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Communicating the complexity of computer-integrated operations

An innovative use of process modelling in a North East hospital Trust

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Abstract *The English National Health Service has undergone unprecedented political, economic and technological change. This has resulted in a requirement for radical improvements in operational efficiency and effectiveness. An effective IT infrastructure supporting key operational processes and management reporting is now seen as essential. This paper outlines the findings from empirical research in a North East hospital Trust. The authors collaborated on a requirements analysis project to investigate and model business processes and information flows using an automated IDEF0 software tool. A participatory action research framework was used, informed by principles derived from critical social theory, to describe the complexity of the situation and provide improved communication amongst stakeholders. The paper concludes by reflecting on the need for more "ideal" speech situations in order to deal with complex operations management problems where political, power and social issues can obstruct effective implementation of new computer-integrated operations.*

Introduction

During the 1980s and 1990s the NHS underwent unprecedented change. The drivers for this change were political, economic and technological (Packwood *et al.*, 1991; Thomas *et al.*, 1995). A major area of scrutiny was the day to day operations management of the hospital sector that was perceived to be inefficient and in need of reform. Vast amounts of data are generated every day in hospitals and the information derived from such data has the potential to aid clinical and operational decisions about patient care and resource usage. The conversion of this vast amount of data to information of real value requires a great deal of processing which Government felt could easily be achieved automatically by computers (Child, 1986; Faulkner *et al.*, 1987; Willcocks and Marks, 1989; NHS Management Executive, 1992; Sheaff and Peel, 1995). Large scale computer-integrated systems were seen to be the solution and the feasibility of this approach was initially piloted at three hospitals in Darlington, Greenwich and Nottingham. Unfortunately many of these high profile

information systems projects have ended in disaster or only partial success (National Audit Office, 1996; Wainwright and Waring, 2000). All too often they have been seen as purely technical implementations and the real issues, primarily organisational and political in nature, have been ignored.

Proctor and Brown (1997) graphically illustrate the need to focus on the human and organisational issues in their discussion of the disastrous Hospital Information Support Systems (HISS) project at Nottingham. They point to conflicting cultures between departments, the HISS team and the external IT consultants as factors contributing to difficulties. Added to this the operational processes within the hospital had not been accurately modelled and the new system did not reflect the way many people needed to work. Thus a number of informal systems emerged which by-passed the ineffective computer system.

These are not new integration problems suddenly appearing in the NHS and many such cases have been encountered in manufacturing (Waring and Wainwright, 2000). The question is what can be done to address them? It is our belief that more innovative approaches to the process of requirements analysis prior to implementing integrated systems in the NHS is one way forward; an approach that is pragmatic taking account of human, organisational and political issues, yet based on a solid theoretical underpinning which is sympathetic to complex, politically driven organisational environments. We propose that a process modelling approach informed by the critical social theory (CST) of Jurgen Habermas may be a way forward and provide empirical evidence to support our case.

The first section of the paper develops an argument for a more informed view of NHS organisations, recognising them as complex systems environments and outlines the relevant theory which can be applied to the process of introducing integrated systems. The second section comprises empirical research and uses a case study to describe and interpret the experience of a North East hospital. This organisation embraced the concepts of efficiency and effectiveness through management reform, business process redesign and the progressive introduction of new information systems and technology. It provides an account of the methodology used in the research and how the process modelling technique IDEF0, encapsulated in a computer aided software package, was utilised to assist and inform stakeholders in the hospital about their information flows and the political difficulties involved in re-designing their business and organisational processes. The paper then draws some innovative conclusions concerning the participatory approach used for process modelling (guided by an emancipatory philosophy) with the key hospital stakeholders, the problems of developing integrated systems, and finally identifies some issues related to understanding the political context within acute hospital trusts.

The critical social theory of Habermas

The work of Jurgen Habermas and critical social theory (CST) has made extensive impact in the field of modern European philosophy. It is not our

intention to engage in the substance of these philosophical debates related to the ideology of marxism and managerialism but to consider some of the principles that have guided other researchers in developing theory applicable in organisational studies. A more detailed balanced discussion and critique of critical social theory can be found in Held (1980) and Fay (1987).

CST is relatively well established within management studies and increasingly is becoming known in the operational research and information systems field (Alvesson and Willmott, 1996; Mingers, 1992; Flood and Jackson, 1991; Flood and Romm, 1996; Hirschheim and Klein, 1989, 1994; Lyytinen, 1992; Lyytinen and Klein, 1985). Habermas (1972) has expressed concern about how technical knowledge interest (where a desire to control outcomes is preferred to more discursive communication leading to an ideal situation where people are freed from domination and control) has come to dominate society through technocracy (Alvesson and Skoldberg, 2000, p. 115). Habermas (1972) argues that there is a need to restore man's ability to engage in critical reasoning and not be steered by ideas and values which we have not subjected to scrutiny. To do this there is a need to develop communicative competence or action (Habermas, 1984).

Agreement that is achieved through communicative action is based on underlying assumptions. When an agreement between a group of actors about a shared background can no longer be taken for granted, the actors embark upon discursive action. Here various assumptions concerning the communication background are subjected to careful analysis and their validity is tested. Discursive action is thus oriented towards the co-operative search for truth, the clarification of unclear message content, the analysis of the intended use of the messages and so forth.

The four criteria of clarity (can what is being said be understood by the receiver), truthfulness (is what is being said truthful), sincerity (is what is being communicated done with good intent) and social acceptability (is the communication in keeping with the values and norms of the receiver) define the validity of communications in the same manner as effectiveness is used to measure purposive-rational actions (Habermas, 1984).

Discursive action is aimed at justifying any or all of the four claims should one become the subject of doubt. This requires that all actors respect certain "ground rules" when claims are made for and against raised claims in the pursuit of rational justification (Habermas, 1979). This would require organisations to be transformed towards a structure where all actors have a chance to express opinions, to enter or leave the discourse, and to honour what Habermas (1979) calls the "force of better argument".

The principles of CST are seen to be harmonious with participative methodologies for information requirements analysis in complex political and pluralistic environments. It may therefore be used as an underpinning philosophy (and epistemology) to inform a participative approach to process and information flow modelling.

Participative user-centric and socially responsible methodologies such as socio-technical design and soft systems methodology have been developed and adopted in the field of IS and operations research. ETHICS (Mumford and Weir, 1979) is the best known socio-technical approach and appears to be more user-focused than traditional structured systems development approaches (often referred to as “hard” methodologies) but does not critically challenge the rationality and acceptability of management goals; it does not deal with negative aspects of power, domination and control. It may act as a complement to “harder” methodologies to offset potential resistance by users upon ICT implementation. In the UK and notably in the public sector, research carried out by Checkland (1981) has established soft systems methodology (SSM) as an adjunct to structured methods – in particular less structured problem situations. SSM is more participative, questions goal setting, is less technocratic and is based on an action learning cycle. Although SSM is seen as a progressive methodology in both the operational research and IS field it does have its critics who believe that it is naïve in its approach and does not address the real organisational issues of power, politics, domination and control (Jackson, 1982). These critics have tried to offer alternative approaches to implementation that have an underpinning theory based on critical social theory (Alvesson and Willmott, 1996; Hirschheim and Klein, 1989). Willmott *et al.* (1990) propose that new opportunities may lie in the development of more “socially responsible” and democratic approaches to ICT design, development and implementation. This has implications for the IS specialist or systems analyst who would be required to act in an appropriate manner.

Knights and Murray (1994) argue that the power of the IS specialists is also linked to the technical-rational discourse they utilise which “depoliticises” the development and use of technology as it supposes these specialists to be impartial experts. Tensions exist between the IS specialist as “a technical rationalist selflessly pursuing unified and uncontested corporate goals” and the forces of power, politics, control and domination which cannot be ignored and can impact upon the implementation (Knights and Murray, 1994, p. 90). Complex systems, typified by ICT within the healthcare environment, are ones that Jackson and Keys (1984) have articulated as being suitable for an approach informed by critical social theory. In the IS domain, complexity is demonstrated where organisations implement integrated systems that cross departmental boundaries, have large numbers of diverse operational processes and which involve a large number of staff. The NHS and its need to integrate staff across departments and across service boundaries is an ideal organisation to explore innovative approaches to ICT implementation which promote participation of users and inculcate more social responsibility in the IS/IT specialist staff.

The emancipatory philosophy of Habermas and its attack on positivism (scientific and technical domination of society) has been attractive to a number of academics. Yet this work is highly theoretical and has been criticised because of its lack of engagement with the practical (Held, 1980). Habermas has

provided little guidance for those wanting to advance emancipatory action and change. Nevertheless, Mingers (1992) constructively suggests that the way forward is to be guided by Habermas's (1974) key principles. These principles involve three stages:

- (1) The development of critical theories about the nature of the social situation in terms of the position and true interests of the actors within a social structure.
- (2) Use these theories to enlighten concerned actors as to their position. This may lead to "authentic insights" and changed attitudes. Mingers (1992) argues that it is only success at this stage that provides the validation of the theories.
- (3) The enlightened social group chooses tactics and strategy to be adopted in the actual political struggle.

A participative approach, informed by CST, formed the basis of exploratory research (Waring, 2000) conducted at a North East hospital (named North East Hospital for the purposes of this case example) where a new integrated e-mail and document workflow IT system was being considered as a replacement for a number of manual operations. The next sections provide a description of the research methodology and the context of the research.

Research methodology

The methodology used in the project was participatory action research (PAR) informed by principles derived from critical social theory. It was being developed as part of a PhD programme by one of the authors and had been used at a previous research site. Stringer (1993) suggests that an authentic socially responsive methodology must enable participation, acknowledge people's equality of worth, provide freedom from oppressive debilitating conditions and enable the expression of people's full potential.

Udas (1998) argues that the PAR notion of full participation of all systems stakeholders is captured in Habermas's work on the importance of communication in critical theory. The "ideal speech situation" is based on the need for group or community truth to be arrived at through consensus. This point is reinforced by Stringer (1999) who continues by stating that the emancipation process requires critical self-reflection on action and the conditions that create action. Previous work by the researchers (Waring, 2000) in the area of user requirements elicitation for IT development had identified the potential usage of new software process mapping tools as a diagrammatic medium of communication to enable systems developers and users to understand each other's requirements more effectively. This dialogue was enhanced by adhering to a simple set of rules embedded in the process modelling methodology, ICAM definition method (IDEF0; www.idef.com). Hence IDEF0 rules for input, process, output and mechanisms embedded in intuitive MS Windows based process modelling software (IDEFINE) were a

facilitating device to enable common understanding between actors in the research programme. The modelling enabled enhanced discourse and understanding and sat favourably within a Habermasian and emancipatory philosophy.

The research had three phases comprising semi-structured interviews, observation and IDEF0 modelling. A total of 23 semi-structured interviews were conducted to gather information on organisational structures, tasks, roles, business and clinical processes and information flows. These were audio taped, transcribed and fed back to respondents for comments/amendments. The team met with senior staff from the chosen IT vendor, explored the potential of the proposed integrated package and also spent some time in two of the departments, Medical Records and Outpatients, observing working practices. From the information elicited in the interviews, together with documentation relating to data gathered within the departments, the processes in the pilot departments were graphically represented using IDEF0 software (Metasoftware – IDEFINE, www.metasoftware.com). These models were developed by the researcher alongside users from the departments and in response to what they wished to be represented. Thus the models became a communication aid for users as they were shared within the pilot departments and were not predicated on the underlying technical methodology. The IDEF0 models were also fed back to the IT Vendor for discussions relating to the feasibility of the suggestions emerging from the pilot departmental users.

The integrated e-mail and document management project at North East Hospital

The NHS has always been a very complex organisation due to the national and local structures, the diversity of stakeholders, the complex political environment, and the effects of demographics and pressures from developing technological opportunities. This context is managed at both national and local levels against increasing pressures to deliver higher quality, more efficient and effective services, with the constraints of optimising resources in terms of finance, people, infrastructure and technology. This complexity was typical at North East Hospital.

Although one of the original RMI pilot sites, at the time of the research, North East Hospital had not invested in information systems or IT for a number of years choosing to concentrate its efforts in gaining Trust status in the early 1990s. As Government reforms continued to emerge the hospital had difficulty in changing its operational activity and producing the necessary information to support the management of the Trust. The IT issue was further complicated by the fact that the Hospital was suffering from a legacy of systems dating back to the early 1980s which ran on different platforms and provided the Trust with many problems of data transfer. This legacy also applied to the microcomputer systems. Departments appeared to have had a great deal of autonomy and consequently had randomly purchased hardware and software for their own use without reference to the Trust as a whole.

Problems at the Trust hospital

To compound the difficulties faced by the Trust with regards to its technical infrastructure there were problems with basic information needs and the systems which provided that information.

The following problems were identified as strategic by the Trust management.

Contracting information. Many hospital decisions and planning were based on the contracting process. The Trust had no real-time information with regards to contract information and hence both clinicians and senior management had little confidence in the quality, timeliness and accuracy of the information provided.

Waiting lists. Waiting list information was a contentious issue throughout the NHS sector. In North East Hospital there was no standard method for maintaining waiting lists and management suspected that the clinical directorates within the Trust were not keeping them accurate and up to date.

Referral patterns. A further area for concern for the Trust was its inability to gather information relating to the referral patterns of its patients. It appeared that GP referrals were increasing out of all proportions for a number of clinical departments. However, the respective departments had no procedures in place to collect the relevant information. Hence the Trust did not know the source of demand and why it was happening and hence they could not take action.

Management also identified specific operational problems relating to:

Bed management. The central administration of the Trust needed up to the minute information on the status of beds on each ward. This was done through the patient administration system (PAS) and the ward returns (WR). WR were expected to be produced by nursing staff each evening and indicated where patients had been discharged back into the community and where there were vacant beds. However, wards were inconsistent in producing this information as it meant diverting at least one nurse away from his/her clinical duties and this resulted in WR being ignored or completed in haste. The ultimate consequence for the hospital could be the loss of income or for a patient on the waiting list, a delay in medical procedure.

Pathology. This department was a source of great concern for the clinical departments and irritation for junior doctors. Many blood and tissue tests were delayed through the inefficient processes surrounding collection of samples and reporting of results was equally as poor. An example of this was where junior doctors would carry blood samples to the Pathology department in order to give priority to their patients. This would by-pass normal collection protocols and cause operational problems elsewhere in the system.

It was against this background that early in 1996 the authors were approached by North East Hospital to collaborate on a requirements analysis project which was intended to investigate certain business processes and to address some of the Trust's difficulties with information flows. The IT manager and the Information Services manager had been tasked with solving the problems as identified by management. The preferred solution was a technical implementation of an integrated e-mail and document management system. However, in the course of discussion with the authors it emerged that the Trust had a history of failed IT projects. These failures had produced a negative opinion of IT systems in general and of the administrative management of the hospital specifically.

Reasons for these failures could not be easily elicited and so the researchers proposed an action research strategy that would aid the researchers and the organisation in the understanding of the issues surrounding this particular implementation. Before considering the whole of the Trust it was agreed to perform a pilot study which would encompass the following departments: Information Services; Outpatients and Medical Records; Business Management; Pathology; General Surgery and Liver Transplant.

These departments were chosen by the Trust management because there appeared to be particular difficulties within. Various power bases and hospital politics were causing some serious breakdowns in operational activities and information bottlenecks. The Trust hoped the research project might bring to light some of the issues and go some way to address them.

Findings from the research

The findings from the work undertaken at North East Hospital are structured using the three stage methodology of Habermas (1974).

Stage one: the social situation within the pilot departments

The initial interviews prior to the process modelling gave the researchers insight into the social situation within North East Hospital. For example there was a tension between the hospital management and the clinical directorates to the point where there was open hostility. If this was not bad enough, within the General Surgery Directorate there was what only could be described as a "turf war" ensuing between Liver surgeons and General surgeons. General Surgery had developed its own coding system for clinical operations and surgical procedures that was at odds with all other coding in the Trust. The Liver surgeons chose to use Trust coding methods.

Nurses within General Surgery objected to being asked to do even more administrative work at the expense of patient care. This brought them into conflict with Outpatients and Medical Records (OP&MR) who required ward information to meet government requests for bed occupancy, admissions and discharges.

OP&MR were at the centre of much of the operational activity and acted as a conduit for many information flows. The manager of this department had the

“ear” of the Chief Executive and was seen to use this influence to develop her own systems and to persuade other managers to become part of them. These “personalised” systems led to much duplication of effort and overlap with the work of Information Services. This caused stress in the relationships between the two managers of the respective departments.

The Trust had its own Business Management department which relied on information from clinical areas in order to develop business plans, monitor contracts and liaise with local health authorities and GPs. They often came into conflict with clinical consultants when they got a query from a GP about a particular patient on a waiting list as there were discrepancies between what GPs were told was happening and the actual situation in the hospital. Business Management was also in conflict with Pathology as Pathology had been allowed to operate almost like a discrete small business and even had its own marketing manager.

The Pathology department was highly unusual as it spent a good deal of its efforts developing external business – but not Pathology. It was involved in reprographics and health checks for private medical patients. This brought in much needed funds for the department and ultimately the Trust. This external focus led to conflict with internal customers who felt the service, with respect to testing and results reporting, could be much better.

In summary the interviews produced a great deal of historical, social and political information about the respective departments. The complexity and sensitivity of the situation needed to be communicated to all concerned along with nature of the information flows and business processes, which potentially might become part of the integrated e-mail and document management system.

Stage two: enlightenment through IDEF0 process modelling

The main objective in stage two was to model the individual departments’ work and the interface between them where difficulties arose. These models and diagrams were then fed back to the users, discussed, amended and fed back once more for clarification. In order to do the work it was necessary to get the approval of both management and staff within these areas for maximum co-operation and clarity.

The richness of the data elicited not only allowed the processes to be studied in some detail but also gave further insight into the political nature of problems that had been arising. Although the IDEF0 tool had an underpinning methodology the researchers did not use it rigidly as the objective was to facilitate communications between users and enlighten them as to the nature of what was taking place within the Trust. Communication and discourse can only take place through a common language – the models and diagrams. The users were encouraged to make use of everyday Trust language for the models.

The small extracts in Figures 1 and 2 illustrate what emerged from the investigation and how those involved in the project wanted the systems to be represented. Although traditional users of IDEF0 may criticise us for not using

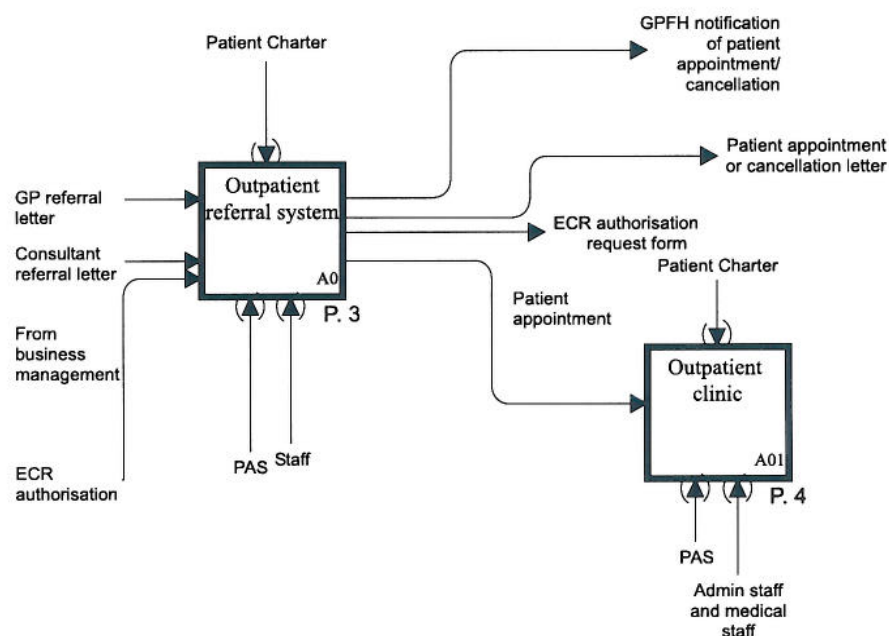


Figure 1.
Model produced with
users from General
Surgery and OP&MR

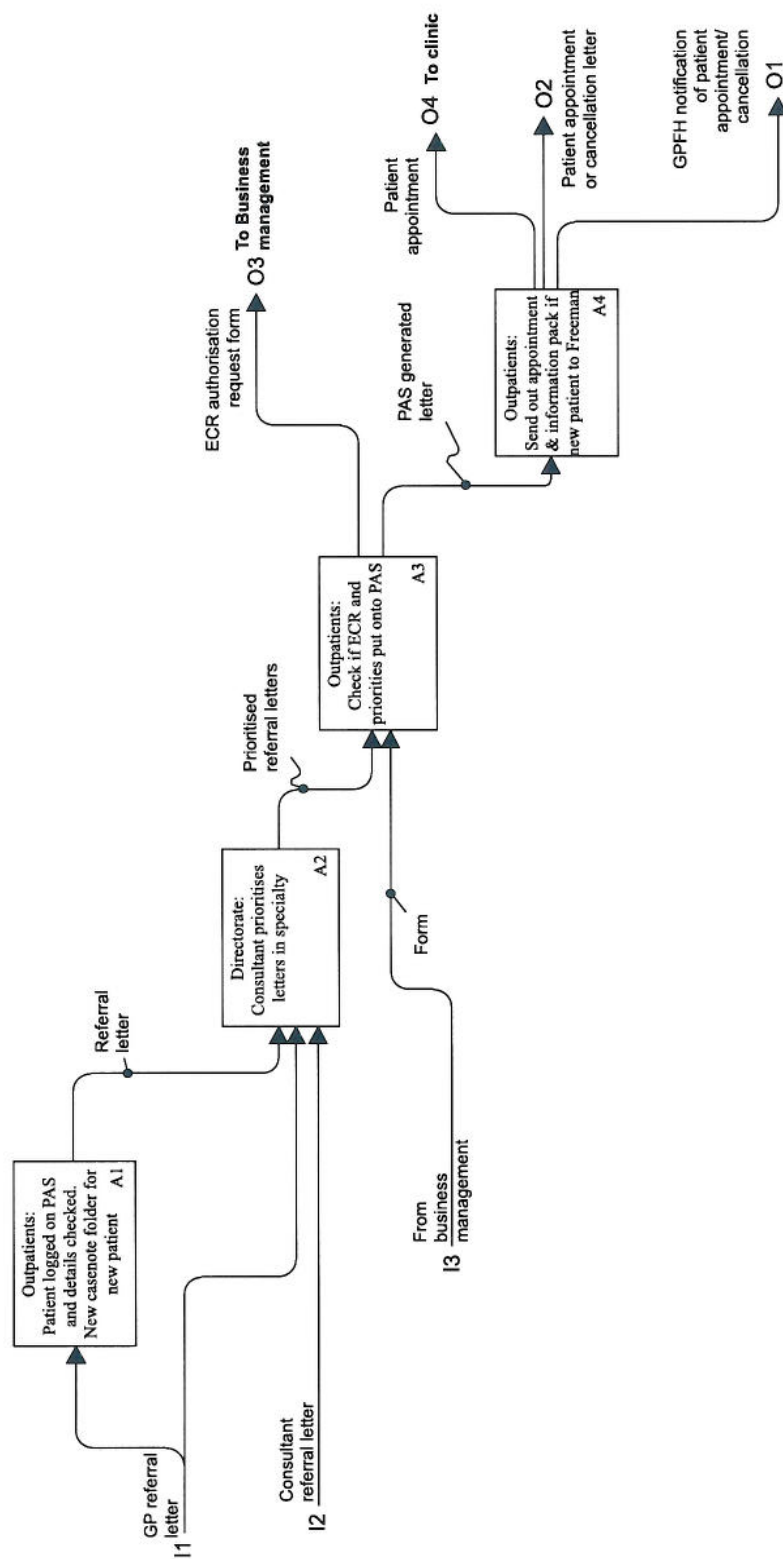
the tool in its intended manner it brought to the surface in a graphical way what was going wrong in the way patients were being referred.

This part of a larger model, Figure 1, shows how patients are referred and then access an outpatient clinic. By decomposing the “outpatient referral system”, Figure 2, it became clearer to staff where certain problems were occurring and could be improved.

One problem identified in this system was that referral letters from GPs were coming into the hospital at two distinct points – first in outpatients and also to the consultant in the directorate. If the letters came into Outpatients they were logged onto the patient administration system (PAS) but if they went first to the directorate then they could be “lost” depending on when the consultant dealt with them. This had repercussions for waiting times measured against the Patient Charter and it began a debate on whether referrals could be done differently. It was in fact technically feasible to have direct electronic access by GPs into consultant clinic appointments.

It was apparent from the interviews and the modelling that a large proportion of staff was not aware of how their job impacted on other areas of the Trust. However, when the first iteration of modelling was complete the researchers went back to the interviewees to discuss the models. In OP&MR this was done with the staff as a group and included the manager of OP&MR. They found the diagrams clear to follow and because it was done from a user perspective they could relate to the language and the terms being used. Once they orientated themselves they made some suggestions as to where there was missing information. This had not come out in the original interviews. The modelling of their systems made the information flows explicit and it was not unusual to hear “I know it sounds silly but we have always done it like that”

Figure 2.
Further detail of the
Outpatient referrals in
General Surgery



and it gave rise to some reflection on how they might change some of their practices. It also allowed discussion of where the integrated system might assist their work and give them the opportunity to exchange manual data flows for electronic ones. Obviously they were keen to see benefits for their department and not for it to be all one way flow. This was important for the nursing staff whose primary task was patient care and whose experience of the nurse management system was extensive data entry with no information in return.

Having completed the work in the pilot departments the results were presented to the IM&T strategy group for further reflection. They, too, had never seen the Trust processes represented in this particular way and were very interested in what was being discovered. It allowed the Computer Services manager to start to understand the business and to realise what difficulties needed to be overcome before the implementation of the integrated system. It also allowed the Information Services manager to see why some of his information was inaccurate, how duplication of some data gathering processes were occurring and the many information bottlenecks that were the cause of so much stress to his staff.

Users in the other pilot departments were surprised at the detail that could be included in the modelling and were interested to see the models for the other departments and how they interfaced with their particular department.

Stage three: agreeing a way forward

Having explored the difficulties within the pilot departments and graphically represented the business processes and flows of information it was appropriate from the research perspective and that of the Trust to develop an agreed way forward. Stage three took the form of volunteer departments determining aspects of their systems that could be more tightly coupled to others through the use of the proposed e-mail/document management software – providing it was mutually beneficial.

For example, a major bottleneck in the “Outpatient referral” process was the need for OP&MR to have Extra Contractual Referrals (ECRs) authorised by Business Management. This involved staff literally running between departments trying to get the signature of the correct member of staff. By discussing the problems using the models produced in IDEF0 the managers of the individual departments agreed that the ECR request could be dealt with electronically using the proposed new system as it would benefit both departments. Electronic signatures could be accepted.

A new protocol was agreed between Pathology and Liver Transplant for the sending and receiving of tests and their results. This would involve the development of specific forms for recording results on the proposed integrated e-mail/document management system.

Ward staff in General Surgery and those in OP&MR began to see how the need for relevant information was important to both areas. Thus they entered into a dialogue that resulted in a thawing of relationships and an agreement to

provide ward returns via the proposed new system and handle enquiries from the Wards by e-mail.

This discussion between departments continued until there was agreement as to how the new system might be piloted within the five departments. The results can be seen in Figure 3.

However, there were staff who thought the pilot “would be another waste of time and money” (Head of Clinical Pathology, March 1996) and did not want to participate. No one was forced to become involved unless they wanted to and could see benefits for their department or ward.

The IM&T strategy group was given the final models to consider plus a diagram that highlighted the possible documents and workflows which had been agreed with the users for the proposed pilot integrated system.

At this point the potential vendors of the system had to be consulted as to whether their product could do what the users wanted. So the next step was to contact them and arrange a session to feed back to them the results of the modelling and to explore the possibilities of exchanging manual documents for electronic ones.

The meeting that took place between the researchers and the supplier was informal but involved representatives of senior management. The company specialised in technical solutions for organisations and did training for them. However, they did not become involved in the organisational issues that frequently arose and were not particularly interested in the business aspects of implementation. Their product was intended to be generic and not function specific. They had done very little work with the NHS and were hoping to get into that market.

We went through the possible electronic information that could be transmitted by the system and this was seen as feasible. However, what did emerge was that the creation of the templates for these documents would have to be done by the Trust staff and this had implications for training and staff resources. This information was fed back to the IM&T strategy group who had to make a decision as to whether to go ahead with the proposed implementation of the pilot integrated system or to consider another solution. All of the data collected and the modelling of information flows was presented to the Trust in the form of a report that was then left with them.

Discussion

Implementing integrated systems is not a simple technical process. It is highly social and political. The degree to which it is successful is dependent on many factors not necessarily relevant in every organisation. The approach adopted in this paper explicitly set out to examine many of the issues that are not addressed in other traditional implementation methods and to explore the value of the work.

By developing critical theories about the nature of the social situation in the pilot departments we discovered a number of relevant issues that could impact upon the project. Traditional approaches often assume that an implementation

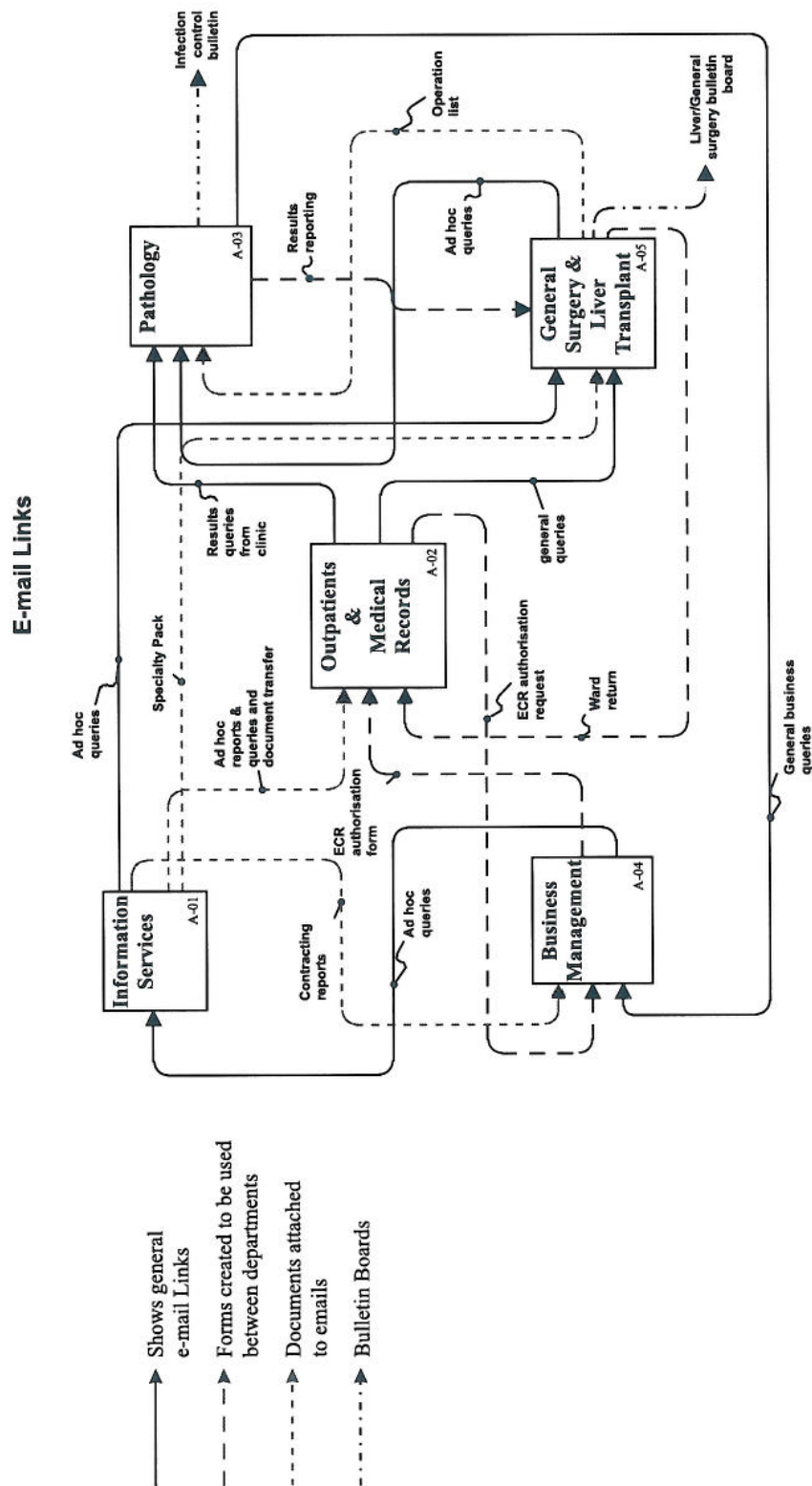


Figure 3.
Agreed changes to
operational activities

is unique and undertaken in isolation of its historical context. However, historical “baggage” in this situation was very important. We encountered a number of people who had been involved in failed systems and systems procurement that had been unsuccessful. Many staff had become cynical towards computers and the benefits they supposedly brought. Although recognising that the hospital needed capital investment in the form of new information technology they were reluctant to get involved.

A result of the incongruent relationship between central administration and the clinical directorates was the difficulty in collecting high quality data at source that would feed directly into the contracting process. Staff within directorates were collecting and validating data on a regular basis that when passed to the central business function went through further validating processes. This was continually adding to staff workloads and to stress levels. There was also the perception that certain departments were continually asking for more and more data to be collected and never feeding any information back or where feedback occurred it was of poor quality, in the wrong format or too late to be useful. This needed addressing.

The approach also highlighted poor industrial relations, a lack of up to date IT skills and a low morale and motivation level generally among clinical staff faced with increasing workloads due to government initiatives.

IDEF0 was used to try to provide insight into the issues by means of a common language. Habermas (1979) argues that through language there is an innate aim to achieve mutual understanding. This can be achieved by focusing on agreement, common understandings of customary behaviour, meaning and values and on maintaining social relationships. Habermas is also concerned about how meanings are constituted and in particular, how power is involved in that process. He distinguishes between the “ideal speech situation” and “distorted communication”. In an ideal speech situation people are able to communicate freely and reach consensus on the basis of their shared understandings. In systematically distorted communication, power and influence are used to generate a “false consensus”. Alvesson and Deetz (2000) also relate the concept of systematically distorted communications to that of suppressed conflict and discursive closure. Discursive closure exists wherever potential conflict is suppressed. There may be several processes involved. First, disqualification of certain groups or participants from the discourse. Second, denying people the right of expression or access to speaking forums. Third, asserting that there is a need for expertise in order to speak and fourth not providing the right skills so that people can speak adequately. So it is not sufficient simply to understand how people see the world and reach consensus but it is vital also to be able to understand how certain forms of meaning have been generated through the manipulation of power.

By communicating across departmental boundaries with many staff in the pilot project there was an attempt to address the issues of systematic distortion of communication. Everyone was eligible to participate and did not need to be expert in systems implementation or process modelling methodologies.

Through a simple approach to IDEF0, staff were able to explore their own systems and procedures as well as those in other departments and ultimately to pass comment on them. They could see by interpreting the models where different social relations, power and politics were preventing new working practice. For example consultants who insisted on vetting every referral for their specialty when in reality some of this work was being done by their secretaries and could be addressed by direct access to waiting lists by GPs through electronic means.

Ideally this approach would lead to all concerned in the proposed implementation entering into discursive action facilitated by the IDEF0 modelling. Then all claims being made within the context of the implementation would be exposed to the four criteria of clarity, truthfulness, sincerity and social acceptability that define the validity of communications (Habermas, 1984).

The final part of this approach to agree a way forward is predicated on everyone having an equal role in the process and having their concerns raised and accommodated. It is obvious that in reality this is extremely difficult to attain as organisational hierarchy, professional status and education will all impact upon this highly political endeavour. As researchers in the process we also had become very much aware of many of the problems that were making staff lives a misery and which needed addressing. The negotiated "way forward" was an implementation that would improve the working lives of as many staff as possible within the pilot study and would bring benefits to patients being treated there. Nothing was imposed by management or the research team.

Conclusion

This paper has been an exploratory study of implementation of integrated systems underpinned by a practical interpretation of some of Habermas's work. We recognise that our understanding has been influenced by other authors' interpretation and some of our approach may lack the degree of reflexivity and insight needed to make this much more robust a project. However, we would argue that this approach has many merits and addresses genuine concerns for all users of integrated systems. As a society we must recognise that IT can make individuals' lives miserable through imposing working practices that have not been thought through carefully for their consequences and outcomes. Organisational politics and individual personal agendas can impose IT solutions that are completely inappropriate. One major concern we had as researchers was the absence of a patient-centred focus to a number of the departments. Although the NHS is all about the treatment of patients, many of the individuals who worked within the pilot departments were mainly concerned about their own systems and at no time was the impact upon the patient a real concern. Even the issue of waiting lists was government focused around the consequences of non-delivery.

Nevertheless the approach we adopted exposed many issues and challenged the rationale for the new integrated system by allowing staff to have information previously unobtainable in one place and to ask pertinent questions. It does not bury organisational politics but brings them to the fore and demands management to confront and address them. We did not see it as our role to supply management solutions but to provide the medium for more informed discussion. This does not mean that we were unaffected by the process or that we did not have a view on how they might proceed. We, as researchers, were exposing ourselves to scrutiny through the demystification of the practice of systems analysis by giving them the opportunity to participate and determine the outcomes. It is highly stressful for all concerned and as researchers in the process we too found the experience difficult. However, we believe that the approach to implementation we have taken is one with which we want to continue, refine and to develop further insight.

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