

“There’s something else missing here”

BPR and the requirements process^{*}

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Biography. In pursuing a number of academic and commercial research initiatives, Crabtree, Rouncefield, and Tolmie’s research contributes to the ongoing development of CSCW systems. The authors have conducted comprehensive sociological studies of work in a variety of domains providing retail banking services, library services, container shipping services, tourist information services, and more. Their “ethnographic” work is used to ground IT design in real world, real time work-practice.

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Abstract. Business Process Reengineering (BPR) offers one potential and increasingly influential solution to the requirements problem in software engineering by focusing on core processes. In considering an ethnographic study of process modelling, we suggest that BPR approaches "miss something" of fundamental importance in generating requirements - namely the situated work-practices whereby processes are produced. BPR overlooks the actual work that systems must support if they are to resonate with, and the same time transform, practical circumstances of use. We outline a strategy for explicating work-practice for purposes of system design which compliments the effort to "reengineer the corporation".

Keywords. IT design, process modelling, work-practice, ethnography, instances.

INTRODUCTION

As demand for IT to be more responsive to human activities increases from all quarters, the production of requirements becomes an increasingly complex and problematic matter. In the software engineering community it is increasingly acknowledged that requirements elicitation should be informed by an analysis of the real world circumstances of work and its organisation. Capturing requirements resulting from the real world, real time organisational and social context of systems use is an important factor in software design and development (Goguen, 1993).

In delivering this report we are concerned with workplace activities and approaches to the implementation of organisational change through IT design. We take the production of system requirements to be one of the central problems here. Placing an emphasis on core processes, Business Process Reengineering (BPR) offers one potential and increasingly popular solution to the requirements problem which, simply put, is a problem preoccupied with the question: what to build? Despite widespread successes, a variety of reflective studies by parties involved with BPR suggest that the approach often "misses something" important in the effort to implement IT-based organizational change (Strassmann, 1994; Davenport, 1995; Grover *et al.*, 1995; Reid Moomaugh and Associates, 1995). Ethnographic studies of BPR in action suggest that the descriptive apparatus employed in the production of process maps is a primary source of trouble, glossing and thereby

obscuring the human work-practices from which processes emerge in the real world. BPR is, as such, insufficient for purposes of requirements specification in itself - specification, that is, of *what* to build. We outline ethnography as an alternate yet complimentary descriptive apparatus and mode of analysis supporting requirements specification for work-oriented interactive systems.

BUSINESS PROCESS REENGINEERING AND REQUIREMENTS SPECIFICATION

Business Process Reengineering (Hammer and Champy, 1993) or BPR is of increasing influence in the world of work and systems design alike insofar as IT solutions are often seen as facilitating business solutions. BPR provides a focus, direction and putative requirements for future systems in redesigning the workplace and purports to offer a systematic means of understanding of how organisations function and what has to be done to promote successful organisational redesign. BPR conceptualises what goes on in organisations in terms of business processes which are construed of as any logically related tasks that use the resources of the organisation to provide defined results in support of the organisation's objectives (Harrington, 1991). Business processes are further defined according to their measurable relationship to the customer as any activity or group of activities that takes an input, adds value to it, and provides an output to an internal or external customer (ibid.).

The analytic work of BPR involves the careful identification of organisationally defined tasks concerned with meeting business objectives, and of establishing the ownership of the processes whereby the objectives are met through the coordinated accomplishment of those tasks. This analytic work requires determining where the process boundaries are, where they begin and end, and what the inputs and outputs to the process are through identifying owners of, suppliers to, and customers of, any particular business process. The fundamental presumption at work here is that quantifiable benefits such as the elimination of duplication, error proofing, automation, and

standardisation, will be obtained from the identification, measurement, and respecification of process (Davenport and Short, 1990).

As noted above, central to the analytic work of BPR is the notion of core processes. That is, processes that

the business's strategic thinking has identified as critical to excel at to meet or beat the competition. They make up part of the company's set of core competencies. (McHugh *et al.*, 1995: 52)

Core processes need to be identified in order to redesign work and generate requirements for potential IT solutions, and the initial stage of BPR analysis is appropriately characterised as the discover phase, having a typical duration of some 8-12 weeks (Johansson *et al.*, 1993). The discover phase is directed towards the creation of a high-level vision of what the organisation should be like in the future. Creating a high-level vision is predicated on selecting appropriate processes to reengineer. As Carr and Johansson (1995: 103) point out, "*doing a process right is not enough - picking the right process is the key*". The problem of course, is how might organisations go about picking the "right" process thus creating suitable visions of the future defining the scope of, and requirements for, IT solutions?

Analysing the Organisation

Picking the right process, or processes, and envisioning the future relies on identifying the "as-is" activities which current work processes consist of. Identification is achieved through mapping the as-is activities comprising particular work processes (*ibid.*). Mapping, in this context, consists of assembling "quickmaps" (Johansson *et al.*, 1993). Quickmaps are "first-cut representations" of current business processes (*ibid.*). They provide the "big picture of the processes in a macro sense", thereby defining the internal and external connections and boundaries between processes, and the

workflow characteristics and controls placed on each process (ibid.). Rather more specifically, and as Carr and Johansson (1995: 139) put it,

Process maps should be detailed enough to break a process down into more manageable units for teams to work on redesigning. Even if many activities within the as-is process are to be eliminated in the reengineering, it is important that the map identifies those activities.

So quickmapping is all about getting down to the work activities which a work process is composed of, thereby identifying the core processes of the business and their constituent parts. Quickmaps are diagrammatic representations of the processes that characterise the workplace. They elaborate each process and its inter-connections with other processes in terms of the input and output activities that comprise it, and the work units and departments involved in the process. In such detail, quickmaps serve to illuminate the point and purpose of each process and the parts of the process that are important.

Quickmaps lie at the core of Business Process Reengineering, furnishing details supporting the search for targets for reengineering, for the formulation of suitable scenarios envisioning the competitive position of the company in the future, and, ultimately, for designing appropriate processes “to-be”, including information processes (Johansson *et al.* 1993). Analysis in BPR relies, then, on the description of *current work* through quickmapping. In addressing the central issue of description Carr and Johansson (1995: 139) suggest that

You usually don’t need to map the most minute level of detail (such as fax sent, fax received), but rather should stop at least one step above that level - the activity or transaction level (for example, record customer order). It is important to find the level of activity or transaction at which work is actually done and map to that level.

As-is maps are fundamental resources in reengineering. Not only do they serve to create a “fact-based performance baseline” and promote a “common understanding” of work among participants

involved in the task of reengineering, but they also provide concrete resources for the formulation of "future scenarios" (ibid.). Through the formulation of future scenarios as-is maps are transformed into "to-be" maps describing, at the same "transaction" level of description, future processes of work and putative requirements for IT solutions (ibid.). This level of description has, we believe, profound consequences for requirements specification, as an ethnographic study (Wolcott, 1999) of the production of process maps serves to illustrate.

BUSINESS PROCESS REENGINEERING IN PRACTICE

A managerial preoccupation that came to light in a long-term ethnographic study of a major High Street bank - specifically, in one of its new Lending Centres - was that of process modelling and the production of process maps (Hughes *et al.*, 1997). The Lending Centre in question was taking on the work of a number of smaller Lending Centres throughout the North-West of England. The objective of centralising the work was one of ensuring that, for every single process the bank engaged in, there would be a process map so that anyone could come in and do the job in exactly the same way as anybody else. The perception was that there was a definitive way to engage in a particular activity and managers tried to ensure that, for each activity their staff engaged in, there was a process map representing best practice. In observing the production of process maps, it quickly became apparent that the formulation of best practice relies on *ad hoc* considerations of situated actions and work-practices that nowhere figure in the process maps themselves.

An illuminating example is provided by the case of the manager of the Lending Centre's sanctioning department, who was overseeing the production of a process map by members of his staff. The process in question was a complex one regarding how to eliminate or reduce the level of hard-core debt run up by customers using a certain kind of credit card whilst, simultaneously, turning that occasion into an opportunity for what was effectively a sale by offering the customers

loans to clear the debt. In order to achieve this goal, it was clear that staff from the sanctioning department would have to collaborate with staff from other departments (phones, and monitoring and control), and the manager in question was therefore obliged to visit the managers of the related departments in order to discuss the best way to lay the process map out. In the following extract from the fieldnotes we find a marked difference in the understanding of the process between the two members involved in the map's production.

Fieldnote extract #1.

Lee: What they've done is they've come up with a three-stage process map but I don't think it's quite there yet. So what we've got is - what we need is, two separate process maps. We need one for MAC and we need one for Phones and Letters, right. Right, go on, fire away.

Mike: Can I see that?

Lee: Can you see that? Yeah 'cause - there's something else missing here for you (points to area under decision box on stage 3 process map)

Mike: There's something there that's wrong as well (puts '?' under box on stage 2 process map)

Lee: On what?

Mike: It's alright the, the simple thing here. What I 'd like to do is rather than go through it the way - you're saying Yes or No happens okay.

Lee: We'll know all the successes if we get any but we won't know the ones who are comin' back and sayin' no thanks, right, but we wanna - er - I need to know those.

Mike: You will do, because you've been declined. If you get a letter in

Lee: But uh - eh - no, no

Mike: No you will.

Lee: No - for the phone ones, nobody's gonna tell me.

In the course of their interaction together, and as their talk makes available, each manager was concerned to arrive at a process model that would best reflect the day to day activities that their

own particular staff engaged in. Given this, the two managers had to work together at discovering just what might be "missing" from the original model and arrive at some sort of fix that would take the missing elements into account. In bringing missing aspects of work to bear on the process model, the managers engaged in intensive and sometimes heated negotiation, sketching out options on scraps of paper, discarding some and keeping others. The end product of the manager's work together was a complex and highly creative design that was heavily informed by their own experience of the day to day character of their work, and the work of the staff around them. Furthermore, and quite understandably, it was clear that each of the managers had a vested interest in gaining the best advantage for their own staff, with neither of them being prepared to approve a model that, while possibly offering some better overall advantage, would result in a greater workload for the people working in their own section.

BPR approaches place heavy demands on the ability to consistently identify distinct organisational goals, tasks, processes, customers, costs, organisational boundaries, and more. The practical difficulties engendered in the pursuit to identify such factors do not simply reflect a need for greater effort or ingenuity in the attempt to elicit this information but also, and significantly, reflect the fact that these units of analysis do not exist independently of the practical occasion of analysis. Process models are *social constructions* produced by those party to the occasion of analysis. BPR activities might, as such, be said to produce rather than identify organisational goals, tasks, customers and so on. As our example illustrates, those involved in BPR activities may then embark on recruiting members of the organisation to a particular view of what the organisation is, what it does, and what it should do in the future. Ultimately, and in light of their practical relevances, parties to BPR activities must arrive at compromise solutions between the reengineering vision and the practicalities of the day's work:

Fieldnote extract #2.

Lee: So here's another way of doin' it. We end up with a screen-based log that you input into daily, right? Sorta like, sorta like the date (appends date column on the process map), the date of the letter, the account number, and the sort code. So that's your inputs, yeah? And then it's over to us.

Mike: Mm

Lee: As opposed to manual bits of paper - happy with that?

Mike: Yeah. I mean as I say, there's two options you can run

Lee: Yeah

Mike: And it's either manual log, or somethin' on there (gestures to workstation)

That compromises must be made is not to suggest that the process maps and models finally arrived are necessarily a poor or inadequate representations. What we would point to, however, is the fact that numerous *contingent* considerations are brought to bear in arriving at the "right" process. As our example again illustrates, neither of the managers could offer an unproblematic, clear and definitive version of the right process. Instead, and as a routine feature of business process reengineering, as parties to analysis the two managers were obliged to negotiate, argue for, experiment with, and compromise over different possibilities, to embed aspects of proposals within their own experience, and to draw upon a huge range of other wholly *situated work-practices* in order to arrive at something that they could put forward as a representation of best practice.

BPR turns upon an appreciation of situated work-practice by parties to analysis and the construction of process maps and models. It is just these fine-grained work-practices that are missing from any fixed representation of a process however. This has, we believe, profound implications for matters such as standardisation in the workplace as much as it has for the gathering of requirements in system design, as arriving at just what constitutes the standard or process is something that takes a great deal of *ad hoc* work which relies upon *undocumented* practices of work. There is then, "something else missing" from quickmaps, that something being the real

world work-practices which process maps, and their realisation (the real world process itself), rely on for their production and within which systems are or will be embedded and used. There is, then, a clear shortfall in the specification of requirements for future systems of work. That shortfall is, we believe, a consequence of the *level of description* undertaken in doing Business Process Reengineering which explicitly draws description to a close at the level of transactions in contrast to the practices whereby transactions are performed and processes thereby produced as real world arrangements of work.

DOCUMENTING UNDOCUMENTED WORK-PRACTICE

It should be said, lest there be some misunderstanding here, that we are not damning BPR but pointing out that there is an inadequacy in the level of description it proposes for purposes of work redesign in general and requirements specification in particular. We are, then, suggesting nothing more radical than that BPR needs to improve its descriptive apparatus - although doing this may alter its orientation to intervention in the longer term (Randall *et al.*, 1995). With an eye towards description, and as Hughes *et al.* (1994: 430) remind us,

it is through [work] practices that processes are established and, accordingly rooted in socially achieved sets of arrangements.

While BPR recognises the sociality of work in attending to the constituent activities of business processes and their inter-connections, it misses the work-practices in and through which arrangements of work such as processes are produced, maintained, and otherwise organised by *parties* to work's accomplishment. Thus, it fails to describe the socially organised work-practices in and through which processes are actually produced by parties to the work in real time.

Recognising the work-practices implicated in the production of a process, or collection of processes, is not merely incidental to work and systems design but, as we note elsewhere,

If design is to successfully restructure activities and implement new processes of information production (and use), then designers must provide for the performance of the work from which structure and process emerge. (Crabtree *et al.*, 2000: 678)

The issue becomes one of how might the performance of work - that is, the work-practices in and through which work activities are accomplished in real time and processes (structures, and the rest) thereby produced - be brought to bear on the specification of requirements in the accomplishment of organisational change?

A naturalistic approach

One possible approach whereby work-practice may be brought to bear on the requirements process is the ethnographic one. Originally developed out of the "strange tales of faraway places" of early Social Anthropology (Malinowski, 1922), ethnography was subsequently adapted for the study of everyday life through the naturalistic stance of the Chicago School of Sociology (Prus, 1996). Understood as a naturalistic approach, ethnography is principally concerned with *seeing the social world from the point of view of participants* before standing back to make a more detached assessment (Fielding, 1994). As the moniker indicates, the approach is concerned to produce a folk (ethno) picture (graphic). That is, a detailed account portraying what it is that people do, and how, in particular settings (such as the workplace, for example). In describing the approach Shapiro (1994: 418) points out that traditionally the term ethnography

marks a distinction between quantitative approaches to social science and carries with it a commitment to a period and degree of immersion in the social setting being studied that is sufficient to reach a qualitative understanding of what happens there. These are important matters, but beyond this, ethnography can be put to the service of virtually any theoretical school: there are for example Functionalist, Structuralist, Interactionist, Weberian and Marxist ethnographies.

Rejecting theory and favouring empirical investigation instead, one particular approach to ethnographic study which has strongly influenced our own work is the ethnomethodological one, in which members' or practitioners reasoning and methods for accomplishing situations becomes the topic of inquiry (Suchman, 1987). We shall expand upon this orientation as we progress, suffice to say that it is an approach which has enjoyed considerable prominence in the burgeoning field of Computer Supported Cooperative Work (CSCW).*

For the unfamiliar reader, CSCW might be summarily described as concerned to develop computer support for cooperative work. The notion of cooperative work refers to the ways in which work is individuated (Hughes *et al.*, 1991) and articulated (Schmidt and Bannon, 1992). By "individuated" is meant that analytic attention should be paid to the ways in which particular activities of work are organised as individual activities in the workplace. In other words, it might be asked how is *this* particular job of work produced; what practices does its routine accomplishment consist of? By "articulated" is meant that analytic attention should be paid to the ways in which individual activities of work are coordinated. Once again it might otherwise be asked how are *these* particular jobs of work interwoven; what practices does their routine inter-connection consist of?

Normative answers to such questions posit formal arrangements of work as organising devices – plans and procedures are common devices much as processes are, for example. Thus, and again for example, formal procedures underpinning work processes may be seen to provide for work's individuation and articulation. By way of contrast, CSCW sees cooperative work to be the product of members' "self-organizing" work-practices (Suchman, 1995). Procedures do not provide for the accomplishment and coordination of work activities as they are, without remedy, subject to the contingencies of the particular case to which they must be applied. The accomplishment and

* <http://www.cti.dtu.dk/CSCW/CSCWsites.html>

coordination of work activities therefore consists not in following procedures but in *effecting a practically adequate relationship* between formal procedure and the contingent circumstances of actual cases. In order to effect that relationship time and again, day in and day out, practitioners devise work-practices for ordering and managing contingencies and for getting their work done together as a matter of routine (Gerson and Star, 1986). Thus, and as Suchman (1983: 321) puts it,

The procedural structure of organizational activities [for example] is the *product* of the orderly work of the office, rather than the reflection of some enduring structure that stands behind that work.

By focusing on individuation and articulation work, CSCW seeks to identify members' self organizing work-practices and thereby devise computer support for work as it is actually accomplished in real world, real time situations. It should be said that the focus on work's individuation and articulation does not mean that some new phenomena has arisen with the advent of CSCW - work has always been cooperative. It is not the work that has changed in some way with the emergence of CSCW then, *only our perspective on work as designers*, be that in an organisational and-or technical capacity (Suchman, 1989; Blythin *et al.* 1997).

Ethnography for systems design

Efforts to incorporate ethnography into the systems development process have stemmed from the realisation, mainly among systems designers, that the success of design has much to do with the social context into which systems are placed (Grudin, 1990). Systems are used within peopled environments which are, whatever technological characteristics they may have, fundamentally social in character. Ethnography, with its emphasis on the *in situ* observation of interactions within their natural settings, seemed to lend itself to bringing a social perspective to bear on system design (Luff *et al.*, 1993). The main virtue of ethnography lies in its ability to make visible the real world,

real time actions and interactions that comprise the sociality of a setting. As a mode of social research it is concerned to produce detailed descriptions of the "workaday" activities of social actors within specific contexts. It is a naturalistic method in that it relies upon material drawn from the first-hand experience of a fieldworker in some setting and seeks to present a portrait of life as seen and understood by those who live and work within the domain concerned. The purpose of such inquiry is to explicate the work-practices whereby work activities are socially organised by parties to the work in order that designers may grasp "what is really going on" in the course of work, "what is really the problem about doing it", and "what instruments might [therefore] be devised to help resolve these problems" (Hughes *et al.*, 1992).

The social organisation of work

Seeing work as a socially organised phenomenon is not new, indeed organisational and occupational studies have a long history in the human sciences. The attention given to real time action and interaction in the actual accomplishment of work activities is all too frequently epiphenomenal in character however (Garfinkel, 1967). As the late Herbert Blumer (1969: 66) described matters here,

The prevailing practice of psychology and sociology is to treat social interaction as a neutral medium, as a mere forum for the operation of outside factors. Thus psychologists are led to account for the behaviour of people by resorting to elements of psychological equipment of the participants – such elements as motives, feelings, attitudes, or personality organisation. Sociologists do the same sort of thing by resorting to societal factors, such as cultural prescriptions, values, social roles, or structural pressures. Both miss the central point that human interaction is a positive shaping process in its own right. The participants in it have to build up their respective lines of conduct by constant interpretation of each other's ongoing lines of action.

Blumer's message is simple but rarely heeded in the social sciences - social interaction is the accomplishment of parties to it. As such, social interaction is neither a product of objective social factors nor subjective psychological factors but is rather the inter-subjective and mutually intelligible *co-production of participants*. To put it another way, participants engaged in action assemble and fit together (or produce and coordinate) their activities and in doing so construct familiar organisational structures and processes (Garfinkel, 1986). The most familiar and omnipresent "structure" produced by participants or members in assembling and fitting their activities together is the working division of labour – that most obdurate of organisational forms (Anderson *et al.*, 1989). In fitting their activities together, members pass work on to one another, producing in the practical inter-actions of passing, distinct structures and processes of work then. But that is not all there is to the social organisation of occupational settings and events.

Practical actions and interactions are themselves socially organised phenomenon - they are *practiced* actions and activities which in being practiced constitute the day's work. Practiced actions and interactions are engaged in by competent members and are produced and reproduced time and again, day in and day out. Thus, work-practices provide for the routine performance of particular activities, are tied to particular activities and tie activities together as it were. Work-practices are, furthermore, engaged in by a temporally changing ensemble of members. Thus, work activities are socially organised through work-practices – recurrently produced practical actions and interactions that are tied to activities, which connect activities together, and in their accomplishment produce distinct structures and processes. Thus, work-practice provides the practical circumstances of systems usage whether construed in terms of process, structure, network, or whatever other analytic devices may be thought up. In order to address the requirements problem, the question posed on any occasion of inquiry asks just what work-practices are "at work" in the accomplishment of the setting's daily activities?

Making work-practice available to design

Making work-practice available to design requires the immersion of a fieldworker within the setting of concern, gaining an insiders' familiarity with, and gathering descriptions of, given areas of activity. Traditionally, ethnography requires long periods of immersion in the field. Obviously this is not amenable to the constraints of design, particular those of cost and time, and the approach has been effectively adapted to be more responsive to the needs of designers (Hughes *et al.*, 1994). In this regard the ethnomethodological approach we advocate is no different to other approaches. We are faced with the practicalities of gathering data about the work setting and its activities, and typically produce textual descriptions, and sketches of the ecology of the workplace and the activities which constitute the work within it. Where permission is given, the ordinary flow of conversation and workplace chat is recorded and transcribed at a later date. Field notes and audio recordings are accompanied, where appropriate, by the use of video and still photography, which, in combination with textual description, are employed to convey a concrete sense of the real world, real time nature of work as it actually takes place, rather than some idealised version of events (Rouncefield *et al.* 1994).

The materials generated by ethnographic work require ordering such that some intelligible tale can be extracted. Often this is achieved through the use of social science taxonomies and theoretical frameworks. We reject these methods of analysis and seek instead to describe the methodical ways in which work activities are observably assembled and fit together by participants (Benson and Hughes, 1991) and in such a way that the activities described are recognisable to participants thus ensuring the *validity* of the description (Sacks, 1984). An example from a recent large-scale work-oriented design project serves to elucidate what is meant by "methodical and recognisable" descriptions (Dragon 1997).

The Dragon Project was concerned with devising computer support for customer service work in an international container shipping company. One particular design-problem revolved around the work implicated in “taking action when space pressed”. Ethnographic studies of the work revealed that taking action when space pressed consisted of “export handlers” informing the local “capacity manager” by telex of the current number of containers they had booked on board a vessel and of prospective bookings, and asking for an increase in allocation to meet the prospects. The capacity manager coordinated all requests through the use of a hard-copy vessel specific allocation sheet, totting up and writing in the requested increases. The capacity manager then informed “line management” of the actual and prospective state of affairs by using a computer-based artefact akin to an edit sheet, and requested an according increase in allocation for the vessel. Line management checked the actual state of affairs (number of current bookings) for the vessel in all regional offices through an online vessel specific allocation overview, and if any regional office was under-booked and, as its prospects indicated, did not look likely to achieve its allocation, reallocated its quota to offices requesting increases, thus granting the request.

Vessels become increasingly space pressed the closer it gets to the departure date. Thus, taking action is typically a “last minute” activity which is vital to the well being of the business as the company wishes to maximise its operational capacities and get each vessel as full as possible, and full with cargo generating the most income. Given the “last minute” character of allocation, it is not uncommon for several, if not all, offices in a region to be competing for space. Thus, when calculating “prospects” capacity managers often “add” an excess to the total figure, knowing that line management will probably not be able to give it to them but in responding to over-estimated prospects, will probably give them something close to what they really need. This negotiation is on-going and becomes increasingly frenetic the closer the departure date comes. Compromise is the norm here and capacity managers routinely have to “roll” some cargo to the next available vessel which may well be a week away, and which consists in using an on-line export overview displaying customer, commodity, number of containers and other details of relevance to making a decision as to who and what can be rolled in maximising operational capacities and cost-benefit. So the next vessel ...

As the example hopefully demonstrates, a methods description displays the working practices in and through which members accomplish and coordinate their work activities in real-time (obviously this is a somewhat truncated account – the original description includes working documents, allocation sheets, etc.). A methods description is part and parcel of the social organisation of the work activity it describes then, and it instructs the reader/hearer in work-practice by portraying the methods – the reoccurring actions and interactions – in and through which work is accomplished *in situ* (Garfinkel, 1996). In reoccurring situational detail, methods descriptions portray the actual work in and through which both organisational structure and work process emerge in the fitting together of work activities. In details of work-practice we can see, then, just how work activities are structured in the actual *doing* of the work and just how it is that particular work processes emerge from the accomplishment of work activities. Furthermore, in being written up in ordinary language, methods descriptions are recognisable descriptions of work. Methods descriptions may, as such, be read by practitioners for their accuracy. They are, in short, corrigible accounts of work and they may be revised, refined, and elaborated as required.

In addition to issues of structure and work process, methods descriptions elaborate a related phenomena which is of central importance to systems design. In the situated accomplishment of their local work-practices, workers not only produce and reproduce distinct organisational structures and processes of work but also the unique *information processes* characteristic of that work. In doing the work of “taking action when space pressed” for example, a distinct information process observably emerges from the interactional work of parties to the activity’s accomplishment. That work consists of producing, assembling and transforming information over the course of interaction into new, situationally relevant, sequentially ordered, operative states. Thus, “taking action when space pressed” consists of export handlers producing and assembling

information concerning current and prospective bookings and passing on that information to the capacity manager. The capacity manager transforms the information furnished by export handlers into current and prospective bookings for particular vessels. That information is then passed on to line management where it is transformed into information about current and prospective regional bookings for particular vessels. Distinct information processes emerge, then, as the work is passed on through the working division of labour.

Crucial to the production of information processes are the situated work-practices in and through which information is produced, assembled and transformed over the course of being passed on in the course of managing the daily contingencies essential to the doing of good work. Failure to support the situated work-practices productive of real-world information processes can but result in the "misalignment" of technological solutions with real world circumstances of use (Button and Harper, 1996). That is, in a shortfall in requirements and subsequent failure to support *actual* business use. In describing the situated work-practices observably productive of organisational structure, work processes, and information processes, the ethnographic approach we advocate identifies rather than constructs a sense of organisational goals, core processes, and IT requirements in analysing the lived details of the real world, real time accomplishment of work activities.

Describing and analysing work-practice

We use the term "instance" to describe a methods description of some particular activity, such as "taking action when space pressed" (Crabtree, 2000). Instances provide concrete resources for design in that 1) as a collection they describe the work activities and work-practices productive of organisational structures, work processes, and information processes, and 2) as individual units of analysis they convey a concrete sense of "what is really going on" in the course of some activity

and “what is really the problem” in doing that activity. In describing practical problems of work from the point of view of parties to the accomplishment of work activities, instances circumscribe a problem-space for design. Furthermore, in explicating the work-practices in and through which such problems are resolved by participants as a matter of course, instances circumscribe a solution-space for design, providing for the specification of requirements and the formulation of design-solutions. In light of the above instance, for example, it is clear that any usable system will be required to support the work of negotiation that takes place between export handlers, the capacity manager, and line management. That is, the work of monitoring current and prospective bookings; of communicating requests for increases; of coordinating requests; of negotiating with line management, and the rest. In instanced details of real world work-practice *quality criteria* are specified, requirements thereby identified, and appropriate design-solutions devised. As Christensen *et al.* (1998: 19) describe matters here,

Whenever we encountered problems in the implementation, the instance worked as a common resource: whatever the specific design ideas and problems were, the quality criteria was always whether we could support the instance.

The collection of instances not only allows designers to develop support for particular activities then, but in real world details of the passing on of work and information, for the computer supported coordination of those activities across the division of labour. Thus, the ethnographic approach outlined here supports the design of cooperative systems that both fit and transform the practical situations within which they will be embedded and used; namely the practical management of organisational processes in the daily accomplishment of members work.

BPR AND REQUIREMENTS SPECIFICATION: THE “MISSING WHAT”

The rhetoric of BPR is often grounded in a particular conception of the past, its legacy, and effects upon the present ... The “fresh view” of BPR requires a stale past ... it should be questioned whether the present is merely a fossilised sedimentation with forgotten rationales, caused by the past and resistant to change. Such a view hinders concern for the active, innovative, constructive and creative reproduction of order in the here and now. Attention to such possibilities may guide the sensitive design of future support and cooperation arrangements. (COMIC D2.1)

With its focus on core processes, Business Process Reengineering offers one potential solution to the problem of bringing about organisational change through IT design. In light of an ethnographic study of process mapping we have argued, however, that the descriptive apparatus at work in BPR (i.e. quickmapping) is inadequate for the purpose insofar as that apparatus misses the situated work-practices which are productive of processes and process maps alike. Consequently, systems requirements are under-specified.

We have suggested that one potential solution to the problem of description is to use ethnography, an approach well suited to the explication of the real world, real time work-practices in and through which work processes are produced and within which systems are embedded and used. Ethnography furnishes instances which describe the work-practices in and through which the activities comprising the working division of labour are accomplished and coordinated. Instances circumscribe a problem-solution space for design in portraying practical problems of work and work-practices for their solution. In such detail instances provide for the specification of quality criteria, the concomitant identification of requirements, and formulation of design-solutions that resonate with, and at the same time transform, the practical circumstances of systems use.

It is important to stress in bringing our talk to a close that we are not rejecting BPR as an approach to implementing organisational change through IT design. What we are suggesting is that ethnography may be employed as a complimentary approach, remedying inherent deficiencies in BPR analysis which impact profoundly on “picking the right process” and, consequently, on specifying requirements for IT solutions. The advantage of an ethnographic mode of description over quickmapping lies in its ability to portray the work-practices in and through which work and information processes are produced in real time. In such detail, ethnography allows designers - both organisational and technical - to identify which processes are important, why they are important, and just what the work of the process requires for its support.

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