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Systems Development as a Research Act

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Introduction

The authors maintain that there is a weakness in many of the methods employed in information systems development and particularly in the requirements determination phase since this is the most organizationally dependent (Flynn, 1992). The weakness is that although the methods may have an underpinning philosophical basis, they are not explicitly embedded within any social scientific perspective. Such a perspective would enable methods or methodologies to address the organizational contexts in which their use may be envisaged (Hughes, 1998a). This would require systems developers to engage with social actors in order to find out about their social situations. This engagement may be considered to be as much interpretive research as it is practical systems development. Indeed it may be possible to extend the spectrum proposed by Nandhakumar and Jones (1997) in Figure 18.1 to include practical systems development within 'Consultancy'. In the figure they propose that it may be possible to consider the main methods of interpretive research as existing on a spectrum which spans from those which have most distance between researcher and subject to those in which the researcher is most engaged with the subject. They point to Gummesson's (1991) argument that in paid consultancy 'the engagement of the actors is tested by their willingness to pay' and that the effectiveness of the researcher 'can be assessed by the [social] actors'

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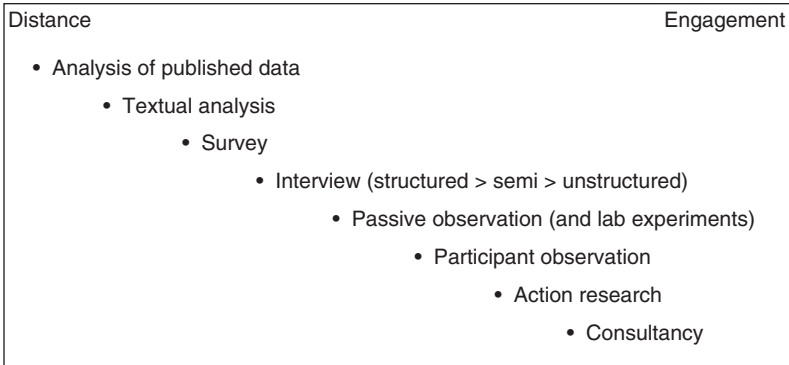


Figure 18.1 Distance and engagement between researcher and subject with different data gathering methods (Nandhakumar and Jones, 1997, p. 113)

willingness to offer them further contracts’. There are problems with this if consultancy can be considered to be research by satisfying these two criteria (Jönsson, 1991). Primary amongst these problems is that researchers require theoretical justifications whilst consultants require empirical justifications (Baskerville and Wood-Harper, 1996). It would seem reasonable then if practical systems development can be considered as interpretive research that there should be some conceptual or inquiring framework within which the work is performed and there should also be reflection, learning and an articulation of that learning. Clearly the articulation of learning about the conceptual framework would be different from say practical systems analysis reports. This difference is well expressed by Sandberg (1982, quoted in Gummesson, 1991, p. 106) who distinguishes between ‘reflection’ and ‘dialogue and action’. In reflection the researcher maintains a distance from the project in order to analyse it with respect to some conceptual framework or theories. In dialogue and action the researcher is involved in dialogue with the organization and takes action in intervening in the domain. Importantly there is *always* an interaction between the researcher’s reflection and his/her work for the client. The distinguishing characteristic is that for dialogue and action it is the requirements of the organization that are uppermost.

In order to explore the IS practitioner as researcher argument the paper is divided into two main sections. The first section considers a piece of research, which illustrates the argument. The research concerns two action case studies in which a conceptual framework was used in practical

requirements determination contexts as the basis of intervention. The second section discusses systems development as research act and uses lessons from the illustrative piece of research to draw conclusions.

The action cases – an illustration of systems development as a research act

In this section the authors present a conceptual framework for use by practising systems developers in the determination of requirements and introduce the reader to the action cases and the learning outcomes. A fuller explication of the framework and the action case studies, which follow, can be found in Hughes (1998a).

The conceptual framework

The development of the conceptual framework was driven by a concern for the use of methods in the requirements elicitation phase of information systems development. The reason for the concern was that many of the methods traditionally employed in this most organizationally context-sensitive area pay little or no attention to organizational concerns from an explicit sociological viewpoint. The authors maintain that in order to find out what is happening in an organizational setting then it is not only desirable but also essential that the method of inquiry used includes a sociological perspective. Developers have traditionally used methods based on a technological rather than a sociological paradigm and this may pose a threat to any serious progress in eliciting requirements in situations which are explicitly sociological. This may apparently be more true for methods associated with requirements engineering, in which requirements are considered to be almost exclusively formal and hence are said to be able to be 'captured'. However there is also a failing amongst the more human centred or situationally centred methodologies such as Soft Systems Methodology (Checkland, 1981; Checkland and Scholes, 1990) that have no explicit sociological underpinning (Brown, 1992).

The framework uses ethnomethodology (Garfinkel, 1967) as the paradigm of inquiry since it is concerned with descriptions of everyday life expressed in the words of those organizational members (actors) involved. Ethnomethodology therefore can be considered to be useful in providing good quality data. However since the elicitation of requirements preempts the design of an information system some tenable method is required to analyse the good quality data that has been collected. In this framework Grounded Theory (Glaser and Strauss, 1967)

is the basis of such a method since as a method of inductive analysis it allows categories concerning the data to emerge and be abstracted such that an account of the organization can be produced. This account is both written and depicted graphically in a hierarchical diagram of categories. A third conjunction of the framework includes the use of action case as the basis of reflection on both the practical intervention and on the conceptual framework. Each of these elements is described below.

Ethnomethodology — a paradigm of inquiry

Schutz (1964) introduced a set of tenets to the discipline of sociology that provides the basis for much of the later phenomenological, ethnomethodological and constructionist theory and empirical studies. He argued that the social sciences should focus on the ways that the 'life world', or the world that everyone experiences and takes for granted, is produced and experienced by members (actors). This subjective orientation led Schutz to examine what he called the 'common-sense' knowledge and the practical reasoning that members use to objectify its social forms. He maintained that individuals approach the life world with a 'stock of knowledge' which is composed of common-sense constructs and categories that are social, and that these constructs and categories are applied to aspects of experience which makes them meaningful. The numerous phenomena of everyday life are subsumed under a more limited number of shared constructs. The shared constructs become the means by which members understand and interpret experience since language is the central medium for transmitting meaning (Schutz, 1967). Thus social phenomenology is based on the tenet that social interaction *constructs* as much as *conveys* meaning. As a strategy of inquiry his aim was a social science which would 'interpret and explain human action and thought'. This focused on how objects and experience are meaningfully constituted and communicated in the world of everyday life.

Garfinkel's ethnomethodology (Garfinkel, 1967) was not just an extension of Schutz's work but much more an alternative to the Parsons' (1966) theory of action in which he maintained that social order was made possible through institutionalized systems of norms, rules and values. Garfinkel felt that this cast social actors as 'judgmental dopes' responding to external factors and motivated by internalized directives. His response was based on similar lines to Schutz (1964) that individuals had language-based and interaction-based 'competencies'. It is through these competencies that the observable orderly features of everyday life

are produced. Garfinkel's (1967) ethnomethodology differs from Schutz's (1964) social phenomenology in that the topic of study was the everyday procedures (methods) that social actors (ethno) used for creating, sustaining and managing a sense of reality. Ethnomethodological study focuses therefore on how actors accomplish, manage and reproduce a 'sense' of social structure. Ethnomethodologists focus on folk (common) methods and common sense reasoning. Garfinkel (1967) refers to this as

the investigation of the rational properties of indexical expressions and other practical actions as contingent ongoing accomplishments of organized artful practices of everyday life. (Garfinkel, 1967, p. 11)

Since reality is produced by way of actors' interpretive procedures then the ethnomethodologists maintain that the actors' social circumstances are 'self-generating' which implies two important properties. First that meanings are essentially *indexical*, that is they depend on context and therefore it is only in the situated use in talk and interaction that objects and events become meaningful. Secondly that social realities are *reflexive* which is to say that interpretive activities are both in and also about the social settings that they describe. Thus the focus for ethnomethodological research is the treatment of talk and interaction as topics for analysis rather than merely as a means of communicating some underlying phenomena. Waters (1994) proposes that for ethnomethodologists the only way in which sociologists can reveal the 'facticity' of social experience is to approach it as would an anthropologist

That is, the sociologist must seek to understand situations, in the terms in which participants give accounts of them, by calling to our attention the reflexive or accounting practices themselves. Sociologists must somehow induce participants to give accounts and thus to reveal the contextually rational properties of their social arrangements. (Waters, 1994, p. 38)

Indeed the social anthropologist Erving Goffman is often associated with ethnomethodology. Goffman (1959) expresses social action in a dramaturgical sense and as such assigns roles to individuals who perform these roles in order that they present a particular impression of themselves. He differs from ethnomethodologists such as Garfinkel since he considers the accounts that actors give as being too narrow a description preferring to include a wide range of other expressions such as body language, dress and so on.

Garfinkel however, maintained the value of the account and proposed methods which explicitly sought to disrupt the continuity of reflexive behaviour in order to demonstrate that the stable social order is a constructed and fragile reality to which we all conspire and which may be undone. One example of this disruptive inquiry noted by Waters (1994) included field work in which the investigators acted like lodgers when living with their own families, and another in which the investigators attempted to overpay for shop purchases. Once the required 'confusion' has been produced in the participant then they are required to give an account of the natural facts. Whilst this disruptive action may appear extreme Denzin (1971) argues that ethnomethodology offers very real insights into the ways in which organizations work. He identifies those especially which process people, since comparable organizations differ in the way that they classify similar events and even in the ways in which they attribute meaning to particular words or phrases.

In the action cases presented here, ethnomethodology provides the means of collecting high quality data using semi-structured interviews to tape, which were then transcribed verbatim. One further aspect of the ethnomethodological approach was to recognize Goffman's concern given above, that in social situations communication is not only described through verbal accounts. Thus the researcher/practitioner was also sensitive to other aspects of communication which undoubtedly had an influence on the collection and later analysis of the results. This is not surprising since this is the expected situation in interpretive research.

Grounded theory – procedures for data analysis

Grounded Theory or as it was originally titled 'The Discovery of Grounded Theory' (Glaser and Strauss, 1967) is a method for the collection and analysis of qualitative data. It was derived as a means of formalizing the operation of the principles of analytic induction first suggested by Znaniecki (1934) and later elaborated by others such as Robinson (1951) and Denzin (1970). In this method conceptual properties and categories may be 'discovered' or generated from the qualitative data by following a number of guidelines and procedures. The two critical stages of Grounded Theory identified by Glaser and Strauss (1967) are first that of constant comparative analysis, a procedure for the identification of conceptual categories and their properties which may be embedded in the data and secondly theoretical sampling which is a category-enriching procedure. The procedures revolve around the coding of transcripts and the development of categories, which lead to the emerging theory.

Glaser and Strauss' (1967) original work had three main purposes. To offer the rationale for theory that was 'grounded', that is to say generated and developed through the inductive analysis of data collected during research projects. At that time this departure from traditional functionalist (Parsons, 1964, 1966) and structuralist (Merton, 1963) theories which were largely deductive was a radical shift. The second aim was to suggest the procedures and the reasons for them and the third aim was to propose legitimacy for careful qualitative research. Interestingly the final aim has been achieved to the extent that Grounded Theory underpins many models of qualitative research (Dey, 1993).

The main application areas of Grounded Theory were most notably in Glaser and Strauss' own research into 'status passage' (Glaser and Strauss, 1970). They were also used in a number of other, usually medical or nursing related, areas such as experiences with chronic illness (Charmaz, 1990) and homecoming (Hall, 1992). Additionally much work has been done with respect to guidance on the use of method. Most notable amongst them include Charmaz (1983); Turner (1983); Martin and Turner (1986); Strauss (1987); Strauss and Corbin (1990).

Grounded Theory differs from other approaches to the analysis of qualitative data because of its emphasis on theory. Strauss and Corbin (1994) maintain that theory consists of

plausible relationships proposed among concepts and sets of concepts . . . Researchers are interested in patterns of action and interaction between and among various types of social units (i.e. actors) . . . They are also much concerned with discovering process – not necessarily in the sense of stages or phases, but in reciprocal changes in patterns of action/interaction and in relationship with changes of conditions either internal or external to the process itself. (Strauss and Corbin, 1994, p. 274)

In reply to criticism that their definition of theory may be too austere or formal they note two important aspects of Grounded Theory,

First, theories are always traceable to the data that gave rise to them . . . Second grounded theories are very 'fluid' because they embrace the interaction of multiple actors, and because they emphasise temporality and process. (Strauss and Corbin, 1994, p. 276)

They stress that grounded theories are interpretive in their nature. This point will be referred to later in this section.

The method of Grounded Theory has spread to many other disciplines including research in information systems. However Strauss and Corbin (1994) regret that the methodology now 'runs the risk of becoming fashionable'. They identify the main risks of this diffusion of the method being the lack of conceptual development of processes. They attribute much of this diffusion of method to the overemphasis in the original (Glaser and Strauss, 1967) work on the inductive aspects of the method rather than the significance of grounded theories and on the importance of theoretically sensitized and trained researchers.

However the proponents of 'pure' Grounded Theory may consider that since the divisions amongst the original coauthors are so great, then the differences in the use of the method by others is only to be expected. This schism between Glaser and Strauss (Glaser, 1992) as to the focus of Grounded Theory is presented as a personal attack by Glaser. Unfortunately this distorts the academic argument which simply put, criticizes the Strauss and Corbin's (1990) version of Grounded Theory as discarding emerging theory which is the basis for induction and replacing it with *forcing* theory from predetermined frameworks. For the purpose of this paper it is the Strauss and Corbin writings that are taken as the latest 'version'.

Returning to the earlier point regarding the interpretive nature of Grounded Theory there is some debate regarding this stance. Whilst Grounded Theory points to its roots in the interactionist tradition and the influences of Mead (1934) and Blumer (1962; 1969) it may be considered to be positivist rather than interpretivist. This is particularly evident in the emphasis placed in more recent writings on the scientific criteria, such as repeatability, that must be applied to Grounded Theory research in order to validate the research process (Corbin and Strauss, 1990; Strauss and Corbin, 1990). However Denzin (1994) maintains that more accurately, Grounded Theory can be considered as post-positivist since although its proponents emphasize the 'good science' model it continues to fit itself to more interpretive styles. The authors consider Grounded Theory in this way given their concern for meaning induced from users' spoken words. They therefore agree with Miles and Huberman (1994) who consider the post-positivist perspective to place an emphasis on multiple realities and researcher interpretation. Thus the use of Grounded Theory and the results produced may be said to be contingent upon the situation or domain under study. This is more in line with the constructivist criteria for quality of research. These criteria rely upon the richness or authenticity of the learning that is achieved and an understanding of the constructions of others, and on the

ontological authenticity in terms of the development of the researcher's personal constructs (Guba and Lincoln, 1994).

The use of Grounded Theory techniques is already established in information systems research (Calloway and Ariav, 1991; Pries-Heje, 1991; Toraskar, 1991, Baskerville and Pries-Heje, 1998) and has been used practically in knowledge elicitation (Oliphant and Blockley, 1991; Pidgeon *et al.* 1991). A major concern amongst all authors is the time taken to perform the analysis, which tends to preclude it from practical systems analysis activities. For the action cases described below the problems of time constraint were mitigated by the use of a software package, QSR NUD-IST (Richards and Richards, 1991), for coding indexing and sorting categories. The use of computers in qualitative analysis may be open to the criticism that for interpretive research the software may lead the research. Yet as Kelle (1995) points out much of this hostility has dissipated with the increased use of sophisticated software packages designed specifically to aid text structuring, indexing and storage.

Baskerville and Pries-Heje (1998) have considered the specific use of Grounded Theory in action research projects. They show how the theory development portion of action research can be made more rigorous by merging some of the techniques of Grounded Theory with the steps in action research; particularly those associated with theory formulation. In this paper the conjunction is considered with respect to action cases as discussed below.

Action case

The use of the term action case in this paper follows from Vidgen and Braa (1997) who approach action case as arising from 'soft' case study which is essentially a method for *understanding* in which there may also be some limited *intervention*, which causes change. It is used here from an alternative perspective in which intervention is planned and from which some understanding is gained about the conceptual framework in order that learning can take place. The term is also intended to convey that the learning may be achieved in a limited number of interventions. Indeed a single intervention for a practitioner should be sufficient to reflect and learn about some project. In terms of action research the term action case may be characterized as 'reflective action research' as discussed by Baskerville and Wood-Harper (1998) in which they maintain that the critical element 'is the actors' discovery of where their behaviour is unexplained by their own understanding'. They note that within reflective action research 'iteration is no longer an end in itself'.

This is clearly important for the practitioner since even within a *single* IS development project he/she may focus on the distinction between what was suggested by the theoretical framework versus what actually happened in practice. A consequence of this is the learning about the theoretical framework and the *process* of development.

Furthermore, action case as used in the illustrative research presented here has a strong resonance with the concept of 'double loop learning' as expressed by Argyris and Schon (1978). They consider double loop learning to mean that following some intervention in an organization it is possible to learn about the domain – they refer to this as single loop learning. However the learning may also challenge the 'norms' or framework which were the basis of the intervention. They suggest that this could cause some conflict amongst managers who established the norms. They refer to double loop learning as a resolution of the conflict. Indeed as Reason (1994) notes double loop learning is critical, since without the reflection on the 'governing variables', or theoretical framework, then it is possible for individuals to produce self-fulfilling systems of action which may lead to escalating errors. We return to this critical issue in the action cases where practical considerations take precedence over the canonical use of methods as noted also by Baskerville and Pries-Heje (1998). Reflection on this is central to learning in the practical situation and to the research outcomes.

Together then, the conceptual framework comprised the conjunction of ethnomethodology as a paradigm of inquiry, Grounded Theory as a method for data analysis and action case as the research strategy for reflection on the domains. The two action cases are given briefly below.

The action cases

The HVP study – domain

The first action case domain was a three site veterinary practice in a city in the East Midlands, which we shall call HVP. One site is in the city centre and the others are situated 5 miles south and 5 miles Northwest of the city centre in large village locations. The Practice is a mixed practice in that it does both small animal and farm animal veterinary work. The Practice is a partnership with four equal share veterinary Partners, one salaried Partner, four full-time veterinary assistants and two part-time veterinary assistants. There are thirteen practice receptionists including a reception supervisor at each site and eleven nurses including a nurse supervisor for each site. Additionally the Practice employs out-of-hours telephone receptionists who usually are the life partners

of the vet on call. The general management of the Practice is through the Partners assisted by a full time Practice Manager and a Practice Accountant both of whom sit on the Practice management team. One accounts clerk and one administrative assistant provide additional administrative support for the Farm Office.

The HVP study – intervention

The nature of the intervention was to help the management team better understand its information needs prior to considering any investment in an IT infrastructure. They expected an outcome of the study to be an audit or evaluation of current work practices and recommendations for change, which would accommodate the introduction of computerized information systems. During the initial talks with the management team the developer made explicit the nature of the intervention methodology and the reasons for it. It was also established and agreed that the work would also have research outcomes. The team agreed that the outcomes of the research and the outcomes that they expected from the study were not in conflict.

The rationale for the study was linked to the management team's agreed strategy, which was presented through discussion rather than being formally documented. The management team in the last three years had seen an increase in the pressure on the city-centre site in terms of an increasing client base and the lack of appropriate accommodation to meet the increased demand. This led to the decision to open a new site, W, which would take some of the client numbers and also enable the practice to offer a purpose-built Farm Office and centre for farmers to visit to purchase veterinary products. The financial profile was such that finding the new premises was viable and the expectation was that the income from the new site would in the long term provide financial stability for the Practice. At the time of the study the management team realized that the growth in business since the opening of the W site had exceeded expectations and were considering ways to stabilize their client base such that a further site would not be required in the future. The management team broadly agreed that the move to a three-site practice had put, and would put, demands on their existing systems, procedures and management and staff.

The research/consultancy proceeded by establishing 'seed categories' for the interviews. Although a departure from the procedures of Grounded Theory, Miles and Huberman (1994) consider this a legitimate way to give initial focus for the interview questions. The three seed categories were understanding of job roles and responsibilities,

decision-making processes and communication between the three sites. The first interviews were followed up with individuals and with groups in order to fill out emerging categories until the major categories were saturated. Saturation is achieved when transcript coding no longer adds to the dimensions or properties of the categories. This was followed in the analysis by the identification of the core category, which is the most abstract representation of the data.

Figure 18.2 illustrates how the highest level of categories relate to a core category. From the written accounts (known as memos in Grounded Theory) of each of these categories an understanding of the domain emerged which was grounded in the organization. The written accounts are given in full in Hughes (1998a).

The HVP study – the practical outcomes

For the HVP management team a number of practical recommendations were made in the form of a report. The report was a distillation of the rich account produced by the use of the analysis method into a relatively thin document that largely ignored the process and context issues, which had led the consultant to make the recommendations. Briefly the recommendations were: to restructure the role of the practice manager; to specify management roles in autonomous sites; to address formal communication systems such as day book and work rotas; to introduce computerized record keeping for client records in the first instance. The management team was pleased with the recommendations and has subsequently acted on all of them to their satisfaction.

The HVP study – the research outcomes

For the researcher one of the important lessons was to consider this distillation into thin descriptions for the management to be a part of

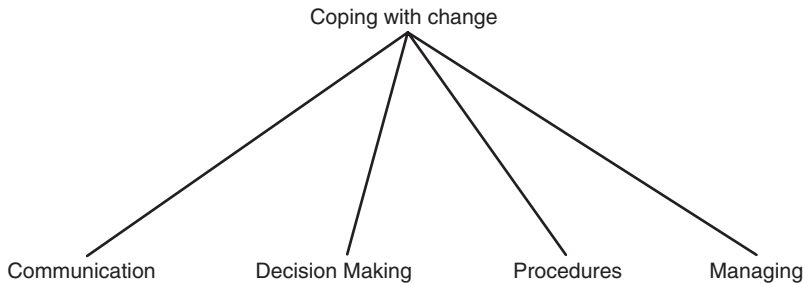


Figure 18.2 Core category and major categories from the HVP action case

the methodology for future interventions. Other research outcomes included the excessive time taken to interview, transcribe, code and categorize the use of seed categories and the adaptation of the original methods into a practical context. What emerged was a revised framework. This revised framework was part of the action cycle and informed future work. The second action case used the adapted framework and methodology.

The FP UK study – domain

The second action case concerns a small manufacturing company, which we shall call FP UK, based in Northeast Wales. It is part of the FP Group consisting of three private limited companies, which are financially independent. The parent company FP A/S was registered in Denmark in 1952 to produce iron dust cores, ferrites and ceramic capacitors. FP UK offers a manufacturing capability for the production of most types of high quality inductors and transformers. Transformers are produced as custom designs and also in standard ranges. A highly flexible production facility ensures short lead times on custom designs as well as standard products. A small amount of business is with factored products (selling Danish manufactured products). Over the years the FP Group has forged strong links with technical institutions and other companies in the UK and the EU and is currently involved in several joint research and development projects with academic and commercial concerns within the EU. FP UK specifically has a design alliance with a German manufacturer and outlets for sales in both Italy and Germany. FP UK employs 18 full time salaried staff who work in administrative or management roles and an additional 20 who are production line workers.

The FP UK study – intervention

FP UK faced two major decisions with respect to the future of the organization. The first was to determine whether the future for FP UK lies either in manufacturing or in sales. The second and related decision was to determine an investment strategy in IT/IS linked to business objectives. The intervention was an audit to establish an IS investment strategy that would enable FP UK to make the decision regarding their future direction.

As with the action case given above, initial discussions included an explicit discussion of the research as well as the practical outcomes. In this case two seed categories were used since these had proved useful in the first case. These were understanding job roles and responsibilities and the impact of IT on work. A change suggested by the learning from

the first case was to cut the time taken for transcribing, coding and categorizing. This was particularly important in the FP UK case because of the tighter deadline set by the sponsors. This was achieved by exploiting the NUD·IST software package and by not fully transcribing all interviews. Using the NUD·IST package it was possible to listen to the taped interviews, transcribe the relevant passage, which would range from a couple of sentences to two or three paragraphs and augment existing categories or create new ones directly and therefore avoid the full transcription step. Because this seemed such a departure from the method, the taped interviews that were not fully transcribed were usually those where categories were being saturated; that is to say they were second or third interviews with the same person. A core category was identified, 'demarcation' and both a full account from the coding was produced in addition to a management report.

The FP UK study – the practical outcomes

For FP UK the practical outcomes were an identification of an existing situation that showed a lack of a common understanding in the use of a variety of information systems and their relation to each other. Also a conflict between organizational goals, expressed by the managing director, and the goals of particular functional areas. The report, which was well received, recommended a single network infrastructure, internal IT integration, exploitation of external IT links, staff awareness issues, the appointment of an IT support manager and the inclusion of IS strategy as part of the business planning cycle.

The FP UK study – the research outcomes

Although the study was a departure from the original procedures for data analysis described by Glaser and Strauss (1967) it should be remembered that the original authors and users of the methods had no recourse to the use of such powerful software tools. In the original paper-based method great emphasis was placed on transcription since the transcribed document was also the physical medium for coding. That is to say margin notes in the form of codes were critical to the success of the method. However the introduction of the software package as the medium reduced the importance of the transcript except as evidence. (It is accepted that the tape itself is evidence but it is much less accessible than paper.) Hence the sequence 'tape-transcribe-code' becomes 'tape-partial transcribe-code'. The difficulty with this is that when the developer needs to compare new documents with existing documents then only the codes or categories or partial transcript are

available and therefore the taped interviews have to be listened to again. A further difficulty with this practical adaptation is the auditability of the method since although categories can be traced to the source document, the document itself is not a full account of the interview. Another consideration on this point is that the paradigm of inquiry for the method, ethnomethodology, is concerned with transcripts being in the interviewees' own words. Whilst the adaptation is true to this in terms of the partial transcript, it clearly does not contain *all* of the interviewees' own words and therefore may not be in keeping with the ethnomethodological perspective. However as with the HVP action case, and as noted in the introduction, this dilemma between practical outcome within time constraints and theoretical rigour whilst of interest to the developer, must be resolved in favour of the practical outcomes. Other research outcomes included the favourable use of the software package in time critical situations and the need for initial seed categories.

Discussion

In this the second section of the paper we discuss the issues of system development as a research act drawing upon the illustrative action cases given above. The action cases presented a theoretical framework that was the basis of practical intervention. For the interpretive researcher reflection on the framework and articulation of that reflection can help to inform future interventions. For the practitioner it must be practical concerns that are uppermost. The major areas for concern arising from this are first the role of the practitioner/researcher and secondly the adaptation of, in this instance, social science research methods into the practical (real world) situation.

The role of the researcher/practitioner

The authors maintain that roles need to be considered for the systems developer, which move beyond the traditional notion of expert and indeed beyond the emergent role of facilitator. That role has been variously expressed as moral agent (Walsham, 1993) or reflective practitioner (Schon, 1983) and considered in the problem solving context (Jayaratna, 1994) where the emphasis is not exclusively on technical skill sets or interpersonal skills but on the thinking skills of the developer. Interestingly, this coincides with the view of the researcher as proposed by Lincoln and Denzin (1994). They would say the researcher, and in the context of this study the systems developer, may be considered to

be the ultimate 'bricoleur' (or Jack of all trades). But more than simply the Jack of all trades, they are also the inventors

they know they have few tools and little by way of appropriate parts and so become inventors (Lincoln and Denzin, 1994, p. 584)

This is a deeper understanding of the limits of methods and openness to learning and adaptation. If applied to information systems methods it opens the door for methodology-in-action and the analysis of our experiences and making explicit learning with fellow analysts and sharing also with those who are affected, that is, 'users'. It is the methodological pluralism (Klein *et al.*, 1991) based on reflexivity, which is context, and the people (agents) in context. This role of developer as bricoleur broadens rather than narrows the scope of action for the systems developer. It challenges methodological purity in action, where dogmatism is at the fore. The bricoleur role also avoids the pitfall of treating the selection of methods and indeed methodologies as one might select a tool from a tool box since the role incorporates the reflective (thinking) aspect.

In the action cases above the use of methods from the social sciences and the explicit understanding and sharing of the ethnomethodology perspective help define the developer's role. However the learning from the action cases shows that this is not restrictive in terms of how the methods must be applied nor does it imply precedence of research outcomes over practical outcomes. In the action cases a paradigm of inquiry and methods of analysis have been used which have produced a written account – this is essentially a *research* outcome. The other research outcomes are expressed as an articulation of the learning that took place about the framework and the methodology for the intervention. For the practitioner however it is insufficient to have produced the account. The sponsors of a study expect also to have recommendations for future action, which they may consider, and then where appropriate act. Although the sponsors and other actors participate in the study they look to the researcher/consultant for what they may term 'expert' guidance – that is what they paid for! (Gummesson, 1991). There is therefore an expectation of a *practical* outcome. In the action cases the practical outcomes expected were achieved by re-presenting the thick descriptions formed from the textual account and the hierarchical accounts as thin descriptions that largely ignored process and context and achieved instead a distillation which was acceptable to sponsors. Rapoport (1970) refers this to as one of the three 'dilemmas' of action

research where the practical pressures interfere with the research process. For the practitioner him or herself it is clearly important to distinguish between the practical pressures and the research process. This can be achieved by critically reflecting on the process and on the research framework.

Indeed, the reflective developer adapts the methodology and makes judgements based on the context. This strengthens rather than weakens the developer's position. Further to this the developer in the cases given actively engaged the users through the validation of interim accounts and hence shared the problems and ultimately gave ownership of future solutions to the users. It may thus be argued that the dilemma receded in the action cases with respect to the researcher/practitioner and it may be more constructive to re-cast the dilemma in terms of the systems developer engaging in interpretive research.

A criticism may be that the learning that takes place in this action case model is almost exclusively internal to the researcher. More commonly this may be expressed by the phrases 'you learn by your mistakes' and 'just put it down to experience'. It would be damaging to leave the situation there. It is the *articulation* of the learning that is powerful, since that is the means by which one person's practical experiences become the shared learning of a community.

There is clearly an implication for training and education of systems developers if this is to be a new role. Although outside of the scope of this paper the authors would point to Walsham's (1993) call for an education based on critical self-reflection. Also the work by Mathiassen *et al.* (1997) who provide an interesting training programme for developing skills in IT organizations which supports critical reflection and organizational learning.

Adaptation of research methods into practical systems development

The second learning point concerns bringing research methods into practical systems development. In the two action case studies the original tenets of both ethnomethodology and Grounded Theory were challenged by practical considerations and adapted accordingly. The authors would maintain that the procedures retain the essential principles of analytic induction within the Grounded Theory approach. However in order to avoid confusion it may be better to rename this set of procedures as grounding information systems rather than to suggest it is the same as the original Glaser and Strauss work. However as noted earlier

even the original coauthors can no longer agree about the substantive theoretical basis of the methods. This departure from prescribed method is perhaps to be expected and as Baskerville and Pries-Heje (1998) note the use of action research will usually change the role of Grounded Theory's elements. This is not uncommon when considering the use of information systems methodologies which differ greatly in practice from their written theoretical form (Hughes, 1998b). The adaptation is indeed not only possible but also worthy. Fitzgerald (1996) notes

In practice, situations will inevitably arise where the developer needs to step outside the methodology, but formalized methodologies often serve to impose a considerable inertia on the development process. (Fitzgerald, 1996, p. 19).

With respect to ethnomethodology in the action cases the movement away from 'pure' ethnomethodological principles was noted in the learning from the FP UK action case. What then remains may be said to be the essence or indeed spirit of ethnomethodology. That is to say that the concern remains with agency and actors and the construction of meaning by the words they use. As Button and Sharrock (1994) noted, when practical priorities become dominant features in the use of methodology it is the fact that the methodology 'instantiated ethnomethodological themes' that is of paramount concern. The action cases presented here adhere to that. This may be an expected outcome of *any* reflective action research since as Baskerville and Wood-Harper (1998) note

The important characteristic of reflective IS action research is its focus on the distinction between theory-in-use *versus* espoused theory. (Baskerville and Wood-Harper, 1998, p. 100 – their emphasis)

The adaptation of methods or theories is entirely acceptable for the consultant engaged in the use of social science research methods. What is critically important is that the adaptation must be the result of reflection on what happened in practice against what theoretically may have been the expected outcome.

Conclusion

The argument presented here is not to persuade practitioners in IS to use and adapt the framework that has been described. It has been described

for illustrative purposes only. The conjunction of ethnomethodology, Grounded Theory and action case provides but one means of intervention in, and understanding of organizational life. The authors' concern is for those IS practitioners who actively engage in organizational life. We would maintain that critical reflection and articulation of learning based on some state theoretical or conceptual framework should be the basis of their intervention. In that way they act both as researcher and practitioner and the results consequently inform both theory and practice. In information systems there is a very close relationship between research *for* systems development and research *into* systems development. The role of action case and an inquiring framework is important in this regard as they provide first a basis for understanding and improving practice and secondly insight for researchers. The onus for proceeding in understanding these issues lies equally with researchers as it does with reflective practitioners.

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