Enhancing clinical and management discourse in ICT implementation

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Abstract *Modern NHS organisations are seen to be increasingly reliant, in terms of achieving improvements and service targets, on the efficient provision of information to enable clinical, administrative and managerial decision making. A key barrier to effective ICT introduction in NHS trust hospitals has been identified as the complex social, organisational and political issues endemic within the organisation, preventing true discourse amongst key stakeholders. This paper describes how the adaptation of critical social theoretical thinking may be used to develop an innovative approach to participative process and information flow modelling. This approach is used within a hospital trust to investigate its potential as a precursor to ICT procurement and development. Empirical results of the research are described with suggestions for a more informed approach to ICT introduction, leading to a re-examination of issues concerning: historical context, emancipatory practice and the role of the systems analyst.*

Introduction

There are many examples in the NHS of failed information systems (Thomas *et al.*, 1995; Wainwright and Waring, 2000). Very few of these projects have been open to close scrutiny but those that have undertaken post-implementation reviews have been seen as purely technical implementations and the real issues, primarily organisational and political in nature, have been ignored (Coopers & Lybrand, 1994).

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 day-to-day operational and business 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 bypassed the ineffective computer system.

These are not new integration problems which have suddenly appeared in the NHS; many such cases have been encountered in other sectors (Waring and Wainwright, 2000). The question is what can be done to address them? It is our belief that more innovative approaches to implementing Information and

Communication Technologies (ICTs) should be considered by the NHS. One way forward may be 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.

The development of such an approach by the authors has been under way since 1994. Much of this work has been informed by the critical social theory (CST) of Habermas (1979, 1984). The aim of this work has been to critically investigate potential emancipatory principles for systems analysis, design and development, synthesised from the wider literature, and then to translate these principles into practice within the context of ICT implementation. Fundamentally, this has been through an exploration of the changing role of the systems analyst to enhance participant discourse within ICT implementation. This paper intends to focus on an empirical study conducted at a North East hospital that had joint objectives, both for clients and researchers, of enhancing organisational communication. This was aimed at eliciting requirements for a new e-mail and document workflow system and exploring the adoption of emancipatory practice in systems analysis. The approach taken for this particular research study was based on Habermas's (1974) three-stage methodology to enable communication between stakeholders and advance emancipatory action and change.

The first section of the paper provides an overview of the theory that has informed the study. The second section comprises the research methodology and empirical research undertaken in a North East Hospital. Finally, in the third section, the paper draws some conclusions concerning the innovative emancipatory approach used for systems analysis with the key hospital stakeholders. It highlights the issues concerned with adopting this more innovative approach and developing integrated systems. Finally, the paper identifies a way forward to conduct emancipatory systems analysis to enable improved discourse and communication. This more clearly identifies and exposes complex social and political situations in Hospital trusts.

Emancipatory practice: the critical social theory of Jurgen Habermas
The concept of emancipation is particularly complex and is not to be trivialised. The consequences of taking an emancipatory approach are serious for both the researcher and the participants in the research project. Emancipation is a highly personal journey and set of activities that result in many new perspectives and deconstruction of existing work practice, commonly held theories, social norms and values. According to Alvesson and Willmott (1992, pp. 432-5):

> Emancipation describes the process through which individuals and groups become freed from repressive social and ideological conditions, in particular those that place socially unnecessary restrictions upon the development and articulation of the human consciousness. The intent of critical social theory (CST) is to facilitate clarification of the meaning of human need and expansion of autonomy in personal and social life ... Emancipation necessarily involves an active process (or struggle) for individual and collective self-determination ... Any substantial and lasting form of emancipatory change must involve a process of critical self-reflection and associated self-transformation ... A fundamental claim of the proponents

of CST is that social science can and should contribute to the liberation of people from unnecessarily restrictive traditions, ideologies, assumptions, power relations, identity formation, and so forth, that inhibits or distorts opportunities for autonomy, clarification of genuine needs and wants, and thus greater and lasting satisfaction.

Alvesson and Willmott (1996) develop this argument further in their text on the contribution of critical thinking within management studies but specifically emphasise the relevance of CST as a basis for developing new forms of emancipatory practice applied to individual and group working.

The work of Jurgen Habermas and CST has made an extensive impact in the field of modern European philosophy. It is not our intention to engage in the substance of these philosophical debates (a more informed overview can be found in Held (1980)) but to consider some of the principles that have guided other researchers in developing theory applicable in organisational studies.

CST is relatively well established within management studies and is becoming increasingly known in the information systems field (Hirschheim and Klein, 1989; Alvesson and Willmott, 1996; Warren and Adman, 1999). Hirschheim and Klein (1989) identify the systems analyst as being integral to implementation of information systems. These individuals could be involved in many phases of systems acquisition from carrying out feasibility studies to training users on the new system. They are at the interface between both the old and the new system as well as being the main information/communication conduit for the project. Successful communication between stakeholders within the context of an ICT implementation is perhaps the major critical factor leading to the eventual outcome of a major project.

Habermas 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 to be steered by ideas and values which have not been subjected to scrutiny. To do this within the context of an information services (IS) implementation there is a need to develop communicative competence or action by both the systems analyst and also the participants within the project.

Habermas (1984) challenges us to examine critically all forms of communication and in particular where agreements are made. Very often there is a political and a power dimension that is often overlooked. He encourages a move towards more informed approaches to discursive action. Discursive action is 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 towards the attainment of more "ideal speech situations". The four criteria below define the validity of communications in a complex, social and political environment (Habermas, 1984):

(1) *Clarity* (can what is being said be understood by the receiver?).

(2) *Truthfulness* (is what is being said truthful?).

(3) *Sincerity* (is what is being communicated done with good intent?).

(4) *Social acceptability* (is the communication in keeping with the values and norms of the receiver?).

Discursive action is aimed at justifying any or all of the four criteria, should one become the subject of doubt. This requires that all participants respect certain "ground rules" in terms of communication. This would necessitate organisations creating IS project conditions, 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 emancipatory philosophy of Habermas 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) *Stage 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) *Stage 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) *Stage 3*. The enlightened social group chooses tactics and strategy to be adopted in the actual political struggle.

The three-stage methodology and the principles of CST have the potential to be translated into a more socially informed approach to systems analysis within the context of highly political and socially complex organisations with pluralistic goals. This approach formed the basis of research (Waring, 2000) conducted at a North East hospital.

Research methodology
The research was part of a larger critical study into the changing role of the systems analyst acting in a more overt emancipatory role within ICT projects. This study was a second iteration in a three-iteration PhD study (involving three North East hospitals) to develop this new approach (Waring, 2000). The first iteration explored suitable action research frameworks and practice (Hospital X), the second iteration (this study, Hospital Y) developed a new approach to enabling better forms of discourse and communication amongst key stakeholders and, finally, the third iteration (Hospital Z) was aimed at adapting the framework to evoke change within an organisation. This is outlined in Figure 1.

The methodology used in the project was participatory action research (PAR) informed by principles derived from CST (Stringer, 1999; Udas, 1998). Udas (1998) believes that PAR must be underpinned by some fundamentals.
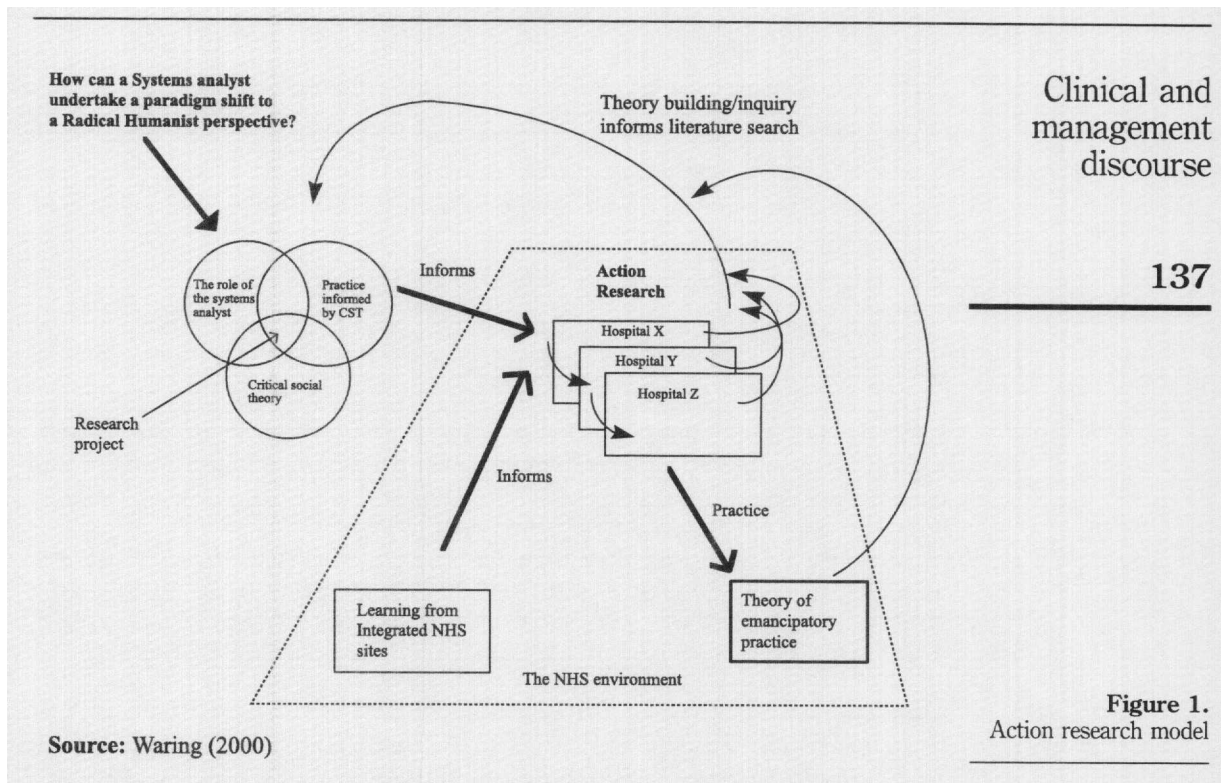
Source: Waring (2000)

Figure 1.
Action research model

The first is that PAR questions the nature of knowledge, research and methods. Second, the nature of knowledge in PAR is for improvement of practice not for the construction of an abstract theory-base. The PAR assumption of the nature of knowledge is that it is created by local practitioners, environments and historical factors. Third, the findings and value of research are retained locally and finally the researcher must be prepared to be flexible and creative. Udas (1998) continues by outlining certain methodological principles which apply to PAR:

- It is participant-centred and non-alienating.
- Research/facilitators enter a project clear about their own theory of social change and can share this with participants in a democratic way.
- The research methods are based on mutual respect and trust and facilitate collaborative inquiry, potential benefits and acceptance of each party's responsibilities.

Stringer (1999) 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.

Stringer (1999, p. 35) states that participation is most effective when it:

- enables significant levels of active involvement;
- enables people to perform significant tasks;

- provides support for people, as they learn to act for themselves;
- encourages plans and activities that people are able to accomplish themselves;
- deals personally with people rather than with their representatives or agents.

PAR is inherently political (Udas, 1998, p. 606). He continues:

> PAR is predicated on the democratic notion that oppressed and marginalised people can transform their social realities through education, research and action, while forwarding their own value system.

PAR (Udas, 1998) must be aimed towards social justice, involve critical reflection on practice, question assumptions on which practice is based and promote collaborative collective action. It is a continuing cycle of research activities involving active participation of practitioners.

Avison *et al.* (2001) critically review the rigour and relevance of action research as an approach to qualitative research. They find that there are three control structures that should be considered: initiation; authority; and formalisation. These must be made overt to enhance the rigour of such qualitative approaches.

Initiation
Hospital Y was undertaking many reforms in response to changing government policy. This gave rise to many problems relating to a lack of information and relevant ICT systems in place to inform decision making at both clinical and management levels. This was providing a highly stressful environment for all who worked there. There were particular problems with five departments: IS; out-patients and medical records (OP&MR); business management; pathology; and general surgery/liver transplant. Various power bases and hospital politics were causing some serious breakdowns in operational activities and producing information bottle-necks. The researchers were invited to participate in a proposed pilot-integrated document workflow system by the information technology and information managers to help alleviate these problems.

Authority
The researchers were given an open remit to investigate the lack of progress to date in the pilot project and to explore alternative approaches to information and work process modelling through systems analysis. Communication amongst project participants was seen as being a problem by management. Control over the project was complex but ultimately determined by the hospital trust IM&T steering committee.

Formalisation
No formal contract for the research was signed, except that the work was conducted on an arranged basis, where the research team provided a report and information flow and process models for the trust ICT project team. Dual objectives were to be satisfied, where the trust received assistance, advice and

facilitation and the researchers were allowed access and freedom to explore alternative methods of emancipatory systems analysis utilising process modelling software adapted for a CST-informed approach.

Within the overall framework of the PAR approach four primary methods of data collection were utilised. The first comprised 23 semi-structured interviews with key participants in the five problematic departments including hospital management, all levels of clinicians (doctors and nurses), administrative and ICT staff. Interviews lasted between one and two hours, were audio-taped, transcribed and fed back to respondents for comments/amendments. The second method of data collection comprised a period of non-participant observation (two full days) of current working practices in OP&MR, where all of the pilot departments' information and work processes could be seen to directly converge. The third method of data collection involved comprehensive document collection (e.g. departmental plans, procedure manuals, pathology test requests, ward returns, monthly hospital statistics) to analyse procedures and information flows. Finally, data from the first three methods were utilised to develop IDEF0 process models utilising graphical workflow modelling software.

The analysis of the data collected was then related to each of the three stages of Habermas's (1974) methodology, as shown in Table I.

Findings of the research
The findings from the work are structured using the three-stage methodology of Habermas (1974).

Stage 1
The interviews conducted with participants across the five departments resulted in a diverse set of perspectives and opinions of the articulated "true"

	Description	Research approach
Stage 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	Semi-structured interviews, observation, document analysis, exploring history, politics, power, relationships, information flows
Stage 2	Use these theories to enlighten concerned actors as to their position. This may lead to "authentic insights" and changed attitudes	Feedback of the analysis of stage 1 to participants; modelling of information flows and work tasks
Stage 3	The enlightened social group chooses tactics and strategy to be adopted in the actual political struggle	Discussion of strategy to improve communications within pilot departments with participants. Incorporate findings into final report to hospital IM&T steering committee

Table I.
The analytical framework

situation concerning current practice and lack of communication between those departments.

Administrative management were concerned with their lack of information about contracts, waiting-lists, referral patterns and bed management. Clinicians were mainly concerned with their relationships with pathology, methods of data collection and recording for clinical coding and medical audit. However, further probing from interviews, document analysis and observation resulted in details relating to failed ICT implementation over a period of years. At a local level general surgeons had developed their own computerised clinical coding system that was at odds with the trust policy and there was open hostility between senior clinicians. 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 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 was highly influential at a senior level in the trust and politically astute. She used this power base to develop "personalised" systems that resulted in optimising her own departmental performance. However, this led to much duplication of effort and overlap with the work of IS. This caused conflicts between the two managers of the respective departments.

Another insight into the social situation at the local level related to the external focus of pathology, who had their own business manager (separate from the trust). 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 that 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 the nature of the information flows and business processes.

Stage 2
The main objective in stage 2 was to engage with the users in the individual departments and enlighten them to our finding from stage 1. This focus on exploring the social situation represented a departure from traditional systems analysis. It was recognised that goals were contestable and that managerial pre-conceptions of problems and their solutions should not be accepted before conditions for effective discourse had been created.

This second stage involved the modelling of current work tasks and information flows fully utilising data collection in stage 1 and then formalising this through the use of the IDEF0 method (a simple process modelling technique representing activities, information flow inputs, outputs, controls and mechanisms). An information flow and process modelling tool (meta-software, work flow modeller) had been selected (as an outcome of research

conducted at a previous hospital trust). This software was flexible, easy to use, and could professionally produce diagrams that were understandable by all levels of employee. The aim was to create a simple communicative, shared and common language to enable equal participation and discourse to take place among key stakeholders. Information flows, work tasks and processes could be quickly and easily represented, stored and disseminated in a graphical and understandable format that would serve as the focus for discussion and debate.

With the users' participation we modelled their work and information flows both within the department and at the interface between them and other departments, where difficulties arose. These models and diagrams were regularly reviewed by users, discussed and amended according to their wishes. This process was facilitated by researchers acting as systems analysts in an emancipatory capacity.

The richness of the elicited data not only allowed the processes to be studied in great detail, but also gave further insight into the political nature of the problems which had been arising. The small extracts in Figures 2 and 3 illustrate what emerged from the investigation and how the systems for referral were represented.

This part of a larger model (Figure 2), shows how patients are referred and then access an out-patient clinic. By decomposing the "out-patient referral
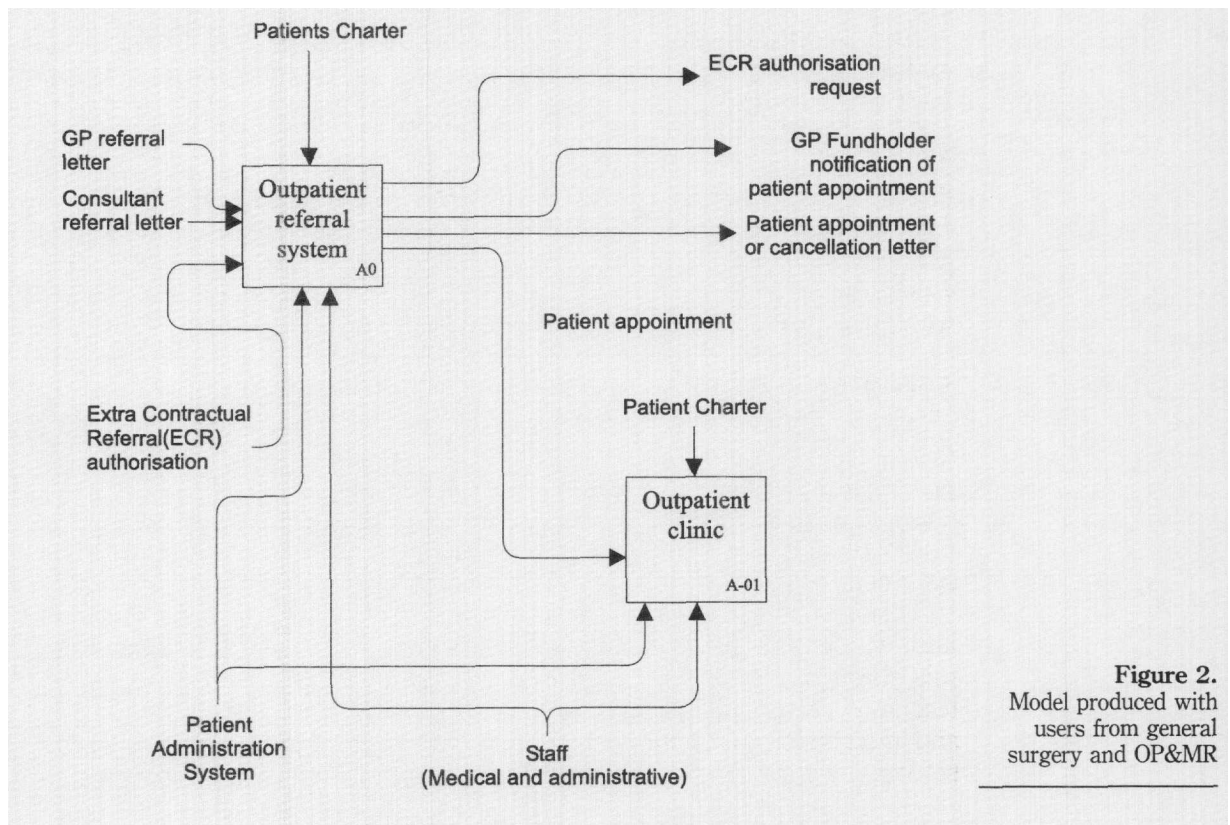

Figure 2.
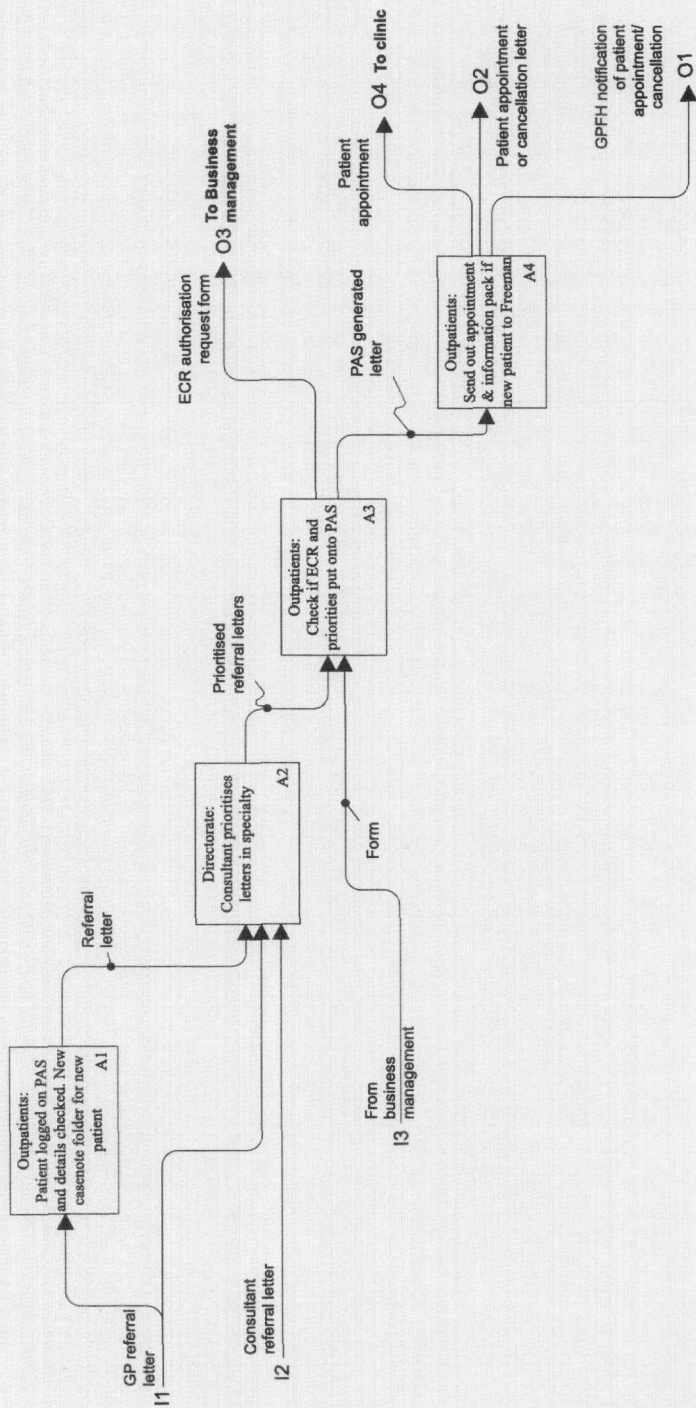Model produced with users from general surgery and OP&MR

Figure 3.
Further detail of the out-
patient referrals in
general surgery

system" (Figure 3), it became clear where things were causing difficulties and "could be improved".

This illustrates that the procedures as laid down by the trust were not being adhered to by the various departments. Theoretically, referrals should have been entering the system through the outpatients department and then logged on to the patient administration system (PAS). In reality, referrals were entering the hospital via a number of routes and were difficult to track. This had repercussions for waiting-times measured against the Patients Charter. The modelling demonstrated that many staff were not aware of how their jobs impacted on other areas of the trust. The interviews, combined with the participative process modelling exercise, enlightened staff in terms of their own current working practices and enabled them to determine how the models were drawn to represent their perspectives.

This was performed as a group exercise with OP&MR and they found the diagrams clear to follow. Also, as it was done from a user perspective, they could relate to the language and the terms being used. Having completed the work in OP&MR and general surgery, the results were presented to the information management and technology (IM&T) strategy group for further reflection. They, too, had never seen the trust clinical and business processes represented in this particular way and were very interested in what was being discovered. It allowed the computer services manager to understand the business better and realise what difficulties needed to be overcome before the implementation of the integrated system. It also allowed the IS manager to see why some of his information was inaccurate, when presenting the monthly executive management reports to the trust board.

The modelling of the systems in stage 2 is a critical step in the methodology, as it made the information flows explicit and surfaced many assumptions never previously recognised. It was not unusual to hear quotes like: "I know it sounds silly but we have always done it like that". Users 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. The modelling gave rise to reflection on the current organisation of work and 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 for electronic data flows.

Stage 3
Stage 3 concerned discussing and verifying the data collected in the first two stages to produce further models of the desired situation for work procedures and agreement on the content, frequency and method for information flows. The actions in this stage had to be fully discussed with all project participants with the creation of conditions for fair and effective discourse. 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. The term "agreed" has many interpretations and we recognise the potential for

manipulation by power holders within the pilot. The approach taken was in 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 – provided that it was mutually beneficial.

For example, a major bottle-neck in the "out-patient referral" process was the need for OP&MR to have extra contractual referrals (ECRs) authorised by business management. This involved staff 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 which 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 4.

However, there were very senior staff who thought that the pilot "would be another waste of time and money" and did not want to participate. Thus no one was forced to become involved, unless they so desired and could see benefits for their department or ward.

The IM&T steering committee was given the final models to consider plus a diagram that highlighted the possible documents and workflow which had been agreed with the users for the proposed pilot integrated system. They then 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 the data collected and the modelling of information flows were presented to the trust in the form of a report. In terms of the action research project this represented the exit point for the researchers. Control and decision making now rested exclusively back with the trust management.

Discussion
This section will consider two main areas of interest that arose from the research. The first area focuses on the use of the participatory approach to enable greater emancipation and discourse within an ICT implementation context involving clinicians, professional workers and users within the NHS. The second area defines the need to rethink the role of the systems analyst in a health-care environment.
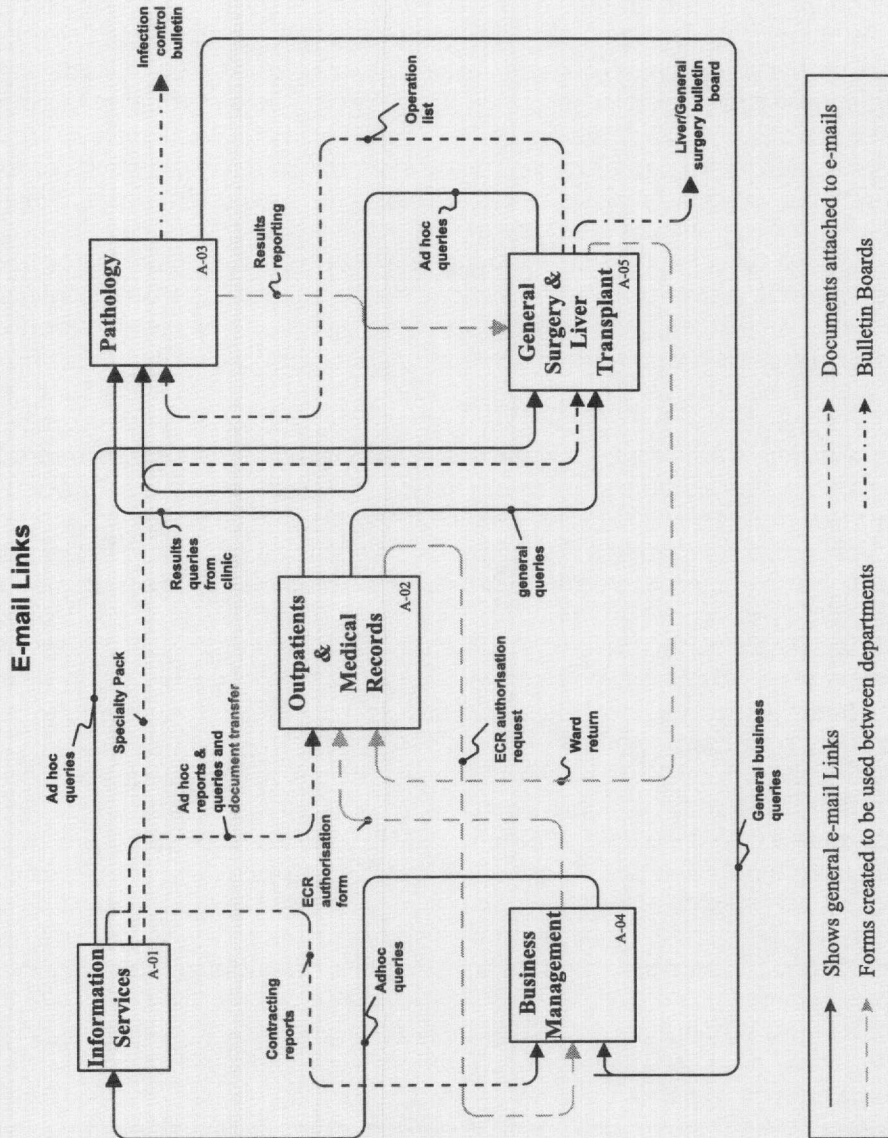
E-mail Links

Infection control bulletin	
Operation list	
Liver/General surgery bulletin board	
Pathology	A-03
Results reporting	
Ad hoc queries	
General Surgery & Liver Transplant	A-05
Specialty Pack	
Results queries from clinic	
Ad hoc queries	
Ad hoc reports & queries and document transfer	
Outpatients & Medical Records	A-02
general queries	
ECR authorisation request	
Ward return	
ECR authorisation form	
Contracting reports	
Adhoc queries	
Information Services	A-01
Business Management	A-04
General business queries	

Shows general e-mail Links

Documents attached to e-mails

Bulletin Boards

Forms created to be used between departments

Figure 4.
Agreed changes to
operational activities

Translating the three-stage methodology into practice

The approach taken in the hospital was our first attempt to operationalise, within the context of an ICT implementation, the highly theoretical methodology, as articulated by Habermas (1979). One of the important aspects of this approach was the development of the critical social theory underpinning the individual departments and the trust as a whole. This allowed us to gather data on the historical, social, organisational and political problems that had arisen over many years, enabling the ICT project to be contextualised at that point in time.

Historicity must be taken into account at the start of the exercise. All systems have some "baggage" and in this pilot we encountered many people who had been involved in previous failed systems. Cynicism must be recognised and careful consideration given to understanding initial inertia and resistance (in many cases justified) within the organisation to the introduction of any new systems. The development of a social theory of the organisation (stage 1) is the key to making progress and facilitating stakeholders to address long-standing inertia.

In stage 2, the IDEF0 tool allowed us to graphically represent inter-departmental work processes and the flow of information through parts of the hospital. In this research programme, the modelling process was facilitated by the researchers themselves. However, the users became interested in both the technique and the explicit nature of the information that could be collected and displayed within the models. This facilitated discussion and debate of individual, departmental and trust-wide work processes and information sharing. These documents were public and open to scrutiny by all concerned, there was no hiding of information and the ethos of the exercise was to share all results with all parties. The learning that emerged from this exercise (this conclusion was simultaneously arrived at by both researchers and users) was the need for the users to control and model their own activities and information needs. This approach was seen as being very amenable to user-centric as opposed to expert-centric modelling. Another important factor was the neutrality of the systems analyst outside the domain of the IT department. The reflexivity that this process engendered allowed a deeper learning to take place, enabling a more informed discussion about tacit factors such as power, politics and departmental agendas, thus beginning the process of emancipation.

The most difficult aspect of this three-stage approach was attempting to obtain agreement on how to move the project forward in order that all parties might benefit from the implementation. From the outset this was the philosophy of the approach adopted. It would have been much simpler to revert back to a managerial instrumentalist approach (as in classical systems analysis) to design and impose change. Stage 3 was more concerned with providing the environment to enable discourse and accommodation to be attained between individuals and departments. This fits within a more democratic and emancipatory model of organisational change. This was seen

as being more idealistic and difficult to achieve but as a necessary precursor to the introduction of ICT within this complex political situation. A simpler approach would have resulted in short-term change but aggravated the historical legacy of failed systems and reinforced old structures, power bases and perceived injustice.

The role of the systems analyst
Within the context of this research project, appropriate technology and ICT solutions were readily available on the market, with examples of implementation successes as well as failures. However, the requisite ICT management knowledge and implementation expertise within the trust were lacking, both within the IT department and amongst end users themselves. This particular implementation would have been fraught with dangers, if the trust management had decided to proceed directly with procurement and installation of the new e-mail and document flow system without prior consideration of the issues and difficulties contained within the present work environment. The role of the systems analyst in this particular project was vital in uncovering the complex nature of the social and political situation and making it overt to all participants in the project. This was not a traditional approach to systems analysis, as it was conducted by researchers using an emancipatory approach that was user-centric, encouraged openness, discourse and debate. This contributed to enabling the users to have equal status within the project to IT staff, hospital management, clinicians and ICT vendors. Most importantly, this removed the expert power and status from the "classic" IT analyst domain (Knights and Murray, 1994). Users were able to use their own everyday language and able to present this in a professional (IT modelling tool) manner at high levels within the organisation.

As was stated earlier in the paper, emancipatory practice is not an activity that can be conducted without much reflexivity, planning, insight and a strong theoretical base. In this case the researchers had spent a great deal of time reflecting upon traditional approaches to systems analysis and process modelling and how their roles must be adapted and changed to adopt a more socially aware interventionist approach. We recognise that there are alternative interpretations of current theory and practice that reveal more sinister insights into the role of information systems and the practitioners therein. Current approaches accept goals without too much questioning and debate. We recognise the asymmetrical power relationships that can affect communications between users and managers and users and systems analysts. We, like Murray and Willmott (1993), view the inclusion of user participation into ICT development methodologies as an attempt to bring technical rationality to what is in effect a social process. In fact user resistance to change is not dysfunctional and occurs when a new information system is likely to bring "reorganisation of work associated with a loss of control of valued material and/or symbolic resources" (Murray and Willmott, 1993, p. 172).

Conclusions

Distinct conclusions from this research may be drawn in four main areas, comprising: the use of the three-stage emancipatory methodology in practice, the benefits of adopting an emancipatory approach, the changing role of the systems analyst in a health-care environment and the distinct benefits and changes that occurred assisting ICT implementation within the hospital.

The three-stage methodology was applied successfully in this particular health-care project and in principle may be adapted for any organisation, if combined with an action research framework and relevant data collection and modelling methods (Table I). Developing a social theory of an organisation will be different for every context but it is essential to lay the foundations for more effective and fair processes of discourse and communication amongst project participants. The modelling process could be performed by the users themselves with adequate facilitation, support and training from a socially responsible systems analyst. The most difficult aspect of the methodology is getting agreement on the action needed to be taken, as at this point power and politics tend to interfere with rational discourse. However, this does not mean that socially responsible practitioners should not attempt to explore alternative and more socially just solutions to organisational problems. The research indicates that this approach will result in more effective progress in terms of organisational change and ICT adoption.

The emancipatory philosophy adopted began an active process of development in terms of individual and collective self-determination. This was particularly important in the context of a health-care environment, where the bases of power and hierarchy may be more exaggerated than normal due to professional culture. However, it is difficult to measure the extent of emancipation of participants in the research, as it involves a personal process of critical self-reflection and associated self-transformation. We need to ask did it change the situation for participants in the research?

Overall improvements could be seen, however, in terms of enabling conditions for more effective discourse through adopting a common language for modelling work tasks and information flows. In terms of the potential for integration of work and systems, the methodology and modelling process led to a better understanding of data, information, work, organisational and technological requirements and the associated problems of implementing ICT solutions. This provided a reflexive framework to begin a process of educating users, managers and clinicians about ICT and how it can benefit the hospital.

We conclude that the systems analyst is still vital within the context of ICT procurement and development projects but that the role should be re-defined and extended to take account of social, political and contextual issues alongside the more accepted technical process and information flow modeling approaches. Thus the systems analyst becomes a champion for users and a focal point for creating discourse between parties within the organisation. This will necessitate new knowledge, training and a changed mindset for the analyst of the future.

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