Welcome to the latest annual volume of Advances in End-User Computing (EUC). This will be my fourth volume as Editor-in-Chief, and I am delighted to be joined in this task by my colleague, Ashish Dwivedi.

Since my editorship began with contributions written in 2007, Ashish and I felt that it would be an opportune time to conduct a retrospective of the Advances Series over the past three plus years, and from that to look at the direction the domain of End-User Computing is taking, and some likely topics of interest for the future.

Perhaps the most striking fact stemming from an analysis of past issues is the sheer range of topics covered by the contributed chapters. Nevertheless, it is possible to draw some conclusions regarding trends in EUC, using this publication as a guide.

Topics consistently represented during the period include ethics, training and ease of use, the internet, and group dynamics related to computing. Perhaps none of this is particularly surprising, but it would seem that certain conclusions might be drawn from the under representation of certain topics, from which we have chosen two domains for further analysis in this section. User involvement is poorly represented (only one specific article in the period) for such a key subject, and it would be encouraging if this were to improve. Users are subject to actions which bring into conflict the needs / characteristics of human actors and the demands of technology, and the wealth of research in this area looks to be a fertile ground for future exploration in the EUC domain. Secondly, computer security is, curiously, not well represented. Our own suspicion is that many practitioners and researchers explicitly or implicitly dismiss this as a technical domain, to be addressed through virus checkers and firewalls. In our view this is an impoverished perception, and there is extensive scope for the investigation of human activity as it impacts EUC security.

On the flip side of this under representation, there are some topics which have been researched and reported extensively in these volumes. Issues related to Knowledge Management (KM), for which there were no chapters at all four years ago, have seen eight appear in the following three years. Design and development of end user systems have, perhaps unsurprisingly, consistently appeared, and a wide range of these issues has been covered. Technology acceptance has also been well reported, both from the perspective of technology acceptance models, and in the more general sense of user acceptance of end user systems.

Given this situation, we thought it would be interesting to look at possible future directions for some of the topics which we view as important for the future of OEUC. We stress that this is very much a personal view, informed from our own research interests, but we hope you will find these worthwhile, and we have attempted to adhere to the volume aim (as contained within the title) of providing “New Explorations” in “Organizational and End-User Interactions”.

Preface
To begin with, we want to look at some of the issues related to user involvement. It is common in studies of information systems (IS) success to see reference to the necessity for user involvement. Justification for this varies from the rights of end users to be involved in systems development, through a “common sense” notion that systems improvement must result, to “proof” of success resulting from the users’ input to the development process. User involvement research focuses on two outcome variables: system quality and system acceptance. But underlying these are the more complex issues of cognitive and motivational factors which give rise to improved quality or improved acceptance.

As long ago as 1984, Ives and Olson suggested a model of user involvement (Figure 1) which illustrates the relevant issues. Their research, interestingly, did not support the belief that user involvement improves the success of computer based information systems. In their extensive review of user involvement studies, few show a strong correlation between involvement and success, and even where such a correlation appears, the link is too weak to be of statistical significance. Having said this, Ives and Olson believe there to be theoretical evidence to support the “common sense notion” of user involvement being important. Their view is that difficulties are caused by lack of rigor in research rather than in the evidence not being available.

This weakness in the empirical evidence is echoed by other researchers, leading to a possible conclusion that IS user involvement research suffers from the lack of a solid conceptual foundation. Interestingly a review of the involvement literature in psychology, marketing and organisational behaviour revealed that researchers in such disciplines have also gone through a period of struggle before achieving conceptual clarity.

Since publication of the Ives and Olsen research, there has been extensive pragmatic analysis of the user in IS, supported by the strong practical predilection towards the belief that user participation is essential to the success of systems, and utilising both quantitative and qualitative methods. There seems little doubt that users agree that in determining the success of the development project, user attitude

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**Figure 1. Descriptive model of user involvement**

![Descriptive model of user involvement](image-url)
toward system development is an important factor. Such an attitude can be seen in a willingness or otherwise to participate in development and implementation, and the factors that may cause the users to avoid participation need to be reviewed. These factors include senior management behaviour, from full support to unwillingness to spend, complaints about cost, corporate culture and organisational politics, and user background and personality.

Causes of user dissatisfaction with information systems are said to include autocratic management, lack of communication before implementation, lack of consultation with users in design and implementation, fear of job losses, lack of training and so on. The issue, however, is not whether user dissatisfaction exists, but what is the effect of such dissatisfaction on the success of the system.

For some, the view that improved system implementation will result from increased user involvement can be ultimately traced to behavioural theory, and in particular the theories of participative decision making and planned organisational change. Participative decision making (PDM) is expected to yield the benefits of increased job satisfaction, increased user acceptance, and improved productivity, by such factors as:

- Providing a more complete assessment of user requirements.
- Providing expertise about the organisation the system is to support.
- Avoiding the development of unacceptable or unnecessary features.
- Improving user understanding.
- Developing realistic expectations about system capabilities.
- Providing an arena for bargaining and conflict resolution about design issues.
- Improving system ownership by users.
- Decreasing user resistance to change.
- Committing users to the system.

So we have a number of suggestions as to how PDM is going to improve systems development and implementation. But two major factors are said to affect the success of participation. Firstly, who should be involved in the development: suggestions include affected parties; top level management; and the actual manager receiving the project. Secondly, the development conditions, in particular what type of system is being developed. For example, with highly technical systems involvement may be wholly inappropriate; and similarly, where systems are clearly defined and have set goals or objectives system quality may not be improved by user involvement.

The other important factor to consider in the development process is that user involvement may not be relevant at all stages, and it may be important to choose the stage at which involvement is applied. One idea is that we regard groups as either consultative, representative, or consensus. This can be taken further by looking at the degree of involvement of users, ranging from no involvement, through involvement by advice, to involvement by doing, where users are members of the design team, to involvement by strong control, where users pay directly for development from their own budgets.

On balance, the lack of confirmation from published studies should not be regarded as evidence that involvement has no effect on ultimate system success, rather it is suggested that the studies themselves are at fault. The need for involvement is stressed by many MIS practitioners, and in the absence of strong theoretical support the “common sense” view that involvement can lead to more acceptable or higher quality systems prevails. Care needs to be taken, however, in deciding who should be involved,
at what stages of development, and how the involvement should be carried out - the type and degree. This decision is largely dependent on organisational climate and the type of system being developed.

**Information Security**

Computer security is, curiously, not well represented within recent Advances in EUC volumes. Our own suspicion, as mentioned earlier, is that many practitioners and researchers explicitly or implicitly dismiss this as a technical domain, to be addressed through virus checkers and firewalls. In our view this leaves extensive scope for the investigation of human activity as it impacts EUC security.

Currently, information security aims primarily to protect information and to ensure it is available to those authorised to access it. What we hope to make clear in this section is that such an approach has led to a practice which constrains rather than enables end users.

One well established definition of Information Security can be found in the US Department of Defense ‘Orange Book’ (DOD 1985:3)

*In general, secure systems will control, through use of specific security features, access to information such that only properly authorised individuals, or processes operating on their behalf, will have access to read, write, create, or delete information.*

Another, more widespread and perhaps broader definition can be found in UK Government publications, for example the Communications-Electronics Security Group, the British Standard for Information Security Management (ISO 2000; BSI 2002), and in the documentation and practice within a large number of organisations who have adopted information security practices. That definition concerns the Confidentiality, Integrity and Availability (CIA) of information.

In the United Kingdom, the source of this can be traced to the early 1990s, when a group of security professionals formed a committee under the auspices of the British Standards Institute, and with the support of the UK Government’s Department of Trade and Industry, to document current ‘best information security practice’ based on the current experience, knowledge and practice of those contributing. The product of this effort was the Code of Practice for Information Security Management. The committee continued to work towards maintaining and improving the code of practice, and today it has developed into the British Standard for information security (ISO 2000; BSI 2002). The same committee continues to maintain and revise this Standard. During the various iterations, Part 1 of the Standard has been accepted by the International Organization for Standardization, commonly known as ISO, as an international standard, ISO-17799.

Part 1 of the Standard (ISO 2000) is a code of practice which contains around 130 controls to be considered and implemented. Part 2 (BSI 2002) contains the same number of controls but specifies their use and is therefore auditable. Both parts of the Standard provide guidance for the development and implementation of a risk-based management system that allows the continued assessment and management of risks. This is delivered through an Information Security Management System (ISMS) that incorporates a cycle which, in essence, compiles a list of the 130 controls and determines whether the absence, or inadequate implementation of these controls is likely to harm the organisation and if so, by how much. Proper management of risks and correct implementation of applicable controls can attract certification to the Standard and the right to use the British Standard kite mark to signify appropriate management of information security.
Whilst the British Standard is not the only approach to Information Security, all of the other key techniques have been reviewed during our research, and a comparison of the British Standard with other available models does nothing to alter the above picture.

Moving from the Standard to current information security literature, a similar pattern emerges of a domain that includes some broad risk-based theory and becomes progressively more specific and technically biased over time, although with some excursions into business and human centred domains. How successful these human centred excursions have been is unclear as they typically focus on superficial ethical issues such as data privacy, and how to get people to accept the required information security practice. Business-aligned literature tends towards the attainment of resources to maintain the security practice rather than a true attempt to align security with business objectives. In terms of quantity of literature there is a massive bias towards technical and operational controls within the domain. In fairness, as technology continues to evolve there is an almost continual need to update the technical security literature base to keep pace. However, this does not adequately explain the relative absence of social literature within what is essentially a domain that radically affects users and how they are expected to behave.

So, through a detailed examination of the British Standard and an extensive review of available information security literature a model has emerged which clearly shows a domain which is dominated by a set of practical controls which are seen as rigid, unclear and largely irrelevant to the business needs of most organisations. What has become clear, even within some recent developments that have sought to provide a more accessible model for managing information such as information assurance, is that all current practice is centric around the needs of the technology and of information rather than the needs of people in general and users in particular. Where human or end user issues are explored in this domain, it is to confer responsibilities and education on people to conform to the needs of the system and to regulate their behaviour.

What emerges then is a domain which is to all intents and purposes technological and operational, as proven by the absence of sufficient consideration for human issues; and a domain dominated by pragmatism as demonstrated by the way in which the principle models in the domain were constructed and are maintained.

But what are the user issues, and how might we best address them? Figure 2 gives some idea of the complexity here.

In terms of user involvement, it is clear that one outcome of an effective implementation of an information security system will be to either reinforce or modify the behaviours of people; to either bring about change or to resist change; and to determine whether external factors are desirable or undesirable. If the behaviours of a person or group of people is considered desirable then the information security system will seek to recognise and reinforce that behaviour, and if the behaviours are considered undesirable then the system will seek to modify those behaviours. Likewise, if a change is either proposed or taking place that is desirable then the system will embrace that change, if the change is undesirable then the system would resist it. If the environment is acceptable and there are no visible opportunities to improve security, then the system would seek to maintain the current position. If the environment is unacceptable then the system will seek to positively change the current position.

It has been argued that the current information security domain can be best represented as a technical practice, with scant regard to human (end user) or social needs. The comparison of social and technical and theoretical and practical issues in Figure 3 forms a link from the factors seen to be most relevant to Information Security to those relating to end users. Information Security is a domain which has hitherto been dominated by technologically–biased, operationally–focused, pragmatic controls. Deeper research
of the domain is revealing a set of largely ignored considerations, in respect of which more human-centred methods are proving of value.

The approach adopted in this section gains its credibility from an explicit basis in social theory. Shortcomings in one of the key standard approaches to Information Security, and in the application of Information Security within a large organisation, have further improved our understanding of how strategies can best be derived and managed to address user issues in this domain. Information Security emerges as a domain dominated by pragmatic, technology-based methods. By acceding to these methods, both the British Standard and industrial practice has favoured a short-term, operationalist approach, in which human factors are seen as largely external to the Information Security ‘system’.

Knowledge Management Systems

As with other issues in this paper, knowledge management (KM) can be argued from a human-centred perspective. Figure 4 views KM and knowledge acquisition generally as a product of human activity, where people in interaction acquire and manage knowledge.

All of this may be made sense of through systems theory, and Table 1 shows how the properties of a (human activity or knowledge) system are enabled by elements of organisational structure or technology.

Knowledge Management has been defined by some as the extraction and conversion of ‘tacit’ knowledge on an individual and organisational level into ‘explicit’ knowledge. Further, it is argued, this explicit knowledge often takes the form of specific electronic ‘tools’ or ‘assets’ which can be manipulated for competitive gain, examples being intranets, groupware and knowledge repositories. ‘Tacit’ knowl-
edge, by contrast, is often described as the ‘hunches, intuition and know-how’ of people, or their ‘skills, routines and competencies’. The aim of KM as regards tacit knowledge might be seen as an attempt to make this often highly subjective knowledge explicit, thereby facilitating its management through such enabling media as technology.

Additionally, a number of studies have called for a more holistic, systemic approach to KM. One such example is the division into the ‘know-why, know-what, know-who, know-how’ questions of KM. Know-how might be seen as technologically focused, know-who as socially constructed and depending on processes of debate, whilst know-why and know-what relate to issues of power and coercion in societal structures.

Finally, there are numerous classifications which aim to demystify KM. We feel that two taxonomies of knowledge detailed below offer a systemic approach towards classification of knowledge, and consequently can aid in demystifying KM.

**POLANYI’S TAXONOMY OF KNOWLEDGE**

A number of leading management theorists have affirmed that the Hungarian chemist, economist and philosopher Michael Polanyi was among the earliest theorists to have popularised the concept of characterising knowledge as tacit or explicit. This is now recognised as the de-facto knowledge categorisation approach (Beijerse, 1999; Gupta, Iyer and Aronson, 2000; Hansen, Nohria, and Tierney, 1999; Nonaka, 1988; Nonaka and Konno, 1998; Zack, 1999). Explicit knowledge typically takes the form of company documents and is easily available whilst Tacit knowledge is subjective and cognitive. The cornerstone
of any KM project is to transform tacit knowledge into explicit knowledge so as to allow its effective dissemination (Gupta, Iyer and Aronson, 2000).

Nonaka and Konno (1998) have also substantiated Polanyi’s contention that there are two kinds of knowledge: explicit knowledge and tacit knowledge. They add that there are significant differences between the way these two kinds of knowledge are viewed in the western and the eastern-based management entities. Western management organisations lay more emphasis on explicit knowledge as it is more recognised and scientifically organised. Eastern management entities and in particular Japanese firms “view knowledge as being primarily tacit, something not easily visible and expressible” (Nonaka and Konno, 1998, pp.42). They also mention that whilst there are two dimensions of tacit knowledge: (1) technical, (2) cognitive, it is the cognitive dimension that moulds the manner in which we perceive the information available to us. This supports the notion raised earlier that creation of knowledge requires human insight.

Zack (1999) also affirms that tacit knowledge is not easily expressed, as we comprehend tacit knowledge at a subconscious level. Explicit knowledge, conversely is more precisely and formally articulated, although removed from the original context creation or use. This definition of explicit knowledge brings to light an important feature of explicit knowledge: that the knowledge passed on is not original.

An analogy can be drawn between explicit knowledge and secondary data. Explicit knowledge can never be like primary data: (i.e. based upon a new concept, which has not been validated). Explicit knowledge has to be based upon real life experiences, which have already taken place. Another distinguishing feature of tacit knowledge is that it is often based upon first hand experiences that others have gone through. The transfer component of tacit knowledge comes into effect when it is disseminated. When dissemination is carried out in written format (manuals etc), tacit knowledge becomes explicit knowledge.

According to Davenport and Prusak (1998) personal knowledge is the outcome of an intellectual process which includes an individuals’ personal experiences, values and sagacity. Organisational knowledge refers to the codified knowledge that is present in organisational storage (document repositories etc) and communication mediums (organisational practices and norms).
Table 1. Systems of Knowledge Management

<table>
<thead>
<tr>
<th>System Property</th>
<th>Human Activity Systems</th>
<th>Implications for Knowledge Management</th>
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</thead>
<tbody>
<tr>
<td>Boundary</td>
<td>The limits of that which can be known</td>
<td>The organisation, or relevant part of it Bounded technological sub-systems which enable the whole system of Knowledge Management to function more effectively</td>
</tr>
<tr>
<td>Emergence</td>
<td>Emergent properties of a knowledge system: e.g. decision making</td>
<td>Structure and technology must be seen in terms of their contribution to the emergent properties of the whole KM system</td>
</tr>
<tr>
<td>Holism</td>
<td>Encompasses technical, human (cognitive and social), and organisational factors</td>
<td>Must not be viewed in isolation, but only as part of the whole KM system</td>
</tr>
<tr>
<td>Interdependence</td>
<td>Changes in part of the system (e.g. human knowledge acquisition)</td>
<td>Technology, organisation, and human activity working together are the source of success in any KM system</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>As human beings we see structures in knowledge systems (hence the data structures in computerised systems)</td>
<td>Organisational structures help facilitate human knowledge acquisition and sharing Technologies support the organisation and/or human actors</td>
</tr>
<tr>
<td>Transformation</td>
<td>The acquisition of knowledge always leads to changes, which may be perceived in organisational terms as transformation processes</td>
<td>The key in transformation achieved through Knowledge Management: technology and structure are enablers</td>
</tr>
<tr>
<td>Communication and Control</td>
<td>These are fundamental to knowledge systems, and once more require understanding of the interactions between human, technical, and organisational issues</td>
<td>Used as aids to communication and control in the overall KM system</td>
</tr>
</tbody>
</table>

**Table 1. Systems of Knowledge Management**

<table>
<thead>
<tr>
<th>System Property</th>
<th>Enabling Mechanisms: Designed Physical Systems</th>
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<tbody>
<tr>
<td>Boundary</td>
<td>Structure Technology</td>
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<tr>
<td>Emergence</td>
<td>Structure Technology</td>
</tr>
<tr>
<td>Holism</td>
<td>Structure Technology</td>
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<tr>
<td>Communication and Control</td>
<td>Structure Technology</td>
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</tbody>
</table>
Blackler Taxonomy of Knowledge

Blackler (1995, pp.1021) has reiterated that the concept of knowledge is complex and, in an organisational context, its relevance to organisation theory has as yet not been sufficiently understood and documented. He further argues that this is one of the fundamental reasons why KM does not have a widely accepted framework which can assist organisations in KM systems. He has identified five main categories of knowledge: embrained, embodied, encultured, embedded and encoded.

- **Embrained knowledge** refers to the knowledge that is dependent on conceptual skills and cognitive abilities. It is also normally associated with scientific knowledge. This kind of knowledge has commanded a high status in western cultures.
- **Embodied knowledge** is rooted in specific contexts and is generally acquired by doing. As such it often said to be action-oriented. It is also assumed to be “partly explicit” as its transmission requires “peoples’ physical presence, on sentient and sensory information, physical cues and face-to-face discussions” (Blackler, 1995, pp.1024)
- **Encultured knowledge** is knowledge that is achieved through a process of socialisation or what Blackler calls “shared understandings”. The author further mentions that encultured knowledge is strongly dependent on language and is “socially constructed and open to negotiations”. As such it would be fair to reflect that encultured knowledge is embedded in the organisations cultural systems.
- **Embedded knowledge** is knowledge “which resides in systemic routines” and which is present in the form of explicit practices and is generally embedded in technology.
- **Encoded knowledge** refers to knowledge that is recorded via signs and symbols, such as books, manuals and codes of practice. In the modern IT age, encoded knowledge has also incorporated electronic forms of knowledge (Blackler, 1995, pp.1025).

Blackler (1995) has noted that the above approach of knowledge categorisation can be problematic. He further mentions that as the concept of knowledge is continuously evolving (as knowledge is continuously being constructed and transformed) it might be more advantageous to focus on the process of knowing. Blackler (1995) views the process of knowing as being mediated, situated, provisional, pragmatic, and contested:

- **Knowing as Mediated**: “New ICT are combining with other developments, such as new economic and organisational structures and new approaches to management to transform the contexts of action”. Here the emphasis is on technologies that support an organisation to collaborate whilst ensuring that there is no fundamental loss of control.
- **Knowing as Situated**: Blackler (1995, pp.1041) points out that knowing as situated “emphasises the significance of peoples’ interpretations of the contexts within which they act and the key role that ‘communities of practitioners’ play in the acquisition and development of skill”. Herein, Blackler highlights the fact that knowledge is formed primarily through a process of practice and reflection, both of which are based upon group interactions and experiences.
- **Knowing as Provisional**: This refers to the fact that the process of knowledge is essentially continuous and implies that we are not able to develop a complete bank of knowledge (Blackler, 1995).
• **Knowing as Pragmatic**: Advances in ICT are likely to bring about a change in the way people learn and work at the workplace. Current organisational systems are becoming “interrelated and complex” resulting in the failure of traditional approaches in organising knowledge. It is fair to assume that the above would lead to a scenario whereby organisational employees would aim to acquire knowledge which would be driven by a pragmatic aim and purpose such as adjusting to the changes in “work methods and priorities” (Blackler, 1995, pp.1041).

• **Knowing as Contested**: Blackler’s (1995, pp.1042) statement that “the concepts of knowledge and power are interrelated” implies that “conflicts are to be expected within and between the new generation of symbolic analysts and problem solvers, and established professionals and managers”. Knowledge is formed primarily when we contest our understanding of what we perceive to be knowledge with others. The outcome of this process is that the contested knowledge finally emerges out of the process of knowing, which occurs through dialogue and interaction with others.

Blackler (1995) has reiterated that the concept of knowledge is complex and, in an organisational context, its relevance to organisation theory has not yet been sufficiently understood and documented. This is one of the fundamental reasons why we believe that KM does not have a widely accepted framework that enables organisations to: (a) create KM systems, and (b) a culture conducive to KM practices.

But what does ‘managing knowledge’ infer from the standpoints discussed in this section (see Figure 5)?

**Figure 5. Early Lessons from Philosophy and Theory**

![Diagram of System of Knowledge Management]

- Epistemology
  - Memory
  - Introspection
  - Reflection
  - Testimony
  - Inference

- Philosophy
  - Subject and Object Combine
  - Reason and Experience form Knowledge

- Theory
  - All Knowledge is Socially / Communicatively Mediated
Epistemology, philosophy and theory all have a part to play in determining the elements of a system of Knowledge Management. Epistemology tells us that knowledge derives from perception, memory, introspection, reflection and testimony. It is subject to a priori concepts, and is extended by inference.

In philosophy, from the time of the Greeks, there have existed fundamental arguments regarding knowledge being a search for truth, or for normative agreement. Initially the argument raged between rationalism and empiricism, and one of Kant’s unique contributions, through the ‘Copernican revolution in philosophy’, was to unite subject and object in knowledge production: subject and object, according to Kant, make each other possible.

Theoretically, following the thinking of Habermas, in which can be seen the echoes of Kant, science produces only one form of knowledge – believing all knowledge to be scientific is an ‘objectivist illusion’. What Habermas does that is so helpful to us is he sites knowledge as mediated by social action, and subject to reflection, without which we end up with self-referential systems which are in danger of producing ‘knowledge’ based on disputable ‘facts’.

One key element of human interaction is communication, and in so far as this may be oriented toward mutual understanding, it might be argued as the foundation of knowledge creation and sharing. In these terms, knowledge is not reducible (as is so often seen in scientific or pseudo-scientific study) to the properties of an objective world, but can be defined according to the a priori concepts that the knowing subject brings to the act of perception. This knowing subject, being social, mediates all knowledge through social action and experience: subject and object are linked in the acts of cognition and social interaction, and the so-called subjective and objective ‘paradigms’ may be represented as just a convenient tool for understanding, which has been accorded too much primacy as a form of reality.

Rather, then, than relying on the concept of paradigms, this concept, and particularly the idea of paradigm incommensurability, should be opened up to challenge. Consider the so-called subjective / objective dichotomy. According to the paradigm argument, viewed (say) from an epistemological perspective, one who sees a problem context as positivistic, and seeks, for example, a technological solution, will be unable to communicate and share knowledge with another who views the same problem context as existing in the views and opinions of those participants involved in and affected by the system of concern. There are at least two fundamental difficulties with this:

1. It contradicts common human practice, and, dare it be suggested, common sense. Human participants in social groups commonly combine technical (‘positivistic’) and interpretative (‘anti-positivistic’) activity, seemingly denying the paradigm incommensurability thesis from an epistemological standpoint.

2. Theoretically, the paradigm incommensurability view seems to have dubious support. At its most basic level, it derives from the idea that technical, scientific, functionalist activity cannot be conducted together with interpretivist, subjective activity. But if, theoretically, subjective and objective are inseparable, paradigm incommensurability becomes much less compelling.

In essence, then, it is the argument of this section that these difficulties disappear once a scientific basis for our thinking is denied. For example, suppose science (as is suggested by Kant: 1724-1804; and Habermas: 1929-) is seen as just one form of knowledge, which in any case is simply a convenient human perception of how the world works. Now, all human endeavour becomes mediated through subjective understanding, and the paradigms as impenetrable barriers disappear. So, the problem of interest
constitution theory being no longer defensible is resolved, since it is no longer being relied on. However, this problem has been replaced with another, which may be stated as follows:

1. Accepting all human actions as mediated through subjective understanding leads to the possibility of a basis for KM in the universal characteristics of language.
2. The dichotomy between subject and object has gone, and with it, paradigm incommensurability.
3. Organisational intervention is recast as an entirely communicative issue. For example, the so-called technical interest of knowledge constitution theory becomes instead a question of how technology may further enable human interaction, all within a framework of human intercommunication.
4. The difficulty which now arises is essentially a practical one, of how to incorporate these ideas into management practice.

The thinking of Habermas (1976; 1987) on communicative action presents a universal theory of language which suggests that all language is oriented toward three fundamental validity claims: truth, rightness and sincerity. What is most compelling about this theory, however, is that all three validity claims are communicatively mediated. This viewpoint is most radically seen in respect of the truth claim, where it is proposed that such a claim results not from the content of descriptive statements, but from the Wittgensteinian approach casting them as arising in language games which are linked to culture: truth claims are socially contextual.

‘Truth’, can therefore be assessed by reference to communication. Rightness is about norms of behaviour, which are culturally relevant, and are therefore to be determined by reference to that which is acceptable to those involved and affected in the system of concern as a cultural group. Finally, sincerity is about the speaker’s internal world: his/her internal subjectivity.

These ideas can now be taken forward to provide a KM approach, or set of approaches, which are theoretically grounded, and closer to that which is experienced in action. The conclusions below begin this process through design of a critical action framework for KM interventions, based on critical theory.

**OEUC and the Internet**

This section seeks to offer insights into EUC and the Internet by applying learning from the fields of social theory and information systems to the specific context of the internet. Key to this understanding is the extent to which the *scope* of information systems (IS) analysis is often seen to be problematic: IS ‘problems’ are frequently ‘solved’ by redefining organisational and human issues in technical terms, and developing the necessary technical solution. Studies on which this section are based have raised significant questions regarding such approaches, exposing many IS developments as not susceptible to a technical solution, but exhibiting complexities stemming from high levels of human activity. Arguably, such findings are of particular importance in web development and management, depending as it does on the understanding and commitment of users who are often remote from and external to the organisation. A clue to how such complex, human-centered issues may be dealt with is to be found in the scoping of these studies which, in systems terms, implies a need to assess the *system boundary*. Within this section an approach to such boundary setting is described, together with the way in which this may be used to inform user-focused internet development.

Table 3 summarises the issues from social theory in relation to the world-wide web. A functionalist approach sees a set of problems to be solved: objective problems which can be determined indepen-
dently of any human viewpoint. In web design this describes a technological, expert-informed approach, where the views of users are seen to be secondary. Through interpretivism, the web is understood as a social, subjective phenomenon, in which the views and opinions of participants become fundamental to its understanding.

From a radical humanist, or critical social perspective, the view of IS as functionalist, ‘hard’, problem solving, is seen to be an impoverished one, over-focused on the use of computer technology. ‘Soft’ 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 radical humanist umbrella. Issues of particular relevance in this respect to web management are determination of the scope, or boundaries, of the system, and, given the boundaries, choice of development, implementation, and management methodologies.

A typical approach to web design, implementation and management, is represented (Figure 6) by the primary boundary. The information to be included is often at best from an expert group, and most of the activity takes place between designers and managers, with system users cast in a passive role.

But such an approach largely ignores the wider user issues, under which users become an active part of the system.

Table 2. A Critical Action Framework for Knowledge Management

<table>
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<tr>
<th>Investigation Of</th>
<th>Investigation Through</th>
<th>Outcome – Knowledge to be Managed</th>
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<tbody>
<tr>
<td>Knowledge as:</td>
<td>Subject and Object investigated through Participative Analysis</td>
<td>“Manage” as a systemic process of participative inquiry</td>
</tr>
<tr>
<td>Memory</td>
<td>Tests of Communicative Rationality:</td>
<td>Outcomes in the form of:</td>
</tr>
<tr>
<td>Introspection</td>
<td>Truth</td>
<td>Systems Descriptions</td>
</tr>
<tr>
<td>Reflection</td>
<td>Rightness</td>
<td>Process</td>
</tr>
<tr>
<td>Testimony</td>
<td>Sincerity</td>
<td>Content</td>
</tr>
<tr>
<td>Inference</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Involves Application Of</td>
<td>Leads to Understanding Of</td>
</tr>
<tr>
<td></td>
<td>Methodologies for Problem Context Analysis</td>
<td>Context in which KM is to be Applied</td>
</tr>
<tr>
<td></td>
<td>Methodologies for Participative Analysis</td>
<td>Processes for Knowledge Exchange to be embedded within the organisation</td>
</tr>
<tr>
<td></td>
<td>Critical Method for Tests of Communicative Rationality</td>
<td>Knowledge Explicated to be Recorded for Shared Use</td>
</tr>
</tbody>
</table>

The review of KM undertaken in this section indicates the potential for approaches explicitly grounded in critical social theory, and points to a possible future direction through a Critical Action Framework for Knowledge Management (Table 2). Research and practice built on this foundation will, we would suggest, more adequately address issues of users in KM environments.
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 web management, 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 domain contrasts with the simplicity with which this part of a web-based intervention is normally undertaken.

Our position in relation to the approach taken is embryonic, and it offers many challenges which have not as yet been addressed by me or other practitioners and theorists. To progress this, we feel concentration now needs to be on web developments in which users are actively involved in the whole process.

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 this problem. A critical social view gives a richer image. Web-based systems are not per se computer systems, but are systems of human activity, consequently, functionalist science or interpretative sociology appear an inadequate basis on which to study them, a wider critical social context seeming more relevant.

We hope that this brief review, and our ideas regarding some of the key domains in EUC, have proved interesting to you. If they inspire you to contribute in the future we will have our reward.

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**Table 3. Social Theory and the World Wide Web**

<table>
<thead>
<tr>
<th>Radical Humanist</th>
<th>Interpretative</th>
<th>Functionalist</th>
</tr>
</thead>
<tbody>
<tr>
<td>The web as a social construction, but now introducing a need to ensure inclusion of those involved and affected to challenge authoritative views.</td>
<td>Web management and usage seen to be a social interpretation. Technical (functionalist) issues serve only to enable the social interaction.</td>
<td>Web management and usage as a technical problem to be solved by experts.</td>
</tr>
</tbody>
</table>

**Figure 6. Critique of the System Boundary**

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 web management, 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 domain contrasts with the simplicity with which this part of a web-based intervention is normally undertaken.

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We hope that this brief review, and our ideas regarding some of the key domains in EUC, have proved interesting to you. If they inspire you to contribute in the future we will have our reward.
Finally, as always, we hope that you, as researchers, educators, and professionals in the domain, find something to enhance your understanding within the content of this volume, and, more particularly, that you enjoy reading about them.

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REFERENCES


