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Romancing the Stone - Aiding Sense-Making in Organizations

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Abstract

Despite many years of implementations, issues surrounding the success or failure of information systems are still shrouded in mystery. In a quest to improve business outcomes from such systems an IS analyst should have a key role to play. Organizational IS can be seen as a composition of individual and organizational learning processes, and as such is in a constant state of change. Knowledge as an individual sense-making process is a shifting sand of lessons learnt, experiential practices, active reflection and is therefore historically unique. Even when the balance of individual competencies, skills and attributes would seem to have been sufficient for the task at hand failure can still result from the combination of factors within that particular project. Organizational sense-making activities suffer from irrationalities of action, skilled incompetence's and a plethora of organizational defence mechanisms. Within the information systems field, contextual analysis is an initiative focused on addressing issues of organizational information systems. Such systems are 'community' initiated, where system development or change activity is mentored by the analyst through the developmental mechanism of continual learning and communication.

Keywords: contextual dependencies, sense making, information systems, organizational learning, systems thinking.

Introduction

Within an organizational context questions are raised surrounding the move towards becoming learning organizations. Such problems sit at the heart of the fundamental processes of change and organizational improvement. These issues may be further explored through a discussion of the following themes:

- The voyage of enquiry into multiple levels of contextual dependencies is surrounded by relativity uncertainty and ambiguity.

- Knowing in time and space as an investigation of information flow and sense-making processes in context.

A desire to learn can be seen as an urge to enter the unknown. While this does require ontology to be taken into consideration the focus of attention is an epistemological question (see also discussion in. Bednar and Welch, 2008). Related to curiosity, desire can for example be romantic and idealistic or affectionate and pragmatic. The key difference (as focused upon here) relates to a relationship that exists between a desire and an intended outcome. The creation of organizational maps, which relate to social, cultural and behavioral patterns of (organizational) learning, locate dynamic knowledge as contextually dependent within an organization. This particular notion of organizational sense-making (e.g. Weick, 1995) includes further complex relations with individual and organizational learning, as well as organizational change. Within this paper we relate individual and organizational sense making processes to systems thinking and make subsequent connections to information systems development. The core of the problematic issues (which we as IS analysts have to deal with) has to do with a difference between 'espoused

theory' - our description of what we think we do; and 'theory in use' - what others can perceive that we do (e.g. Argyris, 1990). The efforts to surface and try to solve such problematic issues can be seen as an inquiry into the informal and subconscious behaviour of individuals - their intra-individual contexts; and the interactions between individuals - their inter-individual contexts (e.g. Bednar, 2000).

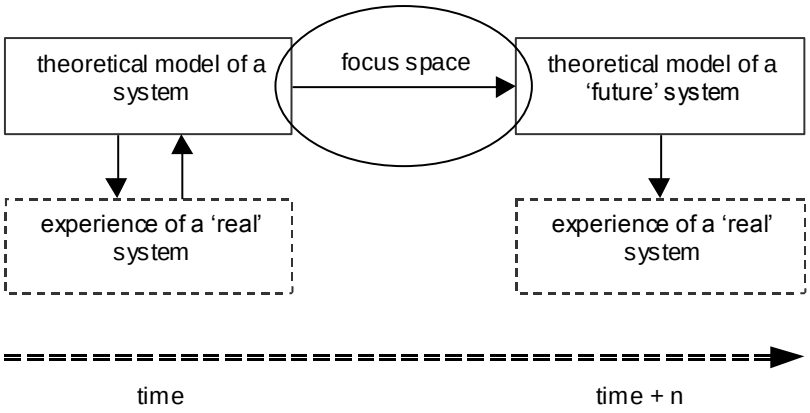

Figure 1: 'Traditional' approach.

Organizational and individual sense-making is viewed here as being rooted in a desire to improve; such a desire may invoke a tension between what is thought of as acceptable and what is thought of as necessary behaviour. A personal ability to break through organizational norms both explicit and tacit demands the personal courage to navigate uncharted waters. To what extent is it realistic or desirable (e.g. for an analyst) to challenge made assumptions of a problem domain? In IS implementations there are examples of organizational pressures where this kind of challenging activities are unwelcome (e.g. Walsham, 1993).

A lack of such challenging of assumptions however can be seen as a blinded voyage. One example of a blinded voyage might be the undertaking of individuals and teams that 'know what they seek'. Whilst an undertaking of those that 'seek what they know' can be viewed as being constrained by a cultural cage.

The desire of a professional analyst may require both courage and curiosity to explore a problem space without (excessive) constraints by invoking a reflexive element within the practiced analysis process.

Voyage of Enquiry

Extract from 'The Hollow Men' (Eliot, 1990, p 80):

Between the idea

And the reality

Between the motion

And the act

Falls the shadow

Information systems analysis can be seen as something that lies in the shadows between ideas and realities. Analysis, which includes both reflection and design is like something between motions and acts. Such ideas are reflected in notions of unspecified

ideals, ambiguous goals and visionary missions which, are shaped by realities that exist in individuals experience from both an organizational and personal perspective.

To be efficient we argue that the desire to transform ideas into realities requires motion and the ability to act. Motion is an inherent impetus for change and a precursor of the act that effects a transformation. An analysis process commences with an idea of exploration, based in unique particular realities of individual experience, where a specific combination of motion and acts represent a voyage of enquiry, into an effective development of a system, which will aim to fulfill (some) organizational needs. Systems development requires an analysis of existing organizational practices and procedures (Checkland, 1981; Avison & Fitzgerald, 1988). Despite a wealth of both research and practice at an organizational level, a continuing propensity for systems to be unsatisfactory within the organizational context, highlights a need for both researchers and analysts to chart new courses. Especially since the charting of new courses might be seen as necessary to make future successful voyages plausible. The success of each such voyage can be related to the desire of both the analyst and those organizational actors operating in their contexts. A sustainable success might require the participants to chart both the progress of a voyage and to reflect upon the findings.

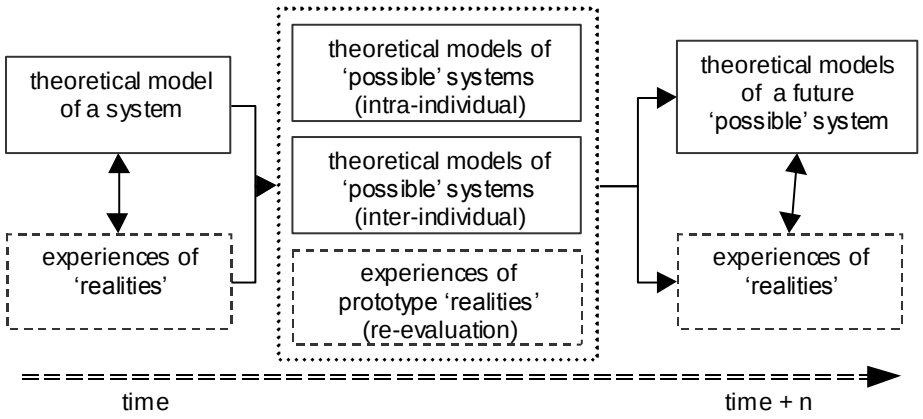

Figure 2: 'Contextual' approach.

The concept of organizational learning (Argyris & Schon, 1978; 1996; Senge, 1990) has fuelled much IS research into structured learning and suggests that a systems thinking approach may provide insight into the complexities of organizational practices. This dimension of the voyage can be represented as a "macro" perspective and can be related to open system theory (e.g. Rogers & Agarwala-Rodgers, 1976). This perspective relates to IS strategy, organizational learning, organizational information systems research and information systems methodology research.

Let's for a moment consider a simple system and the interactions of an analyst with such a system.

Romancing the stone Part I

Consider, for example, a stone on the street as a system member, to most of us this is a pretty simple, almost primitive kind of system because we are capable of interacting with the stone in a very circumscribed number of ways. We can break it, throw it, kick it – and that's about it. Each of these modes of interaction represents a different way to interact with the stone. But if we were geologists (analysts), then the number of different kinds of interactions available to us would greatly increase. In that case, we could perform various sorts of chemical analyses on the stone, use carbon-dating techniques on it, x-ray it and so on. For the geologist (analyst), the stone becomes a much more complex object as a result of these additional – and inequivalent – modes of interaction. (Casti, 1994)

The identification of this level of complexity within a simple system offers insight into the degree of complexity present when the analysis of a complex information system is undertaken. In the study of organizations, (Harvey, Mallalieu, Hardy (1999) it is possible to identify some possible factors that bear upon a particular situation, and often to have some feel for their relative importance. Two issues emerge here in terms of systemic understanding. Firstly, how do you recognise which factors have not been identified? Secondly to isolate identified factors is not meaningful. To decontextualise a process or an operator in order to study them, is to take away their meaning or raison d'être. If you try to remove some of the factors that operate on a situation, then you are removing context and meaning; in essence you are discounting the interactions without which the system becomes a series of objects. It can be seen therefore that any problem with a social element will ramify greatly (Shurville et al., 1997) when the ability to set boundaries around the notion of an object is a complex task in itself. Just as the interconnection of variables is endless, so are implications of any change or posited solution.

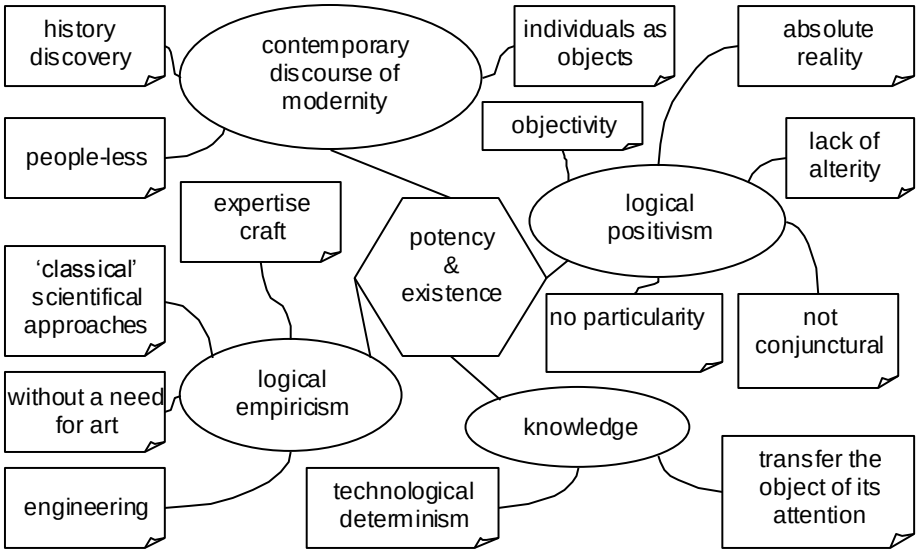

Figure 3: A 'classical' mindmap.

If you isolate a variable/factor/agent, you remove it from its context. For instance, in studying a relationship between an organization's systems and its business processes it may be appropriate to isolate this relationship in the following way. One could model the way in which a process works according to the appropriate manager, and then using the same technique, show a way in which the software related to that business process works, and then compare the two mappings. This would allow an analysis of fit or lack of it, however many important factors have been excluded. Both managers and the staff who operate the computer system may have different expectations of it from those that it was designed to deliver. A study of the business process and the

computer system as they operate will reveal a different pattern from the ideal ones modelled above. The difference between ideas and realities. Such a study will reveal short cuts, extra activities, and clever solutions to problems, even abuses. The difference between motions and the acts.

From a macro perspective the following issues may impact: how a business process is carried out, and the way in which a computer system is being used will be affected by company culture, by the degree of unionization and demarcation, by the education and flexibility of the staff. Whether the specific company for example is buoyant and profitable or defensive and unprofitable. The geographical locus on a site or between sites will also have an effect. The wider context of the organization may have a huge influence: for instance where a particular computer system may have a role in the supply chain. A particularly important supplier or customer may have dictated its use with no reference to the organization's business processes. Above all, the history of both the computer system under consideration, its existence and implementation, and also the overall business process will have an impact: e.g. resentments may still endure following poor practice in technology transfer or in change management (see for example Rogers, 1995; Walsham, 1993).

Beyond this lies a mirroring layer of complexity. This is the layer of the analysts' own attitudes, shaped by their background, their history of experiences and their personality. In some ways this is not open to study by the analyst since they are inside the situation and cannot see the whole of it. Positivistly inclined scientists favour objectivity - the putting aside of the analyst's own views and values in order to establish objective truths (Silverman, 1998). Interpretively inclined social scientists feel this is impossible (Winch, 1958), as being inside the situation, the analyst cannot even identify all those factors that need to be filtered out. In fact, the most fundamental and influential factors may be those, which the analyst is least able to see because they are so much a part of them. Efforts to brake out from detrimentally pre-determined problem spaces can be viewed in Soft Systems Methodology as presented by Peter Checkland (Checkland, 1981; Checkland and Holwell 1998). This difficulty has not been easy as also has been acknowledged in the description of the NIMSAD framework for evaluation (Jayaratna, 1994). The problems of applying limiting and overly narrow approaches to a problem space should not be underestimated and needs to be taken seriously (Kling, 1999).

Some interpretive scientists recommend instead reflexivity or even a 'Reflexive Methodology' (e.g. Alvesson and Skoldberg, 2000). They acknowledge that a researcher's findings will be influenced by their own values and outlook, and instead promote the idea that the analyst should explore and acknowledge them. The self-knowledge will still be imperfect because the analyst is too close to the subject, but at least contemplation is encouraged with the notion of reflexivity.

The challenge for information systems analysts is to delve into this complex, intertwined, plethora of facts which are intrinsically ambiguous, uncertain and relative in order to identify the factors which when combined within the organizational context can best inform systems development. This can be supported by an acknowledgement of the existence of multiple levels of contextual dependencies. An inquiry into these contextual dependencies encourages more than 'traditional' IS analysis (e.g. Bednar, 2000). An analysis undertaken with such an approach becomes a voyage of enquiry.

Knowing in time and space

Extract from 'The Hollow Men' (Eliot, 1990, p 80):

Between the conception

And the creation

Between the emotion

And the response

Falls the shadow

At the heart of a voyage of enquiry into information systems analysis lie the individual actors, the creators whose ideas, realities, motions and acts represent the uncharted course to be taken. This part of our story lies in charting the shadow of individual perspectives, context, sense-making and information flows. The conception of the history of the context in which the information system exists requires knowledge of its creation. For such knowledge to be meaningful it must encompass not only the system 'realities' but also the emotions and responses of the individuals as sub-systems in themselves and as members of the

contextually situated information system. Here the voyage of enquiry charts a course in which knowing becomes situated in both time and space.

This part of the voyage can be to represent the ‘micro’ aspect of the journey, where the focus is on the individual, not the work group or the communicational structure. This ‘micro’ perspective includes an analysis of individual sense-making where the individual is seen as an open sub-system. (Bednar, 2000).

This kind of individual sense-making can be explained with the theory of autopoiesis in terms of a subsystem’s efforts in understanding itself as an entity with relations to a “super-system” or surrounding “world” (Maturana & Varela, 1980). The “micro” perspective might be based on perspectives of individual learning and cognition, which is sometimes represented in HCI (human computer interaction) as philosophical, psychological and management research. Now let’s consider the implications for the analyst in this type of system interaction.

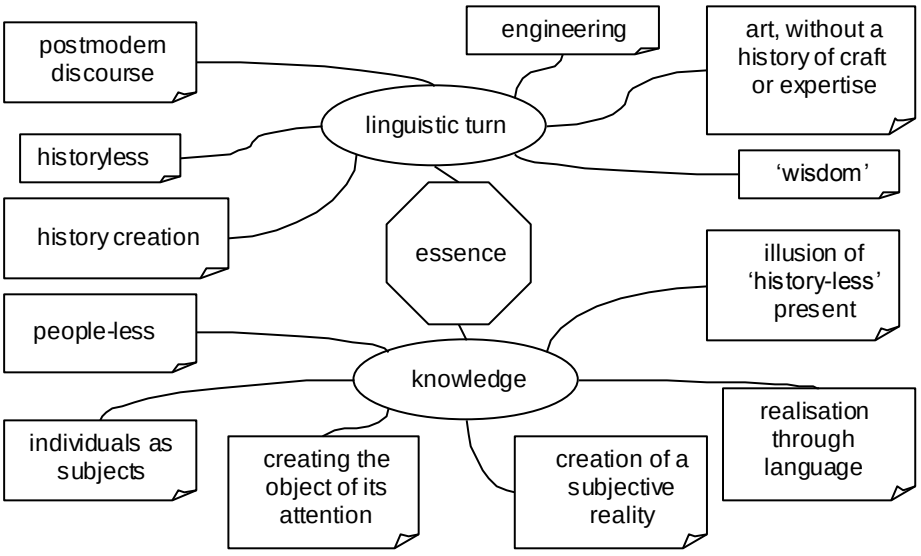

Figure 4: A 'postmodern' mindmap.

Romancing the Stone Part II

An illustration of this position occurs if an individual walks on a beach and picks up a stone, the individual might see a rock with no special characteristics or features. But if the individual were a geology student he or she might recognise different kinds of minerals in that piece of rock. That is to say an individual can only see what he or she knows and what he or she perceives as interesting. (Bednar, 2000)

Enquiries into how an individual actor perceives elements of the system focus on the intra-individual analysis. Such an analysis investigates unique individual interpretations of contexts and sense-making activities in relation to other individuals within overall (unique) organizational contexts (Bednar, 2001a).

By taking an individual focus to the interpretations of contextual analysis the understanding to be developed relates to the unique individual within the organizational context. Langefors (1966) initiated such studies with the notion of the 'infological equation' he stated that the personal pre-knowledge and individual sense-making activities were integral components of an information system. Further efforts have since then been made to target some of the intra-individual aspects of information systems design (e.g. Ingman, 1997; Eriksen, 1998; Zhang, 1999). The notion of contextual dependency purported by Bednar (2000), focuses on an inquiry surrounding unique individuals, their beliefs thoughts and actions within specific (organizational) contexts and situations.

When we undertake an enquiry to chart the course from conception to creation, we may investigate the means by which individuals make things happen. From this viewpoint, people set into motion acts which have both intended and unintended outcomes. The outcomes are a result of combining knowledge, skills, personality traits and attitudes with the unique way in which plans are developed and actions systematized in order for outcomes to be met. Within the course of this journey this aspect represents the shadow between conception and creation. The means by which such plans evolve is dependent upon sense making activity as both an internal cognition and an external behaviour (Dervin, 1989). Such activity enables an individual to construct and shape their own movements through time and space; sense-making activities are therefore, contextually dependant behaviours where the core factor relates to the searching for and use of information (Bednar 2001). Within the field of cognition Piaget, suggests that both meaning and knowledge are uniquely created through interactions with the environment of the individual (Flavell, 1968) where sense-making is influenced by contextual dependencies.

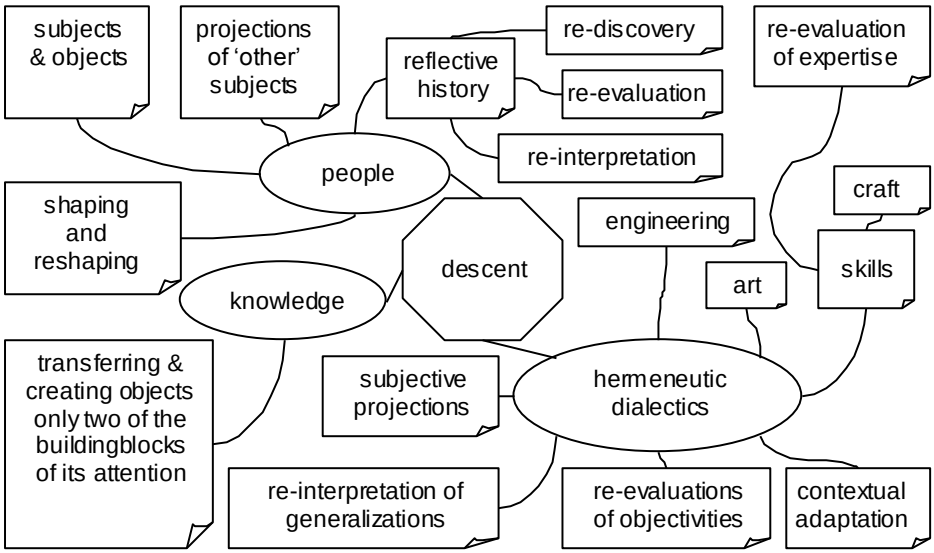

Figure 5: A 'contextual' mindmap.

The journey continues here with the need to comprehend the shadow between emotion and response. The perception of individuals of actions taken or creations made can often be affected by the emotional state of the person involved. Notice for example

the effect of sunshine on a crowd, or the tone and manner of a request for help. For information systems analysts, and others involved, understanding of the emotional context of a system implementation can be a key factor in how successful their intervention may be. Consider for a moment, a system that is being imposed by the perpetrator of a hostile take-over of an organization, individuals are frightened for the future of their work, and all that is familiar with their working environment is being subject to change. The implications of emotions and responses are fundamental to successful analysis and form the underlying contextual dependencies and sense-making activities of organizational actors. Such understanding enables an information systems analyst to explain the shifting nature of the environment in which the task is situated, understanding the variations in this environment are the key to successfully locating knowing in time and space.

Knowing as desire

Extract from 'The Hollow Men' (Eliot, 1990, p 80):

Between the desire

And the spasm

Between the potency

And the existence

Between the essence

And the descent

Falls the shadow

When a voyage of enquiry is founded in knowing the relationship between time and space, the fundamental notion which fuels information systems analysis is desire. As a psychological mechanism desire is a driving force for change with urges for action that are often spasmodic. Desire may exist where the following combination of factors provide a supportive environment for action. The potency of a situation acknowledges that the conditions necessary for the development of future growth prevail and the occurrence of such a situation has to be in existence. The intrinsic qualities or the nature of the situation are captured within the notion of essence and the descent acknowledges that the essence has a history tracing to an earlier source. Information systems analysis is situated within this arena of ('reality') the shadows being explored exist where the situation is fundamental to the ability to develop appropriate systems. An evolution of systems in such an environmental manner is supported by the notions of deutero-learning where the focus for the analyst would be on the notion of 'learning to learn' (Bateson 1999). In such a setting information systems analysis equal desires to comprehend the relevant interactions between system members.

Effective analysis includes establishing the level and nature of tacit agreements established by system members regarding actions and the nature of their relationships. Systems analysis of this type involves enquiries which aim to bridge the gap between the conscious and unconscious actions of and between system members. This bridging effort is a learning activity done through a combination of a) intra-individual analysis, b) inter-individual analysis and c) evaluation (e.g. Bednar, 2000; 2001b). Since these activities also aim at learning of reflection over second order learning (see Bateson, 2000 for more in-depth description of second order learning), they can be considered to some extent to be outside the hierarchies of Bateson's four orders of learning. Knowing as desire can also be seen as a need to explore without previously constructed boundaries as expressed in the following story.

Romancing the Stone Part III

Let us now act as a jeweller. Imagine that we see a stone; we know that we can interact with it in a variety of ways, so that as a member of our system, possible interactions exist in a variety of guises. Consider now the different ways in which we desire knowing the stone. This mode of interaction would combine the elements of both previous stories (change wording e.g. sense-making, approaches etc.). The jeweller (analyst) is interested in knowing the stone (the search for the soul of the stone) in terms of its physical properties, the specific skills required to bring out the potential of the stone. (the interaction of the between system members) The jeweller may cut or polish, according to the properties of the stone and the intrinsic qualities that are

understood on account of his specialist knowledge. The intra-action within a system member (intra individual system) is an emergence in its own right (e.g. Bednar, 2009). A further synergistic element emerges within this story where we consider the design of the intended piece. The jeweller has a stone which furthers the design quest, or he may uncover a stone that he experiences as being so precious that he creates a design to enhance it. The play between different properties of the jewels and design and experience, are indicative of the quality of the effort to romance the stone.

An enquiry into contextual dependencies might aim to integrate macro and micro aspects of organizational change. Such integration could be founded in the requirement of information systems analysts to be explicitly aware of both the inter and intra individual perspectives which impact upon the system within its context. Analysts could be assisted in their activity of enquiry by the application of such techniques as brainstorming, rich pictures and conceptual models alongside mental constructs into useful methods for organizational analysis (e.g. Bednar, 2000). The development of much richer pictures of analysis enables account to be taken of communicational and contextual influences for systems and information systems developments.

Where information systems analysis relates to the combination of science and craft to design activity two aspects of influence, are being explored. Firstly, the intra perspective where one can imagine an oil painter, who may not have great visions with which to inspire his paintings, but, can handle the tools and techniques of his trade with dexterity and expertise. Such a painter is a craftsman of his art and his pictures masterpieces in their own right as a representation incorporating the use of the tools and the ability to invoke images. This exploration relates to the concept of 'fitness for purpose' here the artist would choose the medium that is most appropriate for the intended outcome. Fundamental to this notion of 'fitness for purpose' is a relationship between the selection of the appropriate tool for the task, the presence of empathy between material, subject and technique. This sensitivity represents the shadow between the potency and the existence and relates to the knowledge of the information systems analyst. Potency is inclusive of a desire to grow and develop the knowledge which is in existence. An analyst requires the desire to continually improve the level of technical competence and understanding of tools and techniques, which can produce increasingly meaningful systems within the context of the organization. This skill relates to the reflective practice surrounding the body of knowledge, which encourages the selection of the appropriate tool for the task.

The second aspect explores the inter perspective between system members. Consider the notion of dance, where in each performance the dance has an identity which is its own. This identity emerges from the combination of a variety of factors: of the individual dancers and the uniqueness of both their history and performance, the ambiance of the piece, the contribution of the orchestra, the quality of the setting, the mood of the audience etc. The unique dance emerges as a result of the interactions of, between and at the liminal edges of the group. The rules of such a dances are fluid and subject to change as the dance proceeds. Notions of domination, contribute to who leads and who follows, in an interactive and improvised performance. The relationship between free-flowing dance and information systems analysis can be made explicit in the same way that one cannot step into the same river or view the 'same' dance twice. Where an information system is analysed from an emergent perspective, a level of fluidity in system performance will be better able to fulfill the information needs of the system members (e.g. Bednar, 2009). Such a system may have the capacity to support actors in their own individual methods and practices; it may have the capability to inform in unusual combinations or time responses. Developing and applying contextually relevant concepts, such concepts are rooted in a need for flexibility, adaptability and creativity in the same way as an organization is required to respond to, and engage with its market. Here the required sensitivity relates to the shadow between essence and descent where the fundamental nature of a system and the histories of all its members play a key role in the analysis process (see also discussion in Bednar and Welch 2008). This (inter-individual) system perspective is achieved through the analyst's understanding of the changing nature of the information system, its organizational context and through constant reflexive practice in relation to the system members.

Conclusion

The intransigence of traditional information systems (analysis etc.) is unresponsive in a way that demands change. That change must come from a new paradigm of information systems analysis, development and implementation. This new paradigm is rooted in a desire to learn, where the analyst is undertaking his role with a view of reflexivity towards system and member, where there is a notion of situational appropriateness in the application of tools or techniques, where there is an acknowledgment of the information system as being holistic as and within the context of the organization and where the ideal and pragmatic aspects of such a system have a synergy which encompasses both romance and affection. Knowing as desire in such a system focuses on the play between romance and affection and is the essence of romancing the stone.

Within contextual analysis, the proposed enquiry into contextual dependencies might be seen as a possibility to support more evolved and more contextually viable design approaches; while trying to adapt specific methods used within the scope of an unknown problem space. This kind of approach is meant to offer possible means of structuring highly unstructured, uncertain situations typically, although not exclusively, found in information systems analysis work. Such a quest and desire for knowledge can be supportive for decision-making when the problematic scope is highly uncertain within the environment. Knowing as desire can be seen as a play between romance and affection, a way of romancing the stone.

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