UNDERSTANDING THE EFFECT OF IS CHANGE: A SOCIAL CAPITAL PERSPECTIVE

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Abstract

This paper argues that by adopting a social capital perspective of the effects of Information Systems (IS) implementation we are able to provide insights into both human and technological aspects of change interventions. This theoretical paper is firmly embedded within socio-technical approaches and aims to conceptualise and address concerns relating to organisational issues of systems and technology management. IS implementation inevitably impacts upon the existing work and social relationships within organisations where there is the potential experience of reduced system effectiveness through a periodic lack of coordination and control. It is evident, in this respect, that the adoption of IS produces challenges to human collaboration which clearly add a social dimension to systems management. The paper broadly outlines how a social capital perspective may determine the areas of focus from IS-driven organisational change and provide indications about potential ways to improve system and technology adoption. This may support more appropriate designs for change interventions that enable organisations to accrue more value from IS.

Keywords: Organisational Change, Social Capital, Change Management.

1   INTRODUCTION

The introduction of information systems (IS) in organisations inevitably impacts on existing work and social relations in organisations. As a result, organisations often experience a period of reduced coordination and business performance (Brynjolfsson, 1993, Brynjolfsson and Hitt, 2003). Technologically-driven investment decisions have often been blamed for the phenomenon. However, companies whose IT investment decisions have been driven by business strategy, also experience performance 'dips', due to adaptation costs, difficulties in changing employee and managerial behaviours and attitudes and limited capability to absorb new knowledge (Chew, 1991; Brynjolfsson et al., 1997). The impact of technology on business performance may be acute or prolonged which may challenge the going concern of the organisation. Moreover, reduced performance following the introduction of IS often is attributed to the technology, casting doubts about its business value and raising dissatisfaction with the technology, and even with the IS professionals responsible for it. Hence, it is in the

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interests of both business and IT professionals to minimise the negative impact of IS on performance.

It is becoming common sense that business value from IS derives from usage by employees enhancing labour productivity (Dedrix et al, 2004). Socio-technical approaches have gone some distance to address the impact of technology on human factors, by focusing on the individual as the level of analysis. However, what these approaches tend to ignore is that at an organisational level productivity depends on the work output of groups of individuals. Hence, social aspects of work are of paramount importance. Yet, very little research in the field of IS examines the impact of IS on social relationships. Most of this research focuses on virtual teams and Computer Supported Collaborative Work (CSCW) where different aspects of interactivity and trust in relation to performance have been the main focus of investigation. In contrast, theoretical work by Orlicowski and others focus on the other extreme, i.e. on social structures and their interaction with technology, but that discussion bears little relevance to understanding how to improve organisational performance through technology. What is required is to understand how technology affects the social relationships through which work output is produced within organisations. Hence, it is important to understand whether and to what degree technology facilitates existing relationships and new relationships in organisations.

This paper argues that by adopting a social capital perspective we can predict the impact of IS on social relationships in organisations and thereby on organisational performance. Social capital has been used before as a theoretical lens to explain IS failure, before. For example, Kumar and Bielli (2004) introduced the idea of" trust-based rationalism" (p.222) to examine the role of IS in organizations, introducing the determining role of social capital and collaboration for organisational success. That work introduced the importance of a particular relational aspect of social capital (trust) on examining IS failure. Wasko & Faraj (2005) have also used social capital to explain its impact in electronic networks of practice. The authors used the Nahapiet and Ghoshal model (1998) on social capital to speculate about the impact of existing social capital on the use of technology to share knowledge within a network. Hence, the idea that we can use social capital to examine the impact of IS on organisational performance is certainly not novel, or strange.

Based on the work of Kumar and Bielli (2004) this paper goes on to argue that a social capital perspective can also highlight areas of focus for designing change management interventions to help organisations minimise experienced performance 'dips' following the introduction of IS (Chew, 1991; Brynjolfsson et al., 1997). In doing so, the paper

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is firmly embedded within socio-technical approaches and aims to address concerns relating to social aspects of technology management.

To this end, the rest of the paper broadly outlines how adopting a social capital perspective of the effects of Information Systems (IS) implementation can provide insights into both human and technological aspects of change interventions and indications about potential ways to improve system and technology adoption.

2   ADOPTING A SOCIAL CAPITAL PERSPECTIVE

Despite the recognition that information systems (IS) require careful management of the changes resulting from its introduction in organisations, effective advice on technological management with the view of improving organisational performance is limited and fragmented. In recognition that business value from technology is realised due to and through its use by individuals, Brynjolfsson (2003) points to the need for organisations to invest in the human side of IS implementation through employing highly skilled labour, giving performance-based incentives, providing training, decentralising decision making, thereby emphasising the importance of the human capital. This paper argues that the successful introduction of technology requires more than this. It requires attention to the social capital of organisations, not only because there is a social aspect to working, but because most organisational outcomes are the products of groupwork. Hence, relations and not individuals should be the unit of analysis. It suggests that by adopting a social capital perspective we can diagnose and predict the impact of IS on all areas of social functioning that affect organisational performance. It advocates that IT-driven change initiatives should be seen as a process of developing social capital, which enable 'meaningful and value-laden interactions' (Beeson and Davis, 2000, p. 181) that produce change towards a desired direction. The very concept of social capital was originally introduced to highlight the importance of networks of strong, personal relationships developed across groups over time that provide the basis for trust, cooperation, and collective action in communities (Jacobs, 1965). This is premised on the idea that social interactions change people's preferences, and can thereby affect attitudes and behaviours towards IS adoption or rejection, use or misuse.

Social capital has been linked with the development of capabilities that enable organisations to take advantage of changes in their environment and to harness their innovativeness (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998), be it linked to IT, product development, process improvements or other. Theorists advocate that increases in social capital have a positive impact on creativity, innovation, decision-

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making quality, collaboration and coordination of work (Cohen & Prusak, 2001). Hence, if a technology increases our 'reserves' of social capital it is likely to improve organisational performance.

The most comprehensive framework of social capital, proposed by Nahapiet and Ghoshal (1998) encompass the three dimensions presented in the following sections. Each section defines and describes each dimension. It also provides a set of propositions on how the dimension is likely to be affected by IS implementation and what the expected impact on organisational performance might be.

2.1 The structural dimension

The structural dimension refers to the overall patterning of institutionalised relations between actors (Coleman, 1988) and is determined by the density, connectivity and hierarchy of connections between actors. This dimension is often discussed in terms of its embeddedness, (i.e. internal relations embedded in a social unit or external relations which extend beyond such unit) and its strength (i.e. strong relations, established by frequent contact and weak relations reflecting less frequent communication) (for example see Granovetter, 1985). More recently, focus has shifted towards examining the hierarchical patterning of relations (i.e. relations among peers in the same group, hierarchical relationships within a group or relationships between members of hierarchically disconnected groups) (Adler and Kwon, 2000; Grootaer and Van Bastelaer, 2002).

Expanding the social relationships to 'outsiders' (bridging), such as clients or suppliers in particular, has been argued to directly increase the innovativeness of the organization (Cohen and Prusak 2001; Nahapiet and Ghoshal 1998). The degree to which these relationships can serve multiple purposes determines the dynamism of organizational capabilities (Burt, 2002). Bridging alone however is 'fragile'. Research findings suggest that network ties that are not strengthened by mutual obligations, trusting relationships, and common language or narratives easily break down (Burt, 2002). Hence, the deepening of ties is important for the robustness of relationships.

Altering the frequency, plurality or merely the patterning of social relationships between pre-existing actors and the inscription of new actors in the network affects the structural dimension of social capital. This can result in important changes in the exchange of knowledge and resources among actors (Nahapiet and Ghoshal, 1998). Enabling more or different actors to relate may ensure that multiple perspectives are

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considered, decisions are thoroughly evaluated, and diverse expertise is harnessed (Evans and Carson, 2003).

Based on this understanding the *extent and configuration* of the network is expected to determine organisational performance by affecting the degree of fragmentation in work organisation, the diversity of knowledge and ideas, and the speed of decision making. The following can be proposed:

P1: IS that expand existing networks are likely to be positively related to organisational performance, by increasing the knowledge and human resources available to the organisation.

P2: IS that enable networks to be configured in ways that credible knowledge is transmitted through it efficiently will improve organisational performance by speeding up decision making.

P3: IS that enable networks that engage diverse participants will improve organisational performance by enabling creativity via facilitating the communication of new perspectives and ideas.

Social network analysis methods have already been successfully used for identifying and measuring changes in the structure and patterning of social networks. Auditing the structural dimension of the social capital of an organization identifies who knows what or how, and who is likely to get access to someone in the know, through personal recommendation. Enabling the evolution of social networks can be traced across time by measuring differences in the size, dispersion, integration, homogeneity, frequency of contact, strength of ties, social participation and social anchorage (see Stone, 2001 for a review on relevant research methods).

2.1 The relational dimension

The relational dimension of social capital encapsulates that 'quality' of relationships between members. It encompasses the levels of trust between them (Fukuyama, 1995; Putnam, 1993), norms and social sanctions that regulate social conduct (Coleman, 1990; Putnam, 1995), the system of mutual obligations and expectations (Burt, 1992; Coleman, 1990; Granovetter, 1985; Mauss, 1954), and levels of identification and perceptions of social identity (Hakansson and Snehota, 1995; Merton, 1968). Strong social bonds facilitate information sharing, lend credibility to information shared,

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foster disclosure and transparency and thereby enable perspective sharing. Increases in the relational dimension of social capital (bonding) have thus been associated with increased access to others' knowledge and resources; increased expectancy of value from collaboration; motivation and capability to collaborate (Nahapiet and Ghoshal, 1998). These aspects in turn, are associated with improved creativity, innovation and coordination of work (Cohen and Prusak, 2001).

Based on this understanding one can expect that IS that impact on the *quality* of these relationships can affect organisational performance by influencing people's attitudes and determining the rate of acceptance of a new technology. In particular, this paper proposes that:

P4:	IS that enable participants to trust each other improve organisational performance by reducing the degree of conflict during decision-making, increasing information/knowledge sharing, increasing collaboration

P5:	IS that enable participants to develop mutual obligations with each other improve organisational performance by sustaining increased collaboration.

Changes in the relational dimension can be identified in changes in the level of trust and in the norms of reciprocity in the social system. Trust can be measured in terms of trust between actors (social trust) and trust towards the organization (institutional or organisational) trust. In line with Durlauf's (2002) views, this paper proposes the assessment of social trust in attitudinal terms, assuming trust to be a psychological state (Mayer, 1995) distinct from its behavioural expressions. Changes in the norms of reciprocity have been characterized on the basis of whether reciprocation is in-kind or in lieu, direct or indirect and immediate or delayed (Stone, 2001). Norm analysis captures who is responsible for what, what triggers the enactment of a norm, conditions and exceptions for its enactment and its consequences, and serves as a useful method for modelling norms within a social system. Change interventions could be specifically designed to foster trust and norms of reciprocity in the social system.

2.3 The cognitive dimension

The cognitive dimension of social capital highlights the importance of shared representations, interpretations and systems of meaning among parties. This dimension represents shared language and codes (Arrow, 1974; Cicourel, 1973; Monteverde, 1995) and shared narratives (Orr, 1990) and is particularly important for explaining why social capital resides in the interaction of parties (Burt, 1992), rather

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than in parties themselves. Sharing common language and codes enable a social system to develop joint narratives that encompass task information that facilitate mutual understanding and even debate which are significant for strategic decision-making (Cicourel, 1973), but also social information upon which inferences about the relationship among participants and the participants themselves can be drawn. A succession of joint narratives then defines the joint history which trust draws upon. Increases in the cognitive dimension have been associated with greater ability to combine diverse knowledge and resources, and is thus directly related to dynamic capabilities by leading to improved creativity and innovation, and increased expectancy of value from collaboration that improves coordination of work (Cohen and Prusak, 2001). These are important for improving IT investment decisions for example but also for disseminating knowledge necessary for the competent use of the any new IS system introduced in the organisation.

It can thus be expected that IS that enable the development of *shared knowledge and schemas* within a network that can facilitate organisational performance by leveraging innovativeness, improving coordination. In particular this paper proposes that:

P6:   IS that enable participants to share common linguistic codes (lingo) with each other improve organisational performance by reducing the degree of misunderstandings, improving decision-making, and facilitating information/knowledge sharing

P7:   IS that enable participants to share common history with each other improve organisational performance by facilitating information/knowledge sharing and increasing collaboration

Changes in the cognitive dimension could be measured by increases in the levels of shared understanding and commonality of interests. Fisher and Mandle (2001) report that knowledge convergence is significantly related to team performance. Such effects can be explained in terms of the ease of integrating knowledge, anticipating and interpreting others' behaviours, and disseminating own ideas (Nahapiet and Ghoshal, 1998). Measuring knowledge convergence, however, is only just emerging making the assessment of the impact on the cognitive dimension problematic, at least. Identifying the processes and measuring the extent to which knowledge is shared in achieving joint outcomes has recently entered the discourse of learning sciences (Fischer and Mandl 2001; Jeong and Chi, 1999) and measures of learners' cognitive responses through collaboration have only started to develop (see Ickes and Gonzales,

1996). Possible methods such as cognitive mapping and/or causal attribution analysis could indicate the convergence of people's schemata.

3   DESIGNING CHANGE MANAGEMENT INTERVENTIONS

This paper argued that by understanding how IS affects social relationships we can design complimentary management interventions to facilitate the implementation of IS in organisations and leverage IS business value. Using social capital as a theoretical lens, we developed a set of propositions for analysing the (potential) impact of IS on social capital and organisational performance. This set of propositions may help us highlight and understand the gaps in social dimensions fundamental for the success of organisations. For example, intensification of social relationships within an existing network without expansion of the network or substitution of existing roles with new members may stifle innovativeness, as it excludes new perspectives and ideas from entering the organisation. Inevitably, the organisation will then loose 'touch with reality' and diminish its ability to provide appropriate products and services to their market. On the other hand, excessive expansion of the network will increase the number of nodes within the system but may also decrease the degree of bonding and identification between members. This will challenge the strength of mutual obligations which sustain increased collaboration and may lead to fragmentation, slow coordination and the like. If efficiency is the main source of competitive advantage, such expansion may eventually challenge an organisation's going concern, unless remedial action is undertaken.

Using the offered propositions as analytical guidelines one can start to question the effects of any IS on human collaboration and put in place interventions to diminish negative effects or intensify undesired. Hence, we can start asking questions such as: "how will an ERP system, for example, change the configuration of existing relationship, the trust and mutual obligations of employees and the knowledge base work is based upon?" "What new relationships may the ERP system foster and how are these going to change the knowledge base, the norms and quality of relationships within the social system of the organisation?" Understanding these potential effects can provide an organisation with relevant and contextual insight to help an organisation prepare for remedial change action where necessary.

To promote productivity, and thereby organisational performance, change interventions should (i) intensify the desired effects of IS or (ii) remedy undesired effects of IS. Hence, it is important to understand the degree that IS facilitates (a) existing relationships and (b) new relationships and its impact on (c) efficiency or (d) effectiveness that are the main components of productivity. While these dimensions

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are not mutually exclusive they can give us a typology that can define the areas of focus for change initiatives. Figure 1 presents the typology:
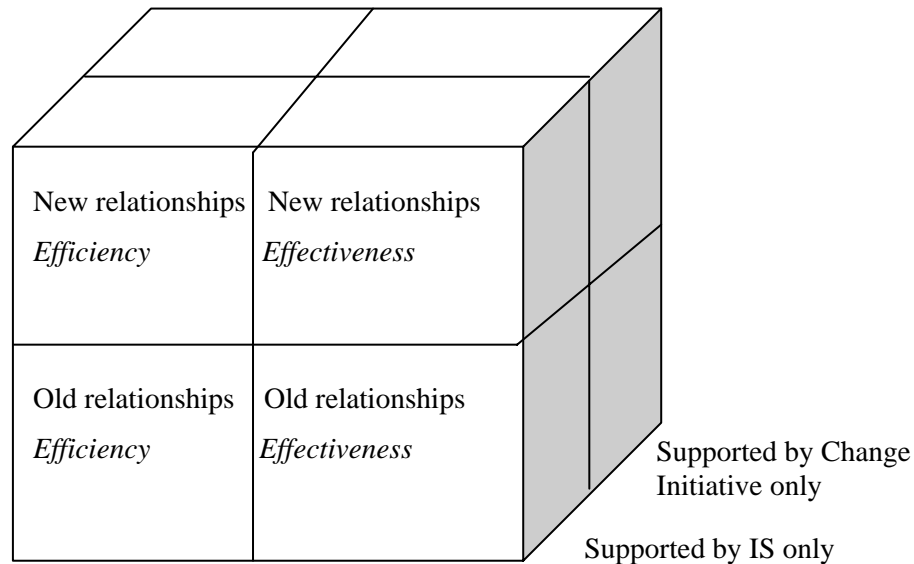
New relationships *Efficiency*	New relationships *Effectiveness*
Old relationships *Efficiency*	Old relationships *Effectiveness*

Supported by Change Initiative only

Supported by IS only

Figure 1: Typology of the areas of focus for IS-driven organisational change

4   CONCLUSIONS AND FUTURE DIRECTIONS

If organisations expect to leverage their performance by improving operational efficiency and their effectiveness, then they need to pay appropriate attention to its impact on their social capital. In most cases, social capital has been associated with pro-social behaviours and attitudes that facilitate communication, coordination and integration necessary for a wide range of organisational processes, from strategic decision-making to supply management, to product innovation, and the like. It is therefore argued that IS which facilitate the development of social capital are more likely to accrue business value from IS.

The adoption of a social capital perspective in the context of IS-driven change creates a new research agenda, for there are insufficient measures which are tried and tested in the context of IS, and a need for theoretical and empirical work which explores its application in context. The assessment tools for measuring the different dimensions of social capital which exist are neither comprehensive nor do they facilitate a holistic view of social capital in organisations as they tend to focus on one dimension (see

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Kuman and Bielli, 2004). Assessment tools that aim to audit all three dimensions are only applicable in the specific contexts for which they were developed (see Grootaer and Van Bastelaar, 2002) but these are as yet under-developed in the context of organisational or IS research. Some potentially useful proxies for measuring changes in social capital are described within the organisational behaviour literature, for example, regular measurement of climate could be used to give indications about the level of bonding (relational capital). Application of approaches such as social network analysis and norm analysis offer new ways to evaluate not only levels of development of social capital, but also its configuration and quality.

A further review focused on existing empirical evidence is needed to establish the relationship between IS solutions, social capital dimensions, operational outcomes, and organisational performance. In this way, a more holistic view of the impact of IS on social functioning and structuring and its impact of organisational performance can be achieved.

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