

Title:

A Narrative Analysis of Information System Development in a Local Government Organisation: Conversations Reflecting Deferred System's Design.

Paper Aim:

Using a Case study making the case for DSD in decision making as a strategic choice.

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Abstract:

Our study concerns how an information system is scoped and defined as an organisation attempts to initiate a web-based information system. We sought to understand the very process of defining and specifying an information system (IS) through conversational analysis within a case study organisation, a local authority in the UK. Our textual data reveals that participants in the instigation and definition of the IS themselves seek to understand the purpose and scope of the proposed IS, leading to tacit and explicit design. They use organisational mechanisms such as vision statement and meetings to develop knowledge. We contend that the very essence of an IS is determined in the social context of the organisation and its mechanisms, and that its nature is emergent and fluid, the feature of deferred system's design, rather than temporally and functionally fixable. We analyse the data gathered to identify the strands of emergent informational and organisational behaviour that supports the case for deferring design decisions to employees. We propose a model depicting IS and information technology (IT) design as integrated social systems, containing tacit and explicit knowledge concerning design, and propose Deferred System's Design as suitable for such an approach.

Keywords:

Deferred System's Design, Deferred Design Decisions, Methodology, Systems Development Life Cycle, Emergent Organisational Behaviour, Conversational Analysis, Scooping requirements, System defining

Introduction

The problem addressed in this paper concerns the process of scoping and defining an Information system (IS) in a local government organisation in the UK as it seeks to develop and extend IS functionality into a web based resource. We adopted an qualitative approach, seeking to understand the context, interrelationships and multiple interpretations that are at work, and applied an approach to study the early stages of specifying requirements *as they emerge* for the web-based casework IS in the local government authority, referred to as Bar (a pseudonym).

In terms of IS, emergent organisational behaviour tend to view IS as resulting from the social dynamics (Ciborra 1991; Orlikowski and Walsham 1996). Conceptualising IS development in terms of social dynamics has led to many authors to draw upon social science disciplines, especially prevalent in the initial system design stages of scoping and defining. Systematic to this underlying approach has been the thinking of system design as a rule-based approach, as apposed to fact-based, and as such Hirschheim et al has characterised the approach of essentially comprising three issues; a) IS's are tied to action, b) an IS is contextualised and, c) IS's are purposefully developed for continual change (Hirschheim, Klein et al. 1995, pg 209). Specifically, we focus upon the perceived difficulty IS has in handling continual and changing demands at the beginning stages of an IS development.

There are many potential solutions that seek to offer flexibility for future or ongoing development in the design process, EUC (End user computing), adaptive systems, tailorability, RAD (Rapid application development) and component based design, are only a few on offer. However, the solutions on offer assume that previously made decisions on the problem of 'what to build' have been largely solved, the issues are further muddied when the intended IS partially utilises existing 'brown-field' systems and social practices. It has been previously recognised and suggested in previous research that there is a need to defer the system design (Patel 1999). This paper develops the approach proposed by Deferred System's Design (DSD) concepts (Patel 1999) into extending the research enquiry to seeking to recognise if deferrals naturally occur in social IS dynamics within the requirements gathering stages, and if they do, if it is possible to distinguish them as such. If this is so, we feel that it would lead a better understanding in the IS decision-making process of the 'what' gets made and when.

We introduce the case study here as an interim progress report of larger fieldwork research project investigating possible approaches to requirements capture for DSD. As such our research protocol objective set out a three-phase plan. Firstly, a discovery phase using qualitative techniques of data collection. Secondly, a systematizing data phase, to assist in conceptualising the data in a coherent way for reliability. And lastly, an analysis phase; the analysis elaboration scheme builds a preliminary theoretical model that may possibly explain and represent the social IS phenomena of deferment; this last stage facilitates validity and testing of patterns of data, adapted from Silverman's suggested five ways of validating (Silverman 2001 pg, 236).

In the rest of this paper we examine the development of a web-based casework IS primarily from the individuals' and groups' perspectives and in the context in which individuals and groups in the organisation operate. We start by providing a description of our research approach and ontological position and the development of research protocol. We use Giddens' sociological theory of structuration to underpin our methods. We go on to consider our overall judgments towards the data selection process, whether the selection is valid to assess the criteria we used for the selection of individuals' and groups' viewpoints. We describe the essential features of the case organisation and provide samples of our data and its analysis, creating a model of IS development around human interaction that leads to tacit and explicit knowledge of design decisions, and draw conclusions for the implications for IS development practice and research.

The Interpretivist Case and Narrative Analysis Research Approach

Orlikowski commented that only 5% of IS research in the late 1980's used interpretive research methods (Orlikowski and Baroudi 1991) Nandhakumar and Jones using the same classification of recent published papers 1993-1996 showed a modest increase to 19% (Nandhakumar and Jones 1997), yet despite its only acknowledged modest increase, Klein and Myers (1999) argued that the interpretive research method is particularly appropriate for the study of IS development, implementation and use within organisations.

Interpretative data collection techniques commonly used in IS practice can be collated into two distinct camps. One, to be used in the initial problem formulation

stages, whereby multiple perspectives can be incorporated into one design, as in Holzblatt and Beyer's ethnographic approach (Holzblatt and Beyer 1993), or the socio-technical approaches such as Checkland's soft systems methodology (Checkland 1993) reflecting many current methodological approaches that lead to a single objective meta viewpoint. Secondly, interpretative tendencies are to be found in many of the user centred design approaches, often utilised and restricted to the interface design stages using pre-formulated, reinterpreted and pre-existing processes as templates and models. Such approaches are seen in the use of prototyping, case tools, and case based reasoning tools.

Over the past decade significant inroads and success of interpretive analysis research is found at the union between the business organisations and the 'fit' of IT IS technology. Various authors (Suchman 1987; Zuboff 1988; Walsham 1993; Orlikowski 1996) have shaped much of this thinking. However, with the growing use of web-based technology, integrated web programs, and the emergence of the paradigm of interconnected web weaving (Berners-Lee and Fischetti 1999), an alternative approach is needed, that is, one defined by hypertextual characteristics (Scharl 2000), together with a convergence of interpretive theory, technology and contextuality (Jones and Spiro 1995). This has led to authors suggesting a new interpretation of IS design based upon an action-centred ontology that encompass 'the domain of action' (Denning and Dargan 1996). This move towards pervasive or ubiquitous computing (Hansman, Merk et al. 2001) based on connectivity has as its basic ontological premise continual change and development, not only in the sociological sense of the human condition, but also in the need to reflect IS design as action based systems. Our research approach and research methodology design needed to reflect this, and we have adopted a procedure for data capture and analysis that seeks to understand the domain of decision making in requirements of scoping and defining design requirements which are composed from the individuals and groups' needs, and which captures intersection points in a web of IS design.

We have selected as our primary data analysis and collection tool conversational analysis (CA), specifically focusing on Harvey Sacks' ethnomological membership categorization methods (Sacks 1992), which facilitate family grouping. However, this approach left us with fundamental methodological issues (dealt with below) and with issues involving presentation. In dealing with the presentation issues, we had the problem of distillation, in a picture snapshot postcard moment. In order to achieve this we co-opted a coarser grained approach of narrative analysis, based upon

Davidson's classification of narrative segments as structural components (Davidson 1997), not dissimilar to Silverman's qualitative interpretive approach of CA (Silverman 2001). We have additionally set out to restrict our primary data source collection to **naturally occurring** conversation by recording the conversation of an IT project team's second meeting. This took place in a meeting room on the morning of the 5th July 2001 (9.30 to 11.45), between eight people. Having recorded the meeting on a portable tape recorder we transcribed the audiotape using transcription schema as reproduced by Silverman (2001). This led on to our second systematizing data phase.

The first methodological issue referred to revolves around the structure of organisation of talk and from the CA conventions of underpinning assumptions on emergent patterns of organisational behaviour that could be at odds with our thinking. Silverman (2000) points out that these patterns stand independently of the psychological or other characteristics of particular speakers. This has potential limitations and implications for the use of interpretive techniques for IS development and, as previously noted IS development needs to be contextualised rather than fact-based. The organisation of conversation and talk is treated as reflecting the structural organisation of a social institution; a view that draws on and is underpinned by Durkheim's conceptualisations of 'social fact' (Silverman 2000). Social fact as used by Durkheim clarified the distinctive subject-matter, that of sociology, its ontological stance, emphasising the psychological creativity of human society. He proposed that human 'association' is a creative process, producing new experiences.

Giddens himself draws heavily upon the ideas of Durkheim, in particular the central concept of the structural properties of societal constraining influences over action (Giddens 1984). However, Giddens proposes an alternative theory. Instead of seeing the structural properties as constraining human society, he contends in his structuration theory that structure is always both enabling and constraining in a duality relationship with agency and power. Later, we use this argument supported by our data analysis to underpin our model. The fundamental assumptions of CA, based upon Durkheim's constraints of action drawing 'social facts' presumes constraints through language in the sense that it pre-processes a range of framed, rule governed properties. The process of language sets limits to cognition and activity. The essence of Giddens' argument in structuration theory is that:

"human societies, or social systems, would plainly not exist without human agency. But it is not the case that individuals and groups create social systems: they reproduce or transform them, making what is already made in the continuity of praxis" (Giddens 1984, pg. 171).

Notwithstanding Archer's (Archer 1996) and others (Callinicos 1985; Willmott 1986; Layder 1987; Held and Thompson 1989; Johnson 1990; Byrne 1991; Mestrovic 1998) general criticism of structuration theory, Jones (1999), Orlikowski (Orlikowski and Robey 1991) and Walsham (Walsham and Han 1991), among others, have suggested that structuration theories are of use for informing IS development. Orlikowski states that it is a mistaken belief to focus on either the constraining or the enabling aspects of systems categories, or either the content or the context of category use and therefore of IS design. She argues it would be better to integrate these alternative views, acknowledging their valid and complimentary perspectives (Orlikowski 1995). From the DSD perspective, we can interpret the performance of people acting in situated contexts, where people act and react reflexively drawing upon their experience, their own position, status, and of their willingness or desire to act or participate in the process of the interaction. We now can go on to observe these features in the process of scoping and defining the IS.

Some Research Design Application Preliminaries

Before introducing the case study, we outline some of our influences on it, set the background, and state the focus of the study. We also, in accordance with ethnographic research of 'showing the hand' (Altheide and Johnson 1994), make explicit the investigators' own motivations, goals, and innate predispositions towards the case studied. This includes a short description of our ontological position. We go on to consider our overall judgements towards the data selection process; and the criteria we used for the selection of individuals and groups' viewpoints. We then go on to give a brief description of our research methods. Our aim is to find the diverse opinions and attitudes that individuals and groups have of the process they find themselves a part of.

The data we present here is part of a larger research project which is investigating a number of possible approaches to the scoping and defining of DSD. In this paper we are investigating the phenomenon that an IS is an organic integrated part of human ongoing societal activity. As such, design and operations performed upon or with an

IS can never be preordained or as a fixed rigid engineered plan, but are more likely to conform to systems tailorability (Patel 1999) (ongoing functionality and interface mutation).

The second aspect that we wish to place *a priori* is in the usage, implicit in the concept and use of, the word 'change'. We believe that there is no such thing as 'fixed'. An IS cannot be specified in fixed temporal or functional senses. We offer an alternate view that the social world is in a constant flux, or, taken from a psychological subconscious view, it is seen as a person (human consciousness) attached, or linked, to an ongoing social activity. It follows that IS development is a part of a continuum in a given operational environment. A metaphor that explains this is to view change, in this context, not as a revolutionary switch, a digital on or off, but an analogue signal of amplitudes, layered within strata-bound processes, creeping at different speeds and different perspectives.

Local Authority IS Development

Here we outline the local authority case and some of the background to IS/IT in local government. Bar provides a wide range of legally stipulated services to a local population of 272,500. Like other similar local authority organisations and civil service provisions in the UK, Bar has a functional relationship organisational structure, with a core corporate policy unit (corporate strategy unit) which is responsible for centralised strategy formulation and planning.

During 1999/2000 a fundamental strategy review of IT service provision was undertaken by an external consultancy resulting in two reports; 'Information And Communication Technology Strategy' and 'Information Technology Service'. The reports' findings and recommendations respond to the central government's initiative white paper which placed a duty on local authorities to 'secure continuous improvements in the way in which they exercise their functions, having regard to a combination of economy, efficiency and effectiveness' (Modernising Government White Paper Cmmd. 4310). It forms part of the wider modernisation agenda developed by the Government to ensure that public services:

- Are responsive to the needs of citizens, and not the convenience of service providers
- Are efficient and of a high quality

- Engage in policy making that is more joined up and strategic, forward-looking and not reactive to short-term pressures

The IT department and IT services underpin the majority of the services that the Council provides; the IT department itself is responsible for provision of the services and how they are managed. They are resourced in three ways, locally, from within the directorate structure, externally through outsourcing agreements, and directly through Bar IT department.

The case study presented in this paper attracts interest to the researchers for the reason that the IT department has recognised the need to re-conceptualise how services are going to be delivered in a web-based environment. The department is starting to address the issues of how to move from the current 'marketing front end' web service, and how to start to adapt and use the web for servicing back office functionality. The department is responding to a request to enable councillors to do their work in locations other than the council offices, it has provided an opportunity for the researchers to focus upon the scoping and defining stages of web development issues.

As a consequence this new IS demand empathises with the strategic reviews and recent IT reorganisation, in that it presents a challenge of not just the why, how and by whom a service is being provided but more importantly the project potentially represents a 'change' in approach in addressing the business needs of the organisation.

We did not draw or look for an intentional and abstract boundary as in traditional IS development. Instead, we adopted an approach of connectivity, of purposeful linkages and networks based on systems of communication that tend to form natural patterns. We describe this as the web-like structure of information and knowledge (Patel, 2001). The web structure does not necessarily lead to a consensus approach, with a start from a specific act of interaction. As such, the bigger picture of context spirals and contracts as connections are formed, broken, and developed.

Conversational Analysis: Establishing Patterns of Information

The prime data gathering event on which this paper focuses was the second meeting of the project team which had met one month before when they had established 'issues' and had identified some areas of project team members' responsibilities.

The data was gathered using a tape recorder, which was then transcribed and validated by a participant who had attended the meeting.

Originally, their brief had emerged from a pilot study in which IT equipment had been purchased and installed for four councillors, but not all were able to access directly to all of the available facilities. From this pilot study, a high level meeting involving the chief executive articulated a 'vision statement' document requiring further action.

Currently administrative control dictates that public enquiries be passed up and down the chain of command, filtered, edited, and then disseminated. The council members now seek to *manage* their own casework as opposed to it being bureaucratically administered. Additionally they need to work outside the council offices and hours by using a web interface.

Directly prior to the project team meeting, two semi-structured interviews were conducted to gather background information. Although this was a single source perspective, the 'war-story' type narrative and personal anecdotes of the senior professional allowed a unique historical insight and a glimpse into what is normally regarded as a closed community. Additionally, this particular introduction facilitated acceptance and legitimacy of the researcher as part of the organisation and not as an independent observer of the subsequent project team meeting.

Further (post) meetings and interviews were conducted adding to the depth of analysis in respect of specialist areas, not covered here in any great depth because of space.

The abridged narrative set out below in TextBox 1 is taken from the opening minutes. We present this edited extract as it succinctly summarises and sets the tone and many of issues for the remaining time the meeting lasted.

The abridged opening statement made by MT (the project lead officer) at the start of the meeting. Lines 15 - 79:

"Ok just a bit of background to this meeting, we've had one meeting of this (of this) group about a month ago, and really was the result of a discussion we had with the leader, where (the) Jeremy and I and some other people were present on a discussion. And the leader was very keen to have a vision on what he wanted, as I do, the support for the members.

Although we deal with expenses, and Gerard's team sorts the expenses out, we only allow for about five pounds a month for a member to meet for provision for IT and it obviously doesn't reflect the cost of what members are doing. So (its that) its trying to make sense of work that to take forward, the notes of the first meeting reflects the fact we aren't going through what the leaders vision and we are trying to scope some of that work, and I made an attempt at trying to develop a project plan which would tell us that it is that we really needed to do hoping that other people would input to that project plan, but I haven't had any comments from anybody, so, we can go through that today to see if anybody if we could capture all the work that needs to be done, and we have and covered the resources to do that in terms of the timetable to deliver upon it. The other thing that I have never been clear about, and the question is coming in my mind more as people are asking me more things, is where should any members queries for support for IT support go, should I know, what are the things that we do for members, or is there somebody in IT for example, taking responsibility in looking after members and needs and making sure that there needs are met.”

Text Box 1: Concerns, Issues and Relative Positions of Individuals and Groups

We applied conversational text analysis to such extracts to develop a broader narrative understanding of the dialogue and rather than developing statistical tabulation using concordance and collocation methodological analysis, we present the data text collected in Table 1 which encapsulates the issues and the contextual domains of the scoping and defining problem. The grouping and identification of the headings are emergent and aim to act as a generative heading from the individual instances and uses in the dialogue. The groupings are made up from the constituents of family members, and the banner headline is an encapsulation of the signs, giving an account of a potential structural or pattern meaning. Such a method of model building is sympathetic to Sacks's intentions of obtaining detailed descriptions of interactional phenomena (Travers 2001). Additionally, the purpose here is to convey not just the structural interpretations but to expose the underlying social patterns and practices concerning information and technology definition and usage.

Individuals and groups	Intentions Plans	Resources (a) Provisions	Resources (b) Financials	Reflections	Artefacts & Equipment
Members (line 23)	Project plan (line 61)	Support (line 23)	Expenses (Line 43)	Vision (22)	Machines
Council (line 29)	Meeting (line 15 -16 - 57)	Intake (line 26)	Money (line 54)	Scope (line59)	Equipment
JC (line 31)	First meeting (line 57)	Team sorts (line 43)	Cost (line 48)	Fits (line 39)	IT
some other people (line 20)	Pilot project (line 50)	Provision (line46)	Pounds (line 45)	Unfair (line 30)	

The leader (line 21)	Timetable (line 69)	Resources (line69)	Budget (line 41)	Mind (line 72)	
		Deliver (line70)		Responsibility (line 77)	
				Apologies (line 31)	
				Question (line 71)	
				A bit ad hoc (line 33)	
				queries	
				we can go (line 65)	

Table 1: Contextual Domains

The structure of the opening lines (15-79) from MT, the lead officer, establishes the 'story preface'; a device recognised by Sacks (Silverman 1998) as helping the speaker to retain the floor. It also establishes the legitimacy and the norms of sanctioned conduct by the narrator MT – who clearly establishes in the opening lines (15 – 22) the background in the relationship in terms of the power structures involved. lines 19-20 “*result of a discussion we had with the leader where the JC and I (.) and some other people were present (.)*”. The other people being the chief executive and interested parties (council members). We also see the text establishing the lines of authorisation “*J and I (.)*” pause for emphasis is a reaffirmation of the power structures. It also shows structuration and operation of power in the authorisation of resources in terms of IT through J in his IT role and the speaker's reaffirmation of her position found in line 22 “*...what he wanted as >I do <the ...*” speech speeded up and emphasis on doing (as well as her position within the group, organisation and cultural position). Finally, in lines 23 - 24 – “*He wanted us to go away and make it happen. Er (0.2) Certainly in time for May 2002*”. This is a reminder of the power relationships. 'He' referring to the chief executive, and the authority delegated through TM's position, firstly as a project lead officer and secondly in TM's organisational position.

The second aspect that Table 1 shows concerns Artefacts & Equipment. The meeting is dominated around the implantation of IS and IT, but MT's concerns are not from an IS background. For example, in several places MT questions the technical experts. E.g. Line 778 MT: 'what does a URL mean?' Line 994 MT: 'what are they then?' In each of the extracts, interjections are noticeably short interruptions

in the flow, between fairly heavy technical talk, and as such the interruptions act as a brake or from the meeting turning into a technical talking shop. It allowed MT to return to the agenda without getting bogged down. Using CA we also show a change (text box 2) in MT's own understanding from the start of the meeting to the end.

<i>Line 1364 MT: I'm learning (0.2) I'm <u>learning</u> (0.3) I now know what the VPN is (0.3) that's a major step forward for me</i>

Text Box 2

The 'how' outlined above has been viewed from the perspective of structure. We have outlined a brief analysis leaning towards what could be construed as using traditionalistic CA methods. However as previously argued, CA through its traditionalist genealogy appeals naturally to social structure. Sacks (Silverman, 1998) contended that meaning and explanations of phenomena are to be found in the way people use the resources to produce context for their interaction. From a Giddensian perspective modalities of structure and agency are of an equal footing. Although a reasonable and satisfactory explanation can be supported from CA from the viewpoint of structure, our contention is that, by incorporating the Giddensian perspective, structure is created in action and participation, by which we can equally support the dualist argument that agency enables structure. The direct relevance here, as Whittington suggested, is that the individuals and groups' participation is essential in order to facilitate deliberate and effective strategy, to influence, shape or modify the system reproduction (Whittington 1992), and this naturally draws upon the individuals and groups' own reflexivity and knowledge. This enables us also to look for the expressed intentionality within the narrative structure of the conversation. This leads us to find how and when: "aspects of structure and context are mobilised or activated by individuals and groups and groups as they seek to obtain outcomes important to them" (Pettigrew 1985).

We have selected interactions that typify the various themes, which make up the narrative structures. The aim is to help in the understanding of the very process of defining and specifying an IS and recognising the natural breaks of IS design deferment points, how they occur, and the situated contexts in which they occur. In the next section we proceed to develop a model that emerges out of the perspectives and analysis undertaken in this section.

The evolving story structure is in response to the opening scheme of MT. The narrative structure theme is developed through the dialogue trying to identify the resources and the monies required for the project (Text Box 3). The actors SD JC and GK explore and try to identify support as they see it as an additional resource.

Line 83 – 87: SD - not covered in any budget anywhere and that is an issue (0.5) we could quite easily buy somebody in to do::: or resourced to provide that service for members (0.8) >it is going to cost< (0.4) that is the problem::.

Text Box 3

Identifying who should scope and define the system (Text Box 4), the narrative started from the position that it would be catered for in-house. Subsequently Text Box 4 suggested buying in a facilitator who would ‘flush out requirements’.

MT: 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.
AS: well (0.5) just saying so rather sounds like rather like pitting three rather articulate and technically aware people against a rather diverse set of people urr that might lead to some bias in what pops out in the end.
MT: I am in your hands because I'm rather [
JC:] a facilitator is rather a good idea because if you get somebody.....

Text Box 4

Text Box 5 (below) identifies the theme of equipment; on what and on whose equipment the members would work. This leads on to a discussion (Text Box 6) about how IT equipment is supported. This issue was one of the few issues that got resolved and a decision made. Leading to a further decision Text Box 7.

MT: my feeling is that I need somebody identified who will respond to queries and will respond and say we will do this for members, and this is how much equipment we have --- and I don't even know for example of if we have an asset register for example the equipment and that we have given or loaned to the councillors, But it would be nice to hold that in one place --- I think that there is some information hold in the z office and in the y I do not know about the x office because again because it is not a part of this structure -- that is a part of a/this problem - but I do not know if they have an asset register, that would include things like new phones or that records the computer equipment and printers and things like that so I need to find a way off including that together.

Text Box 5

C: we need to identify some way of supporting it properly. The big issue for us--- is the on-going money we will need to support whatever it is to do with members

Text Box 6

JC: what are the options well one or two councillors have ADSL connections to the Internet already so we have to find a way of servicing themthe second aspect of this there extra second spin-off yes anybody could use it with their own bit of software so somebody who lives in John O'Groats could access the web from home{the decision was made that from now on we will not pay for any other hardware}.

Text Box 7

The steps that the group took to resolve the issue could be summarised as 'dealing with known factual details'. The solutions or choices available were well understood in the cultural environment in which the actors operate and the actors transferred previously encountered situations and knowledge into resolution of this problem. *"from now on we will not pay for any other hardware".*

A Model of Requirements Analysis: recognising Deferment Points

The research objective is the analysis of IS development seeking to expose the contextual and situational properties of IS development, highlighting deferment points. The research design schema that we have employed was derived from management sciences and underpinned by social sciences' interpretive qualitative research. These are the very properties that have been identified (Patel 1999), as necessary, for developing DSD. In other words, the perspective we have taken takes a step towards recognising that IS development and the organisational environment to which systems are applied are one and the same.

Scoping and defining the problem is normally associated with traditional IS thinking, starting with the rationale of problem definition with the additional goal of arriving at a mutual understanding, facilitating the 'next step' and subsequent development of a 'project plan'. However, instead of viewing this as a fixed reference point from which progress is made, we are able to put forward a different model shown as Figure 2, derived from our research design arguments and also supported by the analysis from the data.

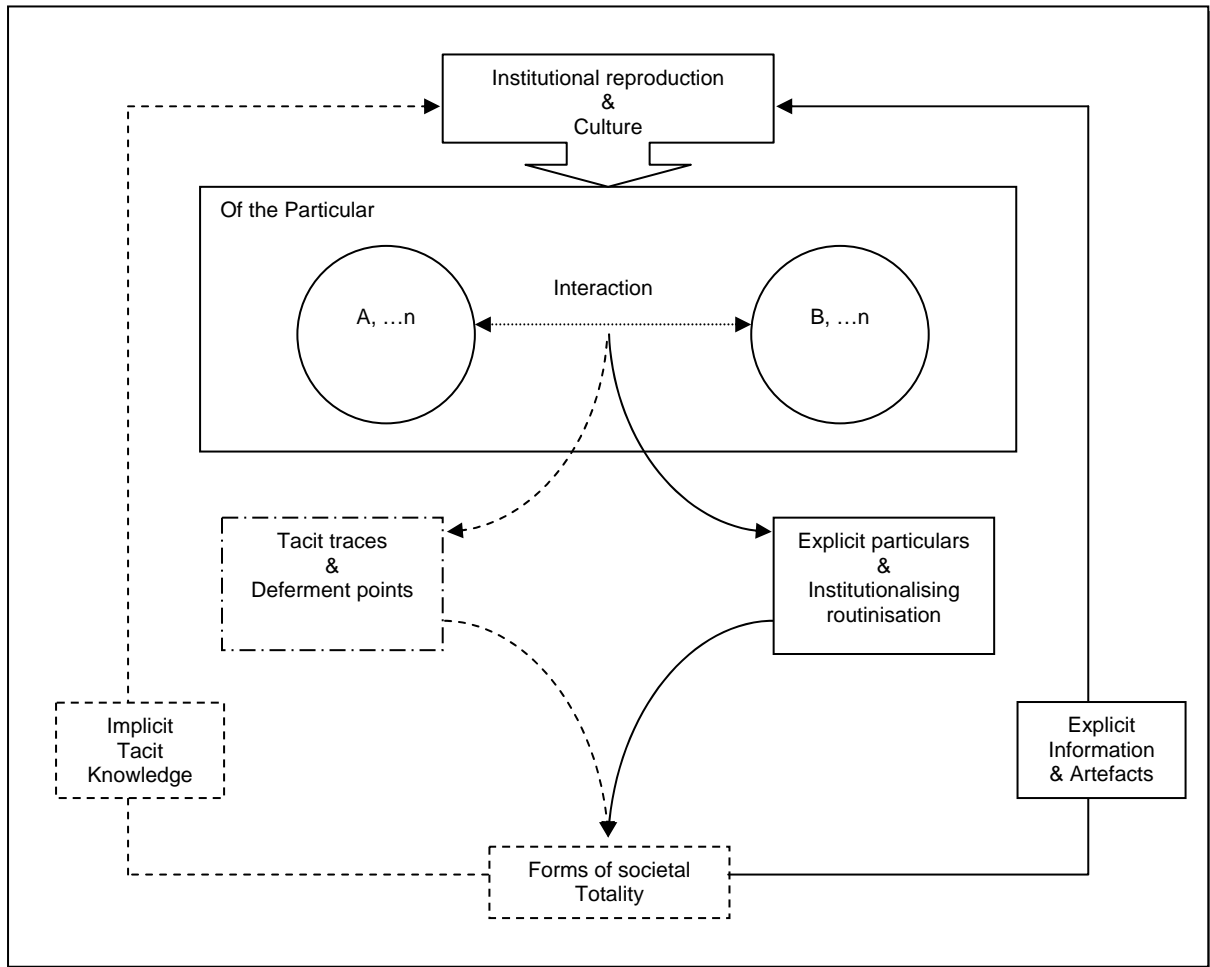


Figure 2: Interaction Deferment Points

In this model (Figure 2) interactions are seen as on-going instances initially between two people (A and B in the circles), and as we will go on to suggest, perhaps, even between a person(s) and an IS. Interactions are defined in the model as ‘of the particular’. For example, interactions in CA have an inherent natural time span, as do all conversations, which have a start and a finish.

The interactions exist, in essence, in the here and now; an interaction has also existed in the past, as a rhetorical moment; as a time slice with the capability of being reconstructed via recordings, pictorially, transcripts or even re-created in performance.

We suggest that the nature of interactions are inherently situated and acted or performed in order to make possible three types of meaning:

1. Symbolic meaning; including metaphoric interpretations, and includes iconic representations covered by, resemblance, exemplar, symbolic and arbitrary (Rogers 1989).
2. Textual meaning; e.g., transcripts, journal papers, books, notes, emails and web chat room MUDs.
3. Discourse meaning; the interactions found in telephone conversations, and open dialogue as in this case between members in a meeting.

An interaction 'of the particular' represented by A and B (Figure 2) may use only one or may use a combination of methods to convey meaning. An example being in conversation where the speaker refers to a document to support or elaborate, indicating additional material sources, thus enriching the meaning. In the case study, the predominant interaction was conversational, 'discourse meaning', as it was a meeting. However, there was in attendance a minutes taker recording the proceeding, and additionally there were documents that supplied textual meaning that were referred to at various points. The documents referred to and used in the whole of the meeting were:

- The minutes of the last meeting,
- The vision statement document.
- The five page 'Project plan', which we expand upon below as an example using the discourse meaning:

The project plan is one of the themes identified in Table 1. We use it's theme here to illustrate the use of the model presented. The following three text boxes are the complete references to the project plan covering the whole of the meeting.

Line 61 .hhh trying to develop a project plan which

Text Box 8

Lines 637-643 MT: right (0.8) okay (0.5) so will do that and then we will need to revisit our plan (0.6) project plan I think. Yes (0.6) okay (0.6) in the meantime then, could we have a look at the draft project plan that we do have, and see if (0.2) if we have captured that we know currently (0.8) are things that we need to sort out.

Text Box 9

*Lines 1386-1387- MT: one other things that is not on the project plan (0.5) [um,
Lines 1388 - 1400 - A S: [can I make a general observation about the project plan perhaps:: (0.3) before you come to a specific point (0.5) this is a good list of tasks that it is not really a project plan (0.6) it does not have any dependencies or time lapse (0.3) I think we do need with so many different tasks*

raised at this meeting, and i am sure at previous meetings that will be captured on a project plan and I think someone ought to be entering this into Microsoft project with dependencies and time lapse and we see if this is all actually practical in the timescale we were actually thinking of

Text Box 10

In the analysis of the project plan using the model, Text Boxes 8, 9 and 10 demonstrate that there is not an 'explicit' plan.

This can be seen in the local interactions of the here and now of tasks, and again in the ongoing discourse of narrative structure. Breaking out of this regionalisation of local context 'of the particular' is proving difficult for the group. There is tacit acceptance that even if it was possible to have a detailed plan, the detail would very much have to reflect tacit and explicit knowledge of the other actors, which is unlikely, since we have already established that no one else has contributed to the existing plan (see text box 2 "*but I haven't had any comments from anybody*"). We can conclude that only a small amount is 'known' about the 'explicit' planning of this project; and we do know that the deadline is fixed to the new intake of councillors. In traditional IS thinking we would say that the scoping and definitions are *dependent* upon other issues, (i.e. incremental development, resources, web interfaces for existing legacy software). The inference that we can draw from the model is the group recognition that the plan has intangible and tacit qualities as discussed below.

We could interpret this as that discourse interaction meaning has failed, and as such the explicit becomes confused and blurred; a possible explanation of this could well be a deliberate action on the part of the actors. In our model, the interactions between A and B are enabled and facilitated by the situational context of 'institutional reproduction & culture' (top of Figure 2), drawing upon the theoretical concepts of 'analytical dimensions of duality of structure' from Giddens (1994). Here any interaction of communication is coupled to the use of power, and through the use of power the use and access to resources. The conclusion would be for the researcher to try to uncover some of the implicit tacit uses of knowledge, rather than follow the possible red herrings of dependencies.

As the model shows, the result or outcome of an interaction has two consequences, explicit particulars and tacit traces. Firstly, an interaction has 'explicit particulars' when a tangible result that is capable of being codified or black boxed emerges. In other words, a particular that is identifiable, quantifiable and one that can be tabulated. It therefore becomes a possible candidate for routinisation and

reproducible action in a structural reproduction of a future interaction. It is also true that an explicit outcome might not have any impact beyond its immediate situated context. An example would be a phone call to the speaking clock. It has only an 'explicit particular', rooted in the specific event.

The second outcome, and the primary interest of this paper in the investigation of scoping and defining the problem of IS development, is the 'tacit traces' of an interaction. As we have already seen and uncovered in the above example of the project plan. Rather than try to explain away the tacit outcome of an interaction, we develop and recognise it's influence upon IS design, specifically it's influence upon how an IS is scoped and defined. Venzin and Krogh (1998) have traced the concept of tacit knowledge back to Michael Polanyi 1958, who suggested that individuals know more than they can say (Venzin, Krogh et al. 1998). At first glance tacit traces are opaque or hidden, it is meaning that cannot be easily put into words. Zuboff's conjecture that 'explicit awareness has a relatively minor role in the performance of action-centred skills' (Zuboff 1988, pg 187) implies that meaning is too layered and subtle to be fully articulated.

We further argue that the outcome of tacit traces is deferment, which we have identified as deferment points. The tacit traces also themselves have meaning, but are rooted more in the social meaning and in this case, in the meaning of interpreting technology. Tacit traces and deferment points only have direct relevance, and are quantifiable in relation 'of the particular' interaction and of action centred skills. A sculptor knows just when to stop carving; from the start of a process the artist cannot tell at what point he has to stop, the artist has deferred to stop at some point in the future.

The analysis drew to our attention that in order to recognise the deferment points we needed to further analyse the usage and the context of the column heading 'reflections' (Table 2). We concluded from the data analysis that deferment points have different complexity levels. An example being the deferment of the requirements and 'user needs' being deferred to the facilitator to uncover. To return back to the project plan example, a more complicated deferment point can be identified when the speaker AC inadvertently and unintentionally evoked a tacit trace that led to a deferment point; "*and I think someone ought*". However, MT (a self confessed non IT person) carried the topic forward into next 'interaction particular' by

saying that she would add some dates, but the topic was then smartly kicked into the long grass by JC (Text Box below), after which it never re-emerged.

Lines: 1401 - 1408

MT: okay (0.5) right all right (0.5) I have used that programme once (0.5) I could use it again (0.5) right we will try and turn this into a project plan with dates and things and see what is happening

J C: you want key points (0.5) otherwise you will bog yourself down in detail[

MT: [okay (.=

Text Box 11

We suggest in our analysis that the planning model itself is largely tacit, and as such has strong empathy with Schuman's findings that plans neither determine action nor fully reconstruct it. Thus, she argued that the success of the Trukese navigators is not tied to 'conventional rules but to local interactions contingent on the actor's particular circumstances' (Suchman 1987, pg, 27-28). We have inferred in the model that the two outcomes of any interaction are not mutually exclusive. We suggest that the two are co-dependent in all situated action. Indeed, in exposing the tacit and explicit outcomes we are helped to come to a greater understanding of situated action informing 'societal totality'. Finally, the interactions and the connections of the interactions are a 'web' of connections. We are not able to predict the future, or the next interaction, and it is only by reflection that we can see clearly the explicit and implicit actions that facilitated the reproductive and cultural structures which enabled the action to take place.

To recap; interaction 'in-use' or 'in-action' is based on the theory of structuration using the modalities of interpretative schemes, resources and norms, which operate by enabling and restricting structural mechanisms (in Giddensian terms Signification, Domination and Legitimation). This facilitates understanding of theory-making in qualitative research. Our model of Figure 2 allows us to investigate particular interaction points and to assist in the understanding of the meaning of situated action. In this case using the methods and tools of CA in the scoping and defining the problem of an IS development project.

Conclusion

We focused on what the eight people said in a meeting room around a large table; an ordinary mundane event, common to all organisations. In examination of the 'what', we uncovered an endless web of connections and a variety of different perspectives on what this IS project meant. In short, we uncovered relationships. How 'people relate to....' These relationships were, and are not obvious, nor were they 'observable' as in a definable single event. Only after reflection and analysis of the transcribed data did the linkages emerge. This produced a metaphor not unlike a child's kaleidoscope; the simile does not end there, as by twisting the data around new patterns and shifts in colour or patterns emerge.

The research design facilitated, indeed, encouraged us to look for and uncover differing interpretations, we had originally set out to focus on seeking to answer our original research question, to see if we could recognise if deferments naturally occur in social IS dynamics, and more specifically in the initial stages of IS design, and if we could recognise deferment points within context. What surprised us in our findings was the number of recognisable deferment points that we uncovered. From this modest research question, more questions have emerged than we are able to answer. The evidence would suggest that reflective practice is not unique to academics; the group left tacit traces in conversation for a whole host of reasons and with different motivations. In trying to define and scope an IS project the perspective that we found is that IS is firmly embedded in the context of the organisation's day to day working practices and is not an adjunct union.

The difficulties in drawing up specifications for scoping and requirements for Information System design can be seen in an alternative view as a series of deferment points. In other words, and as found in this case, a process leading to an IS specification is an agreement upon defining the rules by which the system is to be built. This reflects the (continual) tension between the organisational structural deposition and the in-action as it is played out. This in turn is rooted and perhaps best seen in the connections of the web of relationships.

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