(12), pp. 1184-1191.
- Avgerou, C. and Walsham, G. (eds.) (2000) *Information Technology in Context: Studies from the perspective of developing countries*. London: Ashgate.
- Avgerou, C. (2008) 'Information systems in developing countries: a critical research review', *Journal of Information Technology*, 23, pp. 133-146.
- Avgerou, C., Ciborra, C.U., Cordella, A., Kallinikos, J. and Smith, M. (2005) *The role of information and communication technology in building trust in governance: Towards effectiveness and results*. Washington: Inter-American Development Bank, Washington.
- Avgerou, C. and Madon, S. (2004) 'Framing IS studies: Understanding the Social Context of IS Innovation', in Avgerou, C., Ciborra, C. and Land, F. (eds.) *The Social Study of Information and Communication Technology: Innovation, Actors and Contexts*. London: London School of Economics and Political Sciences, pp. 162-182.

- Avgerou, C. (2008) 'State of the Art: Information systems in developing countries: a critical research review', *Journal of Information Technology*, 23, pp. 133-146.
- Avgerou, C. and McGrath, K. (2007) 'Power, Rationality, and the Art of Living through Socio-Technical Change', *MIS Quarterly*, 31(2), pp. 295-315.
- Avison, D.E. (1997) 'The Search for the 'Discipline' of Information Systems', in McKenzie, G., Powell, G. and Usher, R. (eds.) *Understanding Social Research: Perspectives on Methodology and Practice*. London: Falmer Press, pp. 196-209.
- Avison, D., Lau, F., Myers, M. and Nielsen, P.A. (1999) 'Action Research', *Communications of the ACM*, 42(1), pp. 94-97.
- Aziz, M.A. (2003) *Land records systems in Bangladesh: an analysis of problems and possible solutions*. Dhaka: National Defence College.
- Bachelard, G. (1984) *The New Scientific Spirit (Translation of Le Nouvel Esprit Scientifique 1934)*. Boston: Beacon Press.
- Bailey, A. (2009) 'Issues affecting the social sustainability of telecentres in developing contexts: A field study of sixteen telecentres in Jamaica', *EJISDC*, 36(4), pp. 1-18.
- Bailey, J.P. and Bakos, J.Y. (1997) 'An exploratory study of the emerging role of electronic intermediaries', *International Journal of Electronic Commerce*, 1(3), pp. 7-20.
- Baker, J., Avital, M., Davis, G., Land, F., Morgan, H. and Wetherbe, J.C. (2011) 'ICIS 2010 Panel Report: Technologies that Transform Business and Research: Lessons from the Past as We Look to the Future', *Communications of the Association for Information Systems*, 28(Article 29).
- Barab, S.A., Thomas, M.K., Dodge, T., Squire, K. and Newell, M. (2004) 'Critical Design Ethnography: Designing for Change', *Anthropology & Education Quarterly*, 35(2), pp. 254-268.
- Barab, S. and Squire, K. (2004) 'Introduction: Design-Based Research: Putting a Stake in the Ground', *The Journal of the Learning Sciences*, 13(1), pp. 1-14.
- Barad, K. (2007) *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke University Press.

- Barad, K. (2003) 'Posthumanist performativity: Toward an understanding of how matter comes to matter', *Signs*, 28(3), pp. 801-831.
- Barley, S. (1986) 'Technology as an occasion for structuring: evidence from observation of CT Scanners and the social order of radiology departments', *Administrative Science Quarterly*, 31, pp. 78-108.
- Barley, S.R. (1988) 'Technology, power, and the social organization of work', *Research in the Sociology of Organizations*, 6, pp. 33-80.
- Barley, S.R. (1996) 'Technicians in the Workplace: Ethnographic Evidence for Bringing Work into Organization Studies', *Administrative Science Quarterly*, 41(3), pp. 404-441.
- Barley, S.R. (1990) 'The Alignment of Technology and Structure through Roles and Networks', *Administrative Science Quarterly*, 35(1), pp. 61-103.
- Barley, S.R. and Kunda, G. (2001) 'Bringing Work Back In', *Organization Science*, 12(1), pp. 76-95.
- Barnes, G. (2007) 'Developing Cost-effective and Resilient Land Administration Systems in Latin America', *6th FIG Regional Conference*, San José, Costa Rica 12–15 November 2007: Available at:<http://www.fig.net/pub/costarica/index.htm> (accessed on 30 Dec 2011).
- Barua, A., Brooks, L., Gillo, K., Hodgkinson, R., Kohli, R., Worthington, S. and Zukis, B. (2010) 'Creating, Capturing and Measuring Value From IT Investments: Could We Do Better?', *Communications of the Association for Information Systems*, 27(2), pp. 13-26.
- Baskerville, R.L. and Wood-Harper, A. (1996) 'A critical perspective on action research as a method for information systems research', *Journal of Information Technology (Routledge, Ltd.)*, 11(3), pp. 235-246.
- Baskerville, R.L. and Wood-Harper, T. (1998) 'Diversity in information systems action research methods', *European Journal of Information Systems*, 7(2), pp. 90-107.
- Baskerville, R. (1999a) 'Action Research For Information Systems', *AMCIS 1999 Proceedings*. <http://aisel.aisnet.org/amcis1999/288>, Paper 288.
- Baskerville, R.L. (1999b) 'Investigating information systems with action research', *Communications of the Association for Information Systems*, 2.

- Baskerville, R. and Myers, M.D. (2004) 'Special Issue on Action Research in Information Systems: Making is Research Relevant to Practice--Foreword', *MIS Quarterly*, 28(3), pp. 329-335.
- Baskerville, R. and Pries-Heje, J. (1999) 'Grounded action research: a method for understanding IT in practice', *Accounting, Management and Information Technologies*, 9(1), pp. 1-23.
- Becker, H. (1970) '1970. Interviewing medical students', in Filstead, W.J. (ed.) *Qualitative methodology*. Rand McNally, Chicago, pp. 103-106.
- Becker, S., Crandall, M.D., Fisher, K.E., Kinney, B., Landry, C. and Rocha, A. (2010) *Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries*. Washington, DC: Institute of Museum and Library Services.
- Bell, E. and Bryman, A. (2006) 'The Ethics of Management Research: an exploratory content analysis', *British Journal of Management*, 17, pp. 1-13.
- Bell, D. (1979) 'Communications technology--for better or for worse', *Harvard business review*, 57(3), pp. 20-42.
- Benbasat, I. and Weber, R. (1996) 'Research Commentary: Rethinking "Diversity" in Information Systems Research', *Information Systems Research*, 7(4), pp. 389-399.
- Benbasat, I. and Zmud, R.W. (1999) 'Empirical research in information systems: The practice of relevance', *MIS Quarterly*, 23(1), pp. 3-16.
- Bentley, R., Hughes, J.A., Randall, D., Rodden, T., Sawyer, P., Shapiro, D. and Sommerville, I. (1992) 'Ethnographically-informed systems design for air traffic control', *Proceedings of the 1992 ACM conference on Computer-supported cooperative work (CSCW '92)*. New York:NY: ACM.
- Bentsi-Enchill, K. (1965) 'Do African Systems of Land Tenure Require a Special Terminology?', *Journal of African Law*, 9(2), pp. 114-139.
- Berg, B.L. (2004) *Qualitative Research Method for the Social Sciences*. New York: Pearson.
- Bessant, J. and Rush, H. (1995) 'Building bridges for innovation: the role of consultants in technology transfer', *Research Policy*, 24(1), pp. 97.

- Beynon-Davies, P., (2009) 'Information Systems as Socio-Technical or Sociomaterial Systems', *AMCIS 2009 Proceedings*.
- Beynon-Davies, P. (1997) 'Ethnography and information systems development: Ethnography of, for and within is development', *Information and Software Technology*, 39(8), pp. 531-540.
- Bhaskar, R. (1998) 'General Introduction', in Archer, M.S., Bhaskar, R., Collier, A., Lawson, T. and Norrie, A. (eds.) *Creatical Realism: Essential Readings*. London: Routledge, pp. ix-xxiv.
- Bhaskar, R. (1991) *Philosophy and the idea of freedom*. London: Verso.
- Bhaskar, R. (1978) *A Realist Theory of Science*. Sussex: Harvester Press,.
- Bhatnagar, S. and Schware, R. (2000) *Information and communication technology in rural development: case studies from India*. Washington: World Bank Institute.
- Bijker, W.E. (1995) *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. Cambridge,MA: MIT Press.
- Bijker, W.E., Hughes, T.P. and Pinch, T. (1987) *The Social Construction of Technological Systems*. Cambridge, MA: MIT Press.
- Bijker, W.E. and Law, J. (1992) *Shaping Technology, Building Society: Studies in Sociotechnical Change*. Cambridge, MA: MIT Press.
- Bijker, W.E. (2010) 'How is technology made?—That is the question!', *Cambridge Journal of Economics*, 34(1), pp. 63-76.
- Bilandzic, M. and Venable, J. (2011) 'Towards Participatory Action Design Research: Adapting Action Research and Design Science Research Methods for Urban Informatics', *Community Informatics: A Global Journal*, 7(3).
- Bimber, B. (1994) 'Three Faces of Technological Determinism', in Smith, M.R. and Marx, L. (eds.) *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge,MA: MIT Press, pp. 79-100.
- Bjorn-Andersen, N., Eason, K. and Robey, D. (1986) *Managing Computer Impact: An international study management and organisation*. Norwood, NJ: Ablex Publishing.

- Blau, P.M., Falbe, C.M., McKinley, W. and Tracy, P.K. (1976) 'Technology and Organization in Manufacturing', *Administrative Science Quarterly*, 21(1), pp. 20-40.
- Blumer, H. (1969) *Symbolic Interactionism: Perspective and Method*. CA:Berkeley: University of California Press.
- Boell, S. and Cecez-Kecmanovic, D. (2011) 'Theorizing Information – From Signs to Sociomaterial Practices', *22nd Australasian Conference on Information Systems*, 29th November to 2nd December 2011, Sydney: .
- Boland, R.J. (2002) 'Design in the Punctuation of Management Action', in Boland, R. (ed.) *Managing as Designing: Creating a Vocabulary for Management Education and Research*. Weatherhead School of Management: Frontiers of Management Workshop, , June 14-15, 2002.
- Boltanski, L. and Thévenot, L. (2006) *Justification: Economies of Worth*. Princeton, NJ: Princeton University Press.
- Boyatzis, R.E. (1998) *Transforming qualitative information: thematic analysis and code development*. London: Sage.
- Braa, K. and Vidgen, R. (1997) 'An IS research framework for the organizational laboratory', in Kyng, M. and Mathiassen, L. (eds.) *Computers in context: joining forces in design*. Cambridge, MA: MIT Press.
- Braa, J., Monteiro, E. and Sahay, S. (2004) 'Networks of action: Sustainable health information systems across developing countries', *MIS Quarterly*, 28(3), pp. 337-362.
- Braa, K. and Vidgen, R. (1999) 'Interpretation, intervention, and reduction in the organizational laboratory: a framework for in-context information system research', *Accounting, Management and Information Technologies*, 9(1), pp. 25-47.
- Bratteteig, T. (2003) *Making change Dealing with relations between design and use*
Submitted as partial fulfillment of the degree Doctor Philosophiae
<http://heim.ifi.uio.no/~tone/Publications/Bratt-ifu-bok-02.htm>. Faculty of Mathematics and Natural Sciences University of Oslo Norway.

- Bratteteig, T. (2002) 'Bringing Gender Issues to Technology Design', in Floyd, C., Kelkar, G., Kramarae, C., Limpangog, C. and Klein-Franke, S. (eds.) *Feminist Challenges in the Information Age*. <http://heim.ifi.uio.no/~tone/Publications/Bratt-ifu-bok-02.htm> edn. Budrich, Germany: Verlag Leske.
- Bratteteig, T. and Stolterman, E. (1997) 'Design in Groups—and All That Jazz', in Kyng, M. and Mathiassen, L. (eds.) *Computers and Design in Context*. Cambridge, MA: MIT Press, pp. 289-316.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77-101.
- Brenner, N., Madden, D. and Wachsmuth, D. (2011) 'Assemblage urbanism and the challenges of critical urban theory', *City*, 15(2), pp. 225-240.
- Brooks, L. and Alam, M.S. (2013) 'Designing an Information System for Updating Land Records in Bangladesh: Action Design Ethnographic Research (ADER)', in *Grand Successes and Failures in IT. Public and Private Sectors*. Berlin Heidelberg: Springer, pp. 359-374.
- Brooks, L., Atkinson, C. and Wainwright, D. (2008) 'Adapting Structuration Theory of Understand the Role of Reflexivity: Problematization, Clinical Audit and Information Systems', *International Journal of Information System Management*, 28, pp. 453-460.
- Brooks, L.S. and Atkinson, C.J. (2004) 'StructurANTion in research and practice: Representing actor networks, their structured orders and translations.', in Kaplan, B., Truex III, D., Wastell, D., Wood-Harpner, T. and DeGross, J.I. (eds.) *Information Systems Research: Relevant Theories and Informed Practice, IFIP 8.2 Conference Proceedings*. Boston: Kluwer Academic Publishers., pp. 389-409.
- Bunge, M. (1993) 'Realism and Antirealism in Social Science,', *Theory and Decision*, 35, pp. 207-235.
- Burns, A., Chris, G., Kevin, N., Anne-Marie, B. and Kate, D. (2006) *Land Administration Reform: Indicators of Success, Future Challenges* Washington, DC.: World Bank.

- Burrell, G. and Morgan, G. (1979) *Sociological Paradigms and Organisational Analysis*. London: Heineman.
- Burton-Jones, A. (2009) 'Minimizing Method Bias through Programmatic Research', *MIS Quarterly*, 33(3), pp. 445-A7.
- Butler, J. (1989) 'Foucault and the Paradox of Bodily Inscriptions', *The Journal of Philosophy*, 86(11, Eighty-Sixth Annual Meeting American Philosophical Association, Eastern Division), pp. 601-607.
- Callon, M. (1986) 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay', in Law, J. (ed.) *Power, Action and Belief: A New Sociology of Knowledge?* London: Routledge & Kegan Paul, pp. 196-233.
- Callon, M. (1999) 'Actor-Network Theory: The Market Test', in Law, J. and Hassard, J. (eds.) *Actor Network Theory and After*. Oxford: Blackwell, pp. 181-195.
- Callon, M. (1998) 'Introduction: the embeddedness of economic markets in economics' in The Laws of the Markets', in Callon, M. (ed.) *The Laws of the Markets*. , pp. 1-57.
- Callon, M. (1991) 'Techno-Economic Networks and Irreversibility', in Law, J. (ed.) *A Sociology of Monsters: Essays on Power, Technology and Domination*. London: Routledge, pp. 132-161.
- Callon, M. (1980) 'The state and technical innovation: a case study of the electrical vehicle in France', *Research Policy*, 9(4), pp. 358-376.
- Carlile, P.R., Nicolini, D., Langely, A. and Tsoukas, H. (2013) 'How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies: Introducing the Third Volume of "Perspective on Organization Studies"', in *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies*. England: Oxford, pp. 1-15.
- Carlsson, S.A., Henningsson, S., Hrastinski, S. and Keller, C. (2011) 'Socio-technical IS design science research: developing design theory for IS integration management', *Information Systems E-Business Management*, 9(1), pp. 109-131.

- Cavaye, A.L.M. (1996) 'Case study research: a multi-faceted research approach for IS', *Information Systems Journal*, 6(3), pp. 227-242.
- Cecez-Kecmanovic, D. (2005) 'Basic assumptions of the critical research perspectives in information systems', in Howcroft, D. and Trauth, M.E. (eds.) *Handbook of Critical Information Systems Research: Theory and Application*, pp. 19-46.
- Cecez-Kecmanovic, D., Vidgen, R., Galliers, R. and Newell, S. (2012) *Call for Paper "Sociomateriality of IS and Organizations", 12-13 March 2010 Sydney*. Available at: <http://eventseer.net/e/11918/54852/> (Accessed: 10/18/2012 2012).
- Chaudhuri, S. and Mukhopadhyay, U. (2010) 'Preface', in Chaudhuri, S. and Mukhopadhyay, U. (eds.) *Revisiting the Informal Sector: A General Equilibrium Approach*. New York, NY: Springer New York.
- Checkland, P. (1981) *Systems Thinking, Systems Practice*. Chichester, UK: Wiley.
- Chee-Wee Tan, Benbasat, I. and Cenfetelli, R.T. (2013) 'It-Mediated Customer Service Content and Delivery in Electronic Governments: an Empirical Investigation of the Antecedents of Service Quality', *MIS Quarterly*, 37(1), pp. 77-109.
- Chen, W. and Hirschheim, R. (2004) 'A paradigmatic and methodological examination of information systems research from 1991 to 2001', *Information Systems Journal*, 14(3), pp. 197-235.
- Child, J. (1972) 'Organizational Structure, Environment and Performance: The Role of Strategic Choice', *Sociology*, 6(1), pp. 1-22.
- Chowdhury, M.S. (2011) 'Land management system and digital Bangladesh', *The Daily Star*, 13 December 2011 Dhaka, .
- Chrisman, N.R. (1999) 'What Does ?GIS? Mean?', *Transactions in GIS*, 3(2), pp. 175-186.
- Ciborra, C. (2005) 'Interpreting e-government and development: Efficiency, transparency or governance at a distance?', *Information Technology & People*, 18(3), pp. 260-279.

- Ciborra, C. and Navarra, D.D. (2005) 'Good governance, development theory, and aid policy: Risks and challenges of e-government in Jordan', *Information Technology for Development*, 11(2), pp. 141-159.
- Cole, R., Purao, S., Rossi, M. and Sein, M. (2005) 'Being Proactive: Where Action Research Meets Design Research (2005).', *Proceedings International Conference on Information Systems, 2005, Paper 27.* .
- Contractor, N.S., Monge, P.R. and Leonardi, P.M. (2011) 'Multidimensional Networks and the Dynamics of Sociomateriality: Bringing Technology Inside the Network', *International Journal of Communication*, 5, pp. 682-720.
- Cook, E., Stanely, V., Adlington, G., Bell, K. and Torhonen, M. (2008) 'Information and Communications Technology in Land Administration Projects', *Agriculture and Rural Development*, 38, pp. 1-4.
- Cooley, M. (1980) 'Computerization: Taylor's Latest Disguise ', *Economic and Industrial Democracy*, 1, pp. 523-539.
- Cooper, R.G., Edgett, S.J. and Kleinschmidt, E.J. (2002) 'Optimizing the Stage-Gate Process: What Best Practice Companies are Doing—Part Two', *Research Technology Management*, 45(5), pp. 21-27.
- Coxon, A.P.M. (2005) 'Integrating Qualitative and Quantitative Data: What does the User Need?', *Forum: Qualitative Social Research*, 6(2).
- Crabtree, A., Rouncefield, M. and Tolmie, P. (2012) *Doing Design Ethnography*. London: Springer.
- Crabtree, B. and Miller, W. (1992) 'A template approach to text analysis: Developing and using codebooks', in Crabtree,B.,Miller,W. (ed.) *Doing qualitative research in primary care: Multiple strategies*. Newbury Park, CA: Sage, pp. 93-109.
- Cresswell, K.M., Worth, A. and Sheikh, A. (2010) 'Actor-Network Theory and its role in understanding the implementation of information technology developments in healthcare', *BMC Medical Informatics & Decision Making*, 10(1), pp. 67-77.
- Cross, N. and Christiaans, H.D.,K. (1997) *Analysing Design Activity*. Chichester: John Wiley & Sons.

- Crump, N. and Latham, Y. (2012) 'Analysing change in an Accident and Emergency Department: organisational routines as ongoing and emergent sociomaterial accomplishments', *New Technology, Work and Employment*, 27(1), pp. 52-64.
- Curle, A. (1949) 'A Theoretical Approach to Action Research', *Human Relations*, 2(3), pp. 269-180.
- Dahlbom, B. (1996) 'The New Informatics.', *Scandinavian Journal of Information Systems*, 8(2), pp. 29-48.
- Damgaard, B. and Torfing, J. (2010) 'Network governance of active employment policy: the Danish experience', *Journal of European Social Policy*, 20(3), pp. 248-262.
- Dant, T. (2006) 'Material civilization: things and society', *The British journal of sociology*, 57(2), pp. 289-308.
- Davies, C. (1999) *Reflexive Ethnography*. London: Routledge.
- Davis, L.E. and Taylor, J.C. (1986) 'Technology, organisation and job structure.', in Dubin, R. (ed.) *Handbook of work organisation and society*. Chicago IL: Rand McNally, pp. 379-419.
- Davison, R.,M. and Martinsons, M.G. (2007) 'Action Research and Consulting: Hellish Partnership or Heavenly Marriage?', in Kock, N. (ed.) *Information Systems Action Research: An applied view of emerging concepts and methods*. Springer, pp. 376-394.
- Davison, R., Martinsons, M.G., Kock, N. and Kock, N. (2004) 'Principles of canonical action research', *Information Systems Journal*, 14(1), pp. 65-86.
- Davison, R. (2001) 'GSS and action research in the Hong Kong police', *Information Technology & People*, 14(1), pp. 60-77.
- Deal, T. and Kennedy, A. (1982) *Corporate Cultures*. MA: Addison-Wesley: Reading.
- Deetz, S. (1996) 'Crossroads—Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and Their Legacy', *Organization Science*, 7(2), pp. 191-207.

- Delgadillo, K., Gomez, R. and Stoll, K. (2002) *Community telecentres for development: lessons from community telecentres in Latin America and the Caribbean*. Ottawa: IDRC.
- DeLuca, D., Gallivan, M.J. and Kock, N. (2008) 'Furthering Information Systems Action Research: A Post-Positivist Synthesis of Four Dialectics', *Journal of the Association for Information Systems*, 9(2), pp. 48-64,66-72.
- Denning, P.J. (1997) 'A new social contract for research', *Communications of the ACM*, 40(2), pp. 132-134.
- Denzin, N.K. (1978) *The Research Act*. New York: McGraw-Hill.
- DeSanctis, G. and Poole, M.S. (1994) 'Capturing the complexity in advanced technology use: Adaptive structuration theory.', *Organization Science*, 5(2), pp. 121-147.
- DFID (2007) *Bangladesh in 2030: A DFID horizon scan, Bangladesh*. Bangladesh: DFID Bangladesh.
- Díaz Andrade, A. and Urquhart, C. (2010) 'The Role of Social Connectors in Seeking Computer-mediated Information in Rural Societies', *HUMAN IT*, 11(1), pp. 1-29.
- Dobson, P.J. (2002) 'Critical realism and information systems research: why bother with philosophy?', *Information Research*, 7(2).
- Dobson, P.J. (2001) 'The Philosophy of Critical Realism--An Opportunity for Information Systems Research', *Information Systems Frontiers*, 3(2), pp. 199-199.
- Doolin, B. and Lowe, A. (2002) 'To reveal is to critique: actor-network theory and critical information systems research', *Journal of Information Technology*, 17(2), pp. 69-78.
- Drechsler, A. (2012) 'Design Science as Design of Social Systems – Implications for Information Systems Research', in Peffers, K., Rothenberger, M. and Kuechler, B. (eds.) *DESRIST 2012, LNCS 7286*. - Springer Berlin / Heidelberg, pp. 191-205.
- Duff, W. and McKemmish, S. (2000) *Metadata and ISO 9000 Compliance (Information Technology)*. Available at:

<http://infotech.monash.edu/research/groups/rcrg/publications/smckduff.html>

(Accessed: 6/1/2012 2012).

Dunbar, R.L.M. and Starbuck, W.H. (2006) 'Learning to Design Organizations and Learning from Designing Them', *Organization Science*, 17(2), pp. 171-178.

Easterby-Smith, M., Thorpe, R. and Lowe, A. (1991) *Management Research: an Introduction*,. London: Sage.

Economic Commission for Africa (2008) *Land Management Information Systems in the Knowledge Economy*. Economic Commission for Africa.

Edmunds, H. (1999) *The Focus Group Research Handbook*. Thousand Oaks: Sage.

Evered, R. and Louis, M.,R. (1981) 'Alternative Perspectives in the Organizational Sciences: "Inquiry from the Inside" and " Inquiry from the Outside"', *Academy of Management.The Academy of Management Review (pre-1986)*, 6(3), pp. 385-395.

Falconer, D.J. and Mackay, D.R. (1999) ' Ontological problems of pluralist research methodologies ', *Proceedings of the 5th Americas International Conference on Information Systems*. Milwaukee, USA: , 1467.

Faraj, S. and Azad, B. (2012) ' The Materiality of Technology: An Affordance Perspective ', in Leonardi, P.M., Nardi, B.A. and Kallinikos, J. (eds.) *Materiality and Organizing: Social Interaction in a Technological World*. London: Oxford:Oxford University Press.

Faulkner, A., Lange, B. and Lawless, C. (2012) 'Introduction: Material Worlds: Intersections of Law, Science, Technology, and Society', *Journal of Law and Society*, 39(1), pp. 1-19.

Feldman, M. (2003) 'A performative perspective on stability and change in organizational routines', *Industrial and Corporate Change*, 12, pp. 727-752.

Feldman, M.S. and Orlikowski, W.J. (2011) 'Theorizing Practice and Practicing Theory', *Organization Science*, 22(5), pp. 1240-1253.

Fendt, J. and Kaminska-Labbé, R. (2011) 'Relevance and creativity through design-driven action research: Introducing pragmatic adequacy', *European Management Journal*, 29(3), pp. 217-233.

- Fenwick, T. (2010) 'Re-thinking the "thing": Sociomaterial approaches to understanding and researching learning in work', *Journal of Workplace Learning*, 22(1/2), pp. 104-116.
- Fenwick, T., Nerland, M. and Jensen, K. (2012) 'Sociomaterial approaches to conceptualising professional learning and practice', *Journal of Education and Work*, 25(1), pp. 1-13.
- Fereday, J. and Muir-Cochrane, E. (2006) 'Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development', *International Journal of Qualitative Methods*, 5(1), pp. 1-11.
- Figueiredo, A.d. and Cunha, P.d. (2007) 'Action Research and Design Information Systems: Two Faces of Single Coin', in Kock, N. (ed.) *Information Systems Action Research: Integrated Series in Information Systems, Volume 13, Part I.*, , pp. 61-96.
- Fitzgerald, B. and Howcroft, D., (1998) 'Competing Dichotomies in IS Research and Possible Strategies for Resolution', *Proceedings of the 19th International Conference on Information Systems ICIS 1998, Helsinki, Finland.* , 155-164.
- Fitzgerald, J. (n.d.) *Managing Your Municipal Records: The Right Approach.* municipaltraining.nf.ca/Resources_files/rm-part-one.pdf (accessed on 01 June 2012): The Provincial Archives of Newfoundland and Labrador.
- Fontana, A., and Frey, J.H. (2005) 'The Interview: From Natural Stance to Political Involvement', in Denzin, N.K. and Lincoln, Y.S. (eds.) *Handbook of Qualitative Research*. London: Sage, pp. 695-727.
- Foucault, M. (1970) *The Order of Things: An Archeology of the Human Sciences*. New York: Pantheon Books.
- Frost, N., Nolas, S.M., Brooks-Gordon, B., Esin, C., Holt, A., Mehdizadeh, L. and Shinebourne, P. (2010) 'Pluralism in qualitative research: the impact of different researchers and qualitative approaches on the analysis of qualitative data', *Qualitative Research*, 10(4), pp. 441-460.
- Fry, L.W. and Slocum Jr., J.W. (1984) 'Technology, Structure, and Workgroup Effectiveness: A Test of a Contingency Model', *Academy of Management Journal*, 27(2), pp. 221-246.

- Fulk, J. (1993) 'Social Construction of Communication Technology', *Academy of Management Journal*, 36(5), pp. 921-950.
- Fuller, R.B. (1992.) 'Cosmography: A Posthumous Scenario for the Future of Humanity', in Kuromiya, A.K. (ed.) McMillan.
- Garcia, L. and Quek, F. (1997) 'Qualitative research in information systems: time to be subjective?', *Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research*, Philadelphia, PA.: .
- Garud, R., Jain, S. and Tuertscher, P. (2008) 'Incomplete by Design and Designing for Incompleteness', *Organization Studies*, 29(3), pp. 351-371.
- Garud, R. and Rappa, M.A. (1994) 'A Socio-Cognitive Model of Technology Evolution: The Case of Cochlear Implants', *Organization Science*, 5(3), pp. 344-362.
- Gascó, M. (2003) 'New Technologies and Institutional Change in Public Administration', *Social Science Computer Review*, 21(1), pp. 6-14.
- Gaskin, J. (2012) *Evolution and Variation of Digitally-Enabled Design Routines: An Extended Event-Sequencing Approach*, Department of Information Systems, Case Western Reserve University.
- Geertz, C. (1996) 'The World in a Text: How to Read Tristes Tropiques', in Daniel, E.V. and Peck, J.M. (eds.) *Culture Contexture: Exploration in Anthropology and Literary Studies*. Berkeley: University of California Press.
- Geertz, C. (1983) 'From the native's point of view: on the nature of anthropological understanding', in Geertz, C. (ed.) *Local Knowledge*. , pp. 55-70.
- Geertz, C. (1973) *Thick Description: Toward an Interpretive Theory of Culture*. New York: Basic Book Inc.
- Georgiadou, Y., Bernard, L. and Sahay, S. (2007) 'Implementation of spatial data infrastructures in transitional economies', *Information Technology for Development*, 13(1), pp. 1-6.
- Gibson, J. (1979) *The Ecological Approach to Perception*. London: Houghton Mifflin.

- Giddens, A. (1984) *The Constitution of Society*. Berkeley: University of California Press.
- Gilliland-Swetland, A. (2005) 'Electronic records management', *Annual Review of Information Science and Technology*, 39(1), pp. 219-253.
- Gilliland-Swetland, A.J. and Eppard, P.B. (2000) 'Preserving the Authenticity of Contingent Digital Objects ', *D-Lib Magazine*, 6(7/8).
- GISL International Consultants (2012) *Land Information Systems (LIS) - GISL International Consultants* . Available at: <http://www.gisl.co.uk/lis.htm> (Accessed: 6/8/2012 2012).
- GoB (2011) *Journey Towards A Digital Bangladesh*. Dhaka: Finance Division, Ministry of Finance.
- GoB (2000) *Public Administration for 21st Century: Report of the Public Administration Reform Commission, Volume 2*. Dhaka: Ministry of Establishment.
- GoB (1989) *Report of Public Administration Efficiency Study, Vol. I*. Dhaka: Ministry of Establishment.
- GoB (1973) *Report of Administration and Services Reorganisation Committee, Part I: The Services* Dhaka: Ministry of Establishment.
- Goffman, E. (1990) *The Presentation of Self in Everyday Life*. London: Penguin.
- Goguen, J.A. (1997) 'Toward a social, ethical theory of information', in Bowker, G., Star, S.L., Turner, W. and Gasser, L. (eds.) *Social Science, Technical Systems, an Cooperative Work: Beyond the Great Divide*. London: Lawrence Erlbaum Associates, pp. 27-56.
- Greene, J., Caracelli, V.J. and Graham, W.F. (1989) 'Toward a conceptual framework of mixed method evaluation designs', *Educational Evaluation and Policy Analysis*, 11(3), pp. 255-274.
- Greenhalgh, T. and Swinglehurst, D. (2011) 'Studying Technology Use as Social Practice: the Untapped Potential of Ethnography', *BMC Medicine*, 9(1), pp. 1-7.
- Greenhill, A. (2004) 'The Research Approach and Methodology Used in Interpretive Study of a Web Information Systems: Contextualizing Practice', in Kaplan, B., Truex III, D., Wastell, D., Wood-Harpner, T. and DeGross, J.I.

- (eds.) *Information Systems Research: Relevant Theories and Informed Practice, IFIP 8.2 Conference Proceedings*. Boston: Kluwer Academic Publishers, pp. 213-231.
- Gregor, S. and Jones, D. (2007) 'The anatomy of a design theory.', *Journal of the Association for Information Systems*, 8(5), pp. 312-335.
- Grimson, J., Grimson, W. and Hasselbring, W. (2000) 'The SI challenge in health care', *Communications of the ACM*, 43(6), pp. 48-55.
- Grover, V. and Ramanlal, P. (1999) 'Six Myths of Information and Markets: Information Technology Networks, Electronic Commerce, and the Battle for Consumer Surplus', *MIS Quarterly*, 23(4), pp. 465-495.
- Guba, E.G. and Lincoln, Y.S. (1994) 'Competing paradigms in qualitative research', in Denzin, N.K. and Lincoln, Y.S. (eds.) *Handbook of qualitative research*. CA:Thousand Oaks: Sage.
- Guba, E.G. and Lincoln, Y.S. (1981) *Effective Evaluation: Improving the Usefulness of Evaluation Results through Responsive and Naturalistic Approaches*. San Francisco: Jossey-Bass Publishers.
- Guillemin, M. and Gillam, L. (2004) 'Ethics, Reflexivity, and "Ethically Important Moments" in Research', *Qualitative Inquiry*, 10(2), pp. 261-280.
- Hammersley, M. and Atkinson, P. (1995) *Ethnography: Principles in Practice*. New York: Routledge.
- Han, C.K. and Walsham, G. (1993) *Government information technology policies and systems: Success strategies in developed and developing countries*. Londopn: Commonwealth Secretariat.
- Haraway, D. (1991) *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.
- Harré, R. (2002) 'Material Objects in Social Worlds', *Theory, Culture & Society*, 19(5-6), pp. 23-33.
- Hartmann, H.I., Kraut, R.E. and Tilly, L.A. (eds.) (1986) *Computer Chips and Paper Clips: Effects of Technological Change*. Washington D.C.: National Academy Press.
- Harvey, E. (1968) 'Technology and the Structure of Organizations', *American Sociological Review*, 33(2), pp. 247-259.

- Harvey, L.J. and Myers, M.D. (1995) 'Scholarship and practice: the contribution of ethnographic research methods to bridging the gap.', *Information Technology & People*, 8(3), pp. 13-27.
- Hassan, N.R. and Hovorka, D.,S. (2011) 'Sociomateriality and IS Identity', *ACIS 2011 Proceedings*.
- Hassard, J., Law, J. and Lee, N. (1999) 'Themed section: Actor-Network theory and managerialism.', *Organisational Studies*, 6(3), pp. 385-390.
- Hasselbring, W. (2000) 'Information system integration', *Communications of the ACM*, 43(6), pp. 32-38.
- Hearn, G.N. and Foth, M. (2005) 'Action Research in the Design of New Media and ICT Systems', in Kwansah-Aidoo, K. (ed.) *Topical Issues in Communications and Media Research*. New York: Nova Science, pp. 94.
- Heeks, R. (2010) 'Policy Arena: Do Information Communication Technologies(ICTS) Contribute to Development?', *Journal of International Development*, 22, pp. 625-640.
- Heeks, R. (2006) 'Theorizing ICT4D research (editorial)', *Information Technologies and International Development*, 3(3), pp. 1-4.
- Heeks, R. (2003) *Most E-government for Development Project Fail: how can risk be reduced?*, *iGovernment Working Paper Series, Paper No. 14*. University of Manchester,UK: Institute for Development Policy and Management.
- Heeks, R. (2002) 'Information System in Developing Countries: Failure, Success and Local Improvisations', *The Information Society*, 18(2), pp. 101-112.
- Heeks, R. and Molla, A. (2009) *Impact Assessment of ICT-for-Development Projects: A Compendium of Approaches, Development Informatics Working Paper no.36*. Manchester,UK: University of Manchester.
- Heeks, R. (2002) 'i-development not e-development: special issue on ICTs and development', *Journal of International Development*, 14(1), pp. 1-11.
- Heidegger, M., (1977) *Question Concerning Technology and Other Essays*. New York: Harper Torchbooks.
- Heinrich, C.J. and Lynn Jr. L.E. (2000) 'Means and Ends: A Comparative Study of Empirical Methods for Investigating Governance and Performance', *Journal of Public Administration Research and Theory*, 11(1), pp. 109-138.

- Henry, R. (2012) 'Gifts of grief: performative ethnography and the revelatory potential of emotion', *Qualitative research*, 12(5), pp. 528-539.
- Hevner, A.R. (2007) 'A Three Cycle View of Design Science Research', *Scandinavian Journal of Information Systems*, 19(2), pp. 87-92.
- Hevner, A.R. and Chatterjee, S. (eds.) (2010) *Design Research in Information Systems*. London: Springer.
- Hevner, A.R., March, S.T., Park, J. and Ram, S. (2004) 'Design Science in Information Systems Research', *MIS Quarterly*, 28(1), pp. 75-105.
- Hickson, D.J., Pugh, D.S. and Pheysey, D.C. (1969) 'Operations Technology and Organization Structure: An Empirical Reappraisal', *Administrative Science Quarterly*, 14(3), pp. 378-397.
- Hirschheim, R., Klein, H.K. and Lyytinen, K. (eds.) (1995) *Information Systems Development and Data Modeling: Conceptual and Philosophical Foundations*. Cambridge: Cambridge University Press.
- Hirschheim, R.A. (1985) *Office Automation: A Social and Organizational Perspective*. Chichester, UK: John Wiley.
- Hirschheim, R. (1992) 'Information Systems Epistemology: an historical perspective.', in Galliers, R.D. (ed.) *Information Systems Research: Issues, Methods and Practical Guidelines*. London: Blackweel Scientific Publications, pp. 28-60.
- Hirschheim, R. and Klein, H.K. (2003) 'Crisis in the IS Field? A Critical Reflection on the State of the Discipline', *Journal of the Association for Information Systems*, 4, pp. 237-293.
- Hirschheim, R. and Klein, H.K. (1989) 'Four Paradigms of Information Systems Development', *Communications of the ACM*, 32(10), pp. 1199-1216.
- Ho, X. and Tan, M.T.K., (2004) 'Leveraging methodological pluralism in interpretive research: the example of ERP as a complex phenomenon', *ECIS 2004 Proceedings*. Available at: <http://aisel.aisnet.org/ecis2004/60>(Accessed on 10 January 2012).
- Hoffmann, E.A. (2007) 'Open-Ended Interviews, Power, and Emotional Labor', *Journal of Contemporary Ethnography*, 36(3), pp. 318-346.

- Holland, C.P. (2003) 'The is Core--X Information Systems Research and Practice: it Artifact Or a Multidisciplinary Subject?', *Communications of AIS*, 2003(12), pp. 599-606.
- Hollander, J.A. (2004) 'The Social Contexts of Focus Groups', *Journal of Contemporary Ethnography*, 33(5), pp. 602-637.
- Holstein, L. (1993) *Review of Bank Experience with Land Titling and Registration*. Washington, D.C.: World Bank.
- Hookway, N. (2008) 'Entering the blogosphere: some strategies for using blogs in social research', *Qualitative Research*, 8(1), pp. 91-113.
- Horsburgh, S., Goldfinch, S. and Gauld, R. (2011) 'Is Public Trust in Government Associated With Trust in E-Government?', *Social Science Computer Review*, 29(2), pp. 232-241.
- Howcroft, D. and McDonald, R. (2004) 'An ethnographic study of IS investment appraisal', *Proceedings of the Twelfth European Conference on Information Systems*, Turku School of Economics and Business Administration, Turku, Finland., 779-792.
- Iedema, R. (2007) 'On the multi-modality, materiality and contingency of organizational discourse', *Organization Studies*, 28(6), pp. 931-946.
- Iivari, J. (2003) 'The IS Core - VII: Towards Information Systems as a Science of Meta-Artifacts', *Communications of the Association for Information Systems*, 12(568), pp. 581.
- Iivari, J. (1991) 'A paradigmatic analysis of school of IS development', *European Journal of Information Systems*, 1(4), pp. 39-63.
- Iivari, J., Hirschheim, R. and Klein, H. (1998) 'A paradigmatic analysis contrasting information systems approaches and methodologies ', *Information Systems Research*, 9(2), pp. 164-193.
- Iivari, J. (2007) 'A Paradigmatic Analysis of Information Systems As a Design Science', *Scandinavian Journal of Information Systems*, 19(2), pp. 39-63.
- Iivari, J. and Venable, J. (2009) 'Action research and design science research - seemingly similar but decisively dissimilar', *17th European Conference on Information Systems*.

- Imran, A. and Gregor, S. (2011) 'Vested Interests Obstructing Information Systems Use: Land Administration in a Least Developed Country ', *SIG GlobDev Fourth Annual Workshop, Shanghai, China December 3, 2011* , 1-24.
- International Telecommunication Union (2009) *Measuring the information society: The ICT development index*. Geneva, Switzerland: International Telecommunication Union.
- Introna, L.D. (2007) *Towards a Post-human Intra-actional Account of Sociomaterial Agency (and Morality)* Paper prepared for the Moral Agency and Technical Artefacts Workshop, The Hague, Netherlands Institute for Advanced Study.
- Iveroth, E. (2011) 'The Sociomaterial Practice of IT-Enabled Change: A Case Study of a Global Transformation', *Journal of Change Management*, 11(3), pp. 375-395.
- Järvinen, P.H. (2000) 'Research Questions Guiding Selection of an Appropriate Research Method.', *Proceedings of the Eighth European Conference on Information Systems, Vienna.* , 124-131.
- Järvinen, P. (2007) 'Action research is similar to design science', *Quality and quantity*, 41(1), pp. 37-54.
- Jarvis, S. (1998) *Adorno: A Critical Introduction.* , Cambridge: Polity.
- Jarzabkowski, P. and Wilson, D.C. (2006) 'Actionable Strategy Knowledge:: A Practice Perspective', *European Management Journal*, 24(5), pp. 348-367.
- Jewett, T. and Kling, R. (1991) 'The Dynamics of Computerization in a Social Science Research Team: A Case Study of Infrastructure, Strategies and Skills', *Social Science Computer Review*, 9(275), pp. 246-275.
- Jones, M. (2013) 'Untangling Sociomateriality', in *How Matter Matters*. Oxford University Press.
- Jones, M. (1998) *Information systems and the double mangle: steering a course between the Scylla of embedded structure and the Charybdis of strong symmetry*. In: *UNSPECIFIED* pp. 287-302.
- Jones, M. and Nandhakumar, J. (1993) 'Structured Development? A Structural Analysis of the Development of an Executive Information

- Systems', in Avison, D.E., Kendall, J.E. and DeGross, J.I. (eds.) *Human Organizational and Social Dimensions of Information Systems Development*. Amsterdam: North-Holland, pp. 475-496.
- Jones, M. and Orlikowski, W. (2007) 'Information technology and the dynamics of organisational change', in Mansell, R., Avgerou, C., Quah, D. and Silverstone, R. (eds.) *The Oxford handbook of information and communication technologies*. Oxford: Oxford University Press, pp. 293-313.
- Jones, M.R. and Karsten, H. (2008) 'Giddens's Structuration Theory and Information System Research', *MIS Quarterly*, 32(1), pp. 127-157.
- Jonsson, S. and Gronlund, A. (1988) 'Life with a sub-contractor: new technology and management accounting', *Accounting, Organizations and Society*, 13(5), pp. 512-532.
- Kain, R.J.P. and Baigent, E. (1993) *Map in the Service of the State: A History of Property Mapping*. Chicago: University of Chicago Press.
- Kallinikos, J. (2011) *Governing through Technology: Information Artefacts and Social Practices*. New York: Palgrave Macmillan.
- Kallinikos, J. (2004) 'Farewell to Constructivism: Technology and Context-embedded Action', in Avgerou, C., Ciborra, C. and Land, F. (eds.) *The Social Study of Information and Communication Technology: Innovation, Actors and Contexts*. London: London School of Economics and Political Sciences, pp. 141-161.
- Kallinikos, J., Leonardi, P.M., and Nardi, B.A. (2012) 'The Challenge of Materiality: Origins, Scope, and Prospects', in Leonardi, P.M., Nardi, B.A. and Kallinikos, J. (eds.) *Materiality and Organizing: Social Interaction in a Technological World*. London: Oxford:Oxford University Press, pp. 1-22.
- Karikari, I., Stillwell, J. and Carver, S. (2003) 'Land administration and GIS: the case of Ghana', *Progress in Development Studies*, 3(3), pp. 223-242.
- Kaufmann, J. (2002) 'Cadastral 2014: A Vision for Future Cadastral Systems', *Presented at the 1st Congress on Cadastral in the European Union, May15 – 17, 2002*. Granada, Spain: Working Group 7.1 FIG.
- Kautz, K. and Jensen, T.B. (2012) 'Sociomateriality: new vocabulary or reformulation of existing theories?', *2nd Organization, Artifacts and Practices*

- Workshop: Materiality and Space in Management Organization Studies*.
Université Paris Dauphine: Université Paris Dauphine, DRM UMR CNRS,
LSE Department of Management, 14.
- Keen, P.G.W. (1987) 'MIS research: Current status, trends and needs', in
Buckingham, R.A., Hirschheim, R.A., Land, F.F. and Tully, C.J. (eds.)
Information Systems Education: Recommendations and Implementation.
Cambridge University Press, pp. 1-13.
- Keevers, L. and Treleaven, L. (2011) 'Organizing practices of reflection: A
practice-based study', *Management Learning*, 42(5), pp. 505-520.
- Kelly, D. and Gibbons, M. (2008) 'Ethnography: The good, the bad and the ugly',
Journal of Medical Marketing, 8(4), pp. 279-285.
- Kemmis, S. and McTaggart, R. (2005) 'Participatory Action Research', in Denzin,
N.K. and Lincoln, Y.S. (eds.) *Handbook of Qualitative Research*. London:
Sage, pp. 559-604.
- Kensing, F. and Blomberg, J. (1998) 'Participatory Design: Issues and Concerns',
Computer Supported Cooperative Work, 7, pp. 167-185.
- Khan, M.A. (2011) 'Digitalizing land registration in Bangladesh.', *Blitz*,
6(48,,DECEMBER 07, 2011).
- Kirschner, S.R. (1987) "'Then What Have I to Do with Thee?": On Identity,
Fieldwork, and Ethnographic Knowledge', *Cultural Anthropology*, 2(2), pp.
211-234.
- Kling, R. and Lamb, R. (1999) 'IT and Organizational Change in Digital
Economies: A Socio-Technical Approach', *Understanding the Digital
Economy -- Data, Tools and Research*” May 25-26 at the U.S. Department of
Commerce, Washington D.C.<http://info.cwru.edu/rlamb>
- Kling, R. (1991) 'Computerization and Social Transformations', *Science,
Technology & Human Values*, 16(3), pp. 342-367.
- Kling, R. (1980) 'Social Analyses of Computing: Theoretical Perspectives in
Recent Empirical Research', *ACM Computing Surveys*, 12(1), pp. 61-110.
- Kling, R. and Iacono, S. (1989) 'The institutional character of computerized
information systems', *Office: Technology and People*, 5(1), pp. 7-28.

- Kling, R. and Iacono, S. (1984) 'Computing as an Occasion for Social Control', *Journal of Social Issues*, 40(3), pp. 77-96.
- Kluckhohn, F.R. (1940) 'The Participant-Observer Technique in Small Communities', *American Journal of Sociology*, 46(3), pp. 331-343.
- Kock, N. (2007) 'Preface', in Kock, N. (ed.) *Information Systems Action Research: An applied view of emerging concepts and methods*. Springer, pp. 277-307.
- Kotter, J.P. and Heskett, J.L. (1992) *Corporate culture and performance*. New York: Free Press.
- Krueger, R.A. and Mary, A.C. (2000) *Focus groups: A practical guide for applied research*. Thousand Oaks, CA: Sage.
- Kulkarni, M.N. (2003) 'Beyond Computerisation of Land Records', *Economic and Political Weekly*, 38(24), pp. p. 2338.
- Lâm, D.P. (2012) 'Sociomaterial entanglement in virtual spaces: knowledge creation practice in online platforms', *2nd Organization, Artifacts and Practices Workshop: Materiality and Space in Management Organization Studies*. Université Paris Dauphine: Université Paris Dauphine, DRM UMR CNRS, LSE Department of Management, 14.
- Lamb, R., Sawyer, S. and Kling, R. (2000) 'A Social Informatics Perspective On Socio- Technical Networks', *Proceedings of Americas Conference on Information Systems, Long Beach, CA*. .
- Landry, M. and Banville, C. (1992) 'A disciplined methodological pluralism for mis research', *Accounting, Management and Information Technologies*, 2(2), pp. 77-97.
- Latour, B. (1993) 'Ethnography of a "high-tech" case: about Aramis', in Lemonnier, P. (ed.) *Technological choices: Transformation in material cultures since the neolithic*. London: Routledge, pp. 372-398.
- Latour, B. (1991) 'Technology is society made durable', in Law, J. (ed.) *A Sociology of Monsters: Essays on Power, Technology and Domination*. London: Routledge, pp. 103-131.
- Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers through Society*. Milton Keynes, UK: Open University.

- Latour, B. and Teil, G. (1995) 'The Hume Machine. Can associations networks do more than formal rules?', *Stanford Humanities Review*, 4(2), pp. 47-66.
- Latour, B. (2005) *Reassembling the social: an introduction to actor-network-theory*. Oxford ; New York: Oxford University Press.
- Laurence, B. and Alam, M.S. (2014) 'Designing an information system for updating land records in Bangladesh: Action design ethnographic research (ADER)', *Information Systems Frontiers*, .
- Law, J. (2004) *After method: Mess in social science research*. Abingdon: Routledge.
- Law, J. (1992) 'Notes on the theory of the Actor-Network: Ordering, strategy, and heterogeneity', *Systems Practice*, 5(4), pp. 379-393.
- Law, J. (2012) 'The Materials of STs', in Beaudry, M.C. and Hicks, D. (eds.) *The Oxford Handbook of Material Culture Studies*. Oxford University Press.
- Law, J. (2002) 'Objects and Spaces', *Theory, Culture & Society*, 19(5-6), pp. 91-105.
- Law, J. and Urry, J. (2004) 'Enacting the social', *Economy and Society*, 33(3), pp. 390-410.
- LeCompte, M.D. and Preissle, J. (1993) *Ethnography and Qualitative Design in Educational Research*. San Diego: Academic Press.
- Lecompte, M.D. and Schensul, J.J. (2010) *Designing and Conducting Ethnographic Research*. 2nd ed. edn. US: Altamira Press.
- Lee, A.S. (2010) 'Retrospect and prospect: information systems research in the last and next 25 years', *Journal of Information Technology*, 25(4), pp. 336-348.
- Lee, A.S. (1991) 'Integrating Positivist and Interpretive Approaches to Organizational Research', *Organization Science*, 2(4), pp. 342-365.
- Lee, D. and Mendelson, H. (2007) 'Adoption of Information Technology Under Network Effects', *Information Systems Research*, 18(4), pp. 395-413.
- Lemmen, C.H., van der Molen, P., van Oosterom, P.J., Ploeger, H., Quak, C.W. and Stoter, J.E. (2003) 'A modular standard for the cadastral domain', *Proceedings of Digital Earth, Bmo, Czec Republic, September 2003*.

- Lempinen, H., Rossi, M. and Tuunainen, V. (2012) 'Design Principles for Inter-Organizational Systems Development – Case Hansel', in Peffers, K., Rothenberger, M. and Kuechler, B. (eds.) *Design Science Research in Information Systems. Advances in Theory and Practice*. Springer Berlin / Heidelberg, pp. 52-65.
- Leonardi, P.M. (2007) 'Activating the informational capabilities of information technology for organizational change. ', *Organization Science*, 18(5), pp. 813-831.
- Leonardi, P.M. (2013) 'Theoretical foundations for the study of sociomateriality', *Information and Organization*, 23(2), pp. 59-76.
- Leonardi, P.M. (2009) 'Crossing the Implementation Line: The Mutual Constitution of Technology and Organizing Across Development and Use Activities', *Communication Theory*, 19(3), pp. 278-310.
- Leonardi, P.M. and Barley, S.R. (2010) 'What's Under Construction Here? Social Action, Materiality, and Power in Constructivist Studies of Technology and Organizing', *The Academy of Management Annals*, 4(1), pp. 1-51.
- Leonardi, P.M. and Barley, S.R. (2008) 'Materiality and change: Challenges to building better theory about technology and organizing', *Information and Organization*, 18(3), pp. 159-176.
- Leonardi, P.M., (2012) 'Materiality, Sociomateriality, and Socio-Technical Systems: What Do These Terms Mean? How are They Related? Do We Need Them?', in Leonardi, P.M., Nardi, B.A. and Kallinikos, J. (eds.) *Materiality and Organizing: Social Interaction in a Technological World*. London: Oxford:Oxford University Press, pp. 25-48.
- Leonardi, P.M., (2010) 'Digital materiality? How artifacts without matter, matter', *First Monday*, 15(6-7), pp. 14 November 2012.
- Lewin, K. (1946) 'Action Research and Minority Problems', *Journal of Social Issues*, 2, pp. 34-46.
- Lewin, K. (1945) 'The Research Center for Group Dynamics at Massachusetts Institute of Technology', *Sociometry*, 8(2), pp. 126-136.
- Linstead, S. (1993) 'From Postmodern Anthropology to Deconstructive Ethnography', *Human Relations*, 46(1), pp. 97-120.

- Loebbecke, C. and Powell, P. (2009) 'Furthering Distributed Participative Design', *Scandinavian Journal of Information Systems*, 21(1), pp. 77-106.
- Lofstedt, U. (2005) 'E-government - assessment of current research and some proposals for future directions ', *International Journal of Public Information Systems*, 1, pp. 39-52.
- Losee, J. (1980) *A Historical Introduction to the Philosophy of Science*. Oxford: Oxford University Press.
- MacKenzie, D. and Wajcman, J. (1985) 'The Social Shaping of Technology', in MacKenzie, D. and Wajcman, J. (eds.) *The Social Shaping of Technology: How the Refrigerator Got Its Hum*. Philadelphia: Open University Press, pp. 2-25.
- MacNeil, H. (2002) 'Providing grounds for trust II: the findings of the authenticity task force of InterPARES', *Archivaria*, 54, pp. 24-58.
- MacNeil, H. (2000a) 'Providing grounds for trust II: the findings of the authenticity task force of InterPARES', *Archivaria*, 50, pp. 52-78.
- MacNeil, H. (2000b) *Trusting Records: Legal, historical and diplomatic perspectives*. The Netherlands: Kluwer Academic.
- Madon, S. (1994) *Designing Information Systems for Development Planning*. Heney: Alfred Waller.
- Madon, S. and Sahay, S. (2002) 'An Information-Based Model of NGO Mediation for the Empowerment of Slum Dwellers in Bangalore', *Information Society*, 18(1), pp. 13-19.
- Mansell, R., Avgerou, C., Quah, D. and Silverstone, R. (eds.) (2007) *The Oxford handbook of information and communication technologies*. Oxford: Oxford University Press.
- Mantei, M.M. and Teorey, T.J. (1989) 'Incorporating Behavioral Techniques Into the Systems Development Life Cycle', *MIS Quarterly*, 13(3), pp. 257-274.
- March, S.T. and Smith, G.F. (1995) 'Design and natural science research on information technology', *Decision Support Systems*, 15(4), pp. 251-266.
- Marjit, S. (2010) 'Forward', in Chaudhuri, S. and Mukhopadhyay, U. (eds.) *Revisiting the Informal Sector: A General Equilibrium Approach*. New York, NY: Springer New York.

- Markus, M.L., (1983) 'Power, politics, and MIS implementation', *Communications of the ACM*, 26(6), pp. 430-444.
- Markus, M.L. and Benjamin, R.I. (1996) 'Change Agency - the Next IS Frontier', *MIS Quarterly*, 20(4), pp. 385-407.
- Markus, M.L. and Lee, A.S. (2000) 'Special Issue on Intensive Research in Information Systems: using Qualitative, Interpretive, and Case Methods to Study Information Technology -- Second Installment; Foreword', *MIS Quarterly*, 24(1), pp. 1-2.
- Markus, M.L., Majchrzak, A. and Gasser, L. (2002) 'A Design Theory for Systems that Support Emergent Knowledge Processes', *MIS Quarterly*, 26(3), pp. 179-212.
- Markus, M.L. and Robey, D. (1988) 'Information Technology and Organizational Change: Causal Structure in Theory and Research', *Management Science*, 34(5), pp. pp. 583-598.
- Marshall, C. and Rossman, G.B. (2006) *Designing Qualitative Research*. Thousands Oaks: Sage Publication.
- McFarlane, C. (2011a) 'Assemblage and critical urbanism', *City*, 15(2), pp. 204-224.
- McFarlane, C. (2011b) 'Assemblage and critical urbanism', *City*, 15(2), pp. 204-224.
- McGrath, K. and Maiye, A. (2010) 'The role of institutions in ICT innovation: learning from interventions in a Nigerian e-government initiative', *Information Technology for Development*, 16(4), pp. 260-278.
- Metcalfe, R.M. and Powell, P. (1995) 'Information: a perspective-concerns perspective', *European Journal of Information Systems*, 4, pp. 121-129.
- Millar, L. (ed.)(2009) *Understanding the context of electronic records management*. London: International Records Management Trust.
- Mingers, J. (2004a) 'Real-izing information systems: critical realism as an underpinning philosophy for information systems', *Information and Organization*, 14(2), pp. 87-103.

- Mingers, J. (2004b) 'Re-establishing the real: critical realism and information systems', in Mingers, J. and Willcocks, L.P. (eds.) *Social Theory and Philosophy for Information Systems Research*. Chicester: Wiley, pp. 398-427.
- Mingers, J. (2001) 'Combining IS Research Methods: Towards a Pluralist Methodology', *Information Systems Research*, 12(3), pp. 240.
- Mir, R. and Watson, A. (2001) 'Critical Realism and Constructivism in Strategy Research: Toward a Synthesis', *Strategic Management Journal*, 22(12), pp. 1169-1173.
- Mitchell, R.G. (1991) 'Secrecy and Disclosure in the Fieldwork', in Shaffir, W.B. and Stebbins, R.A. (eds.) *Experiencing Fieldwork*. London: Sage, pp. 97-108.
- Mohammadi, H., Rajabifard, A. and Williamson, I.P. (2010) 'Development of an interoperable tool to facilitate spatial data integration in the context of SDI', *International Journal of Geographical Information Science*, 24(4), pp. 487-505.
- Mol, A. (2002) *The body multiple: Ontology in medical practice*. Durham, NC: Duke University Press.
- Moore, B.H. (2008) 'Land Reform: From Failed Expectations to Renewed Opportunity', *Land Agenda First*, (1), pp. 2-2.
- Moran-Ellis, J., Alexander, V.D., Cronin, A., Dickinson, M., Fielding, J., Slaney, J. and Thomas, H. (2006) 'Triangulation and integration: processes, claims and implications', *Qualitative Research*, 6(1), pp. 45-59.
- Morse, J.M., Barrett, M., Mayan, M., Olson, K. and Spiers, J. (2002) 'Verification Strategies for Establishing Reliability and Validity in Qualitative Research', *International Journal of Qualitative Methods*, 1(2), pp. 1-19.
- Mörtberg, C. (2003) 'In Dreams Begin Responsibility – Feminist Alternatives to Technoscience. In Christina Mörtberg, Pirjo Elovaara and Agneta Lundgren', in Mörtberg, C., Elovaara, P. and Lundgren, A. (eds.) *How do we make a difference? Information Technology, Transnational Democracy and Gender*. Sweden: Luleå: Division Gender and Technology, Luleå University of Technology, pp. 57-69.

- Morton, S.M. (1991) *The Corporation of the 1990s: Information Technology and Organizational Transformation*. New York: .
- Moser, I. (2005) 'On Becoming Disabled and Articulating Alternatives', *Cultural Studies*, 19(6), pp. 667-700.
- Mumford, E. (1981) 'Participative Systems Design: Structure and Method.', *Systems, Objectives, Solutions*, 1(1), pp. 5-19.
- Mumford, E. (2000) 'A Socio-Technical Approach to Systems Design', *Requirements Engineering*, 5(2), pp. 125-133.
- Mumford, E. (1985) 'Socio-technical systems design: evolving theory and practice', in *Computer and democracy: A Scandinavian challenge*. Avebury: Aldershot, pp. 59-57.
- Mumford, E. and Weir, M. (1979) *The computer systems work design: the ETHICS method*. London: Associated Business Press.
- Myers, M.D. (1999) 'Investigating information systems with ethnographic research', *Communications of the Association for Information Systems*, 2(23), pp. 1-20.
- Myers, M.D. (1997) 'Qualitative Research in Information Systems', *MIS Quarterly*, 21(2), pp. 241-242.
- Nandhakumar, J., Rossi, M. and Talvinen, J. (2005) 'The Dynamics of Contextual Forces of ERP Implementation', *Journal of Strategic Information Systems*, 14(2), pp. 221-242.
- Nandhakumar, J. and Jones, M. (2002) 'Development gain? Participant observation in interpretive management information systems research', *Qualitative Research*, 2(3), pp. 323-341.
- Nandhakumar, J. and Jones, M. (1997) 'Too close for comfort? Distance and engagement in interpretive information systems research', *Information Systems Journal*, 7(2), pp. 109-131.
- Nedevschi, S., Jaspal, S.S., Joyojeet, P., Rodrigo, F. and Kentaro, T. (2006) 'Bayesian Networks: an Exploratory Tool for Understanding ICT Adoption', *Information and Communication Technologies and Development, 2006. ICTD '06. International Conference on.* , 277-284.

- Niederman, F. and March, S.T. (2012) 'Design science and the accumulation of knowledge in the information systems discipline', *Journal ACM Transactions on Management Information Systems*, 3(1).
- Niehaves, B., Dreiling, A., Ribbert, M. and Holten, R. (2004) 'Conceptual Modeling - An Epistemological Foundation', *Proceedings of the American Conference on Information Systems AMCIS*.
- Niehaves, B. (2005) 'Epistemological Perspectives on Multi-Method Information Systems Research', *The Thirteenth European Conference on Information Systems, Regensburg, Germany.* , 1584-1595.
- Nilsson, M. (2000) 'Organizational Development as Action Research, Ethnography, and Beyond', *Paper presented at the Annual Meeting of the American Educational Research Association, April 13. LA:New Orleans:* .
- Nkwambe, M. (1991) 'Resource utilisation and regional planning systems (RURPIS) in Botswana.', *International Journal of Geographical Information Systems*, 5(1), pp. 111-122.
- Noble, D.F. (1984) *Forces of Production: A Social History of Industrial Automation*. Oxford: Oxford University Press.
- Nunamaker, J.F. (2007) "Traveling the Last Research Mile," *Distinguished Lecture at the Symposium on Progress in Interdisciplinary Research in Information Technology*,.
- Nunamaker, J.F.J., Chen, M. and Purdin, T.D.M. (1990) 'Systems Development in Information Systems Research', *Journal of Management Information Systems*, 7(3), pp. 89-106.
- O'Connor, H. and Madge, C. (2001) 'Cyber-Mothers: Online Synchronous Interviewing Using Conferencing Software', *Sociological Research Online*, 5(4).
- O'Reilly, K. (2005) *Ethnographic Methods*. London: Routledge.
- Odedra, M. (1993) 'IT applications in the Commonwealth developing countries,' in Harindranath, G. and Liebenau, J. (eds.) *Information Technology Policies and Applications in the Commonwealth developing countries*. London: Commonwealth Secretariat.

- OECD (1989) *Information technology and new growth opportunities Information Computer and Communications Policy Series, ICCP No. 19*. Paris: OECD.
- Orlikowski, W.J. (2010) 'Technology and organization: Contingency all the way down', *Research in the Sociology of Organizations*, 29, pp. 239-246.
- Orlikowski, W.J. (2007) *Sociomateriality: A Practice Lens on Technology at Work*, Seminar Presentation edn. ICTs in the Contemporary World Seminar.
- Orlikowski, W.J. (2005) 'Material Works: Exploring the Situated Entanglement of Technological Performativity and Human Agency', *Scandinavian Journal of Information Systems*, 17(1).
- Orlikowski, W. (2000) 'Using Technology and Constituting Structures: a Practice Len for Studying Technology in Organizations', *Organization Science*, 11(4), pp. 404-428.
- Orlikowski, W.J. (2007) 'Sociomaterial Practices: Exploring Technology at Work', *Organization Studies*, 28(9), pp. 1435-1448.
- Orlikowski, W.J. (1992) 'The duality of technology: Rethinking the concept of technology in organizations.', *Organization Science*, 3(3), pp. 398-427.
- Orlikowski, W.J. and Scott, S.V. (2008) *Sociomateriality: challenging the seperation of technology, work and organisation. Working Paper:174*. London: Information System Innovation Group, London School of Economics and Political Science.
- Orlikowski, W.J. (2010) 'The sociomateriality of organisational life: considering technology in management research', *Cambridge Journal of Economics*, 34(1), pp. 125-141.
- Orlikowski, W.J. (1996) 'Improvising Organizational Transformation Over Time: A Situated Change Perspective', *Information Systems Research*, 7(1), pp. 63-92.
- Orlikowski, W.J. and Baroudi, J.J. (1991) 'Studying Information Technology in Organizations: Research Approaches and Assumptions', *Information Systems Research*, 2(1), pp. 1-28.

- Orlikowski, W.J. and Iacono, C.S. (2001) 'Research Commentary: Desperately Seeking the 'IT' in IT Research--A Call to Theorizing the IT Artifact', *Information Systems Research*, 12(2), pp. 121.
- Orlikowski, W.J. and Scott, S.V. (2008) 'Sociomateriality: Challenging the Separation of Technology, Work and Organization 10', *The Academy of Management Annals*, 2(1), pp. 433-474.
- Orlikowski, W.J. and Yates, J. (2006) 'ICT and Organizational Change: A Commentary', *The Journal of applied behavioral science*, 42(1), pp. 127-134.
- Orlikowski, W.J., Yates, J., Okamura, K. and Fujimoto, M. (1995) 'Shaping Electronic Communication: The Metastructuring of Technology in the Context of Use', *Organization Science*, 6(4), pp. 423-444.
- Österle, H., Becker, J., Frank, F., Hess, T., Karagiannis, D., Krcmar, H., Loos, P., Mertens, P., Oberweis, A. and Sinz, E. (2011) 'Memorandum on design-oriented information systems research', *European Journal of Information Systems*, 20(1), pp. 7-10.
- Oxford Dictionaries (2012) *Definition of Record*. Available at: <http://oxforddictionaries.com/definition/record> (Accessed: June, 01 2012).
- Palys, T. (1997) *Research Deisions: Quantitative and Qualitative Perspectives*. London: Harcourt Canada.
- Parsons, T. (1968) 'Social Interaction', in Sills, D.L. (ed.) *International Encyclopedia of the Social Sciences (Vol. 7)*. New York: Crowell Collier and Macmillan, pp. 429-441.
- Pawson, R. (1995) 'Quality and quantity, agency and structure, mechanism and context, dons and cons', *BMS Bulltin de Methodologie Sociologique*, 47, pp. 5-48.
- Peffer, K., Tuunanen, T., Rothenberger, M. and Chatterjee, S. (2007) 'A Design Science Research Methodology for Information Systems Research', *Journal of Management Information Systems*, 24(3), pp. 45-77.
- Pels, D., Hetherington, K. and Vandenberghe, F. (2002) 'The Status of the Object', *Theory, Culture & Society*, 19(5-6), pp. 1-21.
- Pelto, P.J. and Pelto, G.H. (1978) *Anthropological Research*. England: Cambridge University Press.

- Perrolle, J.A. (1986) 'Intellectual Assembly Lines: The Rationalization of Managerial, Professional, and Technical Work ', *Computers and Social Sciences*, 2, pp. 111-121.
- Perrow, C. (1967) 'A Framework for the Comparative Analysis of Organizations', *American Sociological Review*, 32(2), pp. pp. 194-208.
- Petersen, E.S., Nyce, J.M. and Lützhöft, M. (2011) 'Ethnography re-engineered: the two tribes problem', *Theoretical Issues in Ergonomics Science*, 12(6), pp. 496-509.
- Pfeffer, J. and Leblebici, H. (1977) 'Information Technology and Organizational Structure', *The Pacific Sociological Review*, 20(2), pp. 241-261.
- Pickering, A. (1995) *The Mangle of Practice: Time, Agency and Science*. Chicago, IL: University of Chicago Press.
- Pickering, A. and Guzik, P. (eds.) (2008) *The Mangle in Practice: Science, Society, and Becoming*. Durham, NC: Duke University Press.
- Pinch, T.J. and Bijker, W.E. (1984) 'The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other', *Social Studies of Science*, 14(3), pp. pp. 399-441.
- Pink, S., Tutt, D., Dainty, A. and Gibb, A. (2010) 'Ethnographic methodologies for construction research: knowing, practice and interventions', *Building Research & Information*, 38(6), pp. 647-659.
- Ploeger, H.D. and Stoter, J.E. (2004) (2004). *Cadastral registration of cross-boundary infrastructure objects*. <http://www.gdmc.nl/publications/#Conference%20proceedings%20working%20paper>: FIG Working Paper.
- Polanyi, M. (1967) *The Tacit Dimension*. New York: Anchor Books.
- Pouloudi, A., Gandeche, R., Atkinson, C. and Papazafeiropoulou, A. (2004) 'How stakeholder analysis can be mobilized with actor-network theory to identify actors', in Kaplan, B., III, D.T., Wastell, D., Wood-Harper, A.T. and DeGross, J.I. (eds.) *Information Systems Research: Relevant Theories and Informed Practice, IFIP 8.2 Conference Proceedings*. London: Kluwer Academic, pp. 705-711.

- Prakash, A. and De, R. (2007) 'Importance of development context in ICT4D projects: A study of computerization of land records in India', *Information Technology & People*, 20(3), pp. 262-281.
- Prasad, P. (1997) 'Systems of meaning: ethnography as a methodology for the study of information technologies', in Lee, A.S., Liebenau, J. and DeGross, J.I. (eds.) *Information Systems and Qualitative Research: Proceedings of the IFIP TC8 WG 8.2 International Conference and Qualitative Research 31st May -3rd June 1997, Philadelphia, Pennsylvania, USA*. London: Chapman & Hall, pp. 101-118.
- Prasad, P. (1993) 'Symbolic Processes in the Implementation of Technological Change: a Symbolic Interactions Study of Work Computerization', *Academy of Management Journal*, 36(6), pp. 1400-1429.
- Probert, S. (2004) 'Adorno: A Critical Theory for IS Research', in Mingers, J. and Willcocks, L.P. (eds.) *Social Theory and Philosophy for Information Systems*. Ontario, Canada: John Wiley & Sons Canada Ltd.
- Proenza, F.J. (2007) 'Information systems and land administration', *6th FIG Regional Conference*. San José, Costa Rica 12–15 November 2007: Available at: <http://www.fig.net/pub/costarica/index.htm> (accessed on 30 Dec 2011).
- Provan, K.G. and Human, S.E. (1999) 'Organizational learning and the role of the network broker in small-firm manufacturing networks', in Grandori, A. (ed.) *Interfirm networks: Organization and industrial competitiveness*. London: Routledge, pp. 185-207.
- Putnam, L.L., Bantz, C., Deetz, S., Mumby, D. and Van Mannen, J. (1993) 'Ethnography versus Critical Theory', *Journal of Management Inquiry*, 2(3), pp. 221-235.
- Qazi, U.M. (2006) *Computerisation of land records in Pakistan: a comparative analysis of two projects from a human security perspective*. .
- Rapoport, R.N. (1970) 'Three Dilemmas in Action Research', *Human Relations*, 23(6), pp. 499-513.
- Reason, P. and Bradbury, H. (2001) 'Inquiry and Participation in Search of a World Worthy of Human Aspiration', in Reason, P. and Bradbury, H.

- (eds.) *Handbook of Action Research: Participative Inquiry in Practice*. London: Sage Publication, pp. 1-14.
- Reason, P. (2004) 'Critical Design Ethnography as Action Research', *Anthropology & Education Quarterly*, 35(2), pp. 269-276.
- Reason, P. (2002) 'Preface', in Reason, P. and Bradbury, H. (eds.) *Handbook of action research*. Concise pbk edn. London: Sage, pp. xxiii-xxxi.
- Recker, J. (2012) *Scientific Research in Information Systems A Beginner's Guide* London: Springer.
- Reckwitz, A. (2002) 'Toward a Theory of Social Practices', *European Journal of Social Theory*, 5(2), pp. 243-263.
- Robert, J.M. and Sanders, T. (2005) 'Before During and After: Realism, Reflexivity and Ethnography', *Sociological Review*, 53(2), pp. 294-313.
- Robey, D. (1996) 'Research Commentary: Diversity in Information Systems Research: Threat, Promise, and Responsibility', *Information Systems Research*, 7(4), pp. 400-408.
- Roknuzzaman, M. (2006) 'A survey of internet access in a large public university in Bangladesh', *International Journal of Education and Development Using Information*, 2(3), pp. 86-105.
- Romme, A.G.L. (2003) 'Making a Difference: Organization as Design', *Organization Science*, 14(5), pp. 558-573.
- Rose, J. (1998) 'Evaluating the contribution of structuration theory to the information system discipline.', *6th European Conference on Information Systems*. Aix-en-Provence: .
- Rose, J. and Hackney, R. (2003) 'Towards a structurational theory of information systems: a substantive case analysis', *System Sciences, 2003. Proceedings of the 36th Annual Hawaii International Conference on* . , 9 pp.
- Rose, J., Jones, M. and Truex, D. (2005) 'The Problem of Agency Re-visited', *Scandinavian Journal of Information Systems*, 17(1), pp. 187-196.
- Rose, J. and Jones, M. (2005) 'The Double Dance of Agency: A Socio-Theoretic Account of How Machines and Humans Interact', *Systems, Signs & Actions*, 1(1), pp. 1-37.

- Rosemann, M. and Vessey, I. (2008) 'Toward Improving the Relevance of Information Systems Research to Practice: the Role of Applicability Checks', *MIS Quarterly*, 32(1), pp. 1-22.
- Rosen, M. (1991) 'Coming to Terms with the Field: Understanding and Doing Organizational Ethnography', *Journal of Management Studies*, 28(1), pp. 1-24.
- Rosenbaum, H., Day, R. and Ma, L. (2009) 'Technology, organization and materiality: Reflections on the Problem of Agency', *AMCIS 2009 Proceedings. Paper 703*. <http://aisel.aisnet.org/amcis2009/703>: .
- Rouse, J. (2002) *How Scientific Practices Matter: Reclaiming Philosophical Naturalism*. Chicago: University of Chicago Press.
- Rowland, G. (1995) 'Archetypes of Systems Design', *Systems Practice*, 8(3), pp. 277-289.
- Sahay, S. (1997) 'Implementation of Information Technology: a Time-space Perspective.', *Organisation Studies*, 8(2-3), pp. 229-260.
- Sahay, S. and Avgerou, C. (2002) 'Introducing the Special Issue on Information and Communication Technologies in Developing Countries', *Information Society*, 18(2), pp. 73-76.
- Sahay, S., Monteiro, E. and Aanestad, M. (2009) 'Toward a political perspective of integration in information systems research: The case of health information systems in India', *Information Technology for Development*, 15(2), pp. 83-94.
- Sahay, S. and Robey, D. (1996) 'Organizational context, social interpretation, and the implementation and consequences of geographic information systems', *Accounting, Management and Information Technologies*, 6(4), pp. 255-282.
- Sambamurthy, V. and Zmud, R.W. (1999) 'Arrangement for Information Technology Governance: a Theory of Multiple Contingencies', *MIS Quarterly*, 23(2), pp. 261-290.
- Sanday, P.R. (1979) 'The Ethnographic Paradigm(s)', *Administrative Science Quarterly*, 24(4), pp. 527-538.
- Sawy, O.A.E. (2003) 'The is Core--Ix the 3 Faces of is Identity: Connection, Immersion, and Fusion', *Communications of AIS*, 2003(12), pp. 588-598.
- Schatzki, T.R. (2005) 'Peripheral Vision: The Sites of Organizations', *Organization Studies*, 26(3), pp. 465-484.

- Scholl, H.J. (2004) 'Introduction to the Electronic Government Cluster of Minitracks ', *Proceedings of the 37th Hawaii International Conference on System Science*. IEEE.
- Schön, D.A. (1983) *The Reflective Practitioner*. New York: Basic Books.
- Schön, D. and Bennett, J. (1996) 'Reflective Conversation with Materials', in Winograd, T. (ed.) *Bringing Design to Software*. Addison-Wesley.
- Schultze, U. (2001) 'Reflexive ethnography in information systems research', in Trauth, E.M. (ed.) *Qualitative Research in IS Issues and Trends*. Hershey, PA: Idea Group Publishing, pp. 78-103.
- Schutz, A. (1967) *The phenomenology of the social world*. Chicago: University of Chicago Press.
- Schwandt, T.A. (1994) 'Constructivist, interpretivist approaches to human inquiry', in Denzin, N.K. and Lincoln, Y.S. (eds.) *Handbook of qualitative research*. Sage, CA.: Thousand Oaks, pp. 118-137.
- Scott, S.V. and Orlikowski, W.J. (2009) *"Getting the Truth": Exploring the Material Grounds of Institutional Dynamics in Social Media. Working Paper Series, 177*. London: LSE.
- Sefyrin, J. (2010a) 'Entanglements of participation, gender, power and knowledge in IT design', *Proceedings of the 11th Biennial Participatory Design Conference*. ACM Digital Library, 111-120.
- Sefyrin, J. (2010b) *Sitting on the Fence – Critical Explorations of Participatory Practices in IT Design* Unpublished Doctoral dissertation. Mid Sweden University.
- Sein, M.K. (2011) 'The "I" between G and C: E-Government Intermediaries in Developing Countries', *The Electronic Journal of Information Systems in Developing Countries*, 48(2), pp. 1-14.
- Sein, M.K. and Furuholt, B. (2012) 'View from practice:Intermediaries: bridges across the digital divide', *Information Technology for Development*, iFirst, pp. 1-13.
- Sein, M.K. and Harindranath, G. (2004) 'Conceptualizing the ICT Artifact: Toward Understanding the Role of ICT in National Development', *Information Society*, 20(1), pp. 15-24.

- Sein, M.K., Henfridsson, O., Purao, S., Rossi, M. and Lindgren, R. (2011) 'Action Design Research', *MIS Quarterly*, 35(1), pp. 37-56.
- Sele, K. (2012) *The Role of Sociomaterial Practices in Becoming and Staying Innovative: The AI Lab Case* School of Management, Economics, Law, Social Sciences and International Affairs, University of St. Gallen.
- Sharp, H., deSouza, C. and Dittrich, Y. (2010) 'Using ethnographic methods in software engineering research', *Software Engineering, 2010 ACM/IEEE 32nd International Conference on.* , 491-492.
- Silverman, D. (1993) *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction*. London: Sage.
- Sim, S.E. (1999) 'Evaluating the Evidence: Lessons from Ethnography', *Proceedings of the Workshop Empirical Studies of Software Maintenance*. Oxford, England: , 66.
- Simon, H.A. (1996) *The Sciences of the Artificial*. Cambridge, MA: MIT Press.
- Singh, G., Pathak, R.D. and Naz, R. (2010) 'E-governance for improved public sector service delivery in India, Ethiopia and Fiji', *International Journal of Public Sector Management*, 23(3), pp. 254-275.
- Sinha, S. (2003) 'Computerisation of Land Records', *Economic and Political Weekly*, 38(35), pp. pp. 3739-3740.
- Sirimanne, S. (1996) *The information technology revolution: What about developing countries?* International Development Information Center, *Development Express, No.04*, Canadian International Development Agency.
- Sleeman, B. (2004) 'Recent literature on government information', *Journal of Government Information*, 30(1), pp. 20-41.
- Slife, B.D. (2004) 'Taking Practice Seriously: Toward a Relational Ontology', *Journal of Theoretical and Philosophical Psychology*, 24(2), pp. 157-178.
- Soeftestad, L.T. (2001) 'Aligning needs and means: On culture, ICT and knowledge in development cooperation', *Proceedings of the 24th Information Systems Research Seminar in Scandinavia*, Norway: Ulvik, 47.
- Spindler, G. and Spindler, L. (1992) 'Cultural Process and Ethnography: An Anthropological Perspective', in LeCompte, M.D., Millory, W.L. and Preissle,

- J. (eds.) *The Handbook of Qualitative Research in Education*. San Diego, CA: Academic Press, pp. 53-93.
- Stanley, L. (1990) 'Doing Ethnography, Writing Ethnography: A Comment on Hammersley', *Sociology*, 24(4), pp. 617-627.
- Star, S.L. (1999) 'The Ethnography of Infrastructure', *American Behavioral Scientist*, 43(3), pp. 377-391.
- Strong, D.M. and Volkoff, O. (2010) 'Understanding Organization--Enterprise System Fit: a Path to Theorizing the Information Technology Artifact', *MIS Quarterly*, 34(4), pp. 731-756.
- Suchman, L.A. (2007) *Human-machine reconfigurations: Plans and situated actions*. Cambridge, UK: Cambridge University Press.
- Suchman, L.A. (2012) 'Configuration', in Lury, C. and Wakeford, N. (eds.) *Inventive Methods: The Happening of the Social*. London: Routledge, pp. 48-60.
- Suchman, L.A. (1987) *Plans and Situated Actions: The Problem of Human Machine Communication*. Cambridge: Cambridge University Press.
- Suchman, L. (2000) 'Embodied Practices of Engineering Work', *Mind, Culture, and Activity*, 7(1-2), pp. 4-18.
- Susman, G.I. and Evered, R.D. (1978) 'An Assessment of the Scientific Merits of Action Research', *Administrative Science Quarterly*, 23(4), pp. 582-603.
- Sutton, B. (2012) *Sociomateriality: More Academic Jargon Monoxide*. Available at: <http://tinyurl.com/c228aay> (Accessed: 11/9/2012 2012).
- Swann, C. (2002) 'Action Research and the Practice of Design', *Design Issues*, 18(1), pp. 49-61.
- Tanesini, A. (1999) *An Introduction to Feminist Epistemologies*. Malden, MA: Blackwell.
- Taylor, C. (1979) 'Interpretation and the Sciences of Man', in Rainbow, R. and Sullivan, W. (eds.) *Interpretive Social Science*. Berkeley and Los Angeles, CA: University of California Press, pp. 25-71.
- Taylor, S.J. and Bogdan, R. (1984) *Introduction to Qualitative Research Method*. New York: John Wiley.

- Thomas, P. (2009) 'Bhoomi, Gyan Ganga, e-governance and the right to information: ICTs and development in India', *Telematics and Informatics*, 26(1), pp. 20-31.
- Thompson, M. (2012) 'People, practice, and technology: Restoring Giddens' broader philosophy to the study of information systems', *Information and Organization*, 22(3), pp. 188-207.
- Toaha, M. and Khan, S. (2008) 'Automated digital archive for land registration and records', *Computer and Information Technology, 2008. ICCIT 2008. 11th International Conference on.* , 46-51.
- Trauth, E.M. (2001) 'The Choice of Qualitative Methods in IS Research', in Trauth, E.M. (ed.) *Qualitative Research in IS: Issues and Trends*. Hershey, PA: Idea Group Publishing, pp. 1-19.
- Trauth, E.M. and Jessup, L. (2000) 'Understanding computer mediated discussion: postivist and interpretive analysis of group support system use', *MIS Quarterly*, 24(1), pp. 43-79.
- Trist, E.L. and Bamforth, K.W. (1951) 'Some Social and Psychological Consequences of the Longwall Method of Coal-Getting: An Examination of the Psychological Situation and Defences of a Work Group in Relation to the Social Structure and Technological Content of the Work System', *Human Relations*, 4(1), pp. 3-38.
- Trobia, A. (2008) 'Questionnaire', in Lavrakas, P.,J. (ed.) *Encyclopedia of survey research method*. Sage, pp. 653-656.
- Tsichritzis, D. (1998) 'The dynamics of Innovation', in Denning, P.J. and Metcalfe, R.M. (eds.) *The Next Fifty Years of Computing*. New York: Copernicus Books, pp. 259-265.
- United Nations (1985) *Modern management and information systems for public administration in developing countries*. Washington: United Nations.
- UNPAN (n.d.) *Info-Structure: e-Records*. United Nations Public Administration Network.
- Unwin, T. (2009) 'Context: The Place of Information and Communication Technologies for Development, www.gg.rhul.ac.uk/ict4d/Chapter1.pdf (accessed on 15 June ,2012)', in Unwin, T. (ed.) *ICT4D Information and*

- Communication Technologies for Development*. Cambridge: Cambridge University Press, pp. 1-51.
- USAID (1995) *Ecuador Land Titling Project. Project Paper*. Washington, D.C.: USAID.
- Vaishnavi, V. and Kuechler, B. (2011) *Design Research in Information Systems* . Available at: <http://desrist.org/design-research-in-information-systems/> (Accessed: 5/19/2012 2012).
- van Aken, J.E. (2004) 'Management Research Based on the Paradigm of the Design Sciences: The Quest for Field-Tested and Grounded Technological Rules', *Journal of Management Studies*, 41(2), pp. 219-246.
- van Aken, J.E. (2005) 'Management Research as a Design Science: Articulating the Research Products of Mode 2 Knowledge Production in Management', *British Journal of Management*, 16(1), pp. 19-36.
- van Aken, J.E. (2007) 'Design Science and Organization Development Interventions: Aligning Business and Humanistic Values', *The Journal of applied behavioral science*, 43(1), pp. 67-88.
- van Aken, J.E. (2005) 'Valid knowledge for the professional design of large and complex design processes', *Design Studies*, 26(4), pp. 379-404.
- Van de Ven, A.H. (2007) *Engaged Scholarship: A Guide for Organizational and Social Research*. Oxford, England: Oxford University Press.
- Van House, N.A. (2004) 'Science and technology studies and information studies', *Annual Review of Information Science and Technology*, 38(1), pp. 1-86.
- van Maanen, J. (1983) 'The Moral fix: On the ethics of fieldwork', in Emerson, R. (ed.) *Contemporary Field Research*. Boston: Little Brown.
- van Maanen, J. (2006) 'Ethnography Then and Now', *Qualitative Research in Organizations and Management: An International Journal*, 1(1), pp. 13-21.
- van Maanen, J. (1979) 'The Fact of Fiction in Organizational Ethnography', *Administrative Science Quarterly*, 24(4), pp. 539-550.
- ven der Tuin, I. and Dolphijn, R. (2012) 'Matter feels, converses, suffers, desires, yearns and remembers', in ven der Tuin, I. and Dolphijn, R. (eds.) *New Materialisms: Interviews & Cartographies*. Open Humanities Press.

- Venable, J.R. (2006) 'A framework of design science research activities', *Proceedings of the Information Resource Management Association Conference*. Washington, DC, USA, 21-24 May: .
- Ventura, S.J. (1998) *Land Information Systems and Cadastral Applications, NCGIA Core Curriculum in GIScience*. Available at: <http://www.ncgia.ucsb.edu/giscc/units/u164/u164.html> (Accessed: 6/9/2012 2012).
- Volkoff, O., Strong, D.M. and Elmes, M.B. (2007) 'Technological Embeddedness and Organizational Change', *Organization Science*, 18(5), pp. 832-848.
- Wade, M. and Hulland, J. (2004) 'Review: The Resource-Based View and Information System Research: Review, Extension, and Suggestions for Future Research.', *MIS Quarterly*, 28(1), pp. 107-142.
- Wallace, J. and Williamson, I. (2006) 'Developing cadastres to service complex property markets', *Computers, Environment and Urban Systems*, 30(5), pp. 614-626.
- Walls, J.G., Widmeyer, G.R. and El Sawy, O.A. (1992) 'Building an Information System Design Theory for Vigilant EIS', *Information Systems Research*, 3(1), pp. 36-59.
- Walsham, G. (2001) *Making a World of Difference: IT in a Global Context*. Chichester: John Wiley.
- Walsham, G. (1997) 'Actor network theory and IS research: current status and future prospects', in Lee, A.S., Liebenau, J. and DeGross, J.I. (eds.) *Information Systems and Qualitative Research*. London: Chapman & Hall, pp. 466-480.
- Walsham, G. (1993) *Interpreting information systems in organizations*. Chichester: Wiley.
- Walsham, G. (1995) 'Interpretive case studies in IS research: nature and method', *European Journal of Information Systems*, 4(2), pp. 74-81.
- Walsham, G. and Han, C. (1991) 'Sturcturation Theory and Information System Research', *Journal of Applied Systems Analysis*, 17, pp. 77-85.
- Walsham, G. (2006) 'Doing interpretive research', *European Journal of Information Systems*, 15(3), pp. 320-330.

- Walsham, G. and Sahay, S. (1999) 'Gis for District-Level Administration in India: Problems and Opportunities', *MIS Quarterly*, 23(1), pp. 39-65.
- Wanyama, I. and Zheng, Q. (2010) 'Organizational culture and information systems implementation: A Structuration Theory perspective', *Information and Financial Engineering (ICIFE), 2010 2nd IEEE International Conference on.* , 507-511.
- Wastell, D. (2010) 'Managing as designing: 'opportunity knocks' for the IS field?', *European Journal of Information Systems*, 19(4), pp. 422-431.
- Webb, J.W., Tihanyi, L., Ireland, R.D. and Sirmon, D.G. (2009) 'You Say Illegal, I Say Legitimate: Entrepreneurship in the Informal Economy', *Academy of Management Review*, 34(3), pp. 492-510.
- Weber, M. (1946) 'Science as a vocation', in Gerth, H. and Mills, C.W. (eds.) *From Max Weber*. New York: Oxford University Press.
- Whitman, M.E. and Woszczynski, A.B. (2004) *The Handbook of Information Systems Research* London: Idea Group Publishing.
- Wilkins, A. and Ouchi, W. (1983) 'Efficiency cultures: Exploring the relationship between culture and organisational performance.', *Administrative Science Quarterly*, 28, pp. 468-481.
- Williamson, I., Enemark, S., Wallace, J. and Rajabifard, A. (2009) *Land Administration Systems for Sustainable Development*. ESRI Press.
- Winner, L. (1977) *Autonomous technology: Technics-out-of-control as a theme in political thought*. Cambridge, MA: MIT Press.
- Winograd, T. (ed.)(1996) *Bringing Design to Software*. Addison-Wesley.
- Wiredu, G.O. (2005) *Mobile Computing in Work-Integrated Learning: Problems of Remotely-Distributed Activities and Technology Use* Department of Information Systems.
- Woolgar, S. (1991) 'Configuring the user: the case of usability trials', in Law, J. (ed.) *A Sociology of Monsters: Essays on Power, Technology and Domination*. London: Routledge, pp. 57-99.
- World Bank (2006) *Information and Communications for Development: Global Trends and Policies*. Washington: World Bank.

- Yeh, A.G. (1991) 'The development and applications of geographic information systems for urban and regional planning in the developing countries', *International Journal of Geographical Information Systems*, 5(1), pp. 5-27.
- Zammuto, R.F., Griffith, T.L., Majchrzak, A., Dougherty, D.J. and Faraj, S. (2007) 'Information Technology and the Changing Fabric of Organization', *Organization Science*, 18(5), pp. 749-762.
- Zhao, Y. (2010) 'One Map-Based Land Information System: Towards E-government for Land Management', *E-Business and E-Government (ICEE), 2010 International Conference on.* , 687-690.
- Zmud, B. (1997) 'Technically Oriented Submissions', *MIS Quarterly*, 21(2), pp. xxi-xxiii.
- Zorina, A. and Avison, D. (2011) 'When Environment Matters: Inter-Organizational Effects on Sociomaterial Imbrications and Change', *ICIS Conference 2011* .
- Zuboff, S. (1988) *In the Age of the Smart Machine*. New York: Basic Books.

Appendix A

Research Ethics Approval

School of Information Systems, Computing and Mathematics

David Gilbert,
Head of School, Professor of Computing
Jasna Kuljis,
Head of Information Systems and Computing, Professor of Computing
Tony Rawlins,
Head of Mathematical Science, Professor of Mathematics



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STATEMENT OF ETHICS APPROVAL

Date 28 February 2012

Proposer: Muhammad Alam

**Title: Implementation of ICTs in Land Records Integration in Bangladesh:
Context of Actor Network Governance**

The school's research ethics committee has considered the proposal recently submitted by you. Acting under delegated authority, the committee is satisfied that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that you will adhere to the terms agreed with participants and to inform the committee of any change of plans in relations to the information provided in the application form.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Zidong Wang". The signature is fluid and cursive, with the first name "Zidong" and the last name "Wang" clearly distinguishable.

Professor Zidong Wang
Chair of the Research Ethics Committee
SISCM

**School of Information Systems, Computing
and Mathematics**

David Gilbert,
Head of School, Professor of Computing
Jasna Kuljis,
Head of Information Systems and Computing, Professor of Computing
Tony Rawlins,
Head of Mathematical Science, Professor of Mathematics



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STATEMENT OF ETHICS APPROVAL

Date 14 August 2013

Proposer: Muhammad Alam

**Title: Entangling and Disentangling: Sociomateriality of Designing E-service
of Land Records in Bangladesh. *An Action Design Ethnographic Study***

The school's research ethics committee has considered the proposal recently submitted by you. Acting under delegated authority, the committee is satisfied that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that you will adhere to the terms agreed with participants and to inform the committee of any change of plans in relations to the information provided in the application form.

Yours sincerely,

A handwritten signature in black ink that reads "Zidong Wang". The signature is written in a cursive style with a large, sweeping initial 'Z'.

Professor Zidong Wang
Chair of the Research Ethics Committee
SISCM

Appendix B

Permission from the Organization

From: Ziaur Rahman [miamallar@yahoo.com]
Sent: 12 February 2012 10:50
To: Muhammad Alam
Subject: Permission of Ph.D Fieldwork

Dear M.S. Alam:

Please refer to your email dated 09 February 2012. This is my pleasure to inform you that you are permitted to conduct your fieldwork in the Office of the Deputy Commissioner, Khulna and its subordinate offices.

Thanking you,

Yours Sincerely,

Ahmed Ziaur Rahman
Assistant Commissioner & Executive Magistrate
Office of the Deputy Commissioner, Khulna.
Bangladesh.
Contact no. +8801711-832411
email: miamallar@yahoo.com

Appendix C

Information for Respondents/Participants

I am Muhammad Alam, a Ph.D. student at Brunel University, London, UK. My research topic is '**Entanglements and Disentanglements - Sociomateriality of IT Design in E-service of Land Records in Bangladesh: *An Action Design Ethnographic Study***' which is related to you (your organization). Thus I have chosen you/your organization as the part of my fieldwork.

I would like to observe the process of land records related service delivery at your organization including, staff, land records, technology for providing service delivery of land records, intermediaries and infomediaries for land records and the service recipients, the citizens. In this regard, I would like to interview you, discuss with you, observe the process and make necessary intervention with the organizational process. Since my research methodology is interventional i.e., Action Design Ethnographic Research, I would intend to develop strategies for improvement of the process of E-service of land records from the results of the interview, discussion, observation and intervention. Therefore, the study will intervene, design and redesign of the E-service of land records in your organization.

However, you are not bound to accept the strategy or allow me to continue my research at your organization i.e., continue interviewing, observation, discussion and intervention. At any time you could withdraw your consent. Further, I assure you that your name and your organization will be kept anonymous. Furthermore, the gathered data, information and records from this research will be used for my research purpose only.

If you have any concerns or complaints regarding the ethical elements of this project please contact siscm.srec@brunel.ac.uk or Professor Zidong Wang, Tel. No. +44 01895266021.

Appendix D

Consent Form

I am Muhammad Alam, a Ph.D. student at Brunel University, London, UK. My research topic is ‘**Entanglements and Disentanglements in E-service of Land Records in Bangladesh: An Action Design Ethnographic Study**’. You have been chosen/ selected as a participant of the study to give an interview/ take part in discussion/ take part in intervention/ observe you or your work.

However, you have freedom to withdraw yourself/ your consent from the participant of the study at any time of the interview, discussion, intervention and observation. Even you have right to cancel any part of interview discussion, intervention and observation.

The data, information and documents that would have been gathered from this will not be used as evidence against you rather they will be used anonymously and for the study purpose only.

It is your absolute choice whether you would like to be a participant of this study or not. Further, this consent for will be used for research purpose.

If you have any concerns or complaints regarding the ethical elements of this project please contact siscm.srec@brunel.ac.uk or Professor Zidong Wang, Tel. No. +44 01895266021.

Name of the Participants:.....

Address:.....

Appendix E

List of Questions

1. Observation and Participant Observation: Main questions and issues that have been guided participant observation

1.A. Question and issues relating to organizational process and staff involved in land records service:

1.A.1 How long have you been working in this office/ in this job/ in this post/ in E-service of land records?

1.A.2 What are tasks and responsibilities involved with E-service of land records?

1.A.3 What is your role in process of E-service of Land records?

1.A.4 How is your role with connected with citizens, intermediaries, the UISCs and the E-service center of this E-service?

1.A.5 How is your experience and knowledge important for this E-service?

1.A.6 How many applications do this organization receive for E-service of land records?

1.A.7 What are the access points to receive applications for land records service?

1.A.8 Which is the most used access point for this service? Why?

1.A.9 Why other access points are less used to submit applications for this service? Why?

1.A.10 How do you process/prepare land records on the basis of citizen's application?

1.A.11 What are the steps required processing this service delivery?

1.A.12 How many days take to process the E- service of land records?

1.A.13 How do you maintain priority in processing this E-service?

1.A.14 What are the influencing factors that expedite or delay in processing of this E-service?

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1.A.15 What are hierarchical ranks in the staff and officers involved in the process of service delivery?

1.A.16 How do the staff connected with the middlemen and intermediaries?

1.A.17 What are the organizational units involved in processing land records service?

1.A.18 What are the challenges and prospects of uniting the land records store unit and the land records copying unit? Is any positive impact of uniting land records store unit and land records copying unit?

1.A.19 From the three channels (E-service Center, Web portal and UDC –Union Information Service Centre), which is the quickest channel to provide this service delivery and which is the complicated? Why?

1.A.20 How much cost is involved to access into land records service in each channel?

1.A.21 How much time is involved in receiving of the E-service in each channel?

1.A.22. How does the web portal helpful for intermediaries rather than the citizens or the UDCs' operators?

1.A.23. Does this bilateral network between the UDCs and DRR bilateral network helpful for the staff?

1.A.24 What are the main problems from the staff to maintain bilateral network between UDCs and the DRR?

1.A.25 What are the problems from the UDCs to maintain the bilateral networks viewed by the staff?

1. B. Question and issues relating to citizens to receive the land records service:

1.B.1 How do you receive this service delivery?

1.B.2 How much cost does involve receiving service?

1.B.3 Do the citizens need to submit their application for this service by self or need to take help of someone else?

1.B.4 Why do the citizens need to submit the application for the help of intermediaries/ vested interested networks?

1.B.5 What are the channels to access into this service?

1.B.6 What are the differences of the channels on the basis of cost?

1.B.7 What are the differences of the channels on the basis of reliability?

1.B.8 What are the differences of the channels on the basis of quick service delivery?

1.B.9 What are the vested interests networks are involved in this service to mediate citizens to receive this service?

1.B.10 Which vested interested network does use which channel to mediate this service?

- 1.B.11 How is the vested interest networks engaged with the staff?
- 1.B.12 How is the vested interest networks engaged with the service delivery process?
- 1.B.13 What the skills and knowledge have the actors of vested interests networks to mediate this service?
- 1.B.14 What are the impacts of E-service networks in the land records service delivery?
- 1.B.15 Do the citizens have ability to access into the E-service networks of this service directly?
- 1.B.16 What are the obstacles faced by citizens to access to the E-service networks to receive this service delivery?
- 1.B.17 Out of the three channels of E-service network, which is the suitable for the citizens to access into the land records service delivery at the present context?
- 1.B.18 What is role of the Union Information Service Centers (UDC) in mediating citizens' easy access to the land records service?
- 1.B.19 What are the problems of citizens to access into this service through UDCs?
- 1.B.20 What are the organizational threats from the service delivery organizations for UDCs to mediate this service?
- 1.B.21 What are the threats the vested interests networks to mediate this service delivery by UDCs?
- 1.B.22 Do the citizens aware about E-service networks to access into this service delivery?
- 1.B.23 Do the citizens ready to access to this service through E-service networks the service delivery of land records?
- 1.B.24 Do the citizens have prerequisite information to access into the E-service networks to receive the service delivery of land records?
- 1.B.25 Do the citizens have trust and reliability on E-service networks to receive the service delivery of land records?
- 1.B.26 Why do citizens seek alternative access points than the UDCs?

C. Question and issues relating to A2I:

- 1.C.1 What are goals of A2I behind designing E-service of land records service?

1.C.2 What is the relation between the service provider of land records and the A2I?

1.C.3 Who are involved in the process of designing E-service of land records?

1.C.4 Why is the A2I interested in designing multiple channel of E-service of land records?

1.C.5 Do the A2I evaluate the pitfalls of designing multiple channels of E-service of land records?

1.C.6 Where is the focus of the A2I whether in designing technological network or designing the E-service?

D. Question and issues relating to the Staff and the Officers involved in the land records service:

1.D.1 How is the E-service of land records treated by the Copyists?

1.D.2 How do the Copyists find ways to remain engaged with Vested Interest Networks after introducing the E-service?

1.D.3 How do the Copyists find ways to overlap the E-service with vested interest networks in this service delivery?

1.D.3 How do the Copyists find the aperture in the E-service to get engaged with vested interest networks?

1.D.4 How do the Copyists remove/ disengage the UDCs network from the service delivery of land records?

1.D.5 How have the E-service been treated by the Record Bearers?

1.D.6 How do the Record Bearers find ways to remain engage with Vested Interest Networks?

1.D.7 How do the Record Bearers find the aperture in the E-service to engage themselves with vested interest networks after reuniting the record store and the copyist unit?

1.D.8 What is the role of the Record Bearers with the service delivery of land records from the E-service?

1.D.9 How does the Record Keeper treat the E-service of land records?

1.D.10 How does the Record Keeper maintain relations with vested interest network after introducing the E-service?

1.D.11 What is the role of the Record Keeper with the applications of UDCs?

1.D.12 What is the role of the Record Room Deputy Collector with the E-service of land records?

1.D.13 How is the role of the Record Room Deputy Collector influenced by the vested interests networks?

1.D.14 What is the role the Additional Deputy Commissioner (Revenue-1) in the E-service of land records?

1.D.15 How is the role the Additional Deputy Commissioner (Revenue-1) involved with the vested interest networks?

1.D.16 What is the role the Additional Deputy Commissioner (Revenue-2) in the E-service of land records?

1.D.17 How is the role the Additional Deputy Commissioner (Revenue-2) involved with the vested interest networks?

1.D.18 What is the role the Deputy Commissioner (1) in the E-service of land records?

1.D.19 How is the role the Deputy Commissioner (1) involved with the vested interest networks?

1.D.20 What is the role the Deputy Commissioner (2) in the E-service of land records?

1.D.21 How is the role the Deputy Commissioner (2) involved with the vested interest networks?

1.D.22 What is the relationship between the E-service of land records and staff of the other sections and other offices?

1.D.23 How the other sections' staff are engaged and interested with the E-service of land records?

1.D.24 What are the mechanisms and skills maintained the staff of DRR to resist the E-service delivery between UDCs and the DRR?

E. Question and issues relating to E-service Network: E-service Center, Web Portal and UDC.

1.E.1 What is the role of the E-service center in the E-service of land records?

1.E.2 Which is the easy access point for citizens or the vested interest networks?

1.E.3 Does the E-service Center maintain on time service delivery of land records to citizens?

- 1.E.4 Does the E-service Center provide citizens friendly service?
- 1.E.5 Is the E-service Center friendly to the applications coming from UDCs?
- 1.E.6 Is the E-service Center appropriate for E-service of land records?
- 1.E.7 What is the relationship between the E-service Center (the front desk) and the DRR?
- 1.E.8 What is the aim of setting web for the E-service of land records?
- 1.E.9 Who are the intended users of the web portal?
- 1.E.9 How do the vested interest networks become users of the web portal?
- 1.E.9 What is the influence of web portal in the E-service of land records?
- 1.E.10 How do the web portal and the E-service center resist citizens' access to the E-service through the UDCs?

2. Questions for Open Ended Discussion and Consultation Meetings

- 2.1 What are problems in implementing E-service of land records? What are the ways to overcome the problems?
- 2.2 What are the problems of separation between the records store and the Copyist Room? How could it be solved?
- 2.3 What is the significance of inter-organizational coordination in implementing E-service of land records?
- 2.4 What are the legal obstacles for implementing E-service of land records? What are the legal amendments required for E-service?
- 2.5 What are the problems of multiple channels of access to this E-service?
- 2.6 How do the DRR staff and paper based process obstacle for this E-service?
- 2.7 What is significance of implementing this E-service?
- 2.8 What are the ways to implement to E-service for this Upazilla and how it could be done?
- 2.9 What are the issues relating to digitize land records? How is digitization significant for this E-service?
- 2.10 How is A2I and the Ministry of Land could be benefitted through using the E-service Software for digitizing the land record?
- 2.11 What are obstacles in receiving payment from UDC and their solutions?

2.12 What are challenges have been facing after implementing 100% online application for land records?

2.13 What are the issues that need to be taken into consideration for implementing online application throughout the district?

2.14 What are problem with calculating fees for this service delivery?

3. Questions for Semi-Structured and Unstructured Interview

3.1 What are the problems in implementing E-service of land records? What are the ways to overcome the problems?

3.2 What are the problems of separation between the records store and the Copyist Room? What are the challenges of uniting them? What is the relation between expediting E-service of land records and reuniting of the record store and the copyist room?

3.3 What is the significance of inter-organizational coordination in implementing E-service of land records?

3.4 What are the legal obstacles for implementing E-service of land records? What are the legal amendments required for E-service?

3.4 What are the problems of multiple channels of access to this E-service?

3.5 How do the DRR staff and paper based process obstacle for this E-service?

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3.10 What are the obstacles in receiving payment from UDC and their solutions?

3.11 What are the challenges have been facing after implementing 100% online application for land records?

3.12 What are the problem with calculating fees for this service delivery?

3.13 What are the issues that need to be taken into consideration for implementing online application throughout the district?

- 3.14 What are the goals behind introducing E-service of land records?
- 3.15 What are the reasons behind for developing multiple channels to access into this E-service?
- 3.15 What are the main problems of dual methods i.e. paper based applications and online applications for this service delivery?
- 3.16 What are the obstacles of receiving 100% of online applications for this service?
- 3.17 What are the barriers of paying fees for online applications for this service?
- 3.18 What are the problems of delaying to deliver this service while citizens apply through UDCs, telecentres?
- 3.19 What are the steps/ actions required to make quick service delivery through online applications?
- 3.20 What are the infrastructural problems of E-service of land records? How these could be solved?
- 3.21 What are the reasons behind for developing multiple channels to access into this E-service?
- 3.22 Do the A2I has systems to monitor that how many applications have been received from which channels district wise and as whole the country?
- 3.23 If the middlemen access to this service through District Web-portal of this service, who would monitor it?
- 3.24 UDCs' entrepreneurs are demanding to keep only UDCs' as the access channel for this service, what is your opinion on their demand?
- 3.25 What are legal barriers of implementing E-service of land records?
- 3.26 What are the problems in changing old regulations relating land records service delivery?
- 3.27 Digitization of land records is one of preconditions of successful implementation of E-service of land Records. Is there any steps to digitize the land records preserved in DRR for the E-service?
- 3.28 What would be ways to digitization of damaged records?
- 3.29 What are the infrastructural and organizational readinesses required for E-service of land records?
- 3.30 Do the citizens ready for this E-service? If not, how it could be done?

3.31 What are the problems in organizational process to implement E-service of land records in this district?

3.32 How does this organization select and transfer the Record Keeper, Copyists and staff for E-service of land records?

3.33 What are the reasons behind delaying to receive this service delivery or missing of applications submitted by UDCs for this service?

3.34 What are problems/advantages have been facing after introducing E-service of land records in your district?

3.35 What are the organizational process that obstacle or enhance this E-service?

3.36 Do you think that after E-service introducing E-service citizens are receiving quick service delivery? If yes, what are the indicators? If not, what are the reasons behind?

3.37 Do you think that the multiple channels are problematic to receive applications for this service? If yes, how do these multiple channels problematic?

3.38 What are the legal process that obstacle for this E-service?

3.39 Do you follow all the legal procedures exist in this service? If not, what are the issues that you could not follow and what are these issues?

3.40 What are the problems for a distance located record store room from the copyist room?

3.41 Does this E-service of land records increase or decrease of service delivery period?

3.42 Does this E-service of land records increase or decrease the cost of citizens?

3.43 Does this E-service simplified or complicated the process of land records service delivery?

4. Focus Group Discussion:

4.A Questions for Focus Group Discussion with Citizens:

4.A.1 Why do you need land records? What are the usage of land records?

4.A.2 How do you receive the service delivery of land records?

4.A.3 Who does mediate your land records service delivery?

4.A.4 What are the means of submitting your information/application for land related service?

4.A.5 How many days does it take to receive a service delivery response related to land records?

4.A.6 For land records related services, how many offices do you have to visit?

4.A.7 What are the problems in providing faster service delivery in land records related services?

4.A.8 How could a better and faster service delivery in land records management be provided through implementing technology?

4.A.9 What are the important technological items that could be implementing for better and faster service delivery? (Internet, Email, Kiosk –Local Information and Service Centre, SMS,

4.A.10 Do you have any advantage in receiving E-service of land records from these access points ?

4.A.11 What are the obstacles of using the access points of E-service?

4.B Questions for Focus Group Discussion with Staff:

4.B.1 What are the problems derived from E-service of land records for the staff involved in this service?

4.B.2 Are there any advantages of the E-service for the staff involved in this service?

4.B.3 Comparing to the previous systems of land records service delivery, is the E-service delivery complicate for the staff?

4.B.4 How could the E-service be helpful for the quick service delivery?

4.B.5 What are the prerequisites for succeeding the E-service of land records?

4. B.6 What are problems with the service delivery through Union Information Service Centers (UDC)?

4.C Questions for Focus Group Discussion with UDC Operators:

4.C.1 Do you think that E-service of land records is a potential service to the citizens from the UDCs?

4.C.2 What are obstacles to access into the E-service land records from the UDCs?

4.C.3 What are the steps have been taken by the organization to solve the problems?

4.C.4. What are the further actions required to make easy access to the E-service of land from the UDCs?

4.C.5 Who would be most beneficial to from the E-service of land records from the UDCs?

5. Questions for Key Informants Interviews

5.1 What are the challenges and strategies in implementing online application for land records service delivery for whole the district, for the first time in the country?

5.2 What are the dimensions of interests of copyists and middlemen with paper-based applications?

5.3 What are the networks between copyists and middlemen?

5.4 How do the DRR (DRR) staff managed long time posting there and how do they influence the Officers not to implement E-service?

5.5 What are the problems prevailed in E-service of land records?

5.6 What are the problems of E-service of land records from UDC? What are the problems between UDCs and DRR relations?

5.7 How do the E-service influence on middlemen involved in the service delivery of land records?

5.8 After introducing bilateral network between the UDCs and the DRR, how do the intermediaries entered into the E-service?

5.9 Does the network between the UDCs and the DRR reduce service delivery time and the cost for the citizens?

5. 10 Does the network between the UDCs and the DRR secure profit for UDCs?

5.10 Does the network between the UDCs and the DRR helpful for the DRR?

6. Questions on the UDC blog for UDCs' entrepreneurs

6.1 What are the problems involved with E-service Center (the front desk) to deliver the E-service of land records?

6.2 What are the ways to solve the problems of E-service center involved in this service?

6.3 What are the problems in DRR to process E-service of land records?

6.4 What are the suggestions to overcome the problems of DRR in the E-service of land records?

6.5 What are the problems in sending fees (court fee) for land records service from the UDCs to the DRRs?

6.6 What are the mechanisms to overcome the existing problems in sending fees for E-service of land records?

6.7 What are the main barriers to receive quick service delivery in the process of E-service of land records?

6.8 Would you please provide necessary recommendations to provide the quick service delivery in the process of E-service of land records?

6.9 Please feel free to express your opinions, experience and ideas relating to E-service of land records?

7. Questionnaire Survey on Using of the access points of E-service throughout the country

7.1 Which one is the most used access points for E-service of land records?

7.2 Which one is least is least used access points for E-service of land records?

7.3 What are the reasons behind of less use of UDCs as an access point of E-service of land records?

7.4 What are the process using by the district in which UDCs have become the most used access point for the E-service?

8. Archival Methods and Document Analysis

8.A. Issues relating to laws and acts

8.A.1 What are the laws and legal acts related E-service of land records?

8.A.2 How do they influence the E-service of land records?

8.A.3 What are the steps taken to revise the laws and acts for adapting with the E-service of land records?

8.A.4 What are the problems in revising the laws and acts with process of E-service of land records?

8.B. Issues relating to temparing of application and land records

8. B.1 What are the papers and stamps required to submit application?

8.B.2 What are the differences between submtting applications in different access points?

8.B.3 Why do the E-service center receive paper applications and thereafter input them into the E-service network?

8.B.4 Why do the intermediaries prefer to access into the E-service through paper based applications?

8.B.5 How do the intermeidaties and staff manipulate E-service through submitting paper based applications at the E-service center?

8.B.6 How do the intermeidaties and staff manipulate E-service through submitting paper based applications by Web Portal?

9. Interventions: Action and Design

SL	Design and Action
9.1	Designing Systems for Receiving Online Applications: The study designed organizational and technological processes to receive only online applications for E-service of land records instead of parallel paper based application submission systems.
9.2	Designing Organizational Network: The study designed network between Union Information Service Center (UDC), the telecentres and the DRR, the organization processed E-service of land records for paying fees in advance instead of sending fees through postal.
9.3	Designing Single Channel of E-service: The study designed single channel for access into the E-service of land records i.e. the UDCs instead of multiple channels.
9.4	Redesigning the organizational process: The study redesign the organizational process through removing numbers of paper based registers involved in this service delivery management.
9.5	Designing the Organizational Structure: The study designed and redesigned the organizational structure involved with the E-service of land records. It has united the record store room and copyists' room.
9.6	Cataloguing and arranging registers of land records: The study catalogued and arranged the records registers toward the end of easy sorting and collecting.
9.7	Redesigning the Processes involved with E- Service: The study removed a number of steps involved in processing this service
9.8	Designing network for online payment of fees One of the sites of the study intervened online payment of fees as an interim basis.
9.9	Digitizing land records The study expedited the digitization process of land records.

10. Question Relating to consultation with technical experts

10.1 What are the reasons behind designing multiple channels to access into the E-service of land records?

10.2 How do you monitor citizens' access to the E-service system?

10.3 Do you have any mechanism to monitor how many applications have been coming from which channel to the E-service?

10.4 Have you given any training to the Union Information Service Centers' entrepreneurs on filing and processing applications for E-service of land records?

10.5 What is the role of A2I with the E-service of land records?

10.6 What are the technical problems in A2I to implement this E-service?

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