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HUMAN INVOLVEMENT AND E-BANKING

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Abstract: The fast advancing global information infrastructure (including information technology and computer networks such as the internet and telecommunications systems enable the development of electronic commerce at a global level. The nearly universal connectivity which the Internet offers has made it an invaluable business tool. These developments have created a new type of economy, which many call the 'digital economy'. The aim of this paper is to offer the reader a means by which human involvement in e-banking may be evaluated and improved. At the heart of this problem lies a need to characterise human involvement, since, once the issues are clear, the specific e-banking factors can be related to them in the form of a model. In this work we therefore take as our task: 1. What do we mean by human involvement or participation, and how does this compare to the often overwhelmingly technology-based approaches to information systems developments? 2. Where might human involvement be grounded theoretically? 3. How is this theoretical grounding to be taken forward to a set of pragmatic approaches to be applied by practising managers? E-banking owes its existence to a revolution in the enabling technologies. In this paper, however, we are less concerned with the technologies in themselves, and more with how value and advantage may be leveraged from them. To understand the issues here we need to go back to their roots, which lie in the adoption and application of information technology. In the early days of IT, most approaches to its implementation and management focused on the technology (the so-called "technology-based" approach). The sections which follow therefore begin with this, before outlining the more recent human-centred methods which are of such value in e-banking. Consequently, we will first look at participation from a recent historical perspective, and use this to develop an approach to human involvement which is applicable to the domain of e-banking. Finally, we will present action guidelines for human involvement in e-banking, and describe how these may be used to evaluate and implement e-banking solutions which are true to participative needs.

Keywords: e-banking, human involvement, information technology

INTRODUCTION

As has been argued earlier in this material, e-banking owes its existence to a revolution in the enabling technologies. In this paper, however, we are less concerned with the technologies in themselves, and more with how value and advantage may be leveraged from them.

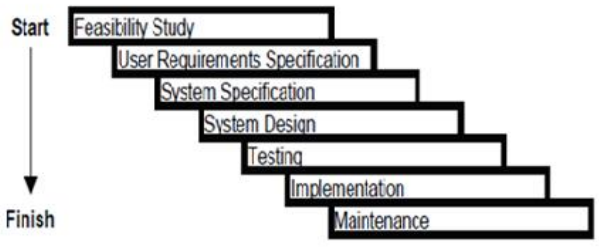
To understand the issues here we need to go back to their roots, which lie in the adoption and application of information technology. In the early days of IT, most approaches to its implementation and management focused on the technology (the so-called "technology-based" approach). The sections which follow therefore begin with this, before outlining the more recent human-centred methods which are of such value in e-banking.

The technology-based approach

It has been argued that the design and development of information systems (IS) has been traditionally dominated by technical, problem solving approaches, leading to tensions when the system to be developed is more user based. The need for discovering the requirements of users seems not to be disputed by information systems developers, but is typically achieved by including a user analysis stage within an existing problem solving approach. This approach, inherited from computer systems development, relies primarily on the systems development life cycle (Figure 1).

The systems development life cycle is a stage wise or waterfall method, whereby each stage is undertaken in a linear sequence, and in principle requires the completion of one stage before the next is commenced. So, for example, work on system design would not be authorised until the system specification was written and approved.

Figure 1. The systems development life cycle



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User requirements specification fits uncomfortably into this process, since such requirements are seldom fixed, but change over the life of a project. As can be seen from the following example, there are situations where such an approach is

desirable, but care needs to be taken to ensure that the necessary conditions are in place for it to succeed – and e-banking simply does not fit this model.

A number of methodologies adhere to these principles, through which information systems development is perceived largely as a technology-based, problem solving, engineering task, geared to engineering the best solution to meet a given requirement specification within the known or anticipated constraints.

Technology-based approaches: the problem

The argument for an alternative to these technology-based approaches is supported by the findings from a number of studies of systems failure. Examples range from simple failure to meet performance goals, to catastrophic failure of the type evidenced in the London Ambulance Service and Taurus, the London Stock Exchange System. The British Computer Society has a special interest group which looks at organisational aspects of information technology (OASIG). A study by this group [OASIG 1996] concluded that up to 90% of information technology (IT) investments do not meet the performance goals set for them, and listed the technology-led nature of the process, and the lack of attention to human and organisational factors as key issues in this lack of success, [Beath and Orlykowski 1994] support this view, and mount a convincing critique of the interaction between users and systems professionals in IS, concluding that the concentration on, and commitment to, user participation is revealed as ideological rather than actual, with users frequently shown to be passive rather than active participants in the process. They see the various systems development methodologies as containing 'incompatible assumptions about the role of users and IS personnel during systems development.'

Human-Centered Methods

The limitations of technological approaches to IS gave rise, from the 1960s on, to the so-called 'soft' or human-centered methods. It is argued that traditional 'engineering' approaches are 'hard' or technology-based, being premised on a view of the World which sees it as composed of determinable, rule-based systems. 'Soft' methods, by contrast, take a human-centered stance: issues are seen as determinable only from the viewpoints of human participants. Many examples are available for the use of human-centered approaches to IS, including, for example, soft systems methodology [Checkland & Haynes 1994] and interactive planning [Ackoff 1981], which rely on a more holistic view: to understand an information system, the technology, organisation, and human activity need to be addressed interdependently, not as separate, independent issues. This recognition of the merits of both 'hard' and 'soft' approaches to IS has further given rise to a number of methods of IS development which may be categorised as mixed for example: ETHICS [Mumford and Henshall 1978; Mumford 1994], multiview [Wood-Harper, Antill et al. 1985; Watson & Wood-Harper 1995], and client led design [Stowell 1991; Stowell & West 1994]. The information systems failure example

from London Ambulance, outlined below, is a clear example of the need for integration of technical and human issues in an intervention, and the outcomes to be expected when this is inadequately carried out.

A report on the failure [Hamlyn, 1993] makes it clear that implementation of any future system must be supported by a full process of consultation. Whilst the project management, and technical aspects of the implementation, were far short of that which would have been expected for this kind of project, there were in addition a number of 'human' aspects which had been inadequately considered, including poor training and incomplete 'ownership' of the system. The finding by consultants reviewing the failure that 'the computer system itself did not fail in a technical sense … but … did what it had been designed to do..', further suggested issues stretching beyond purely technical boundaries. Following this initial failure, a new computer-aided dispatch system was successfully implemented, but only through an approach which paid heed to the whole system of concern, of which the technical system was just one interactive part. A clear trend can be discerned here, toward approaches which have the potential to address both technical and human-centered issues within a single intervention. In the next section, a theoretically and practically informed grounding for such an approach is developed and discussed.

Information Systems as Social Systems

The conclusion to be drawn is that a view of information systems as a purely technological domain is an inadequate one. Such a perspective reduces the complexity of the system of study, and attempts to define it in terms of rules and procedures by which given inputs can be turned into predictable outputs: a so-called deterministic system. A human-centered approach is quite different. Human activity systems are 'complex' and 'adaptive', and cannot be fully described in terms of rules and procedures: to understand such systems requires recourse to social theory.

Recent work with emergency services, outlined in the example below, serves to highlight some of the benefits to be derived from seeing IS as social systems.

A number of key issues emerged from this which helped guide the future of the study. One key example was that, in spite of massive investment in communication technologies, most operational-level communication used mobile telephones. This was surfaced by one group seeing their operation as 'isolated islands of information, linked by tenuous pieces of wire'; when they should have been 'complex, social, communicative structures with no perceivable barriers to communication.' The interesting fact was that the technology to support the later is already owned by each service, but is not used in the way that those involved in the day to day operation would see as most beneficial. Furthermore, such a conclusion demonstrates the relevance of this debate to e-banking. In the last twenty years or so, information systems have become more fragmented and distributed, 'user' issues have grown in importance. E-banking represents a highly distributed form

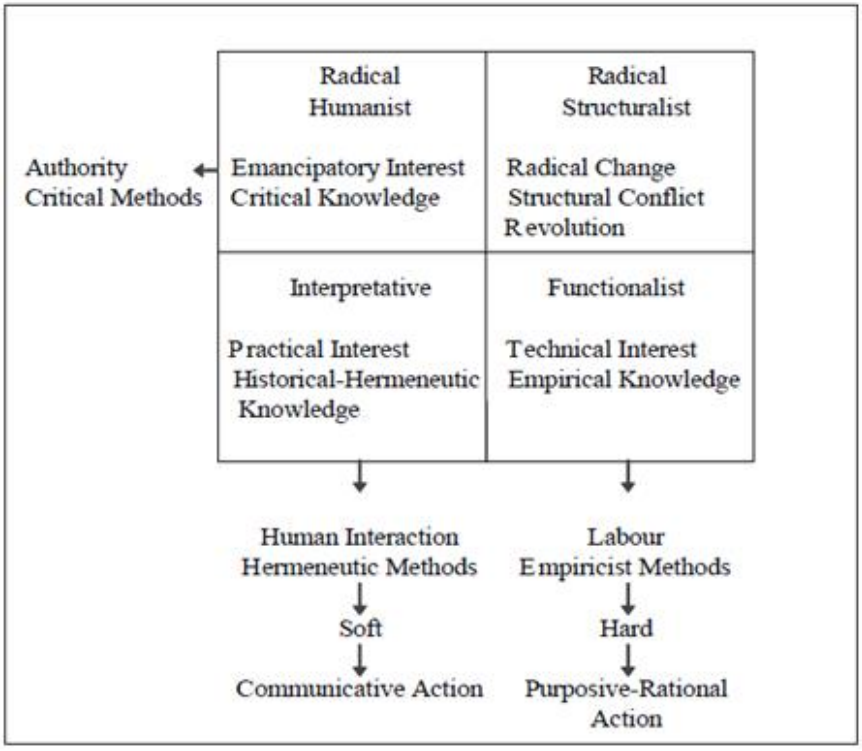
of technology-enabled information, in which a disparate user base needs to be catered for. In effect, the social system to be 'served' is gaining ascendancy over the technical system: the later has the task of facilitating or enabling – technology has finally ceased to be an end in itself!

The question to be answered, then, is how this system of concern might best be perceived from a social theoretical perspective. Many information systems theorists have found the classification presented in Figure 2 to be the most applicable categorisation of social theory within the IS domain.

This is drawn from original work by Burrell and Morgan [1979], according to whom all social theories can be categorised into one of four paradigms: functionalist, interpretivist, radical humanist and radical structuralist. A functionalist approach sees social action as the application of labour to advance humankind through instrumental means.

The World is seen as a set of problems to be solved: objective problems which can be determined independently of any human viewpoint. In e-banking design (Figure 2), for example, this describes well a technological, expert-informed approach, where the views of users are seen to be secondary.

Figure 2. A classification of social theory [Clarke 2000]



Source: own elaboration

Through interpretivism, the World becomes socially constructed through communicative action. Here, e-banking (Figure 2) would be understood as a social, communicative, subjective phenomenon, in which the views and opinions of participants become fundamental to its understanding. From a radical humanist, or critical perspective, the early, technological, view of IS as functionalist, 'hard', problem solving, is seen to be an impoverished one, overfocused on the use of computer technology. 'Soft' or human-centered methodologies have been pursued as a solution to this problem, and have been to some extent successful. But recent thinking questions the ability of 'hard' and 'soft' approaches to achieve the agenda they apparently set out for themselves, and points to a need to combine approaches under the umbrella of social theory. Radical humanism offers the potential to achieve this, and is therefore pursued in the next section, with focus on two issues of particular relevance in e-banking management:

1. Determination of the scope, or boundaries, of the system.
2. Given the boundaries, choice of development, implementation, and management methodologies.

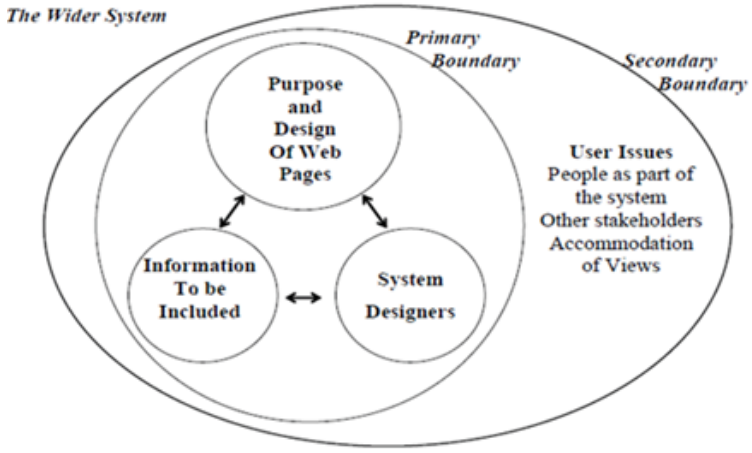
To complete the picture from the perspective of social theory, radical structuralism looks to ways of changing the World in which we live by altering the material conditions that surround us. In terms of e-banking, this might be relevant where direct political action were required – for example, if a particular Political regime banned the use of relevant technologies. Our view is that this perspective has limited relevance in Western industrialised economies.

Scoping e-banking Management: The Critica l. Assessment of System Boundaries

In e-banking management, making a decision on the system boundary is therefore an issue to be settled before further progress can be made. Whilst the problem of system boundaries has exercised the minds of both academics and practitioners for many years (for a summary of early works see [Jones 1982], it is from Ulrich [1983; 1988; 1996] and Midgley [1992] that the recommendation to critically challenge what should or should not be considered part of any system is drawn. Midgley's approach is to begin with a boundary definition which is accepted as arbitrary, and progress by " looking for grey areas in which marginal elements lie that are neither fully included in, nor excluded from, the system definition." The critical choices made at the boundary are of truth and rightness: truth being represented by questions of what is, and rightness by questions of what ought to be. In respect of e-banking, we have to balance availability and security, whilst gaining the enabling benefits of new technologies. Taking such a stance gives a starting point for the critique of boundary judgements in an e-banking intervention as represented by Figure 3. Here, a typical approach to e-banking design, implementation and management, is represented by the primary boundary. The information to be included is often corporate, but at best might be requested

from an expert group (marketing, for example). Most of the activity takes place between designers and managers, with system users cast in a passive role.

Figure 3. Critique of the system boundary (adapted from Midgley 1992)



Source: own elaboration

By contrast, it is recommended that critical assessment of the system boundary be undertaken by a representative sample of participants in the system. The approach might work as detailed below.

1. An arbitrary system definition is presented (Figure 3). The primary boundary represents the main area of concern, whilst the secondary boundary encompasses that which is seen to be marginal to that area. Beyond this, all other issues are represented by the 'wider system'.
2. A brainstorming session [de Bono 1977] is set up, attended by representatives of all the key participant areas. The purpose of the session is to enable participants in the system (those 'involved and affected') to conduct the critique on their own behalf.
3. The system is critiqued within the brainstorming session by a combination of Midgley's and Ulrich's approaches to boundary critique:
   - Midgley's [1992] approach to examining what is in the margin for elements which support the secondary boundary or the primary boundary.
   - Ulrich's [1996] approach to challenging system boundaries through twelve "critically heuristic boundary questions" which address issues of motivation, power, knowledge and legitimisation (see Table 1).

In this example, Ulrich's critical boundary questions are applied to the web design aspects of e-banking. This reconceptualisation of the system is an important part of the intervention, focusing discussion not on a clearly defined technical or organisational problem to which a solution is to be found, but on the complex and

Table 1. Critically heuristic boundary questions

Question	"Is" Mode	"Ought" Mode
1	Who is the client? Whose purposes are served by the system? *The web site manager.*	Who ought to be the client? *All who are involved in and affected by the system of concern.*
2	What is the purpose? *To present a corporate presence via the internet.*	Who ought to be the purpose? *To meet the changing requirements of all involved and affected.*
3	What is the measure of success? *Up-to-date web presence.*	Who ought to be the measure? *"User satisfaction".*
4	Who is the decision maker? *Senior management.*	Who ought to be the decision maker? *Decision rests with management, but should be informed by participant involvement.*
5	What conditions are actually controlled by the decision maker? *Resources, final approvals.*	What components of the system ought to be controlled by the decision maker? *Should manage, not control.*
6	What conditions are not controlled by the decision maker? *External factors.*	What resources and conditions out to be part of the system's environment? *All on which it potentially impacts.*
7	Who is the system designer? *Web designers under the web site manager.*	Who ought to be the system's designer? *Web design should be professionally carried out, but informed by the changing requirements of participants.*
8	Who is involved as an expert, what is the nature of the expertise and what role does the expert play? *Designers: control the whole development within guidelines laid down by the management.*	What kind of expertise ought to be involved, who should exercise it, and what should his/her role be? *Mixture of technical and social issues to be considered.*
9	Where is the guarantee of success? With experts, political support etc? *Experts.*	Where ought the guarantee of success to be? *Full participation.*
10	Who represent the concerns of the affected (but not involved)? *Not represented.*	Who ought to represent these concerns? Who among the affected ought to become involved. *The views of all involved and affected should be taken into account.*
11	Are the affected given the opportunity to emancipate themselves? *Not involved.*	To what extent ought the affected to be given such an opportunity? *Participation only works where users are free and able to participate.*
12	What World view underlies the system of concern? *Command and control system.*	On what World view ought the design of the system to be based? *Inclusive, participative, informed.*

Source: own elaboration

ideals of the stakeholder groups involved in the system. The task becomes not one of how to engineer a solution to a known and agreed problem, but how to study and improve a problem situation made up of complex interacting issues. *People are not only part of the system, they are the primary focus of study.* From the issues raised by boundary critique, it becomes possible to consider intervention strategies.

Discussion: Future Trends

The impetus for undertaking this study has been the failure of hard and soft systems development methodologies to address the needs of all participants in an e-banking system. Theoretically it has been demonstrated that this failure, at least in part, can be traced to the uncritical nature of both hard and soft methodologies, and a need, from a social systems viewpoint, to combine hard and soft approaches within a critical framework. Critical boundary setting, focusing on the normative system definition, has further enhanced this study. Just as a structured approach tends to focus on technical issues, so a concentration on 'what is' tends to lead to a belief that there is only one accurate perception of the system of concern.

A critical approach to boundary judgements has opened up a wider consideration of 'what ought to be' in e-banking, including those involved and affected as participants with whom expertise is seen to reside. The richness this has brought to 'user analysis' within the web systems analysis example contrasts with the simplicity with which this part of an e-banking intervention is normally undertaken. Since the early stages of this study, theoretical and empirical work in this domain has progressed significantly, and this paper would be incomplete without a consideration of these issues.

A useful general summary of thinking concerning mixing of methodologies, methods or techniques, can be found in Mingers and Gill [1997]. In outline, the thrust of both theoretical and empirical analysis has focused on the perceived shortcomings of approaches which concentrate on a single methodology or paradigm, and alternative conceptions of how methodologies, methods or techniques drawn from different paradigms might contribute within a single intervention. So, for example, Mingers and Brocklesby [1997] see the main approaches to mixing "methods, methodologies and techniques within the broad field of management science" as the system of systems methodologies [Jackson & Keys 1984] and TSI. They criticize these approaches for effectively promoting the use of whole methodologies – a view which it could be contended is supported by the strong suggestion within TSI that there should be dominant and dependent methodologies within an intervention. A better approach, they suggest, would be to mix methodologies, or parts of methodologies, from different paradigms, promoting this approach as "multimethodology". They argue, for example, that TSI: "provides no structure for the ongoing process of the intervention – leaving that entirely up to the selected methodology", and offering in its place an: "appreciate, analyze, assess, act" framework.

Midgley [1997] argues that it is more helpful to think in terms of methodology design than just the choice of whole methodologies, or even, by implication, simple choice of parts of methodologies, and promotes the idea of the "creative design of methods" as an application of their oblique use [Flood & Romm 1995], and as a way of enhancing TSI in practice. Another stream that has informed intervention practice in recent years is action research (AR). AR explicitly relies on critical reflection as a means of validating the outcomes of a given investigation, and in this sense may be seen to have much in common with the critically informed intervention approached recommended in this paper. Further information on the position of AR in relation to organisational intervention may be found initially in Flood and Romm [1996] and Clarke and Lehaney [1997]. Our position in relation to these approaches is still developing, and it offers many challenges which have not as yet been addressed by me or other practitioners. To progress this, I feel concentration now needs to be on a Kantian view of critique as promoted and developed, for example, by Ulrich [1983], and on creatively designing methods, having regard to the issues raised from the critiques of TSI and the system of systems methodologies, always within a critical framework. Finally, action research practice needs to be embedded into the intervention framework.

CONCLUSION

Arguments about whether to use a hard or soft methodology, and which hard or soft methodology to use, in web development, implementation and management, seem to offer only a limited perception of most e-business problem situations.

A 'critical complementarist' view gives a richer image. The argument should not be about whether to use this or that methodology, but rather what critically, theoretically, and practically informed mix of methodologies best deals with the problem contexts encountered in a given intervention. From this perspective, the hard-soft debate seems to offer only a partial view of e-banking. Such systems are not *per se* computer systems, but are systems of human activity or micro social systems, consequently, functionalist science or interpretative sociology appear an inadequate basis on which to study them, a wider critical social context seeming more relevant.

The approach currently most widely tested in this respect is total systems intervention, underpinned by the theoretical endeavour of critical systems thinking, but emerging evidence suggests developing this into a richer critical systems practice, focusing on a Kantian view of critique within a broader action research framework. From all of this can be drawn general findings, together with guidelines for future development, implementation and management of e-banking, which are presented in summary form below.

Findings

From the discussions of this paper, the following general findings can be distilled:

1. The domain of information systems is dominated by technology-based methods, weakly mediated by human-centered ones.
2. Human activity is more fundamental to the domain than such an approach acknowledges, and consequently the investigation of methods underpinned by theories of social interaction are indicated.
3. From research in the social domain, a foundation in critical social theory emerges
   as a promising direction.
4. Within such an approach, the first issue to be addressed is that of *understanding* the problem context. For this, critical social theory points to the use of critical systems heuristics and critical boundary judgements to critique and determine the system boundary.
5. Boundary critique further informs intervention strategy. The methods required must embrace functionalist (technological), interpretive (human-centered), and radical humanist (emancipatory, participatory, 'social inclusion') issues.
6. In any future work, the ongoing research in the application of critical theory to management issues must be considered, and a brief outline of this is provided.

Given these findings, how might a manager seek to action them?

Guidelines: The Implications for Managers

(1) Determine the initial scope of the system of concern. (2) Identify the social group(s) involved in and affected by that system. (3) Form representative samples from these groups.

In terms of management action, the challenge here is *not* to see e-banking development and management as a problem to be solved by an expert group of developers. A framework (for example, of user groups) needs to be established, from which the contribution from those participating in web usage can be drawn. But a word of caution: the groups and membership of them should not be fixed, and, of course, should not be limited to managers or those in authority.

Actions

(1) Conduct boundary critique to initially determine the system of concern. Continue this throughout the project. (2) Use participative forums to discuss all issues of web design, development and implementation. (3) Choose and implement the relevant methodological approaches in a critical complementarist framework.

Initially, formal boundary setting sessions will be needed to set the scene. Quite quickly, groups will form their own clear views about the scope of e-banking developments within a particular organisational context (it will become 'culturally'

ingrained), and less time will be necessary in formal sessions to discuss this. The forums can then be used to surface the issues, the only primary requirement in terms of expertise will be a facilitator who can assist with guidance on the process.

E-banking management is a task to be conducted within a social framework. A purely technical approach, or even a technical approach informed from participative analysis is insufficient to address the complexity of the problem contexts encountered. It is essential to recognise that what is being dealt with is a social system, albeit enabled by technology, and, this being so, it is difficult to envisage how such an undertaking could be informed from anywhere other than social theory.

What has been presented in this paper is argued to be a thoroughly theoretically and pragmatically informed approach based on these principles. Try it – it works!

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