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Abstract. A primary purpose of traditional systems analysis is seen as 'capture' or 'elicitation' of user requirements, in order to produce specifications as a basis for information systems design. Such a view presupposes that user requirements are pre-existing and clear, and that the particular 'users' concerned know what they are, and can therefore articulate them. We would argue that none of these assumptions can be taken for granted. If a system is to be created which is useful to particular individuals, we suggest that they need to take ownership and control of the analysis themselves. By exploring their own experiences, aspirations and sense-making processes in the context of their problem space, they may enable richer and more comprehensive understandings to emerge. A creative process of requirements shaping may then be promoted. Our focus, therefore, moves away from problem description by an external analyst, towards contextual inquiry, which supports creative thinking and problem re-definition by those individuals most affected. We will discuss methods which may facilitate exploration of multiple, simultaneous and dynamic roles of the same autonomous individuals, separately and collectively. Such methods may enable emergence of reflective, shifting perspectives, leading to deepened understandings of problem experiences. This approach makes it possible for resolutions to be created that address experiences, rather than descriptions, of problems.
Keywords: systems analysis; contextual inquiry; requirements shaping; emergence.

1 Introduction

As information systems are now fundamental to the activities of people in organizations, both in business and other walks of life, the ways in which they are planned and created is a subject worthy of a careful consideration. The theme of this paper is systems analysis and its role in supporting requirements shaping. This may form a basis for design of systems which are useful to the particular individuals who engage with them in their work or everyday lives. A primary purpose of traditional systems analysis may be seen as 'capture' or 'elicitation' of user requirements, to produce a specification upon which information systems design may be based (Avison and Fitzgerald 2005). Such a view would presuppose that user requirements are pre-existing and clear. It suggests that the particular 'users' concerned ultimately know what their requirements are, and can therefore be helped to articulate them by an

expert analyst or requirements engineer. We would argue that none of these assumptions can be taken for granted.

The assumptions guiding the ideas presented in this paper are related to a move from the general to the specific (from the standardised to the unique). People engaged in the activities of organizational life, continually create and apply 'knowledge' relevant to their work. It is important to consider different ways in which a person may 'know' something. Some 'knowledge' is explicit and it is possible for one person to attempt to communicate it to another, e.g. I might give a visitor directions from the car park to a particular building. Other things are known at a less accessible level, e.g. I know how to drive a car, but I could not tell another person exactly how to do it – I could only demonstrate my skill. There are still further aspects of our knowing which are not accessible even to ourselves – things we may not be aware that we know, which could only be accessible through experience or perhaps by experiment (Nonaka 1991; Polyani 1966). If an expert analyst simply asks a person to describe the requirements of her job, this may reveal those aspects of which the person is explicitly aware. Observation and questioning might reveal some of her implicit knowledge of the way she performs certain tasks. However, a description which is at best imperfect is likely to result. It is our view that, at their best, traditional methods for requirements analysis may enable people to transform their implicit knowledge into explicit knowledge, in order to produce a 'useful' description of requirements for a system. However, if it is possible to use methods which go beyond this, to enable individuals to explore multiple experiences of dynamic roles, and tease out a range of shifting, reflective perspectives (requirements shaping), then they may go further. In seeking to explore experience, rather than to describe a problem space, tacit as well as implicit knowledge may be supported to emerge. Designed systems which are not perceived as useful may be a result of lack of analysis, or of less-than-comprehensive analysis. We would argue, however, that no analysis aimed at mere description of a problem space is likely to form a basis for creation of systems that will fully satisfy their users. The aim of analysis may be to uncover what is not known. This in itself cannot suffice, however, without opportunities to reflect and evaluate what emerges. Individuals need opportunities to explore multiple, simultaneous and dynamic roles, and consequent differing perspectives, in their experiences of a problem space (Bednar 2001; Minati 2006). This is an active, creative process and not a discovery of something existing.

The nature of problems which arise in organizational life tends to be complex. Many different dimensions impact on one another and are difficult to disentangle when seeking for a resolution. It would be possible for those engaged in analysis to become discouraged in the face of complexity and to wish to find ways to simplify problem spaces. As Claudio Ciborra points out (Ciborra 2002), there has sometimes been a tendency for IS developers to ignore the role of human choice behind the exploitation of technical artefacts, and to use common methods to tackle technical and human dimensions of a design space. However, we suggest that a better approach is to 'complexify' analytical approaches. It is recognised in cybernetics that every distinct dimension of a complex system needs to be controlled in a way which is appropriate to its characteristics (Ashby's law of requisite variety). It is easy to see

that a car with brakes but no steering wheel would be difficult to drive – direction and speed each needing appropriate controls (Ashby 1964). By analogy, every dimension of a complex problem space needs to be addressed with an appropriate analytical approach. This does not necessarily mean that we need a multiplicity of tools and techniques, catering for many different threads of problem spaces. However, we do need to exercise our human ingenuity to reflect and adapt the methods available to us in order to address complex problem spaces appropriately (Ciborra 2002). We need to engage in what Gregory Bateson (1972) calls 'second order' reflection in relation to professional IS development practice.

We believe that it is possible to analyse, design and implement information systems to support organizational needs, and enhance organizational business processes. In order to bring this about, it is both possible and necessary to raise the quality of practice in information systems analysis to make it more responsive to needs of individuals in the organization concerned. In order to achieve this vision, it is necessary to pursue development of methods for analysis as part of information systems development. Fundamental to the ideas discussed in this paper is a belief that the particular individuals who are involved in the problem situation requiring resolution should own and control the process of analysis (Friis 1991). Only in this way can we hope to promote design of systems which will be perceived by them to be useful.

2 Requirements Shaping

Computer and communication technologies have been used to transform the content, nature, process and context of information systems and their use over the past few decades. Researchers and practitioners are faced with a growth not only of new technologies, and resulting new communication media, but also with an unprecedented surfacing of hybrid cultures and communities of practice (Klein 2004). On the one hand, we lack any general professional body to oversee debate about the issues and problems to be addressed in IS development, or the methods and methodologies needed to tackle them. On the other hand, there are a number of different communities of practice which reflect a paradigmatic divide (Klein 2007). This has an impact on our understandings of the interrelated processes occurring in information systems development in practice. The multiple perspectives within this field are creating new and interesting challenges. One particular area which poses such a challenge is systems analysis. Human behaviour and interaction, communication processes and individual and collective sense-making approaches all provide legitimate concerns for analysis. However, in practice, attention is often confined to technological concerns and descriptions of task-based activities (e.g. socio-technical design).

The acquisition of new information technology systems or capabilities by an organization is necessarily preceded by, and intertwined with, a set of activities in which the organization develops an understanding of its current state, its goals, and the possible costs and benefits relating to this innovation. We refer to this process as 'Requirements Shaping'. These activities might relate to a process labeled as 'requirements capture' when discussed from a software engineering perspective (Som-

merville 2006). This may include, as a (small) part, the creation and modification of one or more documents for use in contractual negotiations related to the design and delivery of information technology, e.g. a document that might be called a 'requirements specification'. However, it is not restricted to this. Such practices of 'requirements capture' are not our primary focus. At its best, the term 'requirements analysis' may incorporate all the activities we hope to denote when we use the term 'requirement shaping'. For example, analysis using the Soft Systems Methodology (Checkland 2003) begins from the assumption that there is a 'problem situation' rather than a known problem to be solved, and inquires into both the situation and possible actions within that situation. However, in some settings, the term 'requirements analysis' may presume that some 'requirements' are pre-existing and, hence, available to be 'found' or 'elicited'. Our objective in coining the term 'requirements shaping' is to avoid this narrow interpretation of requirements analysis. This paper will go on to explore some of the activities and decision processes that ideally need to take place well before an organization can be in a position to specify requirements in terms of their business. We wish to put forward our ideas in an effort to promote more successful requirements analysis for information systems development.

Analysis using participatory approaches, e.g. ETHICS (Mumford 1995) or SSM (Checkland 1981), does not always support requirements shaping effectively, due to problems of decontextualisation. Efforts to explore a problem space must focus on questions of emergence. Ways in which a problem is defined and redefined when perspectives shift will influence conceptualisation and ultimately any proposed solutions. If an analyst merely supports users in their problem definition (decontextualised analytical inquiries), then there is a danger that solutions will be sought to problems described, and not problems experienced by actors within the problem space. However, if an external analyst supports users in becoming analysts themselves (contextualised analytical inquiries), and thus to take ownership of the analysis, a solution based on problems as they are experienced may result (see Table 1). Contextual inquiry therefore forms an agenda for analysis in which individual perspectives can emerge and play a role in a creative process of requirements shaping.

Table 1: Nature of Inquiry		
	Decontextualised	Contextualised
Overview	External analyst supports users in carrying out their problem definition.	External analyst supports actors in becoming analysts themselves.
Characteristics	Danger that solutions will be sought to problems described (pre-defined), not necessarily problems experienced by users.	Possibility for actors take ownership of the analysis. Solutions sought based on problems as they are experienced by actors.

Research into the success of IS/IT projects (Ward 2003; 2004) illustrates the importance of problem ownership in relation to IS/IT projects in business organizations. In this research, senior managers in a range of businesses were asked about

their perceptions of realised benefits from IT projects. It was found that the greatest satisfaction was expressed in those firms where IS competence was regarded as an integral part of managing a business. In those firms where IT was seen as a separate function, owned and controlled by IT professionals, and servicing the business, satisfaction with the outcome of projects was considerably reduced. If organizations are to be enabled to develop their IS 'capability', we would argue that collaborative approaches to IS development are indispensable. Other authorities agree that bringing about successful organizational change requires a deep understanding, which is dependent on analytical and evaluative strategies (Avgerou and Madon 2004). It may be most useful to view Information Systems development as one special case of intentional, beneficial change in a human activity system (Checkland and Holwell 1998). Writing specifically in the field of software engineering, Sommerville (2004) asserts:

"... human, social and organisational factors are often critical in determining whether or not a system successfully meets its objectives. Unfortunately, predicting their effects on systems is very difficult for engineers who have little experience of social or cultural studies." p.35

and later on that page:

"...if the designers of a system do not understand that different parts of an organisation may actually have conflicting objectives, then any organisation-wide system that is developed will inevitably have some dissatisfied users."

3 Contextual Analysis

The pervasive nature of IS in organizational life has led to a blurring of traditional boundaries between system development practice and organizational or business development. We also note that many smaller organizations are unlikely to have access to services of professional system analysts, management consultants or requirement engineers. They may often depend for advice upon the organization responsible for the supply and implementation of technical systems. This might be limited to delivery of a combined hard- and software 'solution'. Such an arrangement puts the whole burden of responsibility of system analysis, system planning and requirements analysis on the organization itself. However, the impact of implementing new technologies on organizational development could be quite significant. Hence a high standard of systems analysis, uncovering needs and expectations which members of the organization have from the proposed system, may be crucial. Evidence exists to suggest that an effective inquiry into the fit between an IS process and a business process in a specific organization could make or break the business (Fincham 2002; Markus and Robey 2004). We should not underestimate the importance of organizational analysis, to make sense of possible business process enhancements that could be supported by new technologies (Child 1984). Furthermore, the increasing importance of IS implementation practices for the political and social arenas that constitute organizations must be considered. If these inquiries are confined to a superficial examination of goals, tasks and decisions, the results may be

very unsatisfactory. Inquiry into opinions and sense making processes, relating to a multitude of issues in the organizational arena forming the context of IS development, can be seen as crucial to successful IS development practice (Walsham 1993).

Accelerating pace and complexity of activities in a global economy have, in recent decades, led to a growth in pressure for faster exploitation of new information and communication technologies (ICT's). Such pressures put new demands on organizational and business processes for the planning and acquisition of information technologies. The coming of the Internet, and the growth in international networks, both technological and organizational, have brought with them new demands for technologies to support organizational business activities, from managing client relationships to strategic planning, decision making and management of 'knowledge'. As ICT's becomes more and more advanced and pervasive in organizational life, so their successful implementation becomes even more crucial to the survival of the organization.

In several methodologies (for instance SSADM and DSDM inter alia) systems analysis is depicted as an early stage in the process of developing an information system (see e.g. Avison and Fitzgerald 2005). However, when considering systems analysis, a question arises - whom it is intended to benefit? One perspective could suggest it is the professional analyst herself, contemplating the task of designing an information system for someone else. This would put the analyst into a central role in the process of development. However, a further question then arises as to the purpose of analysis. If its aim is to enhance understanding of the problem space, who is supposed to create a better understanding, and of what? An information system may be defined as one whose purpose is to support individual people in their efforts to inform themselves or others in relation to their affairs. We may therefore wish to look differently at the supposed audience for IS analysis methods, and their place in the overall progress of development. Experience suggests that expert-dominated (and/or management-imposed) solutions to information problems may not always be 'bought into' by the users, because they may find that the systems produced are not relevant to support them in their professional activities. This has led researchers to believe that it may be worthwhile to involve the users themselves in co-creation of systems. Client-led design (Stowell and West 1995), or participatory techniques, such as the ETHICS methodology (Mumford 1995), have resulted. However, in a client-led or participatory approach, a focus is often placed on a communication gap. It is assumed that users do not necessarily know their own requirements well enough to communicate them effectively to an analyst/developer. Techniques to bridge this perceived gap are seen to be needed – to enable the users to articulate their needs and the developers to appreciate fully what the requirements are so that a useful system may be produced (i.e. both functionalist and neo-humanist approaches).

While efforts to overcome the communication gap are important to take further, this view still fails to address sufficiently the contextually dependent dimensions of complexity. It is not simply that the users are unable to articulate their pre-existing requirements, and therefore need a developed language and tools. First, they must be able to create an understanding of what those requirements might be, in relation to a problem space which represents their experience of working life. It is not a process

of requirements capture or requirements specification, but one of requirements shaping for creation of understanding. Support for this creative process is vital to any vision of useful systems. We suggest a collaborative approach to development in which analytical efforts continue throughout the process. Those individuals who will use the systems to be designed must own and control the analysis, supported by professional facilitators, in order to be able to explore their understandings of their experiences.

Complexification and uncertainty in organizational contexts pose apparently insuperable epistemological problems for a foundational view of knowledge. Contextual analysis might be considered as an approach that addresses these problems and their implications for research in information systems. An analyst considering a relative view of knowledge might have to look critically at a series of exemplary approaches, which might use different ontologies. Information systems research relating to contextual dependencies attempts, among other things, to build on previous core research in information systems. Researchers may, for example, explore ways in which contemporary open systems thinking can be applied to specific critical issues (see e.g. Maturana and Varela 1980; Bednar 2001). Particular emphasis is placed on multiple sense making processes, and ways in which these are played out within the frameworks of learning organizations and information systems.

A need to focus on the individual was recognised as long ago as the 1960's, when Borje Langefors started to develop the 'infological equation' (Langefors 1966). Whilst it may not have been clear to Langefors' contemporaries at the time, this work (as it is presented in the 'Theoretical Analysis of Information Systems') served to highlight the significance of interpretations made by unique individuals within specific organizational contexts (Langefors 1995). Since that time, many different aspects of contextual dependency have been a subject for IS research. For example, during the early 1980's, some information systems researchers (e.g. Olerup 1982) focused on organizational contingencies and contexts, while others (e.g. Sandstrom 1985; Flensburg 1986) concentrated attention on interpretations in local contexts of individuals and groups. However, ideas surrounding contextual analysis and its relations to individuals, groups and teams would become even more pronounced in research on continuous development. For examples of this, we may look at the work of Agner-Sigbo and Ingman, (1992) and Agner-Sigbo et al (1993). A focus on individuals and groups is also visible in research on prototyping (e.g. Friis 1991), and on individual and team learning in participative design of Information Systems (Hagerfors 1994).

Efforts have also been made to target intra-individual contexts, such as sensemaking and ethical dimensions in information systems development (Ingman 1997; Eriksen 1998; Zhang 1999). Andersen et al (1990) point out the importance of recognizing that there is no obvious or necessary consensus over requirements, or objectives, for an information system. They go on to suggest, therefore, that user-oriented, participatory managerial approaches should be adopted. While some researchers have focused on individual managerial perspectives, e.g. where a business manager is a 'user', (e.g. Carlsson 1993) others have touched upon national, cultural and political contexts (e.g. Baark 1986).

More recently, some efforts to deal with context have involved the use of actor-network theory (Latour 1999). Others, such as Claudio Ciborra who also recognised the difficulty to address individual uniqueness in relation to complexity, turned to Heidegger for inspiration (e.g. Ciborra 2001). Contemporary approaches to contextual analysis (e.g. Bednar 2000) aim to apply specially adapted methods to study how people construct understanding and meaning, and how information needs, and information use, are created by individuals within this process. The concept of contextual dependency is of interest because it supports a focus of inquiry on unique individuals, and their beliefs, thoughts and actions, in specific situations and contexts. This kind of inquiry is intended to provide support to individuals in a contextually dependent creation of necessary knowledge. This in turn may enable successful communication, analysis and, eventually, information systems development to occur.

The authors do not intend to suggest that contextual analysis should necessarily replace other, traditional approaches of IS development. It is advocated as a complementary approach which may help analysts to avoid a conflict related to unproblematic assumptions of ontological beliefs and logical empiricism. For example, analysts sometimes hold unquestioned beliefs of unproblematic objectivity and 'truths'. Like some of the traditional communicational theories, traditional approaches to IS analysis may be based on assumptions around a 'sender-receiver' model (see Grunig 1992). A contextual approach to analysis is intended to focus instead on a user-oriented perspective. Very simply put, an inquiry might focus on what Organization A wants to achieve with its information and communication system. However, if the inquiry was based on contextual analysis, it would ask instead what the individual users want to achieve, and what roles and specific purposes their activities in organizational contexts might have. What makes their unique situation recognizable? What specific role do they give to information within the organization's business? The inquiry is therefore to be seen as an inquiry into user assumptions and needs within the space of an open information system (an 'organization'). This could also be described as a bottom up perspective on information and communication systems, i.e. systems that are shaped with the intention to serve specific organizational actors and their needs. Contextual analysis, as an approach which tries to take contextual dependencies into consideration when systems are to be designed, could be seen as a response escalation in complexity in organizational life.

Approaches to IS analysis and IS development are dependent on ways in which a problem space is framed, and by whom. Soft Systems Methodology (SSM) is one possible approach which may be applied in organizational analysis and problem solving (see Checkland 1999). A distinctive characteristic of SSM lies in its criticism of analyses in which problem spaces are taken for granted (Checkland and Poulter 2006). This might be the case where, for example, analysts assume problem areas to be predefined and 'understood' by 'clients' and 'users' and 'only' in need of interpretation by an expert. Checkland has encouraged consideration of individual 'Weltanschauungen' (or worldviews) by those attempting to explore complex problem spaces using SSM (Checkland 1999). Contemporary work which illuminates these ideas further has been provided by Bergvall-Kåreborn (2001), and by Cooray and Stowell (2006). More generally, framing of problem spaces has also been given

consideration by Ulrich in his extensive discussion of boundary critique.   Many researchers have recognized that, even if technical problems can be of great significance, behavioural issues can be even more important.   For examples, see Avison and Fitzgerald (1995), Checkland and Holwell (1998) and Kling and Scacchi (1982). We should not focus our attention solely on a division between relationships of IS analyst and user (individuals or groups). Some researchers have presented approaches which open up possibilities for studies of more complex frameworks of relationships (see for example Jayaratna 1994; Bednar 1999; 2000). With the help of analysis relating to narratives of mental constructs, relationships can be discussed within a more context-dependent framework of reasoning.

4 Contextual Inquiry

We view contextual inquiry as an exploration into the nature of open systems thinking and how systemic identities are maintained and generated within a specific context. Analysis can also be said to involve a professional analyst's activities and specific use of methodologies, rhetoric and strategies to construct local arguments and findings. By the end of an initial study, an analyst might for example be familiar with some of the major strategies currently available (within a targeted organization) for further inquiries into contextual dependencies.

The nature of 'inquiry' is problematic. What are the boundaries of a particular inquiry? What are the characteristics of that inquiry? In contextual analysis, in order to facilitate requirements shaping, we need to approach boundary setting carefully. Support for this may be found for instance in work by Claudio Ciborra. Writing of the process of developing large scale infrastructures, he said:

'The message emanating from this… can be captured in a nutshell by stating that the complex process of 'wiring the corporation' cannot be understood let alone managed by applying approaches that were effective for mechanical organisations and assembly line type of technologies and processes.' (Ciborra and Hanseth 2000, p. 2).

Not only do we not always know the answers to our inquiries but very often the problems themselves need to be reframed before we can know what questions to ask. The boundaries of a problem space require consideration and critical reflection since observation varies with the stance of the observer. Any particular observer has both the duty and the privilege to make judgements regarding the boundaries of the problem space according to her own perspectives (Ulrich 2001). In contextual inquiry we are concerned with a double hermeneutic cycle since we attempt to make sense of a problem space populated by people who are themselves autonomous sense-making agents. A discussion of this phenomenon may be found in Klein (2004).

The first cycle is that found in all processes of human inquiry, including those of the natural sciences, where personal sense-making is harnessed to interpret phenomena. The second cycle arises when personal sense-making is engaged to interpret social phenomena. Here, subjects of the inquiry include other human beings, who are themselves autonomous sense-making agents. There is a need to consider their

sense-making processes as part of the inquiry, which adds a further level of complexity to the investigation.

Consider the word 'artefact' as it relates to information systems. As pointed out by Saur (1993), information systems consist of a great deal more than simply artefacts:

'Economic task, organizational, human relations/labour process and technical perspectives are all involved' (Saur 1993, p.10).

Thus, the term is problematic to the kinds of questions we would wish people to ask in their requirements shaping. We can recognize this where people attempt to incorporate Actor Network Theory in their inquiries (see for example Latour 1999). Human individuals communicate with intention (see, for example, discussion by Habermas 1984). Communication and intention is context-dependent and interpretation of context continually changes over time. This will influence sense-making and communication efforts (see Wittgenstein's later work and his discussion of language games). Constant change of interpretation, and consequently of perceived meaning, (i.e. information) was highlighted by Langefors in the infological equation (see Langefors 1966).

We are concerned with phenomenology and hermeneutics – human consciousness. Edmund Husserl is widely regarded as a founder of phenomenology. He considered that structured organising human consciousness cannot be explained in terms of generalisations learned from experience, but are presumed by experience (Husserl 1954). Thus they form the basis of an individuals 'life-world'. Gadamer (1987) developed this concept of life-world to point out individuals' submergence in the constantly changing context of their experiences. Individuals are embedded within their historical culture through the inter-dependence of language and context which cannot be transcended. According to Gadamer we interpret our world through language which is at the same time a part of our life world.

However we would argue that from a perspective of hermeneutic dialectic sense-making is an act of creation not just interpretation. At the level of scene-setting we agree with Berger and Luckman (1967) that individual construct their own view of reality by interpretation of experience. However we wish to go beyond this in emphasizing the importance of boundary setting through critical reflection and the need to consider the second hermeneutic cycle.

One possible vehicle for contextual analysis is the Strategic Systemic Thinking framework (Bednar 2000). Actors participating in this, in support of requirement shaping, develop narratives which are then classified and categorised. Actors also develop their sense-making about those narratives through language games (Wittgenstein 1958).. The language game is the process which shapes the clustering exercise, by means of which they also categories narratives into clusters. As a result, participants create an understanding as to which narrative belongs to which cluster. A language of categories is created through language games. The intention is to create some foundation for a common language. We can relate this to discussion by Habermas (1984) on communicative action. A common language is built up through interaction in the form of language games. A living language is interpreted; meaning is not included in the language.

Contextual inquiry through the SST framework might, in principle, be undertaken as follows:

1. Through language games we develop clusters.
2. Every narrative is discussed by every actor.
3. Every narrative is compared and elaborated upon in relation to previously discussed narratives.
4. Both the discussion and its content include the level of abstraction.
5. Understanding is developed through negotiation and interaction, language is also developed through interaction.

Here we perceive the double hermeneutic circle. We see language and meaning-making constantly changing through negotiation. The purpose of contextual inquiry may be seen as discovery and creation of new understandings as a way to support breaking away from prejudice and bringing about a shift in the dominant paradigm within which sense-making takes place.

Thomas Kuhn suggests that there is a common perception of progress through selection as paradigm shift occurs. However, we would point out that there is also a possibility for regression, i.e. a 'stupidification' of society. As Kuhn recognises, the perception of progress is almost inevitable since those who espouse the 'winning' paradigm will not encourage any further interest or attention to the work of defeated rivals.

"Why should progress also be the apparently universal concomitant of scientific revolutions? Once again, there is much to be learned by asking what else the result of a revolution could be. Revolutions close with a total victory for one of the two opposing camps. Will that group ever say that the result of its victory has been something less than progress? That would be rather like admitting that they had been wrong and their opponents right. To them, at least, the outcome of revolution must be progress, and they are in an excellent position to make certain that future members of their community will see past history in the same way." (Kuhn 1996, p.166)

Returns to earlier paradigms are possible, but are likely to be patchy (consider members of the Flat Earth Society denying modern ideas of geography, or the Seventh Day Adventist Church objecting to the theory of evolution) or derived from a longer term view in which further evidence is available to confront the prevailing paradigm. Contextual inquiry is not intended to be seen as a basis upon which 'good decisions' will always be made. The purpose in undertaking contextual inquiry is to provide a richer information base upon which decisions could be made for better or worse.

The boundary of a problem inquiry will be drawn in time and space, but is also framed by characteristics. Orlikowski (1994), for instance, proposes an approach for examining underlying assumptions (framing phenomena). Technological framing she perceives as essential to understanding of development, use or change of technology in organisations. The linguistic turn (see Klein 2004 p.128) is relevant here, because language influences the nature of the questions we might ask. When we frame these questions, it is important that we take into account both hermeneutic cycles.

Conclusions

The concept of a 'network of actors' is relevant for us to consider. If an information system is seen as an artefact, consisting of linked elements (including people) making up a greater whole, then complexity is ironed out, as the individuals become invisible to the inquirer. However, if an information system is seen as a network of human actors, communicating by interaction using available means, then complexity may be recognized through the individual sense-making processes of each individual. The 'system' is something which emerges from that interaction between individuals.

An essential feature of contextual inquiry is framing of the problem space (see Orlikowski 1994), and boundary critique (Ulrich 2001). These are the responsibility of individual analysts, i.e. those whose problem space it is. Boundaries will change through many dimensions including (the experience of) the nature of the problem, its relevance and what the problem space comprises. In this paper, we have developed and presented arguments in favour of requirements shaping and its relevance to systems analysis. In doing so, we have distinguished requirements shaping from other concepts such as requirements elicitation or specification. We have done this from a particular perspective of contextual analysis, which we refer to as contextual inquiry.

We have discussed a collaborative approach to design, in which individuals involved in a problem space are encouraged to take ownership and control of their own analysis, with support from an external analyst. We describe a process of requirement shaping through contextual inquiry carried out by the organizational actors themselves. The scope of such inquiry does not just focus on data and processes, but on a phenomenon of processes that is human interaction. Analysts conducting contextual inquiry into requirements shaping also have an opportunity to recognise individual emergence through a hermeneutic dialectic.

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