

Appendix 1a

Definitions of Requirements

Authors	Requirements Definition Used
Bahill and Dean (1999)	Describes What, Not How. There are many characteristics of a good requirement. First and foremost, a good requirement defines what a system is to do and to what extent, but does not specify how the system is to do it. A statement of a requirement should not be a preconceived solution to the problem that is to be solved.
Bell and Wood-Harper (1998)	The systems analyst works with the user within his or her socio-political and economic context to specify the information system requirements of an organization. The system is modelled according to terms of reference and the final outline plans are produced for hardware, software and necessary processing.
Beyer (1994)	Creative design is an immediate response to recognising a need and the knowledge of a technology that addresses that need.
Boehm (2002)	"I can still find many applications in which the requirements are relatively stable and a pre planned architecture can successfully accommodate later increments. In such cases, believing "you aren't going to need it," and Agile means investing heavily in individual skill-building rather than organisational rule sets"
British Standards Institution (BSI)	The BS 6719: 1986 standard guide to specifying user requirements for computer based systems does not provide a definition of requirements, but rather provides a basis for describing user needs and priorities.
Darke et al. (1997; Darke, Shanks et al., 1998)	"Viewpoint development is the process of identifying, understanding and representing different stakeholder viewpoints"
Davis (1988)	"Software Requirements. The activity that includes analysis of the software problem at hand and concludes with a complete specification of the expected external behaviour of the software system to be built"
Davis (1990)	"The requirements stage defines what a system should do without describing how it should do it"
Davis and Leffingwell (1999)	Requirements management is a systematic approach to identifying, organizing, communicating and managing the changing requirements of a software application.
Davis and Leffingwell (1999)	A requirement is a capability or feature needed by a user to solve a problem or achieve an objective.
DeMarco (1978)	"Requirements can be viewed as targets that the design must meet"
Dorfman (2000)	"The products of a good requirements analysis include not only definition, but proper documentation, of the functions, performance, internal and external interfaces, and quality attributes of the system under development, as well as any valid constraints on the system design or the development process"
Flynn and Jazi (1998)	"User-led requirements construction (ULRC), that provides the capability for users to build their own requirements models"
Hirschheim et al. (1996)	"An information system in its simplest form can be defined as a technological system that manipulates, stores, and disseminates symbols (representations) that have, or are expected to have, relevance and an impact on socially organized human behaviour"
Holtzblatt (1994)	"Requirements and design are slippery, happening over time and often on the fly. These conversations are the very stuff of product design. But hanging on to a shared understanding among multiple people from moment to moment is hard. So conversations happen over and over and over again"

IEEE (Institute of Electrical and Electronics Engineers) Standard 610 (1990)	<p>1. A condition or capacity needed by a user to solve a problem or achieve an objective.</p> <p>2. A condition or capability that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or other formally imposed documents.</p> <p>3. A documented representation of a condition or capability as in 1 or 2.</p>
IEEE Standard Glossary of Software Engineering Terminology (1991)	<p>The essence of this approach is reflected in The definition comes from the IEEE Standard Glossary of Software Engineering Terminology. This definition is based on a definition of engineering.</p> <p>“Engineering. The application of a systematic, disciplined, quantifiable approach to structures, machines, products, systems, or processes”</p>
IEEE Std 610.12 (1990)	The process of studying and refining system, hardware, or software requirements.
IEEE Std 610.12(1990)	This unit provides knowledge about the modelling of software requirements in the information, functional, and behavioural domains of a problem. This unit includes a trade-off analysis of performance requirements and the constraints on a system, along with all of the perceived primary and derived requirements of a system, which highlight the effect on development cost and schedule. The unit includes knowledge about various requirements modelling methods (e.g., structured analysis, object-oriented analysis), the use of prototype to examine and assess requirements, and domain analysis techniques.
Jackson (2001)	The requirement is for a continuing interaction between the machine and the problem domains.
Jacobson (2000)	“Requirements analysis identifies the system’s functional requirements and results in a set of textual specifications—one per use case. In design, you model the whole system as a set of communicating objects (blocks).
Jirotko and Goguen (1994)	Requirements are properties that a system should have in order to succeed in the environment in which it will be used.
Lamsweerde (2000)	"A formal specification is the expression, in some formal language and at some level of abstraction, of a collection of properties some system should satisfy"
Laudon and Laudon (1996) - Systems Analysis	The analysis of a problem that the organization will try to solve with an information system.
Laudon and Laudon (1996) - Systems Design	Systems analysis describes what a system should do to meet information requirements; systems design shows how the system will fulfil this objective.
Leffingwell and Widrig (2000)	<p>Software requirements are those things that the software does on behalf of the user or device or another system.</p> <p>We can determine a complete set of software requirements by defining</p> <ul style="list-style-type: none"> • Inputs to the system • Outputs from the system • Functions of the system • Attributes of the system • Attributes of the system environment <p>- able to evaluate whether a “thing” is a software requirement by testing it against this elaborated definition</p> <p>"If it does not - fit our definition and therefore doesn't belong with the overall system or software requirements"</p>

Loucopoulos and Karakostas (1995)	"...the systematic process of developing requirements through an interactive co-operative process of analysing the problem, documenting the resulting observations in a variety of representation formats and checking the accuracy of the understanding gained"
Loucopoulos and Karakostas (1995)	The requirements part of software development is what is termed a hard problem, and yet one which we can ill-afford to leave unsolved.
McDermid (1994)	An effective requirements analysis process will produce a 'good' requirements specification, i.e. one which is effective in its communication role....a good requirements specification as one which: "says everything which the designer needs to know in order to produce a system which satisfies the customer/users - and nothing more"
Newman and Lamming (1995)	"Requirements define what is to be designed, built and put into service. Their role is to do so in such a way as to demonstrate that the defined needs will be met (that is, that the initial situation of concern will be resolved) while making it clear how the design and implementation can be achieved"
Newman and Lamming (1995)	Requirements provide answers to two generic questions that surface many times, in many forms of wording, during the early stages of interactive system design. These two questions are, 'Will it provide adequate support to the user's activities?' and 'How can it be built, given the constraints on cost and resources?'
Newman and Lamming (1995)	It is often necessary to design, build and evaluate a working prototype in order to define the requirements that interactive systems must meet. It is necessary to engage in many aspects of interactive system design in the process of defining the system's requirements"
Orlikowski (1992)	"It prescribed a sequence of systems development stages, articulated the tasks and deliverables of each stage, defined the skills needed to perform the tasks, established guidelines for estimating time and budget requirements, and specified quality control and process milestones"
Pinheiro (2002)	Requirements principles are related to the purpose of the system and to the appropriateness of requirements that correctly describe what is necessary for the system to fulfil its objectives.
Pohl (1993)	"Requirements Engineering can be defined as the systematic process of developing requirements through an iterative co-operative process of analysing the problem, documenting the resulting observations in a variety of representation formats, and checking the accuracy of the understanding gained"
Potts (2001)	Requirements are the properties that should hold in the real world that we want the information artifact to help bring about, not the properties of the information artifact itself.
Pressman (2000)	"The Software Requirements Specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description; a detailed functional description; a representation of system behaviour; an indication of performance requirements and design constraints; appropriate validation criteria, and other information pertinent to requirements"
Schach and Tome(2000)	A software product is engineered to satisfy the client's requirements.
Sommerville (1982)	Requirements capture and analysis is:- "the process of establishing the services the system should provide and the constraints under which it must operate"
Sommerville (1982)	States that requirements capture and analysis is "the process of establishing the services system should provide and the constraints under which it must operate"

Sommerville (1982)	A software requirement is a property that the software system must satisfy
SWE-BOK CMU/SEI-99-TR-004	Requirements Analysis is defined as a process of identifying needs and analyzing on those needs to meet ones expectation.
Thayer and Dorfman (1990)	"Software requirements analysis is the process of studying user needs to arrive at a definition of software requirements"
Thayer and Royce (1990)	A software requirement is a software capability needed by a user to solve a problem or to achieve an objective.
Thayer and Royce (1990)	A software requirements specification is the document that clearly and precisely describes each of the essential requirements (functions, performance, design constraints, and quality attributes) of the software and its external interfaces.
Turner (1987)	"A requirements statement or needs analysis" "Requirements analysis is assumed to be accomplished as part of a closely spaced sequence of activities at the beginning of a project in the life-cycle approach. In prototyping, requirements analysis is performed continuously over the duration of the project. Both rely on a dialogue between designer and users to elicit an expression of needs"
Vidgen (1997)	"Requirements inform the design and implementation of a computer-based artefact... Requirements analysis - as mediation rather than separation, which has been posited as an outcome of a successful IS requirements analysis activity"
Westrup (1999)	A requirement only becomes recognized as such when it is formulated in a specific way that is recognized as legitimate.
Westrup (1999)	"A requirement only becomes recognized as such when it is formulated in a specific way that is recognized as legitimate.... a first step is the identification of needs and their formulation in writing or some other technique ... a process of inscription that translates something unclear and undefined into a representation on paper. A second step is the relating of various inscriptions to produce a set of requirements that are accepted as legitimate.
Wikipedia http://en.wikipedia.org/wiki/Requirements_analysis (Accessed on 10-10-05)	"Requirements analysis in software engineering , is a term used to describe all the tasks that go into the instigation, scoping and definition of a new or altered computer system . Requirements analysis is an important part of the software engineering process; whereby business analysts or software developers identify the needs or requirements of a client; having identified these requirements they are then in a position to design a solution"
Yeh (1990)	The separation of concerns:- it must not constrain how it is to be done, for that is the province of design. "A requirement conveys an essential property that the system must satisfy" A "requirement" is something mandatory. It conveys an essential property or condition that the system must satisfy.
Yeh and Zave (1980)	A software requirements document as "a set of precisely stated properties or constraints that a software system must satisfy"
Zave (1997)	"Requirements engineering is the branch of software engineering concerned with the real-world goals for, functions of, and constraints on software systems. It is also concerned with the relationship of these factors to precise specifications of software behavior, and to their evolution over time and across software families"
Zave and Jackson (1997)	"Requirements engineering is the branch of systems engineering concerned with the real-world goals for, services provided by, and constraints on a large and complex software-intensive system. It is also concerned with the relationship of these factors to

	precise specifications of system behaviour, and to their evolution over time and across system families”
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References: Appendix 1a

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Appendix 1b

Glossary of terms used

artefact	Anything made by human art and workmanship; an artificial product.
because-motives	a genuine because-motive can have only objective probability (Schutz, 1967)
Bracket - [Bracket]	<p>[] – square – the first two quotes below formulate the use of [Bracket] as used in this thesis – a suspension of judgement, doubt, set aside. The last quote informed the Research design of Workbooks.</p> <p>“bracketing presuppositions and theories about the social world, or, at best, maintaining an “ethnomethodological indifference” toward them; requiring a “faithfulness to the phenomena of study”; accepting that human qualities of thought, reason, emotion, planfulness, judgment, and knowledge are involved in human actions; rejecting any pre-formulated and prescribed strategies or analytic methodologies; requiring methodological perspectives which are uniquely adequate for the phenomena to be studied; remaining faithful to the description of members’ methods of practical reasoning and practical actions in the world of everyday life; and avoiding causal, motivational, psychological, and constructive-analytic, interpretations and explanations of human action” (Psathas, 2004)</p> <p>Schutz (1967)</p> <p>it is only after I "bracket" the natural world and attend only to my conscious experiences within the phenomenological reduction, it is only after I have done these things that I become aware of this process of constitution.</p> <p>(Garfinkel and Sacks, 1970)</p> <p>“Brackets are used to designate the following features of formulating:</p> <ol style="list-style-type: none"> 1. Above all, formulating is an account-able phenomenon. This is to say, <ol style="list-style-type: none"> (a) it is a phenomenon that members perform, and (b) it is observable by members, (c) In that members can do the phenomenon and observe it, if is reportable.²¹ (d) The phenomenon is done and reportable by members”
context of discovery	<p>In this thesis, a difference is drawn between; discovery, justification and meaning contexts. Context of Discovery (CoD) is separated out specifically to highlight the purpose of Requirements – the process involved to realise a Requirement – That the theory of Requirements has the generic feature to make the discovery of a Requirement.</p> <p>It is where the interactions between the theoretical constructions take place, and in the practicable organisation of experience by the common-sense thinking of people living their daily lives and connected in manifold relations of interaction. 2.5.1</p>
context of justification	disciplines in referencing, to ‘justify’, using them as authoritative sources and legitimise statements that also support a provisional statement of research and research methods.
contexts of meaning	Alfred Schutz phenomenological interpretative stance and meaning of ‘context of meaning’ within which any one phase of the ongoing action finds its significance’ –

	NOTE: the difference and distinction in the thesis of meaning in the life-world and meaning attributed by theoretical construction in the academic (scientific) world Therefore the contexts of meaning is the interplay between the Justification (COJ) and context of discovery (COD)
endogenous	Growing from within. - Applied to disorders originating within the individual. (OED) "Ethnomethodology's fundamental phenomenon and its standing technical preoccupation in its studies is to find, collect, specify, and make instructably observable the local endogenous production and natural accountability of immortal familiar society's most ordinary organizational things in the world, and to provide for them both and simultaneously as objects and procedurally, as alternate methodologies" (Garfinkel, 1996). Goffman (1974) systematically extends the idea of theatrical framing to encompass mundane situations of everyday life. In contrast to theories that identify standpoints and situated knowledges with social and cultural categories (class, gender, race, etc.), Goffman's frames and situations are locally ordered and highly flexible. In his view, fixed standpoints may be endogenous to particular experiential frames (Lynch, 2000)
ethnomethodology	[f. ethno- + methodology.] A style of sociological analysis associated with H. Garfinkel (b. 1917), which seeks to expose and analyse the methods by which participants in a given social situation construct their commonsense knowledge of the world.
exigent	Requiring a great deal; demanding more than is reasonable; exacting, pressing (OED).
extemporaneous	Not premeditated or studied, off-hand, (OED) – the spur of the moment Improvisation is intentional but looks extemporaneous ('ex tempore'—outside the flow of time) (Ciborra, 1999)
febrifugal	Adapted to mitigate or subdue fever; anti-febrile.
haecceities	The quality implied in the use of this, as this man; 'thisness'; 'hereness and nowness'; that quality or mode of being in virtue of which a thing is or becomes a definite individual; individuality (OED)
in-order-to motive	the orientation of the action to a future event the in-order-to motive of an action is nothing more nor less than the act itself projected in the future perfect tense (Schutz, 1967)
MIS – (IT-IS)	Management Information Systems – In this thesis the term IT-IS is used to encompass MIS – thus, MIS exists as a sub-set. The broader definition is used
polymechny	Multifarious contrivance or invention.
structuralization	Schutz's theory of the predominance of the manipulatory area; structuralization originates in the system of prevailing relevances that start with a biographically determined outlook. In his paper 'Common sense and scientific interpretation of action' Schutz, his claim was that "Strictly speaking, there are no such things as facts, pure and simple". "All our knowledge of the world, in common-sense as well as in scientific thinking, involves constructs, namely, a set of abstractions, generalizations, formalizations, idealizations specific to the respective level of thought organization".
SwSE	Software system engineering
thinkingly	" adv., in a thinking manner, in the way of thought; with thought, consciously, deliberately; in (one's own) thought or supposition (quot. 1894); "thinkingness, thinking quality; thoughtfulness, intellectuality; the essence of a thinking being (quot. 1865).
undifferentiated	If we simply live immersed in the flow of duration, we encounter only undifferentiated experiences that melt into one another in a flowing continuum {Schutz, 1967 #112}

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Appendix 1c

Failure

Author and publication type and date	Main findings Key attributes attributed to Requirement failure	Research approach
Avison and Fitzgerald (2003)	<p>failure to meet the real needs of the business (due to concentration on technological efficiency improvements at the operational level of the organization);</p> <p>overly conservative systems design (due to emphasis on the existing system as a basis for the new system);</p> <p>instability (due to the modelling of processes that are unstable due to changing businesses and markets);</p> <p>inflexibility (due to the output-driven orientation of design processes, thus making changes in design difficult and costly);</p> <p>user dissatisfaction (due to problems with computer-orientated documentation and users' inability to "see" the system before it is operational);</p> <p>problems with documentation (due to its computer rather than user orientation and the fact it is rarely kept current);</p> <p>application backlog (due to the maintenance workload, as attempts are made to change the system in order to reflect changing user needs).</p>	literature review upon Development Life Cycle (SDLC)
Beynon-Davies (1995)	<p>The system has been described as being introduced in an atmosphere of mistrust by staff. There was incomplete 'ownership' of the system by the majority of its users.</p> <p>The lack of a clear organization for IT has meant the absence of a clear strategic vision.</p> <p>it is impossible to point to any single element of the case as being the cause of the LASCAD failure. The description demonstrates how the explanation of a particular information systems failure must be multi-faceted or web-like in nature</p>	Case Study on the London Ambulance Service Computer Aided Despatch (LASCAD) project
Boehm (1976)	<p>Critical problems stemming from a lack of a good requirements specification. These include [6]: 1) top-down designing is impossible, for lack of a well-specified "top";</p> <p>2) testing is impossible, because there is nothing to test against;</p> <p>3) the user is frozen out, because there is no clear statement of what is being produced for him; and</p> <p>4) management is not in control, as there is no clear statement of what the project team is producing.</p>	Experience at IBM & Government/Industry Software Sizing and Costing Workshop, USAF Electron. Syst. Div., Oct. 1974 - U. S. Air Force, rep. RADCTR-74-300,
Boehm (1998)	failure to specify quality attributes, a general misunderstanding about the application's scope, the system boundary, and the inability to recognize that the plan was to focus on the development activities	
Boehm (2000)	Terminations from mismanaged projects that blunder ahead without a clear idea of the operational stakeholders' needs and priorities	Based upon the 1995 Chaos survey of IT executive managers
Boehm (2002)	The top six reasons for failure were incomplete requirements, lack of user involvement, lack of resources, unrealistic expectations, lack of executive support, and changing requirements and specifications	Standish group. cpm / chaos
Bostrom and Heinen	many of its failures have been due to behavioral	a hypothetical example

(1977)	problems – therefore development of A Socio-Technical Perspective	
Bourque (2000)	requirement specifications can miss customer needs, code can fail to fulfill requirements, and subtle errors can lie undetected until they cause minor or major problems-even catastrophic failures	literature
Bronte-Stewart (2005)	arriving at simple and agreeable definitions about objectives, timescales and measurements of what constitute success and failure in IT projects is problematic. IT systems that do not deliver what was expected of them £24 billion or so being spent on IT each year in the UK (BCS 2004) is being wasted	comprehensive survey – report upon literature, paper considers the costs of failure
Brooks (1995)	"The hardest single part of building a software system is deciding precisely what to build No other part of the conceptual work is so difficult as establishing the detailed technical requirements.... No other part of the work so cripples the resulting system if done wrong. No other part is more difficult to rectify later."	Reflective
Bussen and Myers (1997)	Implementation of an executive information systems (EIS) a lack of executive commitment damaging a long time delay Emotional, political and power problems Failure to define objectives clearly Poorly defined information requirements Too narrow focus, and no external information Failure of system to meet users' needs No planning for evolution Requirements narrowly focused	case study - interviewing the main stakeholders
Chung (1995)	Due to our lack of knowledge about the domain and its terminology	Non-Functional Requirement 3 case – and Literature
Computer Weekly (1997)	SUMMARY — The UK needs best practice to be enshrined in law, as in the US. Better guidelines and advice will not prevent IT disasters End-users must buy into the project. If a system is imposed on end-users the risk of failure is greatly increased	
Davidson (2002)	The BIS project presents classic elements of project failure: loss of a project champion, lack of effective user involvement and project direction, organizational restructuring that affected key participants' careers, and difficulties implementing an IS outsourcing arrangement.	longitudinal case study interviews
Davis and Leffingwell (1999)	1. Poor requirements management. - without a clear understanding of the problem we are attempting to solve. 2. Poor change management. Changes to requirements 3. Poor quality control. 4. Little control of schedules and costs. Accurate planning is the exception while unrealistic expectations are the norm	Acknowledge The Standish Group
Davis, Lee, et al. (Davis, Lee et al., 1992)	A short description of the IS application being diagnosed, the system failure	A diagnostic framework and interpretive process for performing a diagnosis of an information system, represented in a two-dimensional framework
DeMarco's (1982)	75% of the cost of error removal has its origin in errors in the analysis stage	
Doherty (1998)	The primary cause for systems' failure has been organisational behaviour problems The relationship between information systems failure and organizational issues is not a new phenomenon	Quoted Henry Lucas (1975)
Editorial (2006)	The government's own Public Accounts Committee (PAC). Its most recent report, published in December 2005, warned of the risk of £10bn (E14.6bn, \$17.7bn) of public money going to waste on IT services no-one wants and no-one may use. The	

	government record in IT provides plenty of evidence for concern.	
Galliers (1984)	Lack of a common theoretical framework to provide consistent underlying assumptions	Statement
Gibson (1999)	ERP --- BPR has also had a high failure rate with consultants estimating that as many as 70% of BPR projects fail (Hammer and Champy 1993)	Reference to Literature
Ginzberg (1981)	Realism of user expectations is critical to implementation success Users must be involved in the system development process	A field study - Trust Department of a large U.S. bank – Questionnaire a longitudinal study of user expectations as predictors of project success or failure
Hirschheim (1991)	Many, if not most, information systems are failures in one sense or another.	Literature review
Hornby (1992)	Organisational issues are not properly addressed during the systems development process	
Jirotko (1994)	Anecdotal evidence suggests that errors in requirements may account for something like 50% of the total cost of debugging. This may help to explain the popularity of the many 'requirements methodologies' that are available, often as expensive commercial products, involving CASE tools, as well as extensive documentation and training programmes. Unfortunately, there is very little reliable information about the relative effectiveness of these various methods'. One important reason for this is the lack of any theory that is adequate to the empirical phenomena of Requirements Engineering;	Anecdotal
Jones (1997)	Have been a number of attempts to develop a theory of IS, ...the failure of these models,...to achieve general acceptance, would suggest that IS does not meet the requirements for Discipline	Literature
Keil and Robey (Keil and Robey, 1999)	De-escalation triggers senior managers, internal auditors, or external consultants	interviews with forty-two IS auditors
Knights (1994)	Have argued that chaos, and the failure of the project to meet its original objectives is probably typical of systems development projects rather than an exceptional case.	Interviews and case studies
Larsena and Myers (1999)	Contribution of this paper is to suggest that "success" is a moving target	An in-depth case study of package-driven BPR
Laudon and Laudon (1996)	75 percent of all large systems may be considered to be operating failures	Based upon Standish Group International
Lee (1999)	"The same information system can be a success in one organisation but a failure in another, while the same organisation can experience success with one information system but failure with another. Hence, the information system and the organisational context must be studied, understood, and managed together, not separately"	Research article on the form the 'Researching MIS' should take in the Future
Lycett (1998)	The constraint that methodical development places on design; namely that it requires design to be a contingent and predictive activity	Statement
Lyytinen (1987)	Information system failure as the 'inability of an IS to meet a specific stakeholder group's expectations'	
Lyytinen (1987).	Inadequacies in requirements have been identified as a major factor in information systems failures ---- requirements specifications are often incomplete, unclear or incorrect	Postulated that there are three object system contexts: the technology context (T), the language context (L), and the organization context (O)
Lyytinen and Robey (1999)	Organizations fail to learn from their experience in systems development because of limits of organizational intelligence, disincentives for learning, organizational designs and educational barriers	draw from the literature on organizational learning to explore reasons for the failure of projects like Taurus.
McLucas (2000)	a. A litany of systemic failures existed at all levels in organisations involved. b. Breakdowns in communication existed	(collection – unknown) With 20/20 hindsight –

	<p>c. Existence of type of organisational culture best described as a 'culture of denial', denial that there were problems.</p> <p>d. Failure to understand and to learn.</p> <p>e. Failure to manage risks.</p> <p>f. Each accident was avoidable, though not predictable in terms of exactly where, or when, or in what form</p>	<p>Concept mapping was used to graphically depict important elements of the evidence,</p>
Montealegre (2000)	<p>de-escalation, troubled projects - Denver International Airport</p> <p>whenever there is reduced commitment to a failing course of action - managers struggle to demolish one view of reality and substitute another</p>	<p>in-depth case interviews</p>
Montealegre and Keil (2000)	<p>Research on de-escalation, or the process of breaking such a cycle. Troubled projects may be successfully turned around or sensibly abandoned. This study seeks to understand the process of de-escalation and to establish a model for turning around troubled projects</p>	<p>A longitudinal case study of the IT-based baggage handling system at Denver International Airport</p>
NATIONAL AUDIT OFFICE/OFFICE OF GOVERNMENT COMMERCE Select Committee on Work and Pensions	<ol style="list-style-type: none"> 1. Lack of clear link between the project and the organisation's key strategic priorities, including agreed measures of success. 2. Lack of clear senior management and Ministerial ownership and leadership. 3. Lack of effective engagement with stakeholders. 4. Lack of skills and proven approach to project management and risk management. 5. Lack of understanding of and contact with the supply industry at senior levels in the organisation. 6. Evaluation of proposals driven by initial price rather than long-term value for money (especially securing delivery of business benefits). 7. Too little attention to breaking development and implementation into manageable steps. 8. Inadequate resources and skills to deliver the total delivery portfolio. 	<p>Government report</p>
Nuseibeh (2000)	<p>Software engineering still lacks a mature science of software behaviour on which to draw, requirements engineers need such a science in order to understand how to specify the required behaviour of software</p>	<p>Literature</p>
POST Report 200 July 2003 Government IT projects Summary (2003)	<p>Why some government IT projects fail</p> <ul style="list-style-type: none"> -Difficulties with IT delivery - difficulties in defining requirements and high complexity - require a range of skills to scrutinise bids, keep up to date with technology, be realistic about what systems are likely to deliver, understand commercial drivers and actively manage suppliers - to include the final users in project development - to ensure guidance is followed by all departments 	<p>2002, the Public Accounts Committee</p>
Rob (2003)	<p>It's always communication</p> <p>Know the project's size and complexity</p> <p>Avoid new or unfamiliar contractors</p> <p>Maintain educational standards for the project team</p> <p>Project management must be flexible</p>	<p>personal experiences as a programmer/analyst by a small IT company in Houston</p>
Rossin (2002)	<p>There is a failure of managers to evaluate their MIS and that they delegate much of the control of the organisation to system designers and operators cannot be wholly substantiated</p>	<p>Quoted from Ackoff viewpoint</p>
Russo and Fitzgerald (2001)	<p>Recovering from the initial failure – background changes</p>	<p>Interviews study of after failure and recovery</p>
Sauer (1993)	<p>There is no unified framework for understanding information systems failure - Our understanding of the nature and causes of failure still has some way to go</p>	<p>Book – based upon literature</p>
Saur and Cuthbertson (2003)	<p>67% functionality achieved by IT projects</p> <p>50% of projects still involve code development</p> <p>30% involve package modification</p> <p>55% of projects exceeded budget</p> <p>60% of project managers expect to a significant extent to have to renegotiate targets</p>	<p>An Oxford University survey</p>

	only 16% of IT projects were successful, around 74% were 'challenged' and 10% were abandoned	
Select Committee on Public Accounts Third Report - 2001 http://www.publications.parliament.uk/pa/cm200102/cmselect/cmpubacc/358/35802.htm	All the parties seriously underestimated the complexity of the project and the risk failed to achieve a shared understanding of what was to be delivered and how inadequate contracting and project management skills, and lack of clear ownership of project delivery and risk management the important reasons were insufficient time for specifying the requirement and piloting; the lack of a shared, open approach to risk management; and divided control	Written and aural evidence
Select Committee on Work and Pensions Written Evidence	An IT project requires stability more than anything else and changes in policy risk significant delays or even complete failure	Memorandum submitted by Computer Sciences Corporation (CSC) (SC 03)
Select Committee on Work and Pensions Written Evidence	Incidences of underperformance and failure are high with up to 50% of IT initiatives being abandoned or failing outright and up to an additional 40% of IT initiatives being delivered late and over budget. Unfortunately, as few as 10% of IT initiatives actually deliver promised business value Most IT project managers are not recruited to address the "SOFT" aspects of IT initiatives failure outweighs the propensity for success by a factor of nine to one, surely it is imperative that we develop a clinical approach to understanding the roots of underperformance and failure.	Memorandum submitted by Dr Joe Mc Donagh (SC 19)
Select Committee on Work and Pensions Written Evidence	Conflicts between the procurement process and the design process can lead to failures in delivery Adopting a COTS approach is likely to require an amount of Business Process Re-engineering as the customers adjust themselves to the constraints that a COTS product brings. Failure to make this change will almost inevitably result in a failure to meet the aims and objectives of the project	Memorandum submitted by Gartner (SC 11)
Select Committee on Work and Pensions Written Evidence	In any implementation of an IT system there will always be risk. We believe that the appropriate way to reduce the risk is to allocate responsibility for managing each risk, in a focussed and robust manner	Memorandum submitted by IBM (SC 15)
Taylor (2001).	There is no single cause for IT project failure. Failure can occur at any point, for various reasons	38 members of the BCS, the Association of Project Managers and the Institute of Management
Thayer (1990)	Software has also been called the biggest block to the Strategic Defence Initiative	Report
The CHAOS Report (1994) http://www.pm2go.com/sample_research/chaos_1994_4.php	31.1% of projects will be canceled before they ever get completed 52.7% of projects will cost 189% of their original estimates the average is only 16.2% for software projects that are completed on-time and on-budget. larger companies - only 9% of their projects come in on-time and on-budget 42% of the originally-proposed features and functions 37.1%, were impaired and subsequently cancelled a third experienced cost overruns over one-third also experienced time overruns Project Success Factors User Involvement - 15.9% Executive Management Support - 13.9% Clear Statement of Requirements - 13.0% Proper Planning - 9.6% Realistic Expectations - 8.2% Project Impaired Factors	survey and several personal interviews total sample size was 365 respondents The sample included large, medium, and small companies across major industry segments, four focus groups

	1. Incomplete Requirements 13.1% 2. Lack of User Involvement 12.4% 3. Lack of Resources 10.6% 4. Unrealistic Expectations 9.9%	
The Sunday Business newspaper 29-01-06	EDS botched the introduction of Chancellor Gordon Brown's flagship tax credits system the mistake "occurred when an under-tested software went live". A faulty computer program overpaid the staggering sum of £2bn in 2003/04, the first year of operation	Secondary
Wilson and Howcroft (2002)	The conceptual aspects associated with an understanding of IS failure In sum, the paper builds on the valuable contribution of Sauer (1993) and others who recognise the importance of organisational context; this adds to Lyytinen & Hirschheim's (1987) understanding of stakeholder perspectives, by indicating that perspectives shift over time and by emphasising the role of power and politics in the mobilisation of bias.	a case study- individual interviews – with those involved in implementing and those expected to use the system (the nurses on the wards).
Woolgar (1994)	Few sustained ethnographic studies of the requirements process itself - we urgently need more	

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Appendix 1d

Solutions to Requirements problem

The understanding of what a Requirement is; and why there is a problem

Seemingly: a Requirement, as a concept, especially taken from the IS-IT development perspective, is a well known and coherent phenomenon.

Starting with a basic well known cited definition; “*A Requirement conveys an essential property that the system must satisfy*” (Yeh, 1990): The implicit assumption made by the domain of IS-IT that purports that the design process of elicitation, escorts the essential property of a Requirement, the conveying is assuming that a process will reveal the essential property. Where ‘X’ is unknown, ‘X’ = (Requirement) the meaning or idea of ‘X’ will be clearly formulated as facts, through operationalization of a classification process. This is in effect the rationalization of Requirements; forming a structuralizing set of norms, theories and prescribed strategies or analytic methodologies together, and applying it to the process; following the Requirements analyses that have been undertaken to produce software which will fit into, or become the system that satisfies.

There is an extensive choice of processes to use to reach a definition of a Requirement. An often cited typical example is; “*software Requirements analysis is the process of studying user needs to arrive at a definition of software Requirements*” (Thayer and Dorfman, 1990); this is typical of the definitions used to describe what it is that a Requirements analyst does. The wrapper process, with its structuralizations around Requirements is [analyses-(Requirements)-software], a cast mould casing that fashions the shape for the actions and justifications, and it also contains the means and motivations for portraying or seeing the world in a certain way, and also provides the tools for the management and design of a Requirement.

Arguably, there are variations found in the methods of representing the world, with

different blue-prints of how the world gives the impression of being, since there are different perspectives and methodical standpoints taken upon the world. For instance, this can be seen in subtle variations found in the definitions, in the Thayer and Dorfman (1990) definition used above, '*process of studying user needs*', whereas, Sommerville (1982) starts with exactly the same definition as Thayer; "A software Requirement is a property that the software system must satisfy (Sommerville, 1982). But, Sommerville takes a 'service' viewpoint upon the operationalizable definition; "*the process of establishing the services the system should provide and the constraints under which it must operate*" (Sommerville, 1982). DeMarco (1978) offers yet another variation upon the same theme; "*Requirements can be viewed as targets that the design must meet*" (DeMarco, 1978). The subtle differences, 'user needs', 'service' or 'target', place alternative emphases upon the design process, or the conditions that the 'system must satisfy', resulting in differing consequences. At which point, ambiguities contained within in IS-IT definitional use begin to be exposed.

The indistinctiveness of what it is that comprises a Requirement emanates from the control process of the definitional method. To use a hypothetical example; if an analyst, designing a system for a hospital focuses on the 'user need' of the patient, it would not be the same user needs as the 'service' provided by the hospital, and it would be different again from the administrative 'target' of treating a patient, as set by governance and driven by best clinical practice, that has to factor in other considerations. The assumption is that they are all one and the same Requirement, something that the system must satisfy, but in essence it is the operational use of the definition of the design process method that is responsible for defining what is a Requirement.

Requirements classification

Delving further into the issue, from the perspective of the differing design process definitions it is found that the inconsistent method control process of definitions reveals underlying interrelated patterns. The 'user-needs', 'service' and 'target', terms that are used by these definitions, belong to three dimensions that are subsumed under a classification framework of Requirements, and although the details of this structure is expounded upon later in the thesis, the definitional directives can be thought about as belonging to a skeleton framework upon which many other definitions and process methods have been developed. The three core parts of the definitional framework are now briefly examined:-

1. The 'correct process', of being able to get the Requirements right

2. Building an informational product
3. Satisfying stakeholders living in the social dimension

Correct Process

The first dimension, 'getting Requirements right' (Canning, 1977) defines not just what the new system should do, its inputs, its outputs, and its processing, but the definitional process of methodological production. The purpose seeks to remove the errors and omissions in the Requirements, to ensure that Requirements are stated accurately and completely and are correctly identified, rather than the trial-and-error approach, which historically led to Requirements statements being erroneous or incomplete (Avison and Fitzgerald, 1995). The process definitions; 'Requirements analysis', identifies the system's functional Requirements and results in a set of textual specifications' (Jacobson, 2000 Pg, 19); with the role of a definition to clarify meaning. Natural language is not well suited for stating Requirements, and every Requirement should be stated in measurable terms, with a test that should be written to validate that Requirement. "A formal specification" is the expression, in formal language, and at some level of abstraction, of a collection of properties some system should satisfy" (Lamsweerde, 2000). This fits with the Sommerville's (1982) definition above, and 'the process of establishing the services system'.

An Informational Product

The second dimension is the using of definitions to create a 'software product'. Consequently, Requirements is a process to obtain a 'product type' for use in an environmental setting. This builds upon the first category by obtaining the correct Requirements, by virtue that the design conception is about building, or buying in products, taking it that nobody buys incomplete parts. Specifically for IS, the process defines information itself as a product that can be manipulated by systems; "*Requirements are the properties that should hold in the real world that which we want the information artefact to help bring about*" (Potts, 2001). Information Design, design features (the product) (Hirschheim, Klein et al., 1995) is a large contributing part of the concept of the 'information system', which addresses the organization and the presentation of data. "The 'states' in the system consist of information about relevant entities and their attributes in the environment" (Yeh and Zave, 1980), and reflect the process-product relationship between the process of system design and it's product (the information system), and the process of using an information system and it's product (management action) (Boland, 1979).

Information designed as a product, encapsulated within the concept of 'information system' is a natural extension of IT into the social and organizational context (Angell and Straub, 1993). The definition "*Requirements define what is to be designed, built and put into service*" (Newman and Lamming, 1995), makes no distinction between a physical product and information-as-a-product, resulting in the approach that treats information as a product, 'People think about product design as a list of features' (Beyer, 1994), a preferred shopping list of things that will satisfy a need, fitting into or improving upon the existing organisational arrangement.

The advantage of having the concept of a product is of holding the end goal in the mind's eye, of having the idea, already pictured as a concept, and pre- formed in the mind, which helps to eliminate risk and aids the working out of what to build, either as a blueprint plan or through iterative prototyping and improvement.

The advocated chief advantage to the product approach is that it helps to separate specification from implementation (Royce, 1970; Dijkstra, 1972; Parnas, 1972; Knuth, 1974), and this is considered as of paramount importance in Requirements (Thayer and Royce, 1990; Pohl, 1993; Jackson, 1995).

A software Requirements specification is a document containing a complete description of what the software will do, independently of implementation details (Kotonya and Sommerville, 2000). "Unfortunately, this model is overly naive, and does not match reality" (Swartout and Balzer, 1982). Partly, the explanation for this lies in the problem of the articulating of a monothetic object which has a distinctiveness, but only auxiliary data reference to the real life-world. From within the data definitional product viewpoint, the construction of a product is where the system is recorded in a place from where it can be reproduced upon demand, as sequences of actions which can be influenced and characterized by the movements of information, hence information can be treated as a product. The analyst's design remit starts by noticing sequences of action and then making improvements on them, by calling attention to them, labelling them, repeating them, disseminating them, and legitimizing them (Weick, 2001). The assumption that gives rise to the issue is contained within the methodology, where the fundamental building blocks of a system are the data, and the underlying nature of the system remains unchanged because the data is static (Wood-Harper and Fitzgerald, 1982); the assumption also extends this concept out into the organization, in thinking that the being is in a static equilibrium and of static Information (Boland, 1979).

Satisfying stakeholders

The consequence of designing information as a product is the acknowledgement that it is part of a system, and that all systems at some point have to interact with people. A system Requirement is “*a system capability needed by a user to solve a problem or achieve an objective*” (Thayer and Royce, 1990). This exposes the third identifiable operationalizable definitional pattern use; the definitional imperative dealing with the life-world of people. “*Requirements are properties that a system should have in order to succeed in the environment in which it will be used*” (Jirotko and Goguen, 1994).

To succeed ‘in-use’ means that there is a third dimension, that of getting agreement with the stakeholders (Pohl, 1993) and at all stages of Requirements the user has to be considered within the concept design, emphasising two aspects; firstly in-design and secondly in-use. The environment or context of the systems in-use presents one of the thorniest of issues for IS Requirements, as changes to the technical aspects are usually far easier to deal with than the human aspects (Mumford and Pettigrew, 1975). Consequently, in this dimension there are many and various choices of definitions of Requirements for encompassing and using a process control in the ‘context of discovery’ (see appendix 1b for glossary of terms). This concept of the Requirements management has to include and cater for the multivariate possibilities that exist within the messiness of the social world, consequently, it marks an interesting boundary of the domain.

Stakeholder involvement in-design

The first sub-dimension definitional Requirements imperative, that of user agreement, which has also produced the main concentration of the collection of methods, has focused upon the understanding of the user or stakeholder perspective, for use in the conceptual design and in the artefact design stages; “viewpoint development is the process of identifying, understanding and representing different stakeholder viewpoints” (Finkelstein, Kramer et al., 1992; Darke and Shanks, 1997; Darke, Shanks et al., 1998). Some of these definitions also consider the design in-use as an end product; “a software product is engineered to satisfy the client's Requirements” (Schach and Tomer, 2000), or to facilitate the user to devise their own specification; “user-led Requirements construction that provides the capability for users to build their own Requirements models” (Flynn and Jazi, 1998). However, there are inherent difficulties with the idea or concept revolving around deciding exactly who is a user or stakeholder, such as the difficulties in even defining or understanding the differences

of viewpoints between a 'client's Requirements' and that of a user, and those of user expectations. Such variations lead to conflicting interests (Ciborra and Hanseth, 1998); users have no legitimate vocabulary (Westrup, 1997) and the problem is of resolving the different dimensions (Pohl, 1993), with an imbalance of the power relations between users and information systems professionals (Markus and Bjorn-Andersen, 1987), and the need for planting the seeds of cooperative design, where users and designers can actively work together (Kyng and Greenbaum, 1991). Even in the modern lightweight development approaches, where story cards represent 'customer Requirements' the stakeholder identification is a known difficult issue (Eberlein and Leite, 2002). The problems of the user-stakeholder-client-customer participation and their involvement in the Requirements elicitation process remains, in definitional terms, as confused today as it did when Mumford (1986) first reported upon the issue; "many people talk about participation, few define exactly what they mean by the term and the same word can mean different things to different groups and individuals" (Mumford, 1986).

The user's social dimension

The user dimension encompasses the context or environment, extending IT into the social and organizational context (Angell and Straub, 1993), with the accompaniment of user agreement, which has the effect of re-marking the boundaries and the limits of influence beyond the product and the user interface, this is predominantly underpinned by a cohort of literature under the broad banner of the socio-technical movement; "the basic idea that 'human activity system' models can be used as a vehicle for what is often thought of as 'information Requirements analysis' (Checkland and Holwell, 1998). This also extends to include areas such as the understanding of 'group work' configuration; "to operationalize the insights from the life-world worldview, to guide specific design issues" (Mandviwalla and Olfman, 1994). But, with the extension, the outward re-marking of the boundaries has brought into play further ambiguities, as the 'life-world' is far more complex than the thinking and understanding about the design for a product, or that of its user interface. For instance, one difficult feature was noted by Franz and Robey (1984) in that there is a largely hidden 'background' of politicking, where motives and self interested behaviour can be masked. Also, users have resistance to change, and this has been seen by many IS professionals as the primary reason why there have been so many failed information systems (Hirschheim and Newman, 1988). This in turn has prompted many researchers to respond by developing solutions, with "new" operationalizable alternative methodical ways and devised definitions to handle these issues.

Researchers have devised methods to limit or ameliorate user demands through 'expectations management' (Boehm, Abi-Antoun et al., 1999), or they borrow theories from other domains such as interaction theory (Markus, 1983), that purport to handle processes of political behaviour. Or they just acknowledge the political issue as a given 'in an imperfect world', in the context of work; "The systems analyst works with the user within his or her socio-political and economic context to specify the information system Requirements of an organization" (Bell and Wood-Harper, 1998). In Hirschheim, et al.'s (1996) review of political organization design it was noted that there are only few specific methods available in the literature.

Discussion on the Requirement definitional perspective; why it is an issue

Taking stock, from a tourist postcard definitional overview of Requirements, it can be deduced that at the detailed level there are signs of fragmentation that question the notion of a Requirement being 'a well known coherent phenomenon', even though the introduction of a framework, encompassing the general thrust of the definitions, brought about a conceptual cohesiveness by enclosing them in three dimensions;

- Those that advocate a methodical procedure, ensuring correctness of Requirements, involving clarifying meaning and promoting methods;
- Those that focus upon building products, including information as a service product of data, and
- Those that focus on the user or stakeholder perspective needs and include the context of systems operations.

No single definition appears to monothetically encapsulate the entire Requirements management process. Furthermore, none of the Requirements definitions characterise the essential element of the meaning of "what is a Requirement?"

Summarising, the IS-IT domain Requirements, from the definitional perspective meaning as given, provides a perspective of Requirements as a conceptualised design process, it specifically focuses upon 'getting-the-Requirements-right',

Thus, we find that definitional perspective does not define what a Requirement is.

A Requirement has to be considered to be the output of the design process, which

does appear to be a methodical process, with methods, procedures and tools, supported by belonging to a domain of science.

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Appendix 3a

Examination of Empiricism as the source of justification for the IS beliefs

This section examines Empiricism as the source of justification for the IS beliefs. There are different versions of Empiricism but the modern natural science model (foundational empiricism) is the model which ISD and ISR considers as the standard to be accommodated within its structures as the concept of requirement-ing-science, maintaining and supporting the construction of theories and facts which are based upon the foundations of self-evident axioms. But, modern philosophers have questioned foundational empiricism, as it fails to be the single guarantor of truth, in that it is only one of the sources of beliefs. This shortfall becomes apparent when examining the boundaries of what is ruled in or out of a domain of study.

Empiricist philosophers think that all our knowledge of the world comes through the senses and experience, but they differ in their account of how precisely senses are experienced or of how perception furnishes us with knowledge about the world. The direct realist theory of perception is the kind of view people tend to have before they have considered the complex issues surrounding perception in any depth. It is considered to be the position of common sense. For this reason it is often, and rather unfairly, termed 'naive' realism, despite the fact that sophisticated philosophical arguments can and have been adduced in support of it.

Empiricism claims that all beliefs are shaped through the use of sense; these are contingent beliefs (Locke 1632-1704) formed by a collection of ideas, 'materials' of knowledge derived from experience (Locke Book 2, sections 3&4). Concepts and experiences are achieved through the sense process of the mind, something that a person may or may not be conscious of, depending on the internal states of mind. The internal senses are the sensory impressions associated with input from the five senses. There are several versions of Empiricism but in this traditional one, the mind starts as a blank piece of paper, a tabular rasa, onto which the experience of life is written (Boland, 2001). However, there are several problems, mainly in that experience and understanding lacks certainty and that beliefs are only contingently

true, in that the direct realist's justification of knowledge of physical objects is viciously circular. The problem for the naive realist is that a person cannot be seen to be able to distinguish between perceiving something which is there, and seeming to perceive something which in reality is not, thus opening the doors to the sceptic, and the difficulty being in the justification.

A stronger variety of realism, indirect realism, builds upon foundational empiricism. The modern natural sciences use this structure for the construction of understanding, placing "facts" at the base. Given facts are collected in the instrumental study of objects, which 'gives' reliable sense data. The objects hold the data which informs the subject matter. The world is 'out-there' awaiting discovery through the development of inferred propositions. In this sense, factual knowledge appears as objective constructs. The factual knowledge about the world can be built on top of incorrigible knowledge by acquaintance (Cardinal, Hayward et al., 2004), incorrigible in that sensations are certain and are immune from sceptical doubt, but these are the foundations that form a bedrock that goes on to infer the existence of the physical world.

The nature of the foundations are cornerstones that enable the building of grand unifying theories of scientific inquiry, all of which are inferred from the universal scientific method that is used to study events. These methods are in turn built upon self-evident axioms. What gives the axioms their security is their relation to the theorems that follow from them. "They are accepted because they are seen to be the neatest and most convenient way of establishing the theorems" (Everitt and Fisher, 1995). The natural scientific outlook incorporates a strict emphasis on the method to achieve representations about an external world. These pictures build inferences about 'Factual' knowledge which are achieved by making propositions and theories about phenomena.

Empirical Foundationalism rebuts scepticism and infinite regress by the nature of the foundations, and the nature of the justification. This is achieved by drawing a boundary around what can be counted as valid to the senses, but as these are not reliable, it is necessary to construct 'contexts of meaning' which are reflected in theories that compose abstract representations of the world. Conventionally, a theory "formulates the relationships among objective, context-free elements (simples, primitives, features, attributes, factors, data points, cues, etc.) in terms of abstract principles (covering laws, rules, programs, etc.)"(Dreyfus and Dreyfus, 1990). In

abstracting it, it is necessary to construct 'contexts of justification', in the terms of general methodological rigour. Thus, mutually supporting the rationale to 'go out' into the world, into the 'context of discovery' and to apply the tools and instruments to support or disprove the theoretical constructions.

References: Appendix 3a

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Appendix 3b

The call for diversity and plurality in studying ISR

The work of this appendix section investigates the ambiguity that occurs from the so-called fragmented adhocracy (Hirschheim and Klein, 2003) which exists to support the multitudinous collection of research tools and methods that purports to investigate the What with the How.

One of the main debates within the domain of ISR has been the call for diversity and plurality in studying ISD. This appears to be particularly relevant to the theme of this enquiry as it may help to establish the underpinnings of the philosophic positions of research. Diversity and plurality in IS research are key concepts that have occupied an important debate for the research community of ISR research for some time. (e.g. see Hirschheim and Klein, 1989; Hirschheim, 1992; Hirschheim, Klein et al., 1995; Benbasat and Weber, 1996; Robey, 1996; e.g. see Lee and Liebenau, 1997; Markus, 1997; Myers, 1997; Baskerville and Wood-Harper, 1998; Livari and Lyytinen, 1998; Kling and McKim, 1999; Gallagher and Webb, 2000; Orlikowski, 2000; Mingers, 2001)

Briefly, outlining the dominant IS literature supporting the current case for diversity, Benbasat and Weber (1996) argued that there are benefits to diversity in the IS discipline, as long as it is 'managed'. Robey traced the debate back to Jeffrey Pfeffer's book of 1982 which criticised the domain of 'organisation science' for resembling a weed patch rather than a well-cultivated garden (Robey, 1996, quoting Pfeffer, 1982). Robey actively promotes pluralism, insisting that researchers should adopt a 'disciplined methodological pluralism'. Many researchers have gone on to cultivate the quest of that time, approaching the subject matter of requirements with the ambition of enfolding academic research back into current practice. In answering the calls for 'managed' and 'disciplined' approach, researchers are left with a variety of methods and approaches. The result over the last decade has led to many diverse attempts to conceptualise the role IT plays in organisational activities; from 'viewing the use of technology as a process of enactment' (Orlikowski, 2000), 'informaté' (as opposed simply to automate) business processes (Zuboff, 1988), situated action (Suchman, 1987; Hert, 1996; Bardram, 1997), a social-analytic perspective (Hirschheim, 1986), actor network theory (Lientz and Swanson, 1981; Walsham, 1997; Callon, 1999; Law,

1999; Fox, 2000), activity theory (Kaptelinin, 1996; Nardi, 1996; Kaptelinin, 1997; Engestrom, 2000; Ryder, 2001) to name only a few.

The ISR doctrine also claims that it has now 'accepted' both qualitative and quantitative methods (Lee and Liebenau, 1997) upon the import of knowledge and methodological practice from poly-disciplines (Mingers, 2001). The pluralist methodological approach, for example such as Minger's (2001) 'Multimethodology' combines different research methods into a mixed-method, thus supporting the proposition that a range of research methods will provide richer and more reliable results. The claim that Mingers (2001) is making is that 'Multimethodology' should be seen as a new paradigm, and not as meta-paradigmatic. But, the 'Multimethodology' approach presented by Mingers (2001) forms a 'critical pluralist perspective', with aspects borrowed from 'critical realism' combined with the biological and cognitive theories (Mingers, 2001).

Hirschheim and Klein, et al. (1996) adopted a slightly different tack, using a conceptual base from the social action theories of Habermas and Etzioni to produce an abstract, analytic "federated" ISD research framework. They set out to demonstrate how it is possible and beneficial to structure the diversity and plurality that is found in ISD into a framework. They believe that a unified ISD research paradigm is neither possible nor desirable, "Diversity, will be the order of tomorrow", and so they promote the fragmented adhocracy consisting of principles, methods and tools variously assembled to form development strategies. They place their primary theoretical base on the theory of 'bureaucracy' as developed in the classical works of Fayol, Taylor, Weber and the modern successors, in such as contingency theories. These base theories are then mixed with the information processing theory of organization design, and the theories of organizational work environment, together with the application of ergonomic principles of work design (Hirschheim, Klein et al., 1996). Hirschheim and Klein, et al are implicitly inferring, by making such a federated framework, which draws upon diverse philosophical underpinnings, that it is possible to make a radical redefinition of what counts as knowledge. Their basic claim is that IS has sets of 'theories' which can be used contingently and when necessary.

One of the problems with the Multi-methodology or federated approaches comes when considering the questions of when, how and which bits (methods, tools) of theory are appropriate to use, and of which bit to use in what circumstance. These parts, or bits of theories, have to join up when considering the total coherence of the

validity of method, within the collection as a whole.

The danger is that the separate research methods might become disconnected from its philosophical foundation. Each method may well have its own ontological stance; furthermore, different methods have different epistemological justifications; to be coherent each will have to point to the same foundational principles, and it is at this point, that the approach becomes questionable. In the Multimethodology approach, the underpinning of critical realism would argue that social structures exist and that they precede autonomous action. Similarly as Habermas does, in his later work, in reformulating his approach in system-theoretic terms which were borrowed in part from Talcott Parsons (Feenberg, 2000). Habermas interprets technical action through the generic concept of instrumentality, judged from the scientific attitude, where nature is seen as a set of objects in linear cause-effect type relations (Lash, 2002). This invokes the criticism from Flyvbjerg (2000) that "The basic weakness of Habermas's project is its lack of agreement between ideal theory and real rationality, between intentions and their implementation" (Flyvbjerg, 2000). Sharrock and Button (1997) examined the argument put forward by Ojelanki Nygwenyama and Kalle Lyytinen (Sharrock and Button, 1997) that Juergen Habermas' theory of communicative action is relevant for the analysis and design of groupware systems. However, they suggested that it was not clear how designers could begin to proceed under the Habermasian framework (Sharrock and Button, 1997), and in their conclusion, they questioned the extent to which grand, holistic, synthesising sociological theories could offer a way forward for designers pointing to the practical difficulties of applying Nygwenyama and Lyytinen's categories of analysis.

The spurious equivalence of the exact fit in the use of combining different epistemological and ontological stances gives the problem of explicitly having to, a priori, and at each stage of the investigation, organise the "finite provinces of meaning" (Schutz, 1962 pg, 340). The problem here, in the multi-approach, as proposed, is; how to determine the nature of the connections, or the bridges which bind these worlds to each other. This has not been made explicit in multi-approach, although it is often suggested to be contingent. As in, contingent is a statement, which 'may' or 'may not', be true. Whereas a necessary statement is one which must always be true. Thus presenting a catch 22; that is; if the ontological foundations are different, then there are different versions of the same facts, which would force the researcher back to defend this position from representative realism, which fits very well with the current scientific view of the world (the place where some ISR is trying to escape

from). Alternatively, accept Descartes' conclusion that there are two worlds.

The argument is not that these multi-methodologies are necessarily wrong, but that there is a need to be careful of their theoretical constructs, in that implicit assumptions have been made about the life-world.

An alternative problem/solution to the construction of a multi-methodology, without the meta construction, is to totally reject it and become an supporter to the so-called "post-modern", dealing with disorder, fragmentation, irrationality (Lash, 2002) and defined by a series of tensions, contradictions, and hesitations (Denzin and Lincoln, 2000). This might well be a legitimate form of research, but what is not so transparent is the philosophical foundation, mainly due to the fact that post-modernism itself is so fragmented. Silverman (1998) makes a similar point; that there is no agreement on the doctrine underlying all qualitative social research; instead there are just a series of labels of 'isms'. Silverman (1998) argues that the vast range of research styles used in qualitative research studies, without any conscious analytic perspective, makes no attempt to characterize qualitative research as a whole, and is open to severe criticism.

The alternative to fragmentation of the approach to methods is cohesiveness, with the use of a meta-theoretical construction kit. Galliers and Land (1987) proposed that ISR is a meta-subject that spans many disciplines, in the social sciences, in business, and, but only occasionally, in the natural sciences. A recent popular approach has been to adopt Giddens structural theory into IS. Giddens is one of the most widely cited social theorists in IS research (Jones, 2000) A number of notable IS contributions that use Structuration include (Orlikowski and Robey, 1991; Walsham and Han, 1991; Orlikowski, 1992; 1993; DeSanctis and Poole, 1994; Nandhakumar and Jones, 1997; Dillard, 2000; Rose and Scheepers, 2001).

Tenkasi and Boland drew on Giddens (1993) to call attention to the social practices and narratives of human actors, based upon generative processes, which are subject to change. The concept they put forward was that in narratives, cognitive structures and schemas are being produced and reproduced. Barley and Tolbert (1997) combined structuration with Institutional theory seeking to 'fuse' the two (Barley and Tolbert, 1997), entailing the methodological encoding of institutional principles into the scripts used in specific settings for investigating processes for IS.

Along with Walsham and Jones, Orlikowski's work draws heavy upon the work of Giddens and his theoretical contributions, with well over thirty papers and articles referencing the Structuralist theory. Jones and Orlikowski, et al. (2004)'s recent critical reappraisal advocates that Structuralist theory should not prescribe a specific research approach by which knowledge might be gained, but should be used to inform the background approach. Examples of which are Orlikowski and Baroudi (1991) synthesis of research approaches, and Orlikowski's (2002) theoretical thesis, stating that knowing is an enacted capability. Orlikowski and Yates (2002) focus on temporal structuring bridging the subjective-objective dichotomy. Duality of Technology (1992). Organizational Transformation (Orlikowski, 1996) and Beath and Orlikowski (1994) also use Structuralist theory to inform about incompatible assumptions in the role of users and information systems during systems development. Recently it is notable that Orlikowski has shifted theorising an extension to Giddens in developing a 'practice lens', to examine how people interact with a technology in their ongoing practices, enacting structures which shape their emergent and situated use of that technology (Orlikowski, 2000; Schultze and Orlikowski, 2004).

The use of Structuralist theory only occupies a small, but influential percentage of research literature in IS. The main claim in IS is that technology is constituted by human agency and that it constitutes human practice. But within the Structuralist theory itself this is more difficult to assess since Giddens has little to say about Technology (Jones, 1999). Jones locates IS in Giddens Structuration (Giddens, 1990) as a part of the concept of disembedding mechanisms. Disembedding is seen as being achieved by two forms of 'abstract systems': firstly, symbolic tokens, pre-eminently money, and secondly, 'expert systems', seen as 'systems of technical accomplishment or professional expertise' (Galliers and Swan, 1997). The expert systems approach clearly belongs to the realms of computer science, whereby knowledge acquisition was an attempt to acquire and structure knowledge via the representation of rules prior to building expert systems (Spaul, 1997). This approach was popular in ISD combined with the rise of 'knowledge' systems, however this resulted in the over-selling of expert systems in the 1980s (Hirschheim and Newman, 1991) leaving Hirschheim and Newman (1991) to note that expert systems can also be viewed as dangerous creations that mimic human intelligence, expert systems as such are a myth, and (Lyytinen and Robey, 1999) a technological fix to remedy practical problems (Cuff, Sharrock et al., 1998).

Cuff and Sharrock, et al. (1998) note that there is some controversy surrounding

Giddens's sociological theorising, involving the nature of the project of synthesising. Giddens's theory on the one hand, which seeks to provide a convincing, overarching framework for sociological analysis, while on the other hand, is it “merely an eclectic collection of ideas which are conceptually and methodologically distinct” (Cuff, Sharrock et al., 1998). The problem Cuff and Sharrock, et al. (1998) highlight is that the goal of ‘synthesists’ reasserts the claims of sociological theory as being more traditionally understood, which is a dispute within sociology, attempting to recombine existing elements into purportedly more inclusive schemes (Jones, 1997).

The application, use and borrowing of structural theory into IS, and co-opted into IS has met with some criticism, with consequences potentially leading to misinterpretation of Giddens’ ideas (Jones, 1997). The argument for caution on using the theory as a suitable tool for investigation for this thesis, rests on the fact that such theories can be spliced with an attempt to transcend and correspond to a 'matching operation' of 'schema' through the use of 'logico-empirical method', the mainstream 'sociological attitude' matching operation' of 'schema' and object the concrete object as an ideal type. Although Orlikowski’s recent work in this field has extended by further embracing ongoing practices and enacted structures, akin to the study of the subjective dimension, there remains epistemological issues that cannot be ignored.

The problems for example is, as Westrup (1995) observed, is that the IS ontological and epistemological analyses used for requirements remain difficult to apply, especially in relation to methodologies and are, at base, philosophical; he suggests three reasons for this; “they abstract and simplify organizational theories while downplaying critiques of those theories; second, those techniques move unquestioningly from descriptive organizational theory to prescriptive practices; and third, they neglect the practices of systems developers that may embody sophisticated organizational awareness but which are not apparent in explicit development techniques” (Westrup, 1995). Consequently, it is not difficult to see why Hirschheim and Klein’s (2003) suggestion that the status of ISD is a 'fragmented adhocracy' of beliefs, and the discipline may indeed be in crisis or headed for a crisis.

Unfortunately, ISR often echoes the *dernier cri* of the social sciences. This diversity and plurality may have enabled the IS academic discipline to flourish with many alternate theoretical propositions, but it has also raised some interesting normative and epistemological questions, namely in the problem of reconciling the differences of descriptive versus prescriptive approaches, and the technological versus the social.

The classical philosophical research, IS debate rumbles on, now built upon largely normative arguments of validity and justification, of theoretical constructs, also at base many see the problem in terms of the subjectivist-objectivist continuum, and importunately the quantitative/qualitative research issues. ISR has forgotten to ask the simple question of: What is ...x...?

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Appendix 3c

Three philosophical positions of Requirements

Three key arguments stand out, Behaviourism, Functionalism and Cognitivism, which promulgate a claim to be theoretical solutions to Descartes' dualism. The Cartesian challenge, the problem of other-minds, and the mind-body problem, has long held a certain fascination and engagement for computer scientists, supplying the foundations for some very powerful arguments, whose relevance, underpinning and justification still reverberate around today in much IS thinking. Its relevance is especially pertinent to a theory of Requirements; this is a brief discussion on how Behaviourism, Cognitivism and Functionalism underpin Requirements.

3c.1 Behaviourism in Requirements

The underpinnings of the theory of Requirements state that the ISD domain must be formalizable; that the operationalization of Requirements has to find the context-free elements and principles to use as a base as the formal symbolic information-processing representations of formal analytical analysis. The attempt is to find the primitive and essential elements, and progressively build up logical relations in the subject (humans or computer) that mirror the primitive objects and their relations that make up the world (Dreyfus and Dreyfus, 1990). The approach by implication is that; if people's actions demonstrate that they have minds, then it can be posited that a machine that does the same actions also has a mind. Epistemologically, there is no direct way of knowing what, if anything, is going on in other people's minds. The implicit assumption of the symbol manipulating approach is to 'specify' the behaviour that is desirable for the system to perform, in the form of Requirements. As posted by the definition of IS by Hirschheim and Klein et al. (1996) "An information system in its simplest form can be defined as a technological system that manipulates, stores, and disseminates symbols (representations) that have, or are expected to have, relevance and an impact on socially organized human behaviour" (Hirschheim, Klein et al., 1996). The challenge is then to design a device or mechanism which will effectively carry out this behaviour.

The behaviourist view solves Descartes' problem with an answer to the mind-body question, namely, that having a mind is having a body with certain specific dispositions. People act in a certain way as a response to the environment, and as if holding certain beliefs. This answer is reflected in the Requirements approach when analysts speak of; 'specifying' the 'systems behaviour', whose structure and behaviour must be understood (Finkelstein, 1994) as technical systems which have behaviour (Land and Hirschheim, 1983) and; "the function and performance allocated to software as part of system engineering are refined by establishing a complete information description; a detailed functional description; a representation of system behaviour" (Pressman, 2000)

The IT analysts' aim of using the theory of Requirements is to effect change, to transform and metamorphose the setting into which the IS-IT system can be placed. Some of Information Systems concerns are of the effective design, delivery, use and impact of information technology in organizations and society (Avison and Fitzgerald, 1995, p. xi). The design of the systems is to have purpose, to act in the application domain, or environment (Jackson, 1991). This has been a consistent theme since the early 1970's onwards, and follows throughout (all) the different methodological system developments eras see (Avison and Fitzgerald, 1999; Avison and Fitzgerald, 2003; Avison and Fitzgerald, 2003) one of the main aspects of which was the promise to solve the so called 'software crisis' in the 1960s directed at finding the causes of Requirements inadequacies (Dorfman, 2000). The consistency of the underlying theme or aim, which was steadfastly uniform throughout the methodological era allows this research to generalise; typically; 'the problem specification, customer Requirements, describes and specifies the system behaviour or capabilities' (Yeh and Zave, 1980). This continues to echo through to the modern XP approaches where; "Requirements stories specify system behaviour (or capabilities) prior to the procurement of a system that provides this required behaviour" (Davies, 2001).

Behaviourism has its roots in behavioural theory, which has academic respectability in the behavioural sciences, with an added kudos that reaches back to the 18th century empiricism (Czarniawska, 1998). Contemporary AI, HCI and some of the CSCW approaches are the modern sister disciplines that have cross fertilized and informed the ISD Requirements modus operandi, as often seen manifested in the modelling approach, which addresses the underlying need of separating people from the problem design space. Requirements specifications definitions strongly reflect this position; i.e. "The construction of the functional Requirements involves modelling the

relevant internal states and behaviour of both the component and its environment” (Balzer and Goldman, 1979). The resultant viewpoint from working from such definitions focuses, but it also detracts from alternative approaches, upon an understanding of ‘behaviour’ as being critical in the Requirements process (Nguyen and Swatman, 2001).

From the definition perspective of Requirements behaviourism, behaviour is, for the analyst, a problem to understand, being situated in the problem domain; it is established as a part of other systems of interaction, as a component in the world, reiterating that everything is, given enough time and effort, reducible to simple components and constructs. Analysts optimise solutions to well-defined problems (Rose, 2002) In the behaviourist model the user’s mind is not considered as a possible topic for scientific study, as it falls outside the sphere of observable physical phenomena and therefore cannot count as legitimate phenomena of science (Hughes and Sharrock, 1997 pg, 170). From such a perspective the analyst has been legitimised, vindicated and is sanctioned for the given perspective for treating the ISD as a world of systems, and ‘correct’ in using justifiable methods so approved, by the body of scientism; that the past provides us with some kind of guide to the future, because the same laws of natural and human behaviour persist over time; that the environment of the system remains stable and the boundaries of the system of interest exist in the real world and can be drawn as a result of a process of discovery (Fenton, 1997).

The models that the Requirements analyst produce ‘represent’ physical objects that impact upon the world, or upon the physical mind (representative realism). The behavioural approach underpins the system analysts’ grounding of the techniques, methods and tools in observable behaviour based upon realist principles (Wilson, 1999). The methods seek to understand basic cause and effect models, as a reaction to something, e.g. such as the effect of the heating thermostat on the temperature in a room. From this understanding, people are actors, with parts to play, also other systems have their part to play as technical actors, and they all interface, at definable boundary lines with differing levels of abstraction hiding the detail away.

The process of behaviour modelling was introduced as a part of the tool set of structured analysis, for example the state-transition diagram (Yourdon, 1993), modelling sequence in which data and functions will be performed. The equivalent object oriented approaches uses Services to define required behaviour (Coad and

Yourdon, 1990)

However, the behaviourist only succeeds in answering half of the Cartesian challenge that states that having a mind is having a body with certain specific dispositions and a frame of mind relative to it, and in the arrangement to the order of a wider architecture of the environment. It lacks the ability to tell us how the system operates, what drives the system forward, specifically how it is possible to infer how the other mind actually works.

3c.2 Functionalism in Requirements

The 'new alternative' to behaviourism, or an updated half way house (Appiah, 2003 pg, 19), is the view that having a mind, for a body, is like having a program for a machine. Often called functionalism, this theoretical construction crosses many theoretical domains from mathematics to modern political theories. Functionalism is the application of explicit, context-free rules and abstract relations among the elements that can account for the order of that domain (Dreyfus and Dreyfus, 1990). People's actions seen from a neurophysiologist's perspective is commensurate to that of an engineer's, also, computer programmers have synergy with the psychologist's view of the mind in that terms of beliefs, thoughts and desires are mental states and events. A functionalist theory says that the internal states of a system fixes how they interact with input, and with other internal states, to produce output.

Hirschheim et al. has systematically traced the complexity of IS development to a set of beliefs (Hirschheim, Klein et al., 1995), and their findings proposed that at the core of ISD there is a dominant root assumption based upon the belief of a unified ontology of functionalist tenets (Hirschheim, Klein et al., 1995). Summarising Hirschheim et al, three characteristics accompany the functionalist tenets; a) The theory, which is rooted in mathematics, b) Abstraction, rooted in the experimental scientific method, and c) Design, rooted in engineering. They also noted that since only functionalist textbooks are available, the academic community perpetuates, consciously or unconsciously, the idea of functionalism (Hirschheim, Klein et al., 1995). This is also reflected by many authors citing that functionalism has dominated IS research to date (Orlikowski and Baroudi, 1991; Hirschheim, Klein et al., 1995; Walsham, 1995; Nandhakumar and Jones, 1997; Goles and Hirschheim, 2000). This is also reflected in the aim of practice to be enveloped by the engineering domain (Luqi and Goguen, 1997; Pressman, 2000; The British Computer Society, 2004). A recent report of a working group of The British Computer Society advocated greater integration of

engineering principles and project management control of projects because of 'organisations failing to implement known best practice' (The British Computer Society, 2004).

The engineering principles of determining the Functions for software Requirements specification is 'the clear and precise description of each Requirement, including its performance, design constraints, and quality attributes of the software and its external interfaces' (Thayer and Dorfman, 1990). The central purpose that drives Requirements analysis is the goal of a 'System Functionality Specification'. Although Tenkasi, (1993) called it a 'deciphering process', he did not think that it involved the 'concept of transcendence'. However, the overwhelming numbers of authors purport that Requirements specification for software systems is the 'essential abstract' characterising attribute of its function, data, and control elements (Yeh, 1990). Requirements specification has been accompanied by the emergence of the production of general guidelines regarding the properties of a good specification, many of which are organised around a functionalist viewpoint (Roman, 1985). Leffingwell and Widrig (2000) state that a complete set of software Requirements is obtained by defining a "thing" is a software Requirement by testing it against this list:

- Inputs to the system
- Outputs from the system
- Functions of the system
- Attributes of the system
- Attributes of the system environment;

"if it does not - fit our definition and therefore doesn't belong with the overall system or software Requirements" (Leffingwell and Widrig, 2000)

3c.3 Cognitivism and the Requirements problem

The aim of this section is to outline the strong influence that the cognitive debate has upon Requirements. The cognitive turn is characterised by its empiricism of scientific rigour, having a wide influence upon the action that people take. Distributed cognitivism assumes that there is a dynamic interrelated cognitive labour framework, distributed amongst individuals in their roles, and is divided between individuals and their artifacts according to different levels of regulations. The cognitive science embraces this normative view of action in the form of the planning model (Suchman, 1988) and with it being distributed within computer systems (Clegg, 1994), the main concern being with the cognitive mechanisms and the individualistic models of

information processing. "The identification of intentions with plans, and plans with programs, leads to an identification of representation and action that supports the notion of "designing" intelligent actors "(Suchman, 1988). "Once representations are taken to control human actions, the possibility of devising formalisms that could specify the actions of "artificial agents" becomes plausible" (Suchman, 1988).

Analogously to behaviourism and its progression to functionalism, cognitivism represents the latest theoretical reincarnation that seeks to address some of the failings of its predecessors. The "cognitive turn" (Tenkasi and Boland, 1993) is Science's new frontier in the investigation into the inner workings of the human mind, led by psychology, the science of the mind. On the surface, there are multitudes of different perspectives presented by the collection of what could be included as cognitive theories as or approaches influenced by them. Its potency is diverse and has spread into, among other places of; decision making (Janis, 1989), decision making in the Requirements process (Nguyen and Swatman, 2001). understanding the language of decision making for computer systems design (Winograd and Flores, 1987) decision Support systems (Iivari and Hirschheim, 1996) Human-Computer Interaction (Winograd, 1996) Information systems and social integration (socio-cognitive) (Hemingway, 1998; Hemingway, 1999) the management of End-User Computing (Brancheau and Brown, 1993) organizational cognition (Weick, 1979) cognitive science for Requirements description (Potts, 2001) autopoietic systems (Maturana, 1999) situated action (Suchman, 1987) cognitive anthropology (Hutchins, 1995; Orlikowski, 2002), and cognitive perspective of differing frames of reference (Orlikowski and Gash, 1994).

Consequently the Cognitive Science term covers a wide and diverse set of meanings which has led to some difficulties (Mintzberg, Ahlstrand et al., 1998). However, it is more often approximately distilled into a debate among proponents of two distinct approaches to the study of human cognition (Norman, 1993). One approach, the founding tradition of cognitive science, is that of symbolic processing, the cognitive model with the "computer model of the mind", represented by the AI approach which is labelled 'hard cognitivism'. At the other end of the scale, the more recent approach emphasizes the role of the environment, the context, the social and cultural setting and the cognitive attitudes have been used to study the larger social, political, and cultural factors that so often cause failure (Goguen and Linde, 1993), and what determines a person's cognitive style (Land, 1992). The situations in which the actors find themselves, often called situated action or situation cognition (Norman, 1993) is

labelled here as soft-cognitivism.

But, at its roots, cognitivism returns to the Descartes issue of mind, body and of other minds and the Cognito problem, 'I think therefore I am', which provided the indubitable certainty that lies at the basis of all our thinking, as previously discussed, providing the rationale for detachment, reflection and the objectification of the real world. But unlike Functionalism and Behaviourism, where understanding of science and philosophy contented itself with describing reality by reducing it to exterior functional relationships, the cognitive theorists' approach adopted into ISD thinking is particularly attractive because it draws together and presents many parallels between thought, perception and computers (Tenkasi and Boland, 1993).

For Gestalt psychologists the way we represent the external world inside our heads is by constructing and acting out the following of, 'schema'. These internalised mental images, scripts, frames or routines are learned constructs and are used to structure and interpret future events. The cognitive theories lay great emphasis upon the way we perceive information, organise it and store it, hence the interest of AI thinking to construct correlations and consistencies in the form of functionally fitting behaviour (Peschl, 2001).

The core assumption is that thought, or the act of thinking itself, can ultimately be reduced to a computation process. This, the "computer model of the mind" draws on the notion of an underlying invisible structure as the fundamental basis for all human and social activity (Giddens, 1979; Dreyfus and Dreyfus, 1990). The 'underlying structure' infers that there are relationships between objects in the world which are well ordered patterns that act as the 'real stimuli to the physiognomy of expression, linking cognitive processes and the development/dynamics of scientific theories (Peschl, 2001) as the justifiable tangential purpose for an actor's rational actions.

The 'computation process', in short, provides the conceptual framework of 'representational spaces' and their interaction between each other and with the environment, thus providing the rationale for the enabling conceptual schemes to establish the basis of Requirements understanding.

Requirements engineering has often been widely recognised as a cognitive process, involving conscious mental efforts to come to a decision (Nguyen, Armarego et al., 2002). The starting point is one where the cognitive science approach intersects with

the computer-human interaction (HCI) (Clegg, 1994), facilitating a framework for the formal representation schemes and Requirements modelling descriptions of the Requirements process tools, and environments to support Requirements engineering methods (Pohl, 1993). The cognitive approach marks a clear difference from the two previous underpinnings, behaviourism and functionalism, in that it facilitates the expansion of the Requirements theory out into the context domain of Requirements interest, based upon the attributions of human form or character. This is exactly what Potts (2001) meant when he says of Requirements: “The anthropomorphic metaphor that procedural abstractions or required features are homunculi or mind-like machines to be understood in terms of commonplace human actions and communicative patterns (Potts, 2001).

There has been considerable support throughout IS-IT for the structured articulation of psychological explanations based upon the cognitive computational model, and mediated by a theory of representation. It lies at the very heart of computer science, and is found in many concepts of information theory. The rational justification is that complex human behaviour, can be, and has been described, and simulated effectively, in physical symbol systems (Vera and Simon, 1993). This notion of symbols includes symbols that we humans use everyday in our lives (Newell, 1980). This is a return to the concept that there exists a social world, of objective structures and that these can be instrumentally manipulated through symbols to capture and maintain the notion of social structure. Cognitivism and behaviourism are really two sides of the same coin, sharing a system of metaphors and simply disagreeing on certain important propositions within that common horizon (Acre, 1993). The form of hard cognitivism is subsumed under a form of ‘behavioural symbolic interaction’ identified as such by Burrell and Morgan (1979) as belonging to the functionalist paradigm. However, soft cognitivism is not an alternative perspective, it is in many respects belonging to the same stable. In their paper Vera and Simon (1993) propose that the goals set forth by the proponents of “situated action” can be attained only within the framework of symbolic systems (Vera and Simon, 1993). Their attack on ‘situated’ presented the hypothesis that asserted that intelligent behaviour ‘is the product of systems that can handle patterns of arbitrary variety and complexity’, they then claimed that Situated action ‘is not a new approach to cognition, much less a new school of cognitive psychology’.

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Appendix 4

Transcription symbols

GAPS – OVERLAPS			
Overlap marked	[C2: quite a [while Mo: [yea	Left brackets indicate the point at which a current speakers talk is overlapped by another's talk
NO Gap	=	W: that I'm aware of = C: = Yes. Would you confirm that?	Equal signs, one at the end of a line and one at the beginning, indicate no gap between the two lines
Overlap Not marked	//	P: If people// I: // You do not	Overlap
PAUSE – BREAKS			
	(0.4)	Yes (0.2) yeah	Numbers in parentheses indicate elapsed time in silence in tenths of a second
	(.)	To get (.) treatment	A dot in parentheses indicates a tiny gap, probably no more than one-tenth of a second
TONE – INTONATION			
Stress	_	What's <u>up</u> ?	Underscoring indicates some form of stress, via pitch and/or amplitude
E-long	::	O:kay?	Colons indicate prolongation of the immediately prior sound. The length of the row of colons indicates the length of the prolongation
LOUD	WORD	I've got ENOUGH TO WORRY ABOUT	Capitals except at the beginnings of lines, indicate especially loud sounds relative to the surrounding talk
Breath out	.hhhh	I fell that (0.2) .hhh	A row of h's prefixed by a dot indicates an in breath; without a dot, an out breath. The length of the row of h's indicates the length of the in breath or out breath

Falling tone	.	That's that.	Indicates a stopping fall in tone
Flat tone	,	one, two,	Indicates a continuing intonation
Faster	><	>so that's it<	Shows talk that is noticeably faster than surrounding talk
Rising tone	.,?	What do you think?	Indicates a speakers rising intonation
Higher pitch	{[hi]}		higher pitch over segment
Lower pitch	{[lo]}		lower pitch over segment
NOTES – REMARKS – BRACKETS			
	(xx)	future risks (xx) and life	Empty parentheses indicate the transcribers inability to hear what was said or removed censored speech
	(word)	Would you see (there) anything positive	Parenthesised words are possible hearings
	[()]	Comment [(this section has an impact)]	
	[Opening Bracket x]		
	Text edited	The text has been edited	For the analysis text that has been removed to aid flow

Adapted From various sources:

Silverman, D. (2001) Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction. London, Sage Publications.

Appendix 5a

Transcript [Bracket 6]

- 1 **[Bracket 6-a START]** [Tape 01ME Sound\Tape 01ME Bracket 6.MP3](#)
2
3
4 C and I hope that the [REDACTED] work will tell us about other systems are other about
5 local authorities use because that is part of their brief to actually look at other
6 parties in terms of members support yeah//
7
8 J yerr//
9
10 C // so in that sense we need to park that to one side (.) yeah the other thing that
11 was on the agenda for action link was this member seminar/workshop that I
12 was supposed to be organising (.) I must say I have not had the chance to it (.)
13 what I would like to do with the get to all we dates from you and just fix it up
14 before August if we can
15
16 G yee
17
18 C // and see how many members are able to come to it and the idea was was to
19 try and talk through some of these things try and get to a specification of what
20 we might want (0.2) the only danger of that is I'm not sure all that they would
21 all necessarily all know what they want at least there would be some steer as
22 to where we would be going //
23
24 V // it would be worth getting a professional facilitator to (.) ensure that does
25 (0.3) pop out because >I mean we can't get anywhere< without defining what
26 they want (0.5) can we?
27
28 C well (.) we last week we had the discussion AXXXX we thought that actually
29 with Gxxx (.) Qxxx (.) and [urr
30
31 G we [trying to get SXXX CXXX weren't we wasn't SXXX CXXXX being
32 suggested as a facilitator//
33
34 C errumm I don't known whether he was actually (.) I can't remember his name
35 umm let me just see (.) in the notes somewhere I did suggested who it should
36 be
37
38 Q you've got UXXX
39
40 C UXXX
41
42 Q UXXX GXXXX
43
44 C Uxxx Gxxx yeah (.) I think there was some reasonable confidence that with
45 three people doing it we should be able to get out most of what we wanted//
46
47 V // well-ll forgive me for saying so but it rather sounds like rather like pitying
48 three rather articulate and technically aware people against (.) a rather diverse
49 set of people urr (0.1) that might lead to some bias in what pops out in the end
50 (.)
51
52 C I am in your hands because I'm [rather
53

Appendix 5a

Transcript [Bracket 6]

- 54 G a] **facilitator is rather** **a good idea b** because (0.3) if you get somebody like Sxxx
55 Cxxxx (1.2)
56
57 C someone internal is [that what you meant /
58
59 G Sxxx is very good if you **could not afford to buy one** in (.=
60
61 V well Sxxxx could probably [do it sure yeah
62
63 C OK yer Sxxx [could do it yeah (.) okay (.)((To J))
64
65 J are [you all right with that //
66
67 C (.) shall we ask//
68
69 J **we can ask him** and asking if you would like to do it (.)
70
71 C would you like to do it (.) you're all technical experts
72
73 J ha haaa (.) we will have a word with Sxxxx and see what he is up to (0.2) but
74 yep he knows that he is involved in this in some way but are not sure to what
75 extent otherwise I would say just by someone in (.) in some ways that would
76 be better (0.1) in some ways (.) in my experience of members they've got a lot
77 more times for buying people in and using professional consultants
78 consultancy that they've all heard of that they think they getting some kind of
79 professional service from as opposed to the using officers and some times (.) it
80 does work quite well
81
82 C and err would you have people in mind?
83
84 J **you could use somebody** like ██████ (.) or something like that (.) it might cost as
85 a few grand (.) but
86
87 G we have used **facilitators** before on different projects (.) we will pull out some
88 names
89
90 C **right** (.) provided they could do it before (.) this side of summer holiday we
91 should go ahead and do that (.) yeh (.) we need to get 2 or 3 dates from you I
92 think probably the third week of July and take one and just go for it
93
94
95 **[Bracket 6-a END]**
96
97
98
99

Appendix 5b:

A worked through example of the construction of a [Bracket]

The example, [Tape 01ME - Bracket 6-a] (See, Appendix 5a below and Figure 5b1), is for the purpose of demonstrating the process of [Bracket] analysis. The structured approach sets out to achieve the analysis of intersubjective meaning of, the topic of recorded conversation.

The analysis approach examines the [Bracket] process at work, exposing the 'aboutness'. The aim of the analysis is to examine the 'emergence' of the concepts involved in the actual doing of the project by the people intersubjectively making-sense of what-they-are-doing. The task of the researcher is to study 'what-is-done' and 'how-it-is-done', and the example below demonstrates how such micro-interaction, spirals outwards, evoking a series of overlapping research topics invoked by asking 'how strange'. Invoking a reflective glance of interest in a kaleidoscope of patterns brought to bear at any one point of social interaction.

'How strange', starts in a pre-suppositional stance, provoking the research analyst into a questioning position using a reflective glance, requiring an understanding of the structuring that has taken place. This is not a process of abstracting out actions in to fit, place or consign a data item to pre-conceived categories. The first step is to 'solve' the question of; 'what-is-it-that-they-are-doing' and 'why-they-are-doing-it'. This is easily done by 'acting' the part, the researcher putting themselves into the role, constrained by the script, the transcription and the listening of the actual words spoken.

Having recognised actions as belonging to process of 'this-is-what-is-happening' then the next part is to invoke the 'what's' more question; why-are-they-doing-it. This last question links to an ever expanding spiral of theoretical constructs that are needed to explain simple interactions. Clues to finding the intersubjective meaning given to actions are often revealed by going beyond the immediate [Bracket] of interaction; reasons for invoking the conversation are in preceding conversations, or invoked by documents used in the sense-making. Alternatively, reasons for the intersubjective

exchange can be found from their own reflections, as the topic of the [Bracket] re-emerges in subsequent conversations. However, sometimes the exact meaning cannot be found; for example some 'in-joke', unique to the people themselves.

Analysis of bracket [Bracket 6-a]

Down the right hand side of the text (Figure Appendix 5b1: [T01-Bracket 6a]) are the markings of some of the steps involved when looking for and identifying the [Bracket] topic of conversation the thinking undertaken in the analysis, before and whilst, doing the method of [Bracket-ing]. The brief overview here is an example of the work of analysis, to demonstrate how to think about the emerged topics of the [Bracket].

This bracket lasts only 3 minutes and 16 seconds long, however within that short time span an lot of things emerge out of this event. Some of them are self evident and other aspects require an explanation. In order to assist in the interpretation of the intersubjective actions, the suggestion is that the researcher herself picks up the transcripts as though it were a script. The approach is best when considering the text and the sound as part of a scene. In this case, the researcher takes each of the roles and performs the lines as actors as in the middle of rehearsals. At first, the meaning is unsure, but as layers of meaning emerge as the iterative role playing takes place.

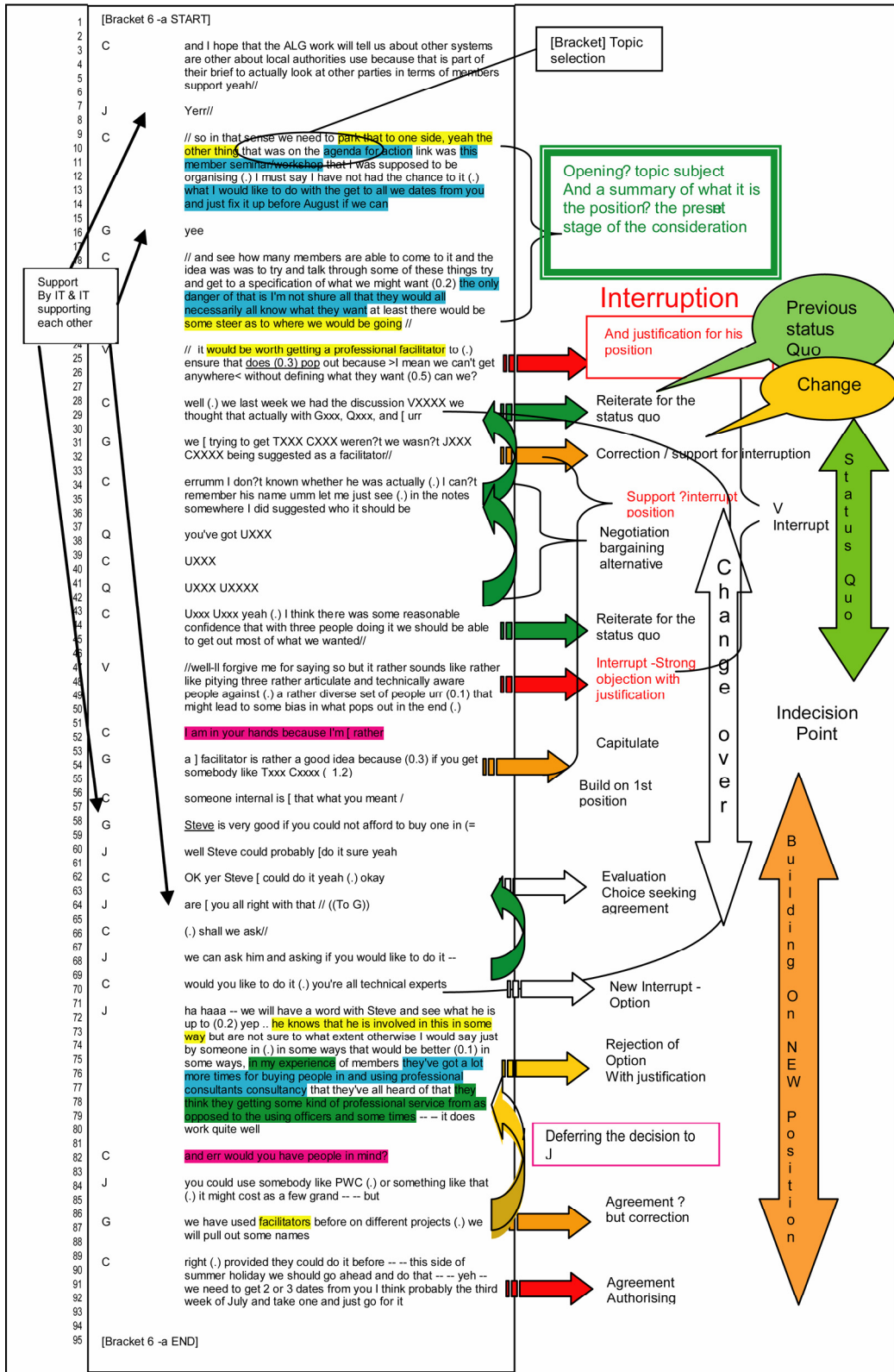


Figure Appendix 5b2: [T01-Bracket 6a]

1. Detailed analysis of opening section: Control

C ...the agenda for action link was this member seminar/workshop...

Text Box Appendix 5b1: [T01-B6a-L11]

The aim here was for C to set up some dates, in-order to “get a specification of what we might want”, referring to the aims of the project group. To set up a meeting with the users

C ...this member seminar/workshop that I was supposed to be organising (.)...

Text Box Appendix 5b 2: [T01-B6a-L11-12]

Note; this also contains the assumption that the project group will have wants.

C ...the idea was (.) was to try and talk through some of these things try and get to a specification of what we might want...

Text Box Appendix 5b 3: [T01-B6a-L19-20]

The next assumption is that the users will not know what they want, echoing a common assumption of IS-IT Requirements thinking.

C ...the only danger of that is I'm not sure all that they would all necessarily all know what they want...

Text Box Appendix 5b 4: [T01-B6a-L20-21]

Lastly C adds in the rationale for perusing such a course, of ‘guiding’ the future actions, thus invoking the need for a method to ‘do’ Requirements. However, it also has an implicit key aspect with the intention of ‘retaining’ an element of the scoping control not only of the workshop but of the project itself.

C ...at least there would be some steer as to where we would be going //

Text Box Appendix 5b 5: [T01-B6a-L21-22]

Outcome: Control of the Requirements process

From the opening exposition, the project group leader C starts with the aim to find out what the users want, mapping directly with the theory of Requirements. From this, one of many other examples, it is possible to understand how ‘talk is directed’ towards achieving an end, also how talk is available for interpretation from a conceptual position, in this case the Requirements perspective. The interest is how this becomes operationalized, the quirk of ‘How-strange’ is the way in which C works with the concept of the theory of Requirements, in that it can be noted that she also intentionally to have an explicit control of Requirements process; “Some steer to where we would be going”. The intentional call for the invoking of norms, procedures

that can be drawn upon in the organising the management of the Requirements elicitation process, consequently the 'steer' is a clear indication of scoping the remit, a exposition for a call to invoke the process of control upon the process.

This listening can become acutely augmented with simple props, such as knowing C's position in the organisation. C is the project leader, she has the authority, by position of project leader, to introduce the topic of conversation, in effect C, in theory, can control what topic is discussed and when (The prevision is that it may not be immediately obvious, but it should be noted as a possible source of interest). But usually even if C does not raise the topic, she usually closes it, for example the closure statement below;

C	right (.) provided they could do it before (.) this side of summer holiday we should go ahead and do that (.) yeh
---	---

Text Box Appendix 5b 6: [T01-B6a-L90-91]

So, simply knowing the hierarchical position C holds in the organisation, the researcher now has additional knowledge in order to delve deeper into the workings of the interactions between the people involved in the project group. Meaning, that when a topic of conversation is initiated and maintained in a topic of conversation it is usually controlled by C. However, when other members of the group hold told the topic of the conversation (hold the floor) then the dynamic power relationships of the group temporally alter, the interloper introducing the topic can do nothing but expose her/his own motivated in-order-to goal. This brings out other dynamics, for instance, who has legitimate authority to speak about the topic under discussion, who has the ear of the project leader, and how do all the roles fit together in a meeting.

Returning back to the opening fragments and the "steer" of the work of gathering in the user wants, and that of the control-over, thereby inferring that the notion of any IS-IT analyst having a 'blank canvas' is suspect. The construction of the work of the group shows that the scope of the project has been previously defined before the actual work of the analyst has even started, and even before the setting up of the project group.

C	well (.) we last week we had the discussion with Vxxx we thought that actually with Gxx (.) Qxx (.) and [urr
---	---

Text Box Appendix 5b 7: [T01-B6a-L28-29]

This conversation occurred during a small meeting one week previously that to determine the composition of the project board. There are many other instances of

'shaping the project' and some of which are extremely subtle. But the point here is that the IS textbook usually starts with an assumption that the work of the analysts assumes the 'control' of their own boundaries, from which they go on to define the problem domain of interest. That the analyst 'goes-in', using the resources of the approach, the methods, at their disposal, to investigate, the 'What'. Whereas what can be demonstratively shown here is that this project management board starts from the assumption that the users don't know what they want, which is the also the assumption of the text book requirements, but they can, 'steer' the context of the investigation of the user wants towards the, as yet undecided wants, of the project board. Having noticed an anomaly occurring, this sets up a research opportunity to mark-out a theme worth pursuing; to compare, contrast, interrelate, and see how these two themes are resolved. That is, to be able to compare the work of the stock of knowledge of IS on requirements, the typication used whenever anybody reflects upon of the domain of requirements and the work of that stock of knowledge found in context of action. Hence, the research aspect can only been seen by sitting in the flow of the work of the group, therefore can only and always is tied to the actual events, rather, and incorrectly, interpreted as the work of the group working within some sort of imposed framework.

Research Note:

From a researcher's reflection, the getting to know, realised by repeated listening and reading of the transcripts, it is possible to construct, or rather, for the researcher to be able to re-construct, de-construct and expose, the process of 'what-is-done' and 'how-it-is-done'. This demonstratively shows the immediate goal of actions involved in the [Bracket] by the people making their phenomena.

Getting it 'right' is a matter of coherence, the actualities are found in the 'making sense', the meaning-in-action, which is also being able to admit that it may not be exactly right, but an explanation made from this standpoint, that this explanation is the best probable explanation that coheres with a presented set of facts as found, and made describable, there in the mundane brute facticity grounded in the ordinary descriptions. It turns out that audio listening has certain advantages over other forms of documentation for the researcher. In that, just hearing the actual incarnate sounds enables the mind to focus, to hear, the immediate action whilst constructing mental pictures of the plot, or of the concepts involved, iteratively being able to 'play' at making the conceptual fitting of the bits of the picture together.

2. Detailed analysis of middle section: Interruption

The next section of the [Bracket] interest starts with an interruption by V (Text box 5b 8Line24). V interjection raises the issue about acquiring the services of a professional facilitator. His motivation is by way of noticing C wanting to 'get a specification'.

V	// it would be worth getting a professional facilitator... ensure that <u>does (0.3) pop</u> out because >I mean we can't get anywhere< without defining what they want (0.5) can we?
---	---

Text Box Appendix 5b 8: [T01-B6a-L24-26]

Notice that this interruption of V causes a small ripple, a diversion of events, that leads to what has been termed here as an indecision point; Which IT people recognise and rush to fill in the difficulty of a perceived gap opened-up by the interruption. Note; although IT people appear to back, down in fact they do not. The control of the remit of the facilitator remains in their control.

If the researcher assumes the 'role' of V to look at it from his position, it can be seen that V reflects the more traditional IT approach. The way of doing IT is through the employment of the Requirements analyst, further that the group needs to employ someone to facilitate this to happen. Notice the question that V invokes is a rhetorical question.

Some background history helps to emphasize V position. He is a data security and protection lead officer, of some considerable experience of IT systems. So when C says:

C	... there was some reasonable confidence that with three people doing it we should be able to get out most of what we wanted.
---	---

Text Box Appendix 5b 9: [T01-B6a-L44-45]

He responds with:-

V	well-ll forgive me for saying so but it rather sounds like rather like pitying three rather articulate and technically aware people against (.) a rather diverse set of people urr (0.1) that might lead to some bias in what pops out in the end.
---	--

Text Box Appendix 5b 10: [T01-B6a-L47-49]

Which immediately leads to putting C in an enigmatic position, why?, because C by her own admission in an earlier [Bracket 1] has the authority, as head of democratic services, a very senior position in the organisation but lacks IT knowledge, as found at the very beginning of [Bracket 1] of this tape.

C my name is C and I am (.) completely rubbish about IT (.) but I am leading this project (.) and we will see it through (.) so you will find me//

Text Box Appendix 5b 11: [T01-B6a-L23-24]

Although she is a leader of the project, she faces with the situation of having to rely upon the 'expertise' of the people co-opted onto the project board. If there was an analogy of what this is like, then it would be; it is a bit like having a shark swimming around in a pool of crocodiles.

C I am in your hands because I'm rather[

Text Box Appendix 5b 12: [T01-B6a-L51]

V's original question acted as an interruption, was satisfied after intermediate dialog by another interjection by G who speaks to attempts to stand in for C by the giving of the answer loco-parenthesis.

AS well Sxxxx could probably [do it sure yeah

Text Box Appendix 5b 13: [T01-B6a-L61]

Looking at the role G performed here adds another interesting perspective. G having being re-shuffled (sideways, passed over in promotion) to IT infrastructure and networking, an old hand in the central core of IT provision had previously had a finger in many projects across the council. Previously being responsible for applications and network services, he has a long history; experience and knowledge of the politicking abound in Springfield's IT provision. Yet, in the ongoing state of IT department re-organisation he still finds himself in a position of being able to influence as he is responsible for the backbone network provision and Web infrastructure. C's attentiveness is itself an interruption, jumping in on an –urr- pause

Cx (.) Qxxx (.) and [urr

G we [trying to get SXXX CXXX weren't.....

Text Box Appendix 5b 14: [T01-B6a-L29-31]

Returning to V interruption, asking C to get in a professional facilitator. C's first response was:-

C well, we last week we had the discussion VXXXX we thought that actually with Gxxx, Qxxx, and [urr

Text Box Appendix 5b 15: [T01-B6a-L29-30]

C points out that last week Gxx and Qxxx were going to do it but G interrupts with eager anticipation:-

G we [trying to get SXXX CXXX weren't we wasn't SXXX CXXXX being suggested as a facilitator//

Text Box Appendix 5b 16: [T01-B6a-L31-32]

The emergence here is the quick interruption by G of 'we were trying to get SC', is literally an attempt to put the words into C speech. See how C corrects this:

C errumm I don't known whether he was actually (.) I can't remember his name umm let me just see (.) in the notes somewhere I did suggested who it should be

Text Box Appendix 5b 17: [T01-B6a-L4-36]

Q now supplies the missing 'third man' name, easing an awkward moment for C, allowing her to continue in the conversation flow in order to answer V interruption.

NP you've got UXXX
C UXXX
NP UXXX XXXX
C Uxxx xxxx yeah (.) I think there was some reasonable confidence that with three people doing it we should be able to get out most of what we wanted//

Text Box Appendix 5b 18: [T01-B6a-L38-45]

Offering the 'third man' name was very attentive listening by Q, after all, he was the middle person mentioned and G was the first.

The third man U who is not present at this meeting. U has also been recently been re-shuffled into a temporary 'acting' role of IT services provision, taking over the application services provision of G's previous responsibilities. He also has had a long history of involvement with Springfield's IT department previously running the business analyst provisions. He was also a colleague of G, both of them applied for the same position however U was appointed 'acting' head. This repositioning leads to some other effects and consequences for the project later on as these two roles re-adjust.

G position is opaque but consistent; he is attempting to get SC to do this piece of work. The first time, found in Text box 16 above, at lines 31-32, the infilling for C but G was given another opportunity to express his position again, by interrupting C again.

C I am in your hands because I'm [rather
G a] facilitator is rather a good idea because (0.3) if you get somebody like Sxxx Cxxxx (1.2)
C someone internal is [that what you meant /

G Sxxx is very good if you could not afford to buy one in (.=
V well Sxxxx could probably [do it sure yeah
C OK yer Sxxx [could do it yeah (.) okay (.)((To J))

Text Box Appendix 5b 19: [T01-B6a-L52-63]

C agrees (OK) G via an interruption, C forgetting the name of the third man, and G re-assurance 'Sxxx is very good' achieves his goal of having SC do the work, and in doing so he has achieved his own aim (if not more), firstly absolves the responsibility of directly gathering in the requirements, secondly, being able to define the remit that the analyst will work, by taking out side of the project board the responsibility of overseeing that piece of work. The G's interjection has also changed the previously planned position found at the pre-project board meeting.

C Uxxx xxx yeah (.) I think there was some reasonable confidence that with three people doing it we should be able to get out most of what we wanted//

Text Box Appendix 5b 20: [T01-B6a-L44-45]

But, for C it is not quite over, nor the topic closed, the OK of line 63 was not full closure; C said it as a question with pause, in effect inviting J to comment, which he did after an another short exchange.

C OK yer Jxxx [could do it yeah (.) okay (.)((To J))

Text Box Appendix 5b 21: [T01-B6a-L63]

J replies, giving the game away that Sxx has already been contacted.

SD ha haaa (.) we will have a word with Sxxxx and see what he is up to (0.2) but yep he knows that he is involved in this in some way but are not sure to what extent ...

Text Box Appendix 5b 22: [T01-B6a-L73-76]

J rounds off that he thinks that, an interesting remark reflecting his viewpoint, but it never resurfaces again so the analysis can put it to one side.

J ...in some ways (.) in my experience of members they've got a lot more times for buying people in and using professional consultants consultancy that they've all heard of that they think they getting some kind of professional service ..

Text Box Appendix 5b 23: [T01-B6a-L76-79]

Finally, C rounds up the topic and closes the [Bracket].

C right (.) provided they could do it before (.) this side of summer holiday we should go ahead and do that (.) yeh (.) we need to get 2 or 3 dates from you I think probably the third week of July and take one and just go for it

Text Box Appendix 5b 24: [T01-B6a-L90-92]

Outcome of this [Bracket]

In the course of the conversation C who is in charge has the authority to initiate, introduce and control the topic of conversations, also C often closes the topic usually with a summing up, and a often produces the list of the actions to be taken. C may have the authority, but lacks the knowledge about IT projects, and has to rely upon the people from the IT department. This becomes a re-occurring problem, and consequently is one of the sub-topics of investigation. By the end of the project, she becomes battle scarred as the IT department attempts to mould the project, indications of the battle has been shown in this [Bracket]. The interactions of this [Bracket] lasted only 3 minutes and 16 seconds long in a meeting that is 1 hour 12 minutes and 51 seconds long. The [Bracket] has identified topics that included; the notion of getting the specification, consisting of what the project board wants, and that the users want (and of course, the assumption that the users do not know what they want). The Project group are seeking to scope the workshop to steer the work of the requirements gathering. C has authority but lacks technical detail knowledge. The control of the requirements specifications had its origins in suggestion by the IT department in the hands of G, Q and U, this was preordained even before the project board started, that the IT department are already marking forward the approach. J is making his mark. G subtly guides C into making a change into getting in a facilitator. U although on the attendee list does not attend and that V assumes the role of an uncle. Lastly, the course and nature of the conversation at this stage of the project is formal, as people are getting to know one another. V has assumed the role as advisor to the group, which he continues to do, often chipping in with questions designed to aid the project from the perspective of concerned uncle.

V	...but it rather sounds like rather like pitying three rather articulate and technically aware people against (.) a rather diverse set of people urr (0.1) that might lead to some bias in what pops out in the end (.)
---	---

Text Box Appendix 5b 25: [T01-B6a-L47-50]

The above expression summaries the whole of the project belongs to V.

Appendix 6a1

Tape 04 De brief meeting

Title	Tape_04ME_05-09-01_De brief meeting
Record Number	ME4
Date of Recording:	05-09-01
File Title	Key Analysis_Tape_04ME_05-09-01_De brief meeting_V4
File Version	V4
File location	
Participants	H C K V Q J G (late bracket end of 6)
Location of recording:	Town Hall meeting Room
Transcribed ref no	
Recording Time – length	44:43 Min
Amendment – dates	
Words	
Today's Date	
Comments on alterations	
Content and summary of recording - About	

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42

[Bracket 1 START] Tape 04ME Sound\Tape 04ME Bracket 1.MP3

C shall we umm (.) shall we talk about mainly the kind of debriefing from yesterday (.) and the work that we need to do going on from where// ...

Comment [H H1]: Agenda Topic opening

J // I really see two things that need to be done (.) one of which is put something together for the leader in terms of a paper that is going to set out what approach it's going to be and two to put in place a project management around making sure that we're going to deliver on what we agreed at the meeting yesterday (.) which I imagine Qxxx will be picking up and doing (.)

Comment [H H2]: 'J' - INTERUPTION Picking up on what we need to do

Comment [H H3]: 'J' - puts forward IS-IT action ITS setting the approach

Comment [H H4]: Paper proposal of the plan of action Seeking -- Authorisation???

H morning (.) printing problems (.) which is probably not working

Comment [H H5]: 2 - Project plan

C you had done (.) I thought you had done

Comment [H H6]: The IT/IS lead agreement --- presenting the 'J' plan of action

H yes (.) I had a problem with my computer (.) it decided to freeze up. I've also got a couple of minutes from the previous meeting

Comment [H H7]: 'J' assigns responsibility to 'Q'

C can I have a copy please?

Comment [H H8]: Interruption

H yes (.) page one (.) page two

C anybody else need it?

H there's a couple

C brilliant (.) Thank you very much (.) right okay umm yes =

J = I think within that project plan you need to probably pick up all of the issues that we've picked up in the minutes previously and also the stuff that came out of the umm other session last night (.) yes if we take it through the agenda (.) that's probably easiest

Comment [H H9]: Re interruption on C

Comment [H H10]: 'J' Continues without change

C lovely (.) okay (.) everybody knows everybody else (.) yes?

Comment [H H11]: 'J' instruction?? You need to pick up -- suggestion

J yes

Comment [H H12]: How it should proceed

[Bracket 1 END]

Comment [13]: C returns to her own agenda - 'J' shot bolt to early?

1 **[Bracket 2 START]** Tape_04ME_Sound\Tape_04ME_Bracket_2.MP3
2
3
4 C brilliant (.) I think probably we'll pick up everything that needs to be picked
5 up on the minutes in the agenda (.) so I'm going to take the minutes as
6 read unless anybody's got an issue

7
8 V yes (.) a couple of observations

9
10 C = ahrr //

11
12 V // one thing I noted when I first read the minutes (.) which was some time
13 ago (.) was I think we took the decision last time (.) I think a conclusion (.)
14 that 24 hour support was too expensive and I think that's probably worth
15 ...

16
17 K not an option

18
19 C right (.) well we'll note that but we picked it up in the member (.) workshop
20 that we//

21
22 J //we did (.) you're right//

23
24 C //the member workshop yesterday (.) yes//

25
26 V the other thing is to make a general point about the minutes (.) the actions
27 are not clear (.) could the actions be made more clear (.) I mean I know
28 there are a couple of (.) the word action appears in bold on a couple of
29 occasions but there are several other actions actually imbedded in the
30 minutes (.) It would be good to see the word action and who is
31 responsible for =

32
33 C =okay=

34
35 H =It is not always clear from the conversation about ...

36
37 V yes (.) I mean a typical example is if there's something buried in there that
38 I was to follow up and something of Gxxxx's to follow up VPN

39
40 C //okay

41
42 C right okay well VPN is a non-goer now

43
44 J we still have some technical work to do but it's not likely we're going to go
45 down that road

46
47 C right

48
49 H not going down it?

50
51 J probably not going down the VPN route and I think this was the
52 discussion we had at the conference yesterday in terms of the
53 mechanisms by which (.) just to explain to people who weren't there

54
55 V can you just say what took place yesterday?

Comment [H H14]: C RETURNING to [Bracket1] opening sequence

Comment [H H15]: Create opening

Comment [H H16]: Pick up on opening – steps into

Comment [H H17]: Pick up on C minutes as read V stepping into the opening of the conversation – taking the floor -

Comment [H H18]: 'V' issue with the minutes not reflecting decisions
1) 24 support

Comment [H H19]: Outcome of workshop – or told at the workshop

Comment [H H20]: 'V' comments on actions in the minutes

Comment [H H21]: 'V' sees assigning responsibility as issue – it is not clear

Comment [H H22]: 'H' – the note taker is just taking the minutes – in a traditional format as an organisational perspective – NOT an IS project management stile ((lack of project management role ?? or seen as organisational norms perspective))

Comment [H H23]: KEY TOPIC

Comment [24]: Interrupt -

Comment [H H25]: Response to 'V' 'Q' informs group of VPN change of plan ((Handling change – acceptance of the change – discussion on it – implications???)

Comment [H H26]: This is not clear that this is an outcome from the workshop

Comment [H H27]: The structure to-be as proposed by IS-IT

56
57 C workshop
58
59 J we had a workshop with members (.) as we discussed
60
61 H where are we now on the agenda?
62
63 C sorry
64
65 H are we talking about ...?
66
67 C we're just giving some background information (.) we're going to talk
68 about the feedback yes (.) you're just getting a bit of information to relate
69 to the notes (.) yes
70
71 J yes (.) which relates specifically to the VPN element that we discussed
72 yesterday at the conference (.) there were two mechanisms by which (.)
73 what did I say?
74
75 C conference
76
77 J whatever (.) that if you're a member and you're in your home (.) you have
78 Springfield over here and you have the internet over here (.) there are two
79 possible ways that you could access the internet and Springfield via a
80 connection to Springfield (.) whether that be a dial up (.) an IJN or an
81 ADSL line (.) which would basically mean Springfield is your ISP (.) your
82 internet service provider and that was the VPN model (.) so that means (.)
83 if you wanted to access Springfield applications you would be able to do
84 so through that connection and if you wanted to go off to the internet (.)
85 you would go out through Springfield's pipe to the internet (0.2) there is
86 another option (.) which we also discussed and in conjunction with Dxxx
87 (.) Nxx and myself we decided was probably more appropriate (.) but we
88 do need to work this through with technical services and work out the best
89 way of making sure this model works (.) and that is to say instead of going
90 from a council member (.) a councillor's home to Springfield (.) that their
91 connection would take them through to an ISP (.) an independent ISP (.)
92 and then they would have access to the full internet (.) but if they wanted
93 to use the Springfield site (.) or Springfield applications (.) they would
94 come via the internet in this way (.) which would mean they go to the
95 internet first and then to use Springfield bits they come directly into
96 Springfield (.) so the model would be that we would design all of the
97 systems that we provide to councillors so that they are available directly
98 through the internet (.) instead of giving them the direct connection to
99 Springfield itself and then letting them out from Springfield to connect to
100 other parts of the internet
101
102 V and you have a list of things that you want to give them access to?
103
104 J we do yes (.) and I think we can come on to (.) I mean if we come on to
105 that in terms of our document that we produced for the session workshop
106 yesterday (.) then we can explain through that process as well
107
108 V and everyone was confident were they that they knew what a VPN was
109 and how it worked (.) when discussing it?
110

Comment [H H28]: Minute taker – taking notice of issue

Comment [H H29]: Modelling – explaining the NEW approach – The Change was IT let before the workshop meeting and presented in a small pre meeting

Comment [H H30]: Option one Springfield becomes the service provider

Comment [H H31]: 'WE' decide ITS

Comment [H H32]: A list of access to applications

Comment [H H33]: Decided

Comment [H H34]: THEY were informed about the option

111 J I think people understood the model of (.) the VPN is the direct link
112
113 V but nevertheless it would go through the internet wouldn't it (.) VPN still
114 goes actually through the internet?
115
116 J VPN's come this way round (.) It's a point to point link (.) so the VPN
117 brings the ADSL line directly into the council and connects to this VPN bit
118 of kit here (.) that then uses the pipe to go out to the internet
119
120 V I see
121
122 J and it's basically two different models but it means if you're using band
123 width intensive applications here and you're getting them to run
124 applications sort of at high intensity applications here then yes you may
125 want to go that way round but it does limit (.) because you have to have
126 that fixed point(.) so what we were saying is if we wanted to allow
127 somebody access from say an internet café (.) the only mechanism in is
128 going to be via this way (.) so it's a better way to develop your
129 applications so that they're all accessible via the internet
130
131 V It is not how I understand a VPN is working but I'll leave that aside (.)
132 umm how will (.) you're perhaps going on to say this but how will you give
133 members access through the internet to things which the public can't
134 access?
135
136 J that will be through some software that we'll put in place to limit that
137 access (.) I mean Dxxxx has given us a spec for some actual bits of
138 software we'd need to put in place
139
140 V and that's off the shelf software is it?
141
142 J we need to talk it through with Dxxxx but I think it is pretty much off the
143 shelf (.) it's giving that kind of protection
144
145 Q I mean what we're thinking is (.) you know (.) banks and other
146 organisations can provide (.) you know (.) private parts of their sites (.)
147 people to access over the internet (.) then whatever method works for
148 them (.) we can use
149
150 J we would use that same technology
151
152 Q and it should be secure enough for us (.) I mean the details haven't been
153 worked out but we've got some estimates (.) costs (.) and that seems to
154 be the way to go (.) It also seems to be the only way that we actually meet
155 this criteria of being able to access these services from anywhere //
156
157 C //yeer
158
159 Q (.) there isn't anything else that will do that
160
161 J and certainly technical services and Dxxxx seemed confident that that is
162 an appropriate model
163

Comment [H H35]: 'J' explanation to VPN

Comment [H H36]: Two different models

Comment [H H37]: The problem of access via an internet café

Comment [H H38]: Justification for the VPN

Comment [H H39]: Difference in opinion

Comment [H H40]: How will it happen?

Comment [H H41]: Spec by IT Dept

Comment [H H42]: COT's

Comment [H H43]: 'Q' Backing up 'J'

Comment [H H44]: Support

Comment [H H45]: Support – legitimising – tech say it is OK

164 V so something like the staff directory which is currently available to
165 everybody over the intranet (.) but nobody over the internet (.) can be
166 made available over the internet
167
168 J yes
169
170 V but access limited to the intranet
171
172 J absolutely
173
174 V and you're confident that that will be done?
175
176 J yes
177
178 V without sort of bespoke programming
179
180 J yes
181
182 Q the other thing which wasn't mentioned last night (.) sorry if I'm ... is that
183 this model is also a model that can be applied to staff in general (.) when
184 we look at the wider issues of remote working (.) things like that (.) this will
185 be the way (.) again (.) that will allow greatest number of people to have
186 that kind of remote working rather than relying on ADSL
187
188 C I think we also need to stress that this option (.) for those that want it and
189 want to pay for it (.) is still there (.) if they're working primarily from home
190 (.) people who//
191
192 J //I would still wish to point them in that direction
193
194 C yes
195
196 J and I think that was the whole point about this because I think people who
197 already have ADSL are the heavy users of the internet (.) which is like the
198 councillor who does all his downloading and his music (.) stuff like that (.)
199 the last thing we want them to do is to come in here and then start
200 downloading all of his music through this route
201
202 C yes
203
204 J It just nicks all of our band width (.) what we want him to do is use his own
205 ADSL line from the internet and go that way (.) so it doesn't hit our
206 network
207
208 H ISP's are built for it aren't they?
209
210 J yes (.) and we need to do some work to make sure this model works and I
211 think (.) you know (.) primarily we were certainly in agreement that this is
212 the way that we want to move
213
214 V one thing of course the spec has to take into account is that in the short to
215 medium term we need to be able to encrypt the stuff that is going badly
216
217 J absolutely (.) certainly Uxxxx has included that in the costings' he's given
218 us

Comment [H H46]: Note that the IS has picked up on possible future issue to the department – reason for rejecting VPN?

Comment [H H47]: C different – has option as still there

Comment [H H48]: 'J' rebuttal

Comment [H H49]: Justification

Comment [H H50]: Illegal use of resources??? Another justification

Comment [H H51]: Not finalised -

Comment [H H52]: 'J' – pointing the way forward --- This way (SIT – way??)

Comment [H H53]: Data security Key to next bracket

219
220 C that's fine
221
222 **[Bracket 2 END]**

1 **[Bracket 3 START]** [Tape_04ME_Sound\Tape_04ME_Bracket_3.MP3](#)
2
3 C can somebody explain to me what encrypting means?
4
5 J it really (.) well it really means that the point of something leaving here (.)
6 that it encrypts the software (.) it encrypts the data (.) so it makes it
7 unreadable by anybody else and then when it turns up at the other end (.)
8 it de-encrypts itself
9
10 H translation
11
12 C yes (.) yes
13
14 Q putting into a kind of code
15
16 C scrambler
17
18 Q yes
19
20 C unscrambling (.) okay
21
22 V the advantage that that has (.) in some ways of implementation (.) is not
23 only does it make it unreadable while it's travelling but it's also a means of
24 authenticating that it has come from a particular person because of the
25 way it's been coded
26
27 C OK right
28
29 **[Bracket 3 END]**

Comment [H H54]: Example of C lack of knowledge about IS-IT
Statement about the lack of knowledge in the organisation about issues – terminology—the technical viewpoint

Appendix 6a2

Key Analysis – Tape 04ME 05-09-01 De brief Meeting

Key Analysis – Tape 04ME 05-09-01 De brief Meeting	1
[Bracket 1]	2
[Bracket 2]	5
[Bracket 3]	11
[Bracket 4]	12
[Bracket 5a]	18
[Bracket 5b]	26
[Bracket 6]	29
[Bracket 7]	33
[Bracket 8]	34
[Bracket 9]	34
[Bracket 10]	34
[Bracket 11]	36
[Bracket 12]	38
[Bracket 13]	40

[Bracket 1]

Synopsis & Overview:

'J' proactive in suggesting that the group needs to put together

- a) A paper for the leader
- b) A project plan

Keywords and Concepts:

Meeting agenda "project plan"

Opening [Bracket 1]

C opens the meeting

Closing [Bracket 1]

C closes meeting

1. Key Triggering Events: [Bracket 1]

as per the schedule

Remarks:

2. Key Actions and Events [Bracket 1]

C the work that we need to do going on....

Text Box 1: Lines 5-6

C opens up the conversation on the previous meeting with the councillors workshop

'J' jumps in

J // I really see two things that need to be done.

Text Box 2: Lines 8-9

J // I really see two things that need to be done (.) one of which is put something together for the leader in terms of a paper that is going to set out what approach it's going to be...

Text Box 3: Lines 8-10

J ...two to put in place a project management around making sure that we're going to deliver on what we agreed at the meeting yesterday (.) which I imagine

Qxxx will be picking up and doing (.)

Text Box 4: Lines 10-12

J ...making sure that we're going to deliver on what we agreed at the meeting yesterday...

Text Box 5: Line 10

The IT/IS lead agreement --- presenting the 'J' plan of action

J = I think within that project plan you need to probably pick up all of the issues that we've picked up in the minutes previously and also the stuff that came out of the umm other session last night (.) yes if we take it through the agenda (.) that's probably easiest

Text Box 6: Lines 31-34

Re interruption on C

'J' Continues without change

'J' instruction?? You need to pick up -- suggestion

How it should proceed

Remarks:

3. Method [Bracket 1]

Jmeeting yesterday (.) which I imagine Qxxx will be picking up and doing (.)
H Morning (.) Printing problems (.) which is probably not working
C You had done (.) I thought you had done
H Yes (.) I had a problem with my computer (.) it decided to freeze up. I've also got a couple of minutes from the previous meeting
C Can I have a copy please?
H Yes (.) page one (.) page two
C Anybody else need it?
H There's a couple
C Brilliant (.) Thank you very much (.) Right okay umm yes =
J = I think within that project plan you need to probably pick up all of the issues

Text Box 7: Lines 12-31

The interruption of 'J' – on line 12 'J' is interrupted – distraction – the important approach HE has nictitated – the beginning of the meeting – TO get in???? --

Remarks:

What effect did this interruption have?

4. Key Structures - Key Resources [Bracket 1]

'J' is setting out the approach – despite interruption – role position

C agenda

Remarks:

5. Key Consequence [Bracket 1]

'J' interruption and agenda - setting

Remarks:

6. Key Sequences [Bracket 1]

Title of Key Sequence: - agenda - "project plan"

C - shall we umm (.) shall we talk about mainly the kind of debriefing from yesterday (.) and the work that we need to do going on from where// ...

Text Box 8: Lines 5-6

J - I really see two things that need to be done put something together for the leader in terms of a paper that is going to set out what approach it's going to be put in place a project management around making sure that we're going to deliver on what we agreed at the meeting yesterday I imagine Qxxxx will be picking up and doing

Text Box 9: Lines -12

Remarks:

[Bracket 2]

Synopsis & Overview:

The VPN element was discussed yesterday at the conference - there were two mechanisms by which you could access the internet -- via a connection to Springfield - a dial up - an ISDN or an ADSL line - which would basically mean Springfield is your ISP - your internet service provider and that was the VPN model - you would go out through Springfield's pipe to the internet. The other option (discussed Uxxx, Qxxx and myself) - decided was probably more appropriate- using an independent ISP - access would be via the internet - this would use off the shelf software --- but -- need to work this through with technical services and work out the best way of making sure this model works

Keywords and Concepts:

Internet, VPN, applications, ADSL, 2 models of access

Opening [Bracket 2]

C I'm going to take the minutes as read unless anybody's got an issue

Text Box 10: Lines 5-6

Closing [Bracket 2]

C that's fine

Text Box 11: lines 213

Close to next topic

1. Key Triggering Events: [Bracket 2]

The member workshop -

Remarks:

2. Key Actions and Events [Bracket 2]

V Yes (.) a couple of observations

Text Box 12: line 8

On the minutes

V we took the decision last time (.) I think a conclusion (.) that 24 hour support was too expensive....

Text Box 13: Lines 14-14

V a general point about the minutes (.) the actions are not clear (.) could the actions be made more clear...

Text Box 14: Lines 25-26

V ...could the actions be made more clear ... there are several other actions actually imbedded in the minutes (.) It would be good to see the word action and who is responsible for =

C =Okay=

H =It is not always clear from the conversation about

Text Box 15: Lines 26-33

C right okay well VPN is a non-goer now

Text Box 16: line 40

Announcing the rejection of the VPN route

J probably not going down the VPN route and I think this was the discussion we had at the conference yesterday in terms of the mechanisms by which...

Text Box 17: Lines 49-50

Jthere are two possible ways that you could access the internet and Springfield via a connection to Springfield (.) whether that be a dial up (.) an ISDN or an ADSL line (.) which would basically mean Springfield is your ISP (.) your internet service provider and that was the VPN model....

Text Box 18: Lines 76-79

Intro to the two models of approach

J ...there is another option (.) which we also discussed and in conjunction with Uxxx (.) Qxx and myself we decided was probably more appropriate (.) but we do need to work this through with technical services and work out the best way of making sure this model works...

Text Box 19: Lines 83-87

J ...so the model would be that we would design all of the systems that we provide to councillors so that they are available directly through the internet (.) instead of giving them the direct connection to Springfield itself and then letting them out from Springfield to connect to other parts of the internet

Text Box 20: Lines 93-97

V and you have a list of things that you want to give them access to?

Text Box 21: Lines 99

Raised and put forward to be an item to be discussed later

J and it's basically two different models....

Text Box 22: Lines 119

Differencing the two models - approaches

Jthe only mechanism in is going to be via this way (.) so it's a better way to develop your applications so that they're all accessible via the internet....

Text Box 23: Lines 124-126

V It is not how I understand a VPN is working but I'll leave that aside (.) umm...

Text Box 24: Lines 128

Technical – challenge not met – V problem not discussed

J that will be through some software that we'll put in place to limit that access (.)
I mean Uxxxx has given us a spec for some actual bits of software we'd need to put in place

Text Box 25: lines 132-134

LIT has got given a specification for the COT's software to enable the access

J we need to talk it through with Uxxxx but I think it is pretty much off the shelf (.) it's giving that kind of protection

Text Box 26: Lines 138-139

COT's

Q and it should be secure enough for us (.) I mean the details haven't been worked out but we've got some estimates (.) costs (.) and that seems to be the way to go (.) It also seems to be the only way that we actually meet this criteria of being able to access these services from anywhere //

Text Box 27: Lines 147-150

Details yet to be worked out – justification for meeting the criteria

Q (.) there isn't anything else that will do that

J and certainly technical services and Uxxxx seemed confident that that is an appropriate model

Text Box 28: Lines 154-157

Q the other thing which wasn't mentioned last night (.) sorry if I'm ... is that this model is also a model that can be applied to staff in general (.) when we look at the wider issues of remote working (.) things like that (.) this will be the way (.) again (.) that will allow greatest number of people to have that kind of remote working rather than relying on ADSL

Text Box 29: Lines 177-181

J yes (.) and we need to do some work to make sure this model works and I think (.) you know (.) primarily we were certainly in agreement that this is the way that we want to move

Text Box 30: Lines 204-206

Remarks:

VPN – rejected – does not meet the criteria Line 149 – the justification – the ADSL route takes band width away – people miss-use – the ADSL line (down loading songs)

3. Method [Bracket 2]

Announcing not going with the VPN option line 37 – ‘J’ 46

JUxxxx, Qxxx and myself we decided was probably more appropriate.....

Text Box 31: Lines 84-85

JSo the model would be that we would design all of the systems that we provide to councillors so that they are available directly through the internet (.) instead of giving them the direct connection to Springfield itself and then letting them out from Springfield to connect to other parts of the internet

Text Box 32: Lines 93-97

V reservations -

It is not how I understand a VPN is working but I'll leave that aside (.)

Text Box 33: Lines 128

List of applications – access to

V And you have a list of things that you want to give them access to?

Text Box 34: Lines 99

J if we come on to that in terms of our document that we produced for the session workshop yesterday (.) then we can explain through that process as well

Text Box 35: lines 102-103

Remarks:

What happened to the discussions upon the VPV OPTION?

4. Key Structures - Key Resources [Bracket 2]

The ISSUE with the minutes

V Highlights an Issue with the actions of the minutes – they are not clear who is doing what -- defective

Vabout the minutes, the actions are not clear. Could the actions be made more clear... ..

Text Box 36: Lines 25-26

The use of minutes – standard council procedure – norms – for meetings – minutes are taken – notes – of decisions and actions – and then edited by the chair and then circulated – these become the informing mechanism – NOTE the real is the informal route the conversations – in coffee rooms - the chats on the telephones

2) H – takes umbrage to the effectiveness of the note taking –

Is this a real lack of method – the result is fluid – simple to operate – little paper work produces clear concise – note the difference of emphasis with the PRINCE approach later on

The 2 models of access to the programs

JSo the model would be that we would design all of the systems that we provide to councillors so that they are available directly through the internet (.) instead of giving them the direct connection to Springfield itself and then letting them out from Springfield to connect to other parts of the internet... ..

Text Box 37: Lines 93-97

'J' Q and in conjunction with U – seek to NOT to use the VPN route – WHY – it would mean that LIT would have to support this approach

J it's basically two different models but it means.... ..

Text Box 38: Lines 119

J and certainly technical services and Uxxxx seemed confident that that is an appropriate model

Text Box 39: Lines 156-157

The LIT believe that this is the model (see note) supply justification for the decision --

Q the other thing which wasn't mentioned last night (.) sorry if I'm ... is that this model is also a model that can be applied to staff in general (.) When we look at the wider issues of remote working (.) things like that (.) this will be the way

Text Box 40: lines 177-180

Note that the IS has picked up on possible future issue –fitting with the ethos of the mission statement - to the IT department that they will have to address – BUT give here as a reason for rejecting VPN? (No - but useful) -

J yes (.) and we need to do some work to make sure this model works and I think

(.) you know (.) primarily we were certainly in agreement that this is the way that we want to move

Text Box 41 Lines 199-200

Some work needs to be done – this has been put forward – by LIT -

The rejection of the VPN route

Janother option (.) which we also discussed and in conjunction with Uxx (.) Qxxx and myself we decided was probably more appropriate (.) but we do need to work this through with technical services and work out the best way of making sure this model works.....

Text Box 42: Lines 83-87

This model has been proposed – there are other explanations – the web mail system could be accessed via the web - - upgrade – without the need to go through the VPN route – secondly --- if LIT became the service suppliers – then they would – by default have to support that service – (this is not the case) – LIT do not want to have to support it --

Remarks:

The rejection of the VPN route – the reasons given here were convenience – appear justified - motivations – internal to IT department – different reflection found internal – comment collected was that the infrastructure was not set up to do the approach as suggested -

5. Key Consequence [Bracket 2]

Justification and rejection of the VPN route – alternative MODEL suggested - COTS software to supply the access – “not fully worked out but it is the route to take”

Remarks:

6. Key Sequences [Bracket 2]

Title of Key Sequence:

Change to the model of the intended approach to the access into the network via the WWW

Remarks:

[Bracket 3]

Synopsis & Overview:

C asks about encryption – C lack of IT knowledge???

Keywords and Concepts:

Encrypting

3. Method [Bracket 3]

C	Can somebody explain to me what encrypting means?
---	---

Text Box 43: Lines 3

Example of C lack of knowledge about IS-IT

Statement about the lack of knowledge in the organisation about issues – terminology—the technical viewpoint

[Key phenomenon]		A	B	C (a)	C (b)	D
[Bracket T04]						
Steering Group Environment / Organisation Context Technical	Requirements Belief a1) we can solve the problem with a product a2) we can get the requirements right a3) we can get all the stakeholders to agree	Provocative Antecedent Conditions (B-1)(B-2)(B-3)	Symptoms of Commensurate / Requirement-ing	Symptoms of Commensurate / Incorrect Requirement-ing	Symptoms of Incommensurate Requirement-ing	
T04-B1						
T04-B1-L5-6 [C: ...the work that we need to do going on...]	a2	Need - Process led	Recognising the Need – and of need for use of a process	Ad hoc process adopted not used recognised method	-	
T04-B1-L8-9 [J:.... // I really see two things that need to be done...]	a1a2a3	setting up the approach to the project - setting up project management needed	Seeking method - wanting to adopt method Project approach will define - get an agreement - method approach is needed approach	The lead was taken up by 'J' NOT by C 'J' announces model without letting the others exactly know what the details of the model are 'J' holds the cards (knows more)	Interrupt – a jumping in by 'J' wants - is setting out the approach - political power role positioning – to gain project control – set the agenda	

T04-B1-L8-10 [J: // I really see two things that need to be done (.) one of which is put something together for the leader in terms of a paper that is going to set out what approach it's going to be...]	a2 a3	[to set out what approach it's going to be] method stakeholder agreement	-method - stakeholder agreement	Method – not named Main Stakeholders – satisfy the leader and not others	to gain project control – set the agenda
T04-B1-L10-12 [J:....two to put in place a project management around making sure that we're going to deliver on what we agreed at the meeting yesterday (.) which I imagine Nigel will be picking up and doing (.)]	a2 a3	Project management need deliver the product	agreement on deliverables	Separation out of approach - method and - project management project management method	-Assigning 'J' & Q to do self selecting -
T04-B1-L11-12 [J:... that we're going to deliver on what we agreed at the meeting yesterday ...]	a2 a3	meeting of the stakeholders needs	Provision of requirements	not clear what was agreed - a general presentation - reiterating an IT perspective	Presentation of proposed system – mainly on access – infrastructure – web based access - no / little detail on councillor system
T04-B1-L31-33 [J: = I think within that project plan you need to probably pick up all of the issues that we've picked up in the minutes previously and also the stuff that came out of the umm other session last night (.) yes if we take it through the agenda]	a2	using previous minutes – the need – method – of the agenda	Collect requirements	-	-

T04-B2							
T04-B2-L14-14 [V: we took the decision last time (.) I think a conclusion (.) that 24 hour support was too expensive....]			Minutes as action points – previous decision reflection	-			Scoping issue - the cost of support – financial constraint upon project – justification point
T04-B2-L25-26 [V: a general point about the minutes (.) the actions are not clear (.) could the actions be made more clear...]			local government - usual meeting norm procedure actions – responsibilities – records	-			The minute taker writes notes – briefly collecting the decisions made - Lack of - method
T04-B2-L26-33 [V: ... could the actions be made more clear ... there are several other actions actually imbedded in the minutes (.) It would be good to see the word action and who is responsible for = C: =Okay= Hi: =It is not always clear from the conversation about]			Using minutes for records	-			lack of rigorous method H minute taker acknowledges difficulty of clarity Project management via the 'method' of using minutes - breaking down

T04-B2-L40 [C: right okay well VPN is a non-goer now]	-	Infrastructure - access	-	-	informs the group - - a removal of option (Implementation Issue) – constraint
T04-B2-L49-50 [J: probably not going down the VPN route and I think this was the discussion we had at the conference yesterday in terms of the mechanisms by which...]	-	Infrastructure - access	-	-	Announcing not going with the VPN option 'J' - DECIDED to do something else - remove choice (Implementation Issue) project - constraint
T04-B2-L76-79 [J:there are two possible ways that you could access the internet and Springfield via a connection to Springfield (.) whether that be a dial up (.) an ISDN or an ADSL line (.) which would basically mean Springfield is your ISP (.) your internet service provider and that was the VPN model....]	-	Infrastructure - access	-	-	(Implementation Issue) option – rational
T04-B2-L83-87 [J: ...there is another option (.) which we also discussed and in conjunction with Dxxx (.) Nxx and myself we decided was probably more appropriate (.) but we do need to work this through with technical services and work out	-	This NEW model – infrastructure The VPN linked to the ADSL option – DECIDED not to be suitable --- the lack	-	-	Q & 'J' have come with a technical NEW model for access VPN is not a solution 'J' Technical NOT

<p>the best way of making sure this model works...</p>		<p>of a feasibility study of WWW access and the possibilities of access into infrastructure</p>		<p>going with the VPN NO reason why --- in last meeting this was the chosen selected solution but now another is on offer technical solution --- no discussion of technical position needs to be discussed with the technical - the setting up of the approach by the Strategy - prior to doing any sort of feasibility study - and prior to real discussions with the technical people involved - tactical political manoeuvre</p>
<p>T04-B2-L93-97 [J: ...so the model would be that we would design all of the systems that we provide to councillors so that they are available directly through the internet (.) instead of giving them the direct connection to Springfield itself and then letting them out from</p>	-	<p>Access through infrastructure – technical constraint</p>	-	<p>constraint on to the system – on how it should be done – access – requirements not known</p>

Springfield to connect to other parts of the internet]							
T04-B2-L99 [V: and you have a list of things that you want to give them access to?]	a1 a2	existing software programs - systems	list of wants	-	(see later notes)		
T04-B2-L119 [J: and it's basically two different models....]	-	Infrastructure access	-	-	(The rejection of the VPN route – the reasons given here were convenience – appear justified – motivations – internal to IT department – different reflection found internal – comment collected was that the infrastructure was not set up to do the approach as suggested) - opening up choice - not clear what the models are – - Using implementation details to guide		

						requirements
T04-B2-L124-126 [J:the only mechanism in is going to be via this way (.) so it's a better way to develop your applications so that they're all accessible via the internet....]	-	Infrastructure	-	-	-	constraint (assumption)
T04-B2-L128 [V: It is not how I understand a VPN is working but I'll leave that aside (.) umm...]	-	options – VPN – Intranet Options – de-selected	-	-	-	Constraint – option already selected – pre-empt – V – technical challenge not discussed –
T04-B2-L132-134[J: that will be through some software that we'll put in place to limit that access (.) I mean Dxxxx has given us a spec for some actual bits of software we'd need to put in place]	a1	IT – offering solution	-	-	solution by technical requirements – not a user requirements	Implementation solution – to infrastructure IT have already have a approach to supplying a solution - produced the approach (Access)
T04-B2-L138-139 [J: we need to talk it through with Dxxxx but I think it is pretty much off the shelf (.) it's giving that kind of protection] (Re internet connection)	a1	Proposal with / by - a Technical solution – COT's	-	-	COT's solution – provides the 'protection' (security issue)- Not a fully worked out yet - option details still to do but	IT driven – solution implementation approach – Security Issue of implementation Non-Functional – being made into

				IT will work it out	requirements
T04-B2-L147-150 [Q: and it should be secure enough for us (.) I mean the details haven't been worked out but we've got some estimates (.) costs (.) and that seems to be the way to go (.) It also seems to be the only way that we actually meet this criteria of being able to access these services from anywhere //]	a1 a2	IT solution – technical solution	-	No detailed specification No options cost driven supplying a technical solution	(IT driven option – as above)
T04-B2-L154-157 [Q: (.) there isn't anything else that will do that J: and certainly technical services and Dxxx seemed confident that that is an appropriate model]	a1	IT position	-	"seemed confident" no value -	closing down the options -
T04-B2-L177-181[Q: the other thing which wasn't mentioned last night (.) sorry if I'm ... is that this model is also a model that can be applied to staff in general (.) when we look at the wider issues of remote working (.) things like that (.) this will be the way (.) again (.) that will allow greatest number of people to have that kind of remote working rather than relying on ADSL]	a3 (IT - perspective)	Model for wider implementation of staff working practice forecasting future possible use	-	constraints – implementation driven not tested out suggesting a standard – without having full security implications - without testing	making a standard – making a technical standard of technical approach by default - lack of wider consultation -

<p>T04-B2-L204-206 [J: yes (.) and we need to do some work to make sure this model works and I think (.) you know (.) primarily we were certainly in agreement that this is the way that we want to move]</p>	<p>a3 (IT Perspective)</p>	<p>repeat of earlier model proposal</p>	<p>-</p>	<p>IT – driven – ‘my way’</p>	<p>a technical solution closing down the discussion for options without investigation - i.e. rejection of earlier VPN model – CONSTRAINTS and Implementation put before requirements</p>
<p>T04-B3</p>					
<p>T04-B3-L3 [C: "... C Can somebody explain to me what encrypting means?...]</p>	<p>-</p>	<p>Not understanding of what -- the concepts mean</p>	<p>-</p>	<p>-</p>	<p>Technical jargon barrier lack - common understanding</p>
<p>T04-B4</p>					
<p>T04-B4-L7-9[C: ummm (.) we had about nine or ten members there (.) so it was really good (.) umm and I think Sxxx and Nxxx you did a marvellous job actually getting a presentation together=....]</p>	<p>-</p>	<p>Q & 'J' did the presentation – originally a facilitator analyst was going to do it</p>	<p>-</p>	<p>-</p>	<p>– Presentation of what they were GOING to do not elicitation - originally they were going for a facilitator</p>

T04-B4-L13-16[C]: = Nxxx and Sxxx... work through the issues with members yer (.) they were told about the vision that the leader has and the kind of (.) we spent a bit of time on the model as well (.) to make sure that everybody understood (.) what we were talking about...]	a1 (IT perspective) a2	leader vision	Vision lead communication means to get common understanding about stakeholders showing stakeholders	shows the common understanding	Imposed model – of implementation constraints
T04-B4-L16-19[C]: ...as we went on members were beginning to articulate their needs (.) I think it would be worthwhile just noting (.) Jxxx (.) just to make sure you don't lose them along the way...]	a2	Minutes as records meeting – needs	needs	vague ambiguity collection of needs using - Minutes as records	recollection and interpretation from personnel notes
T04-B4-L19-20[C]:they said that they still wanted a hard copy of the directory once a year (.) of staff...]	a1	User Needs - gained from workshop - HARD COPY	paper – as an option	never followed through – User need of system not recognised	-
T04-B4-L42-47[C]: ... then actually members talked about having this kind of list of programs that are commonly used by err members and by staff er (.) to be made available (.) to members on their PC's (.) because some of them didn't have er (.) er the err software packages to enable them to read information (.) so that wants to be made available to [them]	a1 a2	Need to read information sent by staff - list of programs used by staff - they wanted them so that they could read them attachments	a need of users applications to work – read information	The correct requirements – the need for application – not fully articulated – the V-IS	

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Appendix 7a

The Research Framework of the Requirement-ist – Phase 2

7a.1 [A] - Antecedent

[A] originates from the work of chapter two. At the basic level, it promotes the mindset that regards software development as engineering, and as a rationalist specification process, “To develop software is to build a machine, simply by describing it” (Jackson, 1995). However, the claim made by Requirements is that the first stage of any IT development is the ‘context analysis’, where the analysts should learn about the target system and its environment, identifying “the major quantitative characteristics of the system and its environment” (Yeh, 1990). The objective is to obtain the ‘What’, by purging implementation details and concentrating upon precise specifications. Abstracting the problem, to state it in clear unambiguous terms definitions and attributes of the system before and during design (Bahill and Dean, 1999).

The assumption here is that, [A] = the Requirements ‘Belief’, that is held, or agreed as being acceptable as a belief in the way to achieve the intended goal. The metaphysical state of belief is analogously held in the individual and in the group mind set in the desires of the group to do Requirements. This is seen by the use in relation to the sentences (statements) that are made in doing the Requirements process. However, it should be noted that there are vast disparities of commitment to the belief among the different parties. Nevertheless, having invited the experts into the decision making process the baggage of professional legitimacy is brought in with their accompanying skills to interpret the law with the nomothetic interpretation of the general laws of Requirements. This becomes not only a judgement on their ability as practising Requirement-ists, but also questions the interpretations made upon the laws of Requirements.

The concrete examples of the group ‘doing Requirements’ (Requirement-ing)

presented in the workbooks are the evidence examples. These exemplars are 'key' segments which have been abstracted as the main intersection of conversations within a [Bracket] of the workbook tapes. The actions form the data set resource to compare with the abstract concepts in the law of the ISD Requirements theory. Previously constructed into the three directives of ISD Requirements are:- a1) we can get the Requirements right, a2) we can get all the stakeholders to agree and, a3) we can solve the problem (with a product). Under these three laws are the characteristics of 'good' Requirements as identified previously in chapter two. The operationalization of which leads to Requirements specification stating the desired function and performance characteristics 'independent of any actual realization' (Roman, 1985).

7a.2 [B] - Antecedent provocative context

[B] is providing the 'direct links' to the specific actions being examined by the Requirement-ist. [B] is the situated context leading up to those 'key' moments and seeking to place the action within a specific context which is not in relation to an idealized objective perspective. The interest is in the relational tie between the activity and the cause of that activity, and the 'what' that provoked 'that' action. Placing the case study samples within the context assists the audit trail and helps to understand the in-order-to motives.

Being provocative is having the quality of provoking, exciting, calling forth (OED) causing a blip that calls for attenuative focus of the mind upon an object, to highlight it against a morass of background detail. This is whilst simultaneously doing the action that is taking place within a project of action. For Schutz action is limited by "a means within the meaning-context of a project, within which the completed act is pictured as something to be brought to fulfilment by my action" (Schutz, 1967). This postulate perspective conceptualizes action as orientation towards a projected act. Actions are 'imbedded in meaning contexts'; are subjectively motivated, and articulated according to their particular interests and according to what is feasible (Psathas, 1975).

During the course of actions, whether it involves others directly or not, the meaning-context is the antecedent condition. Any, and all interactions with this meaning-context are potential sources for a provocative forming concept; the specific interests are the ones that the person or persons interact with, again this is potentially multitudinous, forming endless webs of connection, with infinite variability, nevertheless context is

always taken for granted in the life-world, and context phenomenon is itself a selection.

The previously discussed bracket-ing process lifts out a sequence of actions for examination. The task in the workbooks was intricately occupied with the selection of the start and the finish of a sequence and this was based around the topicality of the conversation, which was dictated to the researcher by the brute-facts of the datum.

One of the subsequent tasks of the Bracketing operations was to ascertain the 'causes of provocation' made in the inter-subjective utterances, and that which brought about the interest for them in the topicality. Many types of causes can be abstracted on the path to the project fulfilment and some of the interactions are genuine while others aim to resist and impede progress, and to provoke a level of further attention. Many actions can be bracketed and post-selected from a background context of order, but the provocation has already been selected by the participants, using their sense-making and understanding as is shown in their interactions.

In the cold light of the morning after, with hindsight, things appear differently than they do at the time of the actions. Consequently the reasoning itself will be different. Whilst in the foray of doing, action is rational to the person themselves at the time. This is set within the context at the time and the ongoing process of the in-order-to motive is the projected state of affairs to be brought about (Schutz, 1953). This is saying that the actions of the doing are different to correspondence to or compliance with an ideal type and this point is fundamental, which has to be unpicked in order to avoid any mistaken attribution.

7a.2.1 A worked example of the in-order-to motive and the post-hoc reasoning in the antecedent condition

In order to show and explain this issue clearly an example is used to demonstrate one particularly interesting type of provocative antecedent condition, discussed by conversation analysts as the 'interruption marker' (Schegloff, 1987). An interrupt is a central place for a variety of sequential markers in conversation; little objects that do a piece of sequential work, fulfilling a potential marker for an antecedent causal point. For example 'Wait a minute!' or 'Oh!', are interjections which operate to announce a turn to the conversations (Schegloff, 1987).

Some 'interruptions' are mere inconveniences, others cause a pause or a temporary stoppage to the natural flow towards achieving the currently engaged project aim. The work of antecedent conditions of the example below shows the Requirements phenomenon under scrutiny. By demonstrating the method of approach in the example below it establishes the detail that is necessary to understand while in the actuality of the doing, exposing the context of the antecedent condition and also its inherent problem. The example shows that what started with an interruption ended in a glossed over account being recorded in the minutes. The example of Requirements phenomenon under scrutiny involves the splitting of the project into phases and the scoping/redefining of the projects intentions. The example highlights the key points of the actions involved in a whole sequence of events, and these demonstrate the actions that affect the whole course of the project, and as such they are antecedent conditions to the Requirements understanding analysis. After the example a subsequent discussion delves further into the meaning of the context and the relationship work undertaken in the analysis approach of this framework.

The example is taken from Tape 21, the moment just past the half way point in the projects scoping and defining life cycle. The bracketed sequence starts when 'C' has identified that the COT's software system is suitable to meet the needs of the Casework Management System (CWMS), but there are still bits to sort out, negotiations to be set up with the company, agreements, the tailoring of the software etc, however, the recommendation made from an independent software consultants report had laid out the options and 'C' after some limited consultation was suggesting that this particular option appeared to be the way forward; she was actively promoting it, presenting this option as the way forward as though agreement was just a case of rubber-stamping. But that is exactly when U the head of IT service provision 'decided to 'interrupt' the flow of the conversation and instead of a done-deal; his action literally threw the project into disarray. After which the project changed direction. The interrupt is one of many types, a common form, of antecedent contextual condition that initiates action, reaction and inaction of the people involved in intersubjective sensemaking while in the doing of a project. The notational use of the '[' marks the start of the overlapping speech and the ']' marks the end of the first speaker. This overlap is a demonstration of an interrupt, showing that the second speaker U was unanticipated; and the question at the end of the U comment also heightens and intensifies the effectiveness of the interrupt and forces a halt to the current direction of the flow of the topic, hence the bridging of the topicality of the [Bracket]. The observation made in the

research notes at the time was that “the ‘tension’ in the room could have been cut with a knife”.

C	= so there's still a bit of sorting out to do in terms of how the remote access will actually work [and I think that there may well be
U	does that mean] that you're changing the whole ethos of this project?

Text Box 7a.1: [T21-B4-L52] + [T21-B5-L4]

This “simple” interruption by ‘U’, causes a whole sequence of subsequent events, and future actions that affect the course of the project. After a somewhat heated debate ‘V’ the data and security officer sums up the newfound difficulty of the groups position, in that it appears the group now has a serious potential problem;

V	worst thing is to promise what is not deliverable (0.2) and if we can't deliver – you've got to make a rational decision as to whether something is achievable and if we judge that the casework management system is not then we mustn't promise it
---	--

Text Box 7a.2: [T21-B6-L144-147]

This was then resolved by a suggestion of;

L	Why don't we make a clear distinction between project one and project two
---	---

Text Box 7a.3: [T21-B6-L151-152]

The original ‘interrupt’ position has been resolved by the suggestion of making a clear distinction of the problem in the project; and this evolves into;

C	Right OK. I'm not unhappy with that and if project two can coincide with project one then that's a bonus if it can't then we just have to live with that and explain that to members
---	--

Text Box 7a.4: [T21-B6-L156-158]

The problem left over is how to explain it; this is then solved by;

H	It's just so we can go to members and say we have delivered what you originally scoped out (.) we believe (.) this is secondary...
K	this is a bolt-on

Text Box 7a.5: [T21-B6-L163-166]

The ‘key’ action here is the splitting of the project, providing key antecedent conditions, however, from this action it carries on, expanding outwards, infinitely opening up ever more horizons of interest, making the arrival of ‘a’ cause into an operation that only seeks to rationalize an event; what is of interest is questioning

what it is, and what makes it relevant. These temporary stoppages, are inconveniencies and obstacles to surmount; they are the problems of making adjustments to the normal course of activities and they develop as the project unfolds; while in the transit of the projecting, in the on-going future perfect tense (modo future exacti) of unfolding. The relational tie between the activity and the cause of that activity, unhinges the difference between the because-to-motive and the in-order-to-motive. In the forgoing example, if the activity was not observed at the time it was recalled, via the minutes of the meeting;

3/4.....There was concern that this would not be compliant with the standards placed on the Members IT system project. Whilst some believed that the SOFTPOINT system could be used in the short term, others believed that it was a better strategy to introduce the CWMS at a later date, when software that better met the needs of the project could be sourced. It was agreed that the project should be broken down to stages in order to understand the priorities and timescale of each section. Phase one would be to provide access to the service directory, provide e-mail as was in the original plan. The second phase would be to introduce the CWMS.

Text Box 7a.6: Recorded Minutes of project group – items no 3&4

Here the event itself has been ‘glossed’ over. Rationalized into “others believed that it was a better strategy to introduce the CWMS at a later date” (CWMS = Case Work Management System). Then, the ‘because-to’ motive was “There was concern that this would not be compliant with the standards placed on the Members IT system project”, providing the rationale of ‘compliant with the standards’.

But, for an enquiring mind the action ‘provokes’ further directed questioning, what standard? And so on, until in theory, the in-order-to motive is exposed, as an activity, as a part of doing a journey towards achieving an aim. But, would any amount of post-hoc questioning produce the real in-order-to account? The account is grounded and tied to the activity, which then extends backwards to an original aim. In the actual datum of the transcripts reproduced above, there was a ‘fear’ and a threat of not being able to achieve the aims of the project; “worst thing is to promise what is not deliverable (0.2) and if we can't deliver.” This was then resolved by a suggestion of “Why don't we make a clear distinction between project one and project two”. But potentially it might not stop there; it could progressively expose further enquiries. Such recursive regression only recalls an old adage, “for the want of a nail the kingdom was lost” (1758). But this appears to be non-problematical once the appeal to justification in the metaphysical world is ostracized. Schutz's (1962) theory of the predominance of

the manipulatory area, limits the life-world actions as segments of actuality within our reach (Schutz, 1970), as a set of heterogeneous activities, each taking place in its own appropriate medium. A set of activities is itself structuralized into theme and horizon (Schutz, 1970) This structuralization originates in the system of prevailing relevances that start with a biographically determined (Schutz, 1953) outlook. In his paper 'Common sense and scientific interpretation of action' Schutz (1953), his claim was that "Strictly speaking, there are no such things as facts, pure and simple". "All our knowledge of the world, in common-sense as well as in scientific thinking, involves constructs, namely, a set of abstractions, generalizations, formalizations, idealizations specific to the respective level of thought organization" (Schutz, 1953). For the purposes in-hand it is therefore not necessary to go beyond the postulate of an immediate system of prevailing relevancies, as anything else could be deemed speculation. This may appear too restricting, but the importance is in understanding the detail of the extemporaneous moment of action that is made in the process of the doing.

Taking that accountability of the audit trail is not regressive beyond the immediate use, in that it does not stretch beyond the immediate horizon, as part of the actual resolution found in the doing of the project itself, it acts as a regressive stop, as 'they' deemed it, themselves, to be of that which is held to account and found in the actuarial doings, but in the above example, we have two audited accounts, the official one produced by the process of production of the report for others to read, in the form of the minutes of the meeting and the other in the actuality of the audited trail, found in the doing recorded details of the [bracketed] Workbook. Again, this is drawing a demonstration of the distinction and of the research problem, between 'real' structures and production artifacts of method. The minutes of the meeting are the bona-fide socially sanctioned account, an example of difference that Sharrock and Anderson (1986) would call 'what-is-really-there-independent-of-the-method-of finding-it' and what is 'only-there-because-of-the-procedures-involved-in-making', highlighting that there is a difference found between the after-account-of and the account-made-in-the-action. The research difficulty in the retrospective attempt, is finding the antecedent causal condition, the question is; was the antecedent start the 'interrupt' by U who was challenging that the 'ethos' of the project was being changed by the intended actions of using and adapting a COT's system. Or, was it seeded not in the interrupt, but in the motivations of the IT department, which was reported as showing "concern that this would not be compliant with the standards placed on the Members IT system project". The latter, official report glossed-over the account giving a different

antecedent gloss, as the report explanation provides the added rationale of 'compliance' with standards, which is an interpretation made in the writing of the report afterwards and is different to that of the involved-in-making. As the case study continues to unfold, the antecedent context turns out to be far more interesting than just a simple interrupt.

The purpose is to highlight some of the previous work undertaken in the workbooks, which is fundamental to leveraging an understanding on the Requirements phenomenon. One of the primary problems is, how to study the phenomenon. The previous work took an alternative default starting position that the facts are from the outset selected from a context, made by the activities of 'our' mind (Schutz, 1962). This starts from an individual perspective, but denies a purely subjective account; the research study of the previous chapters took the given individual perspective as the intersubjective sensemaking process as displayed in the interaction of the actuality of the doing of the project. This short step alleviated the difficulties of acquiring understanding the motivations of the individual; starting with the assumption that motivations are displayed in actions and deeds. Whereas, the use of the antecedent in this phase two framework starts with the assumption that it is possible to identify that there are causal 'inferences' outside the mind of a person, and that they subjectively respond to the objective context. Their actions as actors are limited and embedded into the immediate context of use with the actuarial within reach. Part of the research task is in 'correctly' identifying the causal antecedent condition. The above statement imposes the problem that the [Bracket-ing] cannot extend past the [Bracket] presented as a limiting condition because it would suggest that there would be supervenience reasoning above and beyond each [Bracket].

In previous chapters, the discussion has referred to layers of meaning overlaying an instance. Indeed this is the undeniable case, the drawing to the attention here is to re-emphasise the work in the workbooks, which is to seek out the essence, character and disposition of the intersubjective moment, granting that it is a reasoned position to hold. This is preferable to explaining away anomalies or gloss-over or smothering the anomalies by groupings and concatenation under a heading category to alleviate the difficulties of base causes. The previous research approach suggests that it is these anomalies that help to establish the errors, defects and shortcomings that are contained within the theory. These are the same difficulties found in the life-world; as such, they are arduous problems for research to resolve. Therefore, where compound conditions are uncovered they merely show the inadequacy of the applied theories

and the conceptual abstractions of understanding.

7a.2.2 The antecedent conditions for the Requirements theory

The above discussion debates the connection between the data samples that are found in the previous chapter to be emergent key moments that were produced in a topicality of conversation, However, the focus of this framework is the relationship to the antecedent context as used in the hunt for the Requirements phenomenon, which is a discussion of a different context, here it is about the contexts of the justification of the Requirements theory. The specific zone of interest previously was in the tethering of the data sample to the action, via the Workbook; these concerns were about the context of discovery and the context of meaning. These segments are used in this framework to form the antecedent conditions; they contribute to the data set resource employed, from the in-order-to aspect of the emergent goal of the project in hand, but it still does not account for the validity that is being questioned, which is that of Requirements. The work of the workbooks in the preceding sections set about empirically unpicking what is in effect a supposedly causal relationship, however, upon closer inspection these spirals of horizons soon become too multitudinous to remain meaningful. Therefore, 'the manipulatory area 'to be 'valid' is found and limited to the immediacy of its use, and is referred to in the course of events. The 'context' of the framework of this chapter takes these conterminous actions to be within the context of meaning that is within the sphere of the objective understanding of the domain of Requirements.

The basis of the material collection for the 'context' required more than the analysis of conversations; as the researcher was a stranger in a foreign land, a certain orientation was required, to relate to the topicality of what they were talking about; as the previous chapters discussed this was gathered from ethno field notes, documents, observations, with interviews, semi-constructed within the on-going actions of the period of the investigation, and conceptualised within the workbook. However, it should be noted that some of the "best" insights into the context occurred by just being there, having coffee, chatting, spending time, being interested in what people there were doing, and how they went about 'their' working life, in short, listening, not asking formal questions but living the temporary moments with them. In the chatting and listening 'they', the people involved, accounted for their actions, from the context in which they found themselves, and spoke of their relations to others, the limitations of the technical facilities, the other people's responsibilities that are usually 'not being performed'. Etc etc. These are the very things that cannot be quantified as being

scientific since it is not within the context of research control in that is it has an intuitive feeling of fancy or preference that cannot be verifiable at the time, but having a retrospective reflective stance of a fitting to a rationalised perspective. But this draws upon the very supposition being questioned as to whether or not Requirements is a creation of the mind or whether a Requirement exists as a process to be discovered. The former does not find validity in its ultimate source in the rules whereas the latter does (Kaufmann, 1944), in turn it is dependent upon how values are collected and assessed. If it is in things undiscovered then it is difficult to see how, and in what way items become provocative, the assumption is that they will have natural physical causes and will comply with laws of nature, but a provocative cause calls to attention detail that needs attention, and as such, it forms a need or a want, and that is a Requirement, which is different to that of a Requirement calling for a rational scientific disciplined approach. The upshot revolves around the issue as to whether or not context is a definable entity; or if it is differentiated in the way the duree is organized, and is facilitated by the epoch of the natural attitude.

7a.2.3 The remaining research issue of reconciling what is an antecedent condition

In summary, the Requirement-ist role is to judge whether or not the 'process' that was invoked is admissible as being 'correct' in terms of the spirit of the Requirements law. However, there is still the matter of the research issue, which is the alternate parallel problem to reconcile. It is the problem of the attempt to re-specify the antecedent condition, leading to the problem of the translating, and the actual process of doing the analysis within a 'social' context of discovery. That is, seeking 'a' antecedent causal proposition which produces nothing but ambiguities in the research process, resulting in the glossing over of an explanation with a certain fitting up of the data that has to take place in-order-to present a clear cohesive picture for readers to follow without getting lost in the minutiae of the details. This accords and confirms Bittner's (1973) prognosis about the objectivity and realism in sociology. That "no one has ever succeeded in the objective study of society without relaxing canons of objectivity" (Bittner, 1973). The above position also supports Janis (1982) analysis of the Nixon Watergate tapes and the wider Psychological functions of the Groupthink phenomenon of Concurrence-seeking that the conditions are not yet adequately understood.

Consequently, it should be emphasised, as the above passage explored, that the post

hoc 'bona-fide' socially sanctioned accounts are riddled with Orwellian double speak whose antecedent context conditions claims are a carefully selected window frame by researchers or anybody, for the purpose of an in-order-to-demonstrate a position that they wish to expound.

7a.2.4 The phenomenon of non-attendance maintaining project control affecting antecedences

Exploring another particularly interesting key aspect of control of a framework further is the 'control-of' the Requirements process, or rather the way in which people invoked a provocative 'role' of control in the Requirements process by virtue of their position and involvement in the project group, consequently causing effect upon the Requirements process. The simplest form of this is; to look at who is invited onto the project board. Or rather, who was not, who was left out, or declined to attend. However, this viewpoint is too simplistic, as it only results in 'what-if' questions whose validity cannot be truly established, but there are interesting variations on this same theme that can be directly related to a provocative cause. This is now briefly explored to demonstrate another interesting aspect of antecedent provocative type of action that affects the outcome of the scoping and is defying the process of Requirements, this is called; 'non-attendance authority'. By the powers invested in holding a position or role in the organisation by not attending a meeting, 'I' can still control it's outcome.

The group's work constantly has to make and bring into play, positions of influence. "It is because "I" speak from holding this 'role' (position of responsibility) that "I" am able to say the things that "I" do". Consequently, when the data and security officer speaks about security data issues, his perspective is one of organisational authority, and his viewpoint has to be accounted and accommodated within the group's discourse.

One interesting notable type of occurrence found in this project group was the phenomenon of non-attendance. The effect and accomplishment by non-attendance, by not attending a meeting, strangely maintains the position of control over the area of the responsibility, in that the phenomenon is that by not putting oneself in a position of having to justify to the wider group, one is not responsible for the decision taken for a course of action. This tactic was especially prevalent in and around occurrences when uncertainty was present and was noted in chapter five section 5.5.2 as affecting the decision making process. Whether this was a conscious decision or not is an irrelevance, neither is it necessarily a tactic of running away from the decision-making.

Non-attendance by key people, provokes several effects, in effect it reserves the decision-making responsibility to the person who has the role to hold that position; it is in effect saying that as the responsible role holder that 'my' decisions cannot be openly challenged. The effect in this case was to close down the optional choices that might have emerged from unpredictable conversations and also (secondly, it) helped to facilitate the presentation of plans as done deals, as the 'best option', in subsequent group meetings. Finally, non attendance enables out-of group context private personal communications. Subsequent challenging of these already done decisions especially by non-technical experts, is deeply problematic as the explanations and justifications are made from the point of view of an already worked out reasoning from the 'expert' and from the person with the legitimacy of the job title. The tail signals of the extra out of group context discussions abound, normally as snippets of conversations from the leader informing others in the meeting that IT had spoken last week about a particular subject. What is often more difficult to analyse is the findings from the antecedent condition. But as the above discussion demonstrates, the reasoning analysis that emerges from looking at the non-attendance is one of a number of plausible explanations, and is not the known matter of fact, which was that there was non-attendance that provided a provocative condition, the group management was interrupted, and that this temporarily stopped the flow of achieving the project aim; the effect was upon the group, in that they had to accommodate non-attendance, the interest is in their actions, in relation to the current framework enquiry of Requirement-ing.

In summary, [A+B] = the antecedent conditions, for examining the work of Requirements. [A] is the belief of Requirements, which are the laws that hold in the belief that this is what is needed to be done in order to achieve an IT system. [B], contextualizes the extemporaneous provocative aspects that were 'used' by the people doing the project. These were found in the 'process' that happened in the detailed actuality of the endogenous production of order, and this process is the subject of the next section. This section has focused upon a discussion on the difficulty of defining exactly what a contextual antecedent condition is. This fundamentally questions the selection of a 'fact' from a context from which to compare a variable against. This highlights and concurs with other researchers who similarly had difficulty with determining the antecedence input of processes. Typically the research problem is summarized by Monge Farace et al., (1984) who argues that the traditional research approach of using variance type techniques is not sufficient for the study of change over a period of time, leading to the claim and highlighting the

difficulty in that they 'know of almost no research in organisational communication that could be legitimately labelled as process research' (Monge, Farace et al., 1984). Yet, there has been a long held view in IS of the need to study processes. Pettigrew's theory of contextual-ism suggested the need to study the content, context and process. Avison and Fitzgerald (1995) stress the importance of understanding the relationship process between the organisation and its environment. Myers (1997) points out that IS research has consistently shown that it is the social and organisational contexts of information systems design, development and application which has led to the greatest practical problems. IS has 'recognised' that organisations are emergent systems, from the ongoing and situated actions of organizational members as they engage the world (Orlikowski, 2002) IS has observed in the literature that organisations do not follow fixed patterns ,but are continually being recreated and never obtain a stable state (Hocking, 1998). This emergent nature has many horizons that open up from the 'constant state of flux and change' (Walsham, 1993).

But this is what 'making decisions' is about, in the deciding between the opening horizons, to focus attention on what is relevant, to discern the emergent causal, and decide upon the 'interferences' that interrupt the process. This is a part of the 'perception' that the individual places upon recognising the dynamic ambiguity brought about through experience and the accompanying baggage of knowledge brought to bear upon the problem. Charles Lindblom (1959) proposed that formulating policy decisions has met with limited success; he characterised the system of making policy as a system known as "muddling through" and he suggested that "Making policy is at best is a very rough process. Neither social scientists, nor politicians, nor public administrators yet know enough about the social world to avoid repeated error in predicting the consequences of policy moves" (Lindblom, 1959). His comments were provocative towards the accepted epistemology of the day. Some 45 years later Mintzberg, Ahlstrand, et al. (1998) are still calling for more 'understanding of practice, and not production of 'neat theory' that is found in the various academic studies in strategic management (Mintzberg, Ahlstrand et al., 1998).

7a.2.5 The project group Requirement-ing on the Key phenomenon

This section reviews two assumptions; firstly the assumption that the phenomenon has been 'preserved', secondly that the 'what' and the 'how' of the Requirements theory can be demonstratively displayed by the production of an 'audit trail'. These

assumptions are themselves being challenged nevertheless, and in order to affirm or disaffirm their veracity it is necessary to proceed with some assumption in place.

The data selections for analysis are the 'key' segments of actions that have emerged from the workbook process of 'Verstehen'. Which examined the fundamental 'brute fact' of 'observational datum' that was achieved by the use of the recordings of naturally occurring conversations, through applying the concept of [Bracketing], a method to interrogate (formatted, make sense of) to observe the 'what and how' from a pre-suppositional position. The aim is always to preserve the original temporaneous moment, by understanding the actions projecting the in-order-to motive of an action into the future perfect tense. The purpose of the framework in this chapter is to use these key preserved actions and the sensemaking achievements of the project group, not so as to make a retrospective, tidied up account but in order to make judgemental decisions about their operationalizations in terms of the Requirements belief. There are two reasons that lie behind using the key moments; firstly to remove the pseudo because-motives, as they might not be genuine, also because it is natural to invoke that which it seeks to explain. The retrospective reasoning demonstrates that explanations and reasons are necessary parts of rational causes, but to say what it is about them that makes them rational is not the same as saying what it is that makes them causes. Also the preservation is to act as an audit trail, to facilitate re-examination of the sense-making process as and when it occurred. The point here is to contribute to the wider argument that any re- representation of facts, or of interpretation, is subject to ambiguities and mistakes, and in social settings it is nigh impossible.

The framework begins with a default proposition in assuming the validity of Requirements. It is a 'machine', taking as its default that there are the particular 'legal' norms of Requirements, as defined in the terms derived from other foundational norms. This assumes Requirements as a synthesis and an organization of knowledge in the doing of doing IT projects that have been formed from the coherent and logical Requirements model, which is the process of Requirements. Also assuming that a Requirement is a causal relation, since "causal relations are in terms of laws, explicit reference to the laws is also required in a complete formulation" (Kaufmann, 1944). Implying that the target and all of the steps are known or knowable in character and function.

The foundationalist position. Justified beliefs about the physical world are always

inferred from other beliefs that rest upon sense impressions, although this lacks certain credibility, and the rationalist builds a securer position by the assemblage of self-evident axioms, and by proceeding with reliable steps, with all the techniques typically associated with science, so as to be able to infer and post justified beliefs which hold that natural laws are necessary truths in every world, and in the base world are formed "a priori". The basis here is upon physical laws, with the happenings within the social world being considered irrelevant, as contingent "data," which have to be put beyond question by appropriate methodological techniques, and this puts aside the model of actors responding to symptoms of the environment. But, as an aside, the interpretation of their actions is an interpretation made in conformity with presupposed theoretical laws. Therein lies a deeper set of 'values', with relationships to other sets of laws, and other claims to knowledge. "No methodological controversies in social science have been more embittered than those relating to values" (Kaufmann, 1944). The assumption that this thesis takes is that "systems of logic or mathematics, deductively derived from axioms, are essentially tautological; any other general claim to knowledge is synthetic, which means that it can be counterfactually shown to be false" (Hirschheim, 1992). What this framework is being asked to do is to lay bare and make explicit the axiological rules, while remaining as closely as possible to the actual problems of the practice of Requirement-ing.

7a.2.6 The Role of the Requirement-ist

The Researcher performs the role of the Requirement-ist, a necessary analytic step, in order to be able to distinguish, identify and examine the actions of Requirements. The remit and responsibility of the Requirement-ist is to interpret strictly the rules of Requirements. This section discusses what is meant by 'strictly' and how the identification and distinguishing of the actions is undertaken within the framework.

The Requirement-ist's concern starts by analysing the detailed members "practical accomplishments". In this the Requirement-ist (researcher) performs the role of an auditor according to the rules in the theory of Requirements, with the assumption that Requirements software development is engineering (Jackson, 1995), and that for the most part, the literature on information systems development and Requirements engineering is founded on the natural science model (Alvarez, 2001). From which the task of a general theory of Requirements is to describe that achievement in specifics in all of its organizational variety.

The Requirement-ist researcher performs the role of an auditor, a role to verify that

procedures were 'correctly' followed. The role of an IS auditor was explored in the Keil and Robey (1999) study drawn from a population of IS auditors participating in a mail survey sponsored by the Information Systems Audit and Control Association. In their study, they referred to IS Auditors as the 'preferred' source of information about troubled IS projects because they are '*likely to be more objective*' than IS managers or project team members (Keil and Robey, 1999). However, the mind-set of the auditor in IS often reveals itself in the literature when reviewing project failure. Borrowing the same mindset, that Requirements can be 'correct', achievable and is the process to use to elicit user wants and needs for an IT system, the Requirement-ist adopts the perspective of a software Requirements engineer, as these are the standards by which Requirements should be carried out. Many models describe the role of Requirements engineering activities, an example of which is Nuseibeh and Easterbrook's (2000) list of the activities which the Requirement-ist would be looking for and it includes eliciting, modelling and analysing, communicating, agreeing and evolving Requirements. All of which have been subsumed into the constructs of the theory outlined in chapter two.

One of the salient differences of this research is found in the use of the data set used in the autoptical examination. The usual research practice is the post-hoc collection of the data set material, such as that gathered by interview methods which are often preconditioned somehow to find out about a particular phenomenon such as the factorial problem of software project escalation. Whereas, this research in the previous chapter has laid emphasis upon what kind of "machinery" makes up the practices of doing (Garfinkel and Sacks, 1970). The alternative perspective starts from the questioning, as Garfinkel and Sacks (1970) observed, and in the manner in which 'facts' are used, that "We treat as fact that researchers—any researchers, lay or professional, naive or well versed in logic and linguistics—who start with a text, find themselves engaged in clarifying such terms that occur in it. What should be made of that sort of fact? What do we, in this article, want to make of that fact?" (Garfinkel and Sacks, 1970).

Traditional research treats data phenomenon such as talk, interviews, produced documents and observations, as occasions for reparative practices (Garfinkel and Sacks, 1970), and as utterances of discourse of actual or the potential interaction that exists between the impure mess of actuality and the ideal knowledge of pure aspirations. To be able to assess this requires an auditor who has not any pre-knowledge or assumptions about the biography and purposes of the 'user of the

expression', the circumstances of the utterance, or the previous course of discourse. The auditor has legitimacy, by objectivity and ability, to interpret the formal structures, to make sense of such utterances, and to decide by the use of 'indexical terms' what is actually meant by the phraseology of the participants in the researchers' research project.

The previous chapter phenomena are through and through practical accomplishments; the activities they make are the facts, the activities are accountably rational through the members' "machinery", becoming brute-facts, recalling as in chapter three, that Schutz (1962), distinguishes three types of 'facts', common-sense, scientific and phenomenological. The emphasis in this framework, phase two, follows the doctrine of the scientific aspect of the world, but for Schutz this is not a natural aspect but an artificial one. The scientific fact is constructed by using symbols and definitions, through which scientific facts can be communicated and made verifiable through abstractions into idealizations and generalizations. Methods based on natural science assume that the social world is composed of concrete empirical artifacts and relationships that can be identified and measured. Therefore, as Rosio Alvarez reasoned, the Requirements in the social world has a reality of its own and the individual has not participated in its creation (Alvarez, 2001). This is echoed in the research approaches, the methods and practice application of which are based on the natural science model that assumes that the social world is composed of concrete empirical artifacts and relationships that can be identified and measured. Which also provides the justification and the rationale of the systems engineering approach of Requirements determination as viewed as a rational process (Galliers and Swan, 2000), borne out in the use of the empirical-analytical method previously discussed.

For Schutz the scientific fact is constructed through the construction of symbols and definitions; scientific facts can be communicated and made verifiable through abstractions into idealizations and generalizations (Schutz, 1962), the scientific fact is a construct, derived from natural things by a process of using 'Indexical properties which draws a distinction between the objective conception and indexical expressions in use. These utterances and their indexical properties provide a window through which to gaze upon the bedrock of social order (Clayman and Maynard, 1995) The objective reality of the domain of Requirements is matched up with the word used as an 'indexical sign', although a token may have different meanings in different contexts (Giddens, 1993).

There is a clear distinction being drawn here from the earlier research approach adopted in previous chapters. The distinction, a fundamental alternate conception, is accentuated in the use of the two words 'operationalization' and the notion of 'indexical expressions'. The word 'operationalization' in quantitative research is based on the principles of a concept that is identical with its measurement (Sarantakos, 1988). Operationalization makes it possible to compute a score through the appropriate selection and quantification of indicators and variables. The indicator, "stands for" its referent by indicating it (for example, a thermometer shows temperature, smoke is a precursor of fire, music is used to evoke particular emotions and the leather jacket signifies youth and rebellion) (Llewelyn, 2003). Originally 'Indexicality' is a technical word adapted from linguistics (Coulon, 1995), however the underlying methodological reasoning is propagated and procured in use for sample surveys, measurements of practical actions in HCI, computer simulations of social processes, statistical analyses and mathematical models.

A similar type of indexing work is also seen in the conceptualizing or abstracting methods of open coding, often referred to as "in-vivo codes" (Charmaz and Mitchell, 2001); these are classifications of events, acts and objects that share some common characteristic, "then we can give it the same name, that is, place it into the same code" (Strauss and Corbin, 1998 pg 105). This indexing work, of 'open, 'axial' and 'selective' coding found underpinning grounded theory has similarly been adopted into qualitative data analysis in the many methods and research tools described, for example, by Miles and Huberman (1994), subsumed under the general heading of 'Case Displays' (Miles and Huberman, 1994), and further echoed in Yin (2003) 'Analytic Strategy' approaches and the five analytic techniques (pattern matching, explanation building, time-series analysis, logic models, and cross-case syntheses) (Yin, 2003).

This is the very deportment in which Schutz identified the scientism approach of fact construction by the usage of symbols and definitions which use 'strict' methods within a framework to construct, place, and indexically locate data in the same manner of the Requirement-ist in applying these same strict rules of procedure. The measuring rod, with its calibrated indicators has been supplied by the work in chapters two and three, but instead of stacking numbers into categories, or building from ground-up, the Requirement-ist's work is in assigning the brute-data segments referent into the acceptance or rejection of the theoretical position of Requirements. See diagram (7.2).

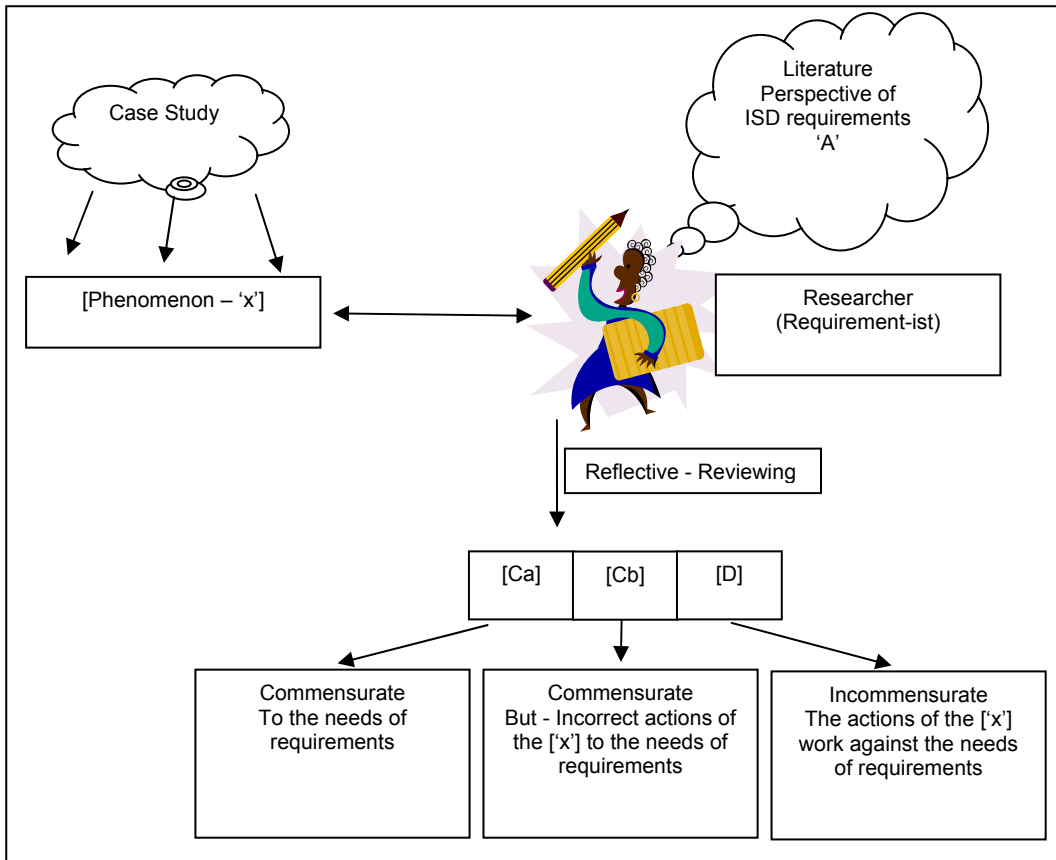


Figure 7a.1: The Requirement-ist work

The Requirement-ist work 'has-in-mind' the constructs of Requirements, with the assumption that the belief foundations are correct and that this application produces valid and verifiable results. When engaging with the data sets the Requirement-ist assesses and judges the given actions within the framework. This conception of operationalization makes it possible to compute, account, and render the social practice itself. The Requirement-ist as such uses the Workbooks to establish the [B] causal antecedent condition and the incommensurable aspects of [D]. But, the 'operationalization' Requirement-ist framework does not try to 'remedy' the indexical expressions, rather the conceptual framework uses the dis-embedded 'context' and resolves the actions and the brute-data items in an account of the actions, in terms of the indexical expressions of the constructs of the Requirements theory.

A typical aim of a Requirements analysis is; 'the process of studying user needs to arrive at a definition of software Requirements' (Thayer and Dorfman, 1990). This is embedded in the Requirements theory to provide the elaborate technical normative

formulation, principles and structure, to decrease un-certainty by being consistent with the rationality context of IS development methods and tools, which has the tendency to give the right answers in general. The Requirement-ist uses the prepositional knowledge in searching through the data to examine the key segment phenomenon of the [Bracket] as symptoms, from which it is possible to form the prognosis. The Requirement-ist task is to decide on any particular data [Bracket] as to its correctness or incorrectness. This is a 'remedial' program of practical Requirements reasoning, which is specified by the particular cohort independence of software engineering as a phenomenal reference discipline, to use for the practice of Requirement-ing; and the act of a Requirement-ist is to recognise and seek compliance with it. The Requirement-ist decides the correctness (or incorrectness) of the actions upon the Requirement-ing 'operationalization', or a further option of can be either commensurate or incommensurate [Ca] or [Cb], or [D].

7a.3 [C] - Requirement-ing; commensurate correct and misapplied

The actions of the Requirement-ing [Ca|b] are essentially the actions that concur positively towards the belief, [Ca] is commensurate, positive and is correct, these activities are model behaviours and found to concur with the literature ideal. [Cb] concurs and is similarly commensurate, but these actions have aspects that echo accounts of projects that have made mistakes in Requirements. The perspective taken on [Cb] is of bad Requirement-ing. Misapplied, incorrectly used, or just 'sloppy', it is a lazy application of the rules of Requirements. These mistakes are actions that would have picked up the epitaph of "could have done better" in the end of term school report.

In both actions [Ca|b] are symptomatic of holding a belief in Requirements [A]. Using Requirements the Requirement-ist is undertaking a reflective prognosis of the symptoms. The Requirements literature acts as a resource, to tie into the account, and help with the assessment. If actions undertaken appear strange then it's a matter of returning to the body of literature seeking clarification. Because there is no Requirement-ing rule book as such, as Requirements has many methods and approaches, then this or that particular action can be provisionally assessed using the three basic constructs of the Requirements theory from chapter 2 and 3.

[Ca] = the symptoms so resemble, or favourably correspond to Requirements that they could be recognised as commensurate with the Requirements belief. These are the symptoms of being commensurate from the doing of Requirement-ing that the analysis foundations are based upon, and are recognisable with the prescribed actions that can be found within the dominant belief structure of the Requirements literature.

[Cb] = Symptoms of being sick, the afflicted sick list, or unhealthy, with regard to the Requirements belief itself. This is the result of doing the Requirements “incorrectly” in respect to the belief, with defective Requirement-ing; of incorrectly following the manual, or the consequences of not following the instructions of the Requirements method / process.

[Cb] = also: collects the [Bracket phenomenon] actions that should have been, but were not picked up due to the lack of application of the Requirements belief.

Defective is in respect to the fixed ideal of the belief, this takes the text book to be prescriptive, as the ‘book’ that offers guidance in the pursuit of Requirements, and the path to follow instructions, procedures, methods, tools and equipment to do Requirements. These manuals, or guide books, offer the theory as a part of ‘social systems’ and posit that the dominant Requirements tradition is to describe and explain social reality in systems terms. One of the assumptions that is being examined in this thesis is the widely held belief that ‘social systems’ exist as social facts and can be described as such in the process of doing Requirements, i.e. Requirement-ing. The actions of Requirement-ing result in the re-description of the social facts as pictograms, representations and linguistic expressions that can describe real-world entities existing independently of the individual actors. Further, that these representations describe systems that translate into IT systems. Unfortunately, as previously pointed out in chapter two, the frameworks that currently exist do not measure defectiveness, as is required here. The literature either gives ‘empirical’ reasons as explanations for failures, or alternatively, as methods for measuring the lack of internal logical consistency.

The question that emerges is: How can we know or discern that the actions undertaken in the [Bracket] phenomenon are defective in respect to the belief in Requirements [A]? The answer is found by firstly looking at the practice; the practical activities of the life-world in the doing renders the [Bracket] accountable, and then by making comparison with the theory of Requirements. The life-world is ‘accountable,’

meaning that it is describable, intelligible, reportable, and analyzable (Coulon, 1995). The specific interest here, [Ca], is in the [accountable-rationality-of-Requirements], used as a resource with which the steering group people render the relationship as fact in a methodological way.

In summary, specific actions of Requirement-ing are displayed in [Ca] or [Cb], where the belief [A] in Requirements can be clearly demonstrated and shown. The [A+C] perspective upon the [Bracket] phenomenon together with the relevant antecedent conditions facilitates the Requirement-ist's examination of the actions that have been constituted, enacted, and made programmable as operationalized procedures that are recognisable as acts involved, as in the Requirements belief (previously discussed earlier). The anticipated result of this perspective is to reveal the 'how' and the 'what' process that is used in the belief structure in the doing in of its work, within the context of its dynamic relationship with the provocative context.

[A + Ca] obvious Requirement-ing correctly – commensurate

[A + Cb] doing Requirement-ing incorrectly – commensurate but, badly applied

However, there are actions that fall outside of the first two conditions and this is given the categorical assignment of; - [D] doing Requirement-ing incorrectly – as incommensurate activities to the Requirements belief.

7a.4 [D] - Incommensurate

There are underlying questions revolving around what is, and is what is not, considered as 'incommensurate'. It opens up a difficult, unresolved debate that appeared in previous chapters in discussions upon how to proceed with research, where it was found that some of these difficulties lay in the way that domain 'methodologies' operated in contexts of 'meaning', justification' and 'discovery'. Summarising the previous work further, it revealed that there was reasonable evidence to show that a theory of Requirements could be underpinned by the methods, using the justification found in the domain of scientism and 'science' as conventionally defined which is always discussed in terms of an objective 'context of meaning' (Schutz, 1967). The task here is not to lose sight of the operationalization of the theory of Requirements. Actions that are incommensurate are actions that are not

commensurate with the theory.

The test of incommensurate, is to look at the method involved; if the process has synthesis with the method of Requirements, then the assessment is to find whether or not it is defective. But if the process appears to consist of trial and error, without a clear class of an “a priori” form of justification then it is clearly incommensurate. The difficulty occurs when the actions show some sort of sense of where a recognition takes place of ‘other’ values. Here the previous work of chapter six Workbooks are re-utilized. As the presuppositional examination of the intentional attitude and the production of intersubjective understanding had actions that were capable of being grouped together they are ‘understood’ as actions that have the same sort of intentions. At a general abstract level it was assumed that there was the same general sense about which of these actions could be associated with an understanding. That is, an understanding in the terms of reference of this framework and at a point at which marks a departure from the *Verstehen* intentional understanding. The commensurate – incommensurate particular action is interpreted in terms of the axiological rules of Requirements. This starts from the proposition that value judgments cannot be part of the corpus of an empirical science. This is normally considered as a priori-analytic-necessary or contingent. But, so that a further ambiguity can be removed, there is a contentious position that does allow a priori necessary synthetic propositions, but these are, or should be, in the form of complex mathematical theorems. But many of the Requirement-ing actions lack the certain preciseness necessary to conform with complex mathematical theorems, so as such there is a certain ‘verbal’ interpretation issue. The solution to the problem is found in the analysis of the meaning, given from the “procedural rules” (Schutz, 1962) and the context of the conventions in the Requirements meaning domain. To simplify the measurement scale, and to maintain exactitude to the rules of correlation, a simple return of yes or no is required.

In [D] the task is to look to the indexicals of the context domain. In [D] it is the dis-compliance taken in conjunction with the set of beliefs. [D] is asking the ‘what’ else question, or else the what is lacking, or what needs to be added to the theory of Requirements; in effect it is acknowledging that there other belief structures, other theories at work that influence the work of the Requirement-ing.

The incommensurate actions clearly operationalize outside the Requirements belief; some of these activities may have not been recognised in IS, others have been

researched and discussed in IS domain but have failed to be re-conceptualized and captured in the Requirements theory. If assigned to [D] then in theory there is no [A], [Cab]' or, the activity of [A], [Calb] exists but is extremely weak and ineffectual compared to the incommensurate type of activity that displaces the operationalization of the Requirements theory.

The role of the Requirement-ist here is the performance of the researcher doing the assessment as in [C]; it is not the responsibility of the Requirement-ist to look for alternate positions other than [C]. The best that a Requirement-ist can do is to offer a 'remedial' program, that which Paul has offered as a palliative fix (Paul, 1994), however, it is also envisaged that this could be undertaken by any number of 'experts', the qualification being of having an understanding of the framework of the Requirements belief. Indeed, it would be of interest here to have an alternative perspective, such as a viewpoint from IS design perspectives, that would propose alternative positions upon Requirements. Although, as chapter three pointed out some of these 'so-called' alternative schools of Requirements approaches are charged by Paul (1994) to; 'try harder', maintain adherence to standards, prototyping, user Participation, Flexibility Analysis, and that they suffer from a confusion of "planning for the future and planning the future"(Paul, 1994). Often at base, these 'so-called' alternatives still want to 'build' the system to an exact specification; as such, it falls under the remit of performing the role of a Requirement-ing. If there are such things as 'other' beliefs, then this would fall outside the remit of this thesis.

The prognoses that end up in [D] show the symptoms of a disease and do not necessarily reveal the name of the disease itself. These leftovers help to establish the inadequacy of the understanding of Requirements as a belief in relation to the IS perspective of achieving an IT project. [D] displays a phenomenon that is recognised, and understood as the sensemaking of the process from the perspective of IS that it seeks to capture. These recorded activities are, incidentally, not recognised as apart of Requirements from the understanding of the dominant conventional perspective since the life-world activities of the Requirements phenomenon and its surrounding detail has been captured and the meta-physical theoretical conception of the coordination compliance to the Requirements construct realization is in place.

Now both sides of the equation are in place. Allowing an examination of a range of possibilities as to the questioning of the definition of Requirements and it's scope of influence.

7a.5 [E] - Observable consequences

E = the effect, the outcome of the observable consequences of the process of Requirement-ing from the antecedent conditions. This forms the subject matter of discussion in section 7.4.

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Appendix 7b

The original Analysis framework of Groupthink

FIGURE 5. Analysis of groupthink, based on comparisons of high- and low-quality decisions by policy-making groups. (Based on Janis, 1972.)

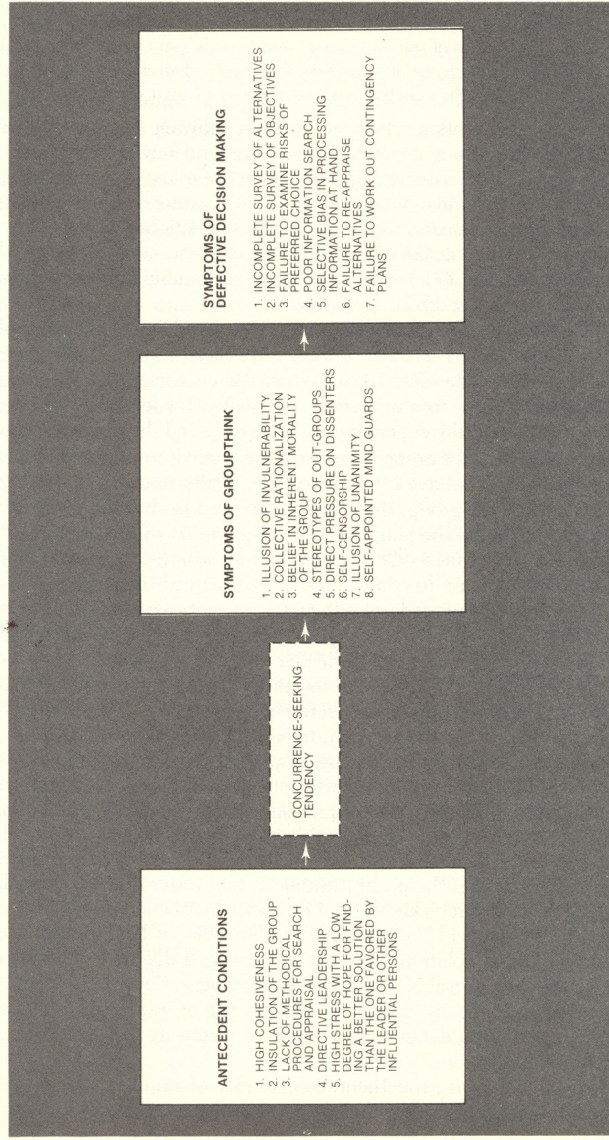


Figure Appendix 7b: Groupthink analysis framework (Janis, 1982) pg132

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