THE INTRODUCTION OF KNOWLEDGE MANAGEMENT TECHNOLOGY WITHIN THE BRITISH COUNCIL: AN ACTION RESEARCH STUDY

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ABSTRACT

The study describes action research undertaken within the Knowledge Management programme of the British Council, a not-for-profit multinational organisation. An interpretive methodology is adopted because of its appropriateness to the study of real-life complex situations. There is a contested literature on Knowledge Management which this study explores and contributes too.

The action research draws on a social constructivist stance to develop and introduce Knowledge Management systems for significant groups within the organisation. A rich set of issues emerge from the literature, and the action research, which contribute to the discourse on Knowledge Management systems and their use in practice. The study suggests that a methodological framework is beneficial in supporting the development and introduction of such systems. However the research identified that Knowledge Management problems cannot be identified and so re-conceptualises Knowledge Management in terms of improvement. A framework is developed (AFFEKT: Appreciative Framework for Evolving Knowledge Technologies) to such improvement. This framework is used in the final action research cycle. The conclusions are drawn from a reflection on the application of this framework and reflection on broader issues raised by the action research.

The study concludes that knowledge management systems should introduced through an ongoing iterative process of reflection and action. Knowledge Management systems should encourage new work practices, however this requires a realisation that the development of a Knowledge Management systems is a reflective process by which the system is integrated into existing practice and enables users to critique this practice.

The study contributes to the discourse concerning the application of technology within Knowledge Management (Galliers 1999; Alavi and Leidner 2001; Butler 2002; Wickramasinghe 2002). It contributes to the field of Information Systems by describing a coherent narrative on the introduction of knowledge management systems within a unique organisational context, and by developing a framework to aid intervention.

CHAPTER 1 INTRODUCTION

"For this, indeed, is the true source of our ignorance – the fact that our knowledge can only be finite, while our ignorance must necessarily be infinite" (Karl Popper, Lecture in 1960).

1.1 Outline

This thesis is a report of an action research study within the British Council, the UK government's overseas cultural relations organisation. The study explores how this organisation undertook an organisational improvement programme based on Knowledge Management. The research adopts a social constructivist stance towards Knowledge Management and towards the role of information communication technologies (ICTs) within Knowledge Management. Through three cycles of action research the study develops a set of practical recommendations on how to apply ICT as part of an organisational improvement programme of Knowledge Management. From these practical recommendations the researcher develops a methodological framework (AFFEKT: Appreciative Framework for Evolving Knowledge Technologies) for developing and introducing technology within Knowledge Management programmes.

The study focuses on the British Council's desire to improve its practice through the application of principles from Knowledge Management. Within this thesis the term "improvement" is used to describe the aspiration, from a particular viewpoint, that led the British Council to implement Knowledge Management. It is used to overcome the contested nature of Knowledge Management in order to take seriously the concept and then intervene within the organisation.

The study concludes by exploring the role of the AFFEKT framework that emerges from this study in relation to broader issues within both the British Council and Information Systems.

This chapter describes the motivation for such a study, describes its importance within the field of information systems and introduces the research theme. The assumptions underpinning the research are described. The structure of the thesis is outlined with a brief summary of each chapter.

1.2 Theoretical Motivation

This study is motivated by a call within the literature for further research into how Knowledge Management is undertaken within organisations and how technology is used as part of this. *"We are particularly interested in manuscripts that focus on the roles of information technology in how people and organisations use and manage not just data and information but rather, all forms of knowledge, such as intellectual capital, organisational memory and learning, group knowledge and documentbases"* (Foreword to special issue of MIS Quarterly (Markus and Lee 1999)).

Knowledge Management is a broad and expanding topic (Scarbrough 1999) with little consensus regarding its definition (Neef 1999; Bhatt 2001). Neither popular literature, nor academic discourse has reached a workable consensus (Raub and Ruling 2001). Knowledge Management is grounded in the now well established concept from management studies that knowledge is a key source of competitive advantage for organisations (Nonaka and Nishiguchi 2001). Yet the topic remains fragmented between disciplines; in a study of 434 Knowledge Management articles (Raub and Ruling 2001), two general areas of interest may be identified, those concerned with information systems and technological issues of Knowledge Management, and those concerned with general management issues. This fragmentation suggests a need for further research which attempts to marry management theory with the practical aspects suggested by information systems discourse (Liao 2003). This study attempts such marriage by adopting an action research approach (Wood-Harper 1989; Checkland and Scholes 1990; Vidgen 1996; Olesen and Myers 1999).

Further fragmentation may be seen between academic discourse which takes seriously the epistemic foundations of the use of knowledge, and the information technology (IT) industry's software solutions which often ignore such discussion and present technology as an effective method of *"managing valuable knowledge assets*[1]*"*. Even within practice, fragmentation is highly evident; at the 2002 "UK Knowledge Management event" (a highly practitioner focused conference) a marked contrast was evident, mentioned by speakers, between the theories presented in the conference hall and the software solutions presented by IT companies in the demonstration hall. While speakers discussed the social aspects of Knowledge Management, emphasising the need to change cultures and practice, software companies were demonstrating technologies which *"automate [the] discovery, organisation and networking of knowledge across the enterprise*[2]*"*.

Motivated by this marked contrast between the use of technology for Knowledge Management in practice, and the dialogue of Knowledge Management as an academic and management issue this study's adopted action research approach explores theory through practice. The study takes seriously the academic literature in an attempt to act practically within an organisation as part of a wider Knowledge Management programme. Literature suggests that while Knowledge Management programmes should address more than technology, technology remains an important component of the topic (Davenport and Prusak 1998; Milton, Shadbolt et al. 1999) and remains central to the research agenda (Alavi and Leidner 2001; Venters, Cushman et al. 2002). For example, the majority of articles associated with Knowledge Management are published within information systems/information communications technology literature (Scarbrough, Swan et al. 1999). Some of this literature suggests that the growth of interest in Knowledge Management within organisations is closely aligned with the development of intranet/web technologies (Cohen 1998; Doyle and du Toit 1998; Chait 1999; Gillmor 1999; Microsoft 1999). While ICT may not deliver Knowledge Management, it forms a catalyst for the development of theory in this area (Davenport and Prusak 1998; McDermott 1999).

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[1] Marketing slogan of Convera, a software company and corporate sponsor of the fifth UK Knowledge Management conference.

[2] Taken from marketing material for Verity Business Portals.

However, it has been argued that the topic is becoming an extension of the marketing effort of the information systems/information technology industry (Swan, Scarbrough et al. 1999), and that these Knowledge Management systems are little more than information systems (Galliers and Newell 2001).

The criticism that Knowledge Management systems are little more than information systems lead to criticism that Knowledge Management is re-branded information management: *"many Knowledge Management projects are, in reality, information projects. When these projects yield some consolidation of data, but little innovative products and services, the concept of Knowledge Management is cast in doubt"* (Gold, Malhotra et al. 2001). In practice, many Knowledge Management approaches do seem to equate information and knowledge (Von-Krogh, Ichijo et al. 2000). Research into Knowledge Management systems suggests that they tend to be employed as information or corporate memory systems, rather than supporting the knowledge activity of staff (Wickramasinghe 2002). This tendency may explain why industry's large focus on technology within Knowledge Management has received much criticism for its degradation of the importance of people (Swan, Scarbrough et al. 1999; Galliers and Newell 2001) because focus on people is generally removed from such technological discourse. This has led many to suggest that technology is only a small part of a Knowledge Management programme; that improvement in the way knowledge is created and applied cannot be sought through technology alone (Davenport and Prusak 1998; McDermott 1999; Bhatt 2001) and in particular that explicit knowledge is the focus of IT technologies, which usually ignores tacit knowledge (Alvesson and Kärreman 2001). It is further argued that ICT can only process information (or even simply data), and that the social aspects of knowledge must be left to human social interaction (Galliers and Newell 2001).

Whether such technologies process information, data or knowledge, it remains that these technologies are being deployed as part of Knowledge Management programmes (Pan and Leidner 2003). Rather than taking a fundamentally critical view of Knowledge Management and the use of ICT in Knowledge Management activity, this study takes them seriously and explores them through practice.

The need for research in this area has been expressed in many places: *"There is a need to better understand the ways in which information is used in knowledge work, from the clerical to senior executive levels and consequently, the ways in which IS/IT might support such knowledge work. This is an area that would seem to be ripe for investigation in masters and doctorial dissertations within the field"* (Bacon and Fitzgerald 1999) similarly in (Alavi and Leidner 2001) (Galliers 1999; Milton, Shadbolt et al. 1999). While a great deal of commercial effort has been expended developing complex Knowledge Management systems, little emphasis has been placed on how to analyse the organisational need for, and use of, such systems, or the issues faced when such systems are introduced into organisations (Scarbrough, Swan et al. 1999; Wickramasinghe 2002).

Knowledge Management systems are often unsuccessful (Schultze and Boland 2000), with some research outlining failure rates of up to 80% (Storey and Barnett 2000). This highlights a need for research into how such systems are introduced, promoted and used within organisations to explore the factors which may lead to such failures. *"While there has been much debate, theorising, and writing of a normative nature on the topic, there is a paucity of research of an empirical nature on Knowledge Management systems"* (Butler 2002). This specific need to research technological tools which increase the ability of an organisation through Knowledge Management principles is included within the Economic and Social Research Council's £3.5m evolution of business knowledge programme (ESRC 2002).

The British Council is a not-for-profit organisation and almost everything it does concerns information, knowledge or social relationships (Capozzi, Lowell et al. 2003). During this study it faced a significant pressure to change its practices and, based on this pressure, considered Knowledge Management as a desirable approach for improvement. This study is thus central within the developing literature on Knowledge Management for it provides a unique study of an organisation's attempt to apply Knowledge Management in the face of pressure to improve. As an action research study it is also able to provide a unique perspective on both the improvement programmes execution and the introduction of technology within such a programme.

1.3 Background to the study

The study outlined within this thesis was undertaken within the British Council as part of its corporate Knowledge Management programme. The following section provides a brief introduction to this context. A detailed description of the British Council and its Knowledge Management programme is presented in Chapter 5 .

The British Council is the United Kingdom's international organisation for educational and cultural relations. Funded by the Foreign and Commonwealth office (FCO) it aims to *"enhance the reputation of the United Kingdom in the world as a valued partner"* (British-Council 1998). Through a network of 7000 staff, working within 110 countries the organisation provides a variety of services to achieve its purpose by *"creating opportunity for people worldwide"* (British-Council 1998).

Faced with such a diverse and geographically distributed operation, the British Council perceives the sharing and development of knowledge to be of paramount importance to its future success (Khalid and Marsden 1999). In the year prior to this research an internal consultation exercise was undertaken to develop a "Knowledge Sharing Strategy" (Khalid and Marsden 1999). This strategy was developed in response to significant external pressure to change current practice and to innovate new practice, and through a perceived need to develop better approaches to the use of knowledge within the organisation in response to such pressure.

This study concerns the use of technology within the "Knowledge Sharing Programme" set up to implement this strategy. It presents the involvement of the researcher undertaking a series of action research studies within the knowledge sharing strategy and was undertaken by the researcher working alongside the British Council's Knowledge Management team and supported by the British Council's Knowledge Manager.

1.4 Area of Concern

This study considers a Knowledge Management system (KMS) to be a set of technologies tailored and introduced for the purpose of improving practice. In undertaking this study a social constructivist approach is adopted, considering

knowledge to be an emergent property of purposeful human activity (Checkland and Scholes 1990). By adopting such an approach a technology must be designed to, in some way, enhance such purposeful human activity. This study argues that the technologies used in devising such systems cannot be considered as intrinsically "Knowledge Management tools" based on their own characteristics, but rather on the method and situation in which they are employed (as suggested by (Hendriks 2001)).

Concepts of Knowledge Management have led to companies marketing products as Knowledge Management systems capable of solving various Knowledge Management issues (e.g. *"to give our clients the power to more effectively capture, shape, share and use knowledge to compete and win!"*[3]). Yet this thesis shows that, for the British Council, problems of knowledge do not exist within the organisation; rather there are problematic situations that are conceptualised by the organisation as capable of improvement through the application of principles from Knowledge Management.

Organisations are not faced with problems such as "poorly managed knowledge" to which an obvious solution exists; rather they are faced with a variety of complex situations, which Russell Ackoff defines as *"a system of external conditions that produce dissatisfaction"*, which he neatly terms a *"mess"* (Ackoff 1974). The problems associated with such messes have been called *"wicked problems"* (Rittel 1971) in that no obvious solution to them may ever exist; only improvement may be sought.

This study introduces the French term "problèmatique" in defining such mess rather than "problem context" or "domain" as such terms imply a structure and hence that a potential understanding of the problem may become existent within the world. A problèmatique is a socially created description employed in order to make sense of, and categorise such mess; it cannot be identified explicitly in the world. The boundary of the problèmatique is constantly changing in response to external and internal influence.

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[3] Mission statement of Sopheon, a Knowledge Management software company (www.sopheon.com).

In analysing such a problèmatique it is not possible to isolate a single problem to which a solution may be sought by Knowledge Management or otherwise as each is interlinked. There is thus no sense of "solution" through Knowledge Management, only incremental improvement. Within an organisation improvement may be sought through many initiatives (including Knowledge Management). The perception of success or failure of such initiatives is socially constructed – it is not necessarily possible to isolate the cause of improvement from the context of general change.

A socially constructed theoretical stance towards Knowledge Management is adopted, and suggests that such improvement is intrinsically linked within purposeful human activity. Knowledge is suggested to be an emergent property of purposeful action; it is disseminated (or rather co-created) through conversational acts; and it is applied in purposeful human activity. This study employs the concept of "communities of practice" (Brown and Duguid 1991; Lave and Wenger 1991; Wenger 1998) in researching Knowledge Management within such a problèmatique.

Within this problèmatique this research considers the focus of improvement through Knowledge Management technology to be human purposeful activity. The area of concern of this study is thus how the introduction of Knowledge Management technologies within an organisational context may lead to improvement in human purposeful activity within a particular problèmatique.

Figure 1 highlights this area of concern, located between understanding of technology (a) which is conceptualised within the problèmatique of the research as a Knowledge Management technology (a subset of all technology available to individuals in their knowledge work), and an understanding of human purposeful activity (b) as conceptualised within the problèmatique of the research through Knowledge Management theory (a subset of individuals totality of purposeful action). This notion of subset highlights that the study cannot identify all technologies and activities which may be employed in the "knowledge activity" of a given individual.

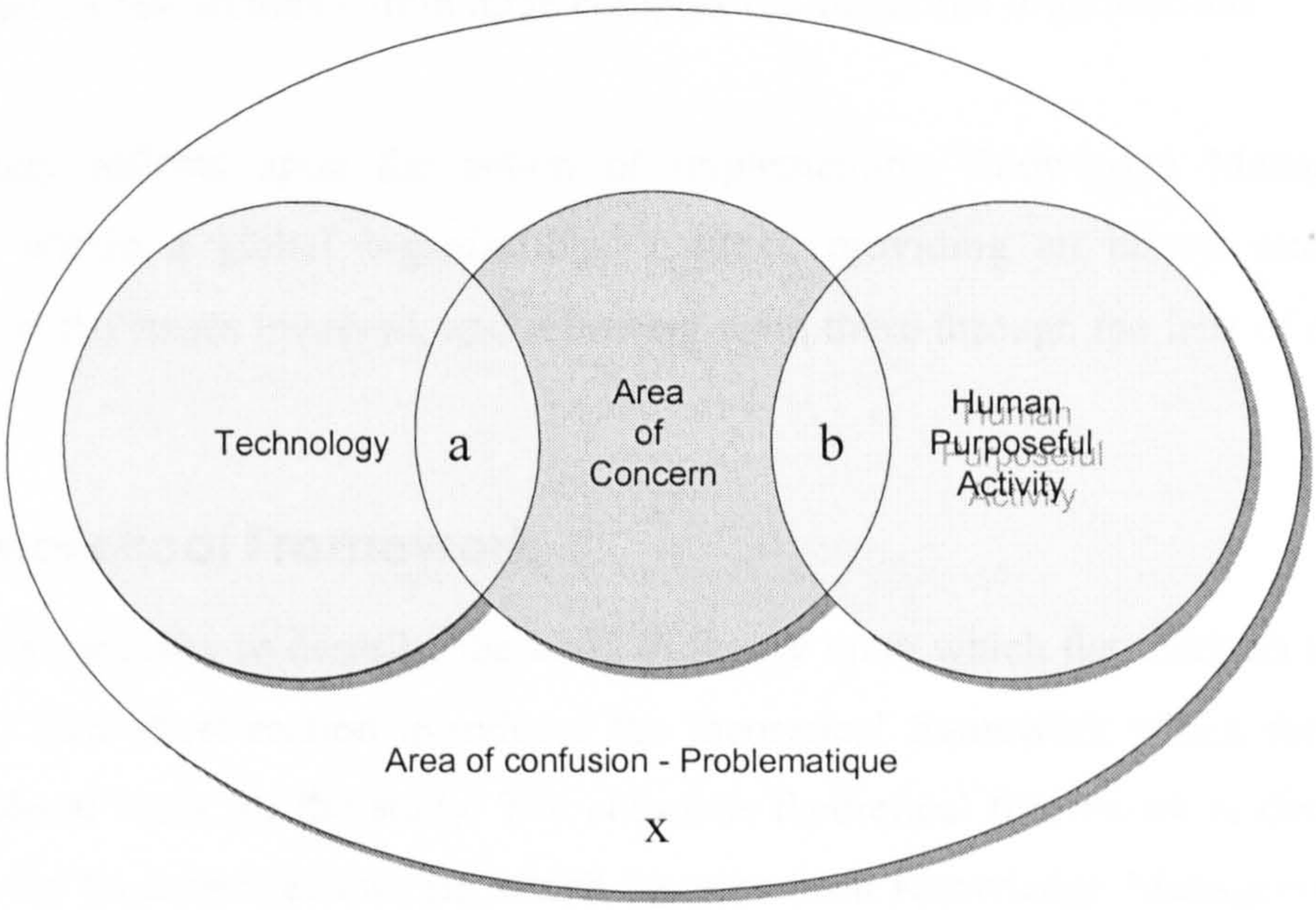

Figure 1: Area of Concern

1.5 Research Issue

In exploring the area of concern outlined above, the study sets out to explore the following broad issue:

- How are concepts of Knowledge Management applied through the introduction of technology within organisational contexts with the aim of organisational improvement?

This issue contributes to the debate on the use of technology within Knowledge Management (Costello 1996; Sørensen 2002; Liao 2003). These questions were arrived at through the initial review of literature within Information Systems and Knowledge Management and through dialogue with individuals involved in Knowledge Management within the British Council. The further development and evolution of the question is described within the action research cycles.

The audiences for this research are:

- organisations embarking on, or currently implementing, improvement programmes associated with Knowledge Management,
- systems developers involved in the design and development of Knowledge Management systems,
- researchers of Knowledge Management,

- action researchers within large complex multinational organisations.

This study reflects upon the action of implementing Knowledge Management systems within a global organisational context, providing an honest and frank account of the issues involved, and reflecting upon these through the lens of existent theory.

1.6 Theoretical Framework

There is a necessity to describe the body of theory upon which the research study is founded. This short section introduces the theoretical framework which forms the philosophical basis for the study. The complete theoretical framework is developed through the literature reviews (in which theories from Knowledge Management and technology are explored) and through the methodology chapter (in which theories of methodology and approach are explored). The theoretical framework is relevant to the problèmatique under investigation, and acts as a guide to learning within the area of concern and an aid to reflexivity (Avison and Wood-Harper 1995).

The framework was developed through a complex dialogue with the literature, with initial interaction within the research context and with colleagues. Figure 2, taken from Checkland (Checkland and Holwell 1998), describes the process of research as the application of a framework of ideas in a methodologically relevant way within a problèmatique (Checkland 1991). Learning is achieved through reflection upon all elements of research. The theoretical framework acts as the "scaffolding" (Walsham 1995) for the exploration of the problèmatique through the methodology which leads to insights.

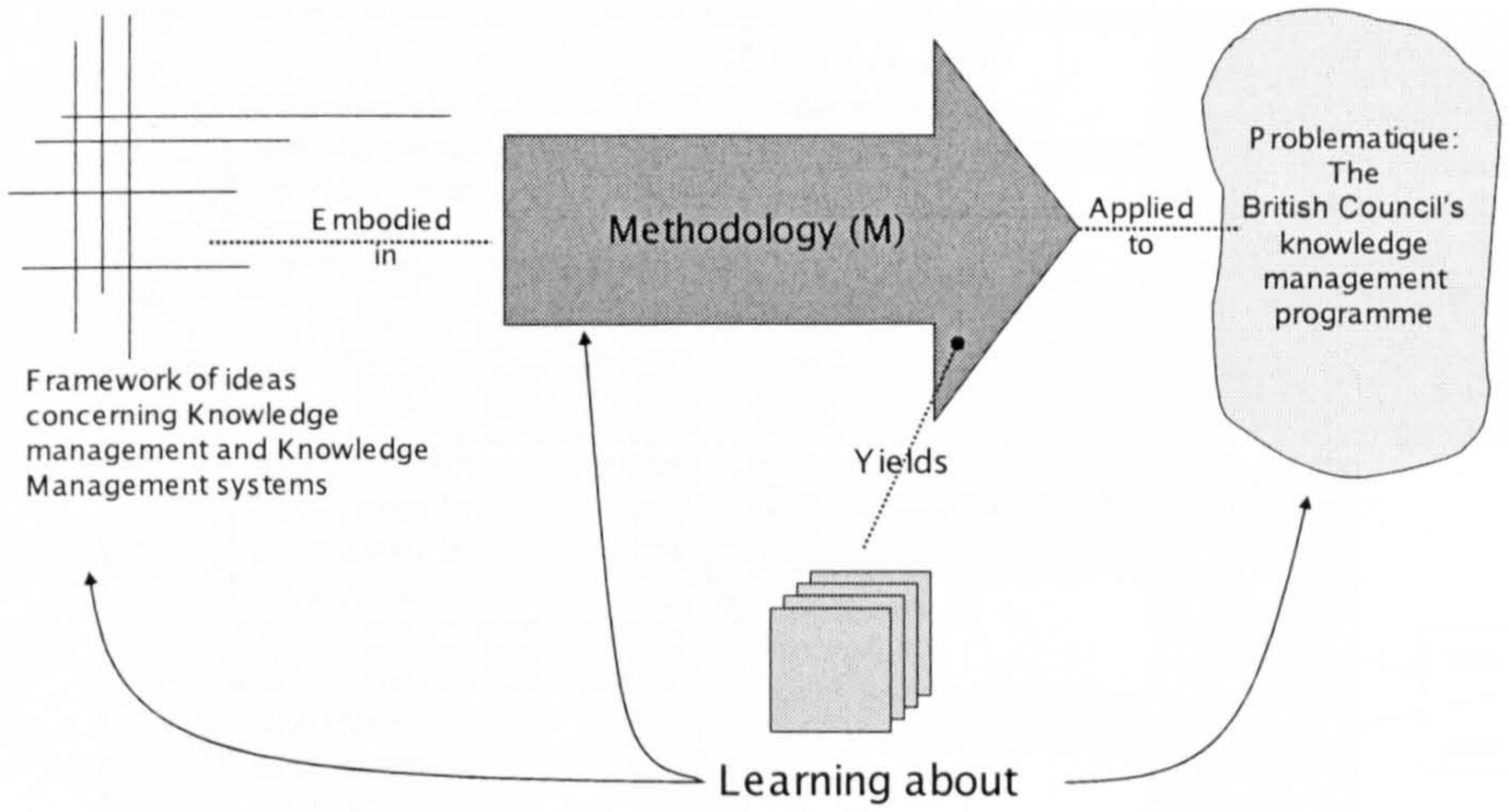

Figure 2: Checkland's process of research based on framework, methodology and problèmatique

Figure 3 outlines the basis for this theoretical framework, demonstrating the areas of interest and relevant literature. This framework is divided into three streams that are developed in (i) the literature review on Knowledge Management (chapter 2), (ii) the literature review of technology within Knowledge Management (chapter 3) and (iii) in the methodology chapter (chapter 4).

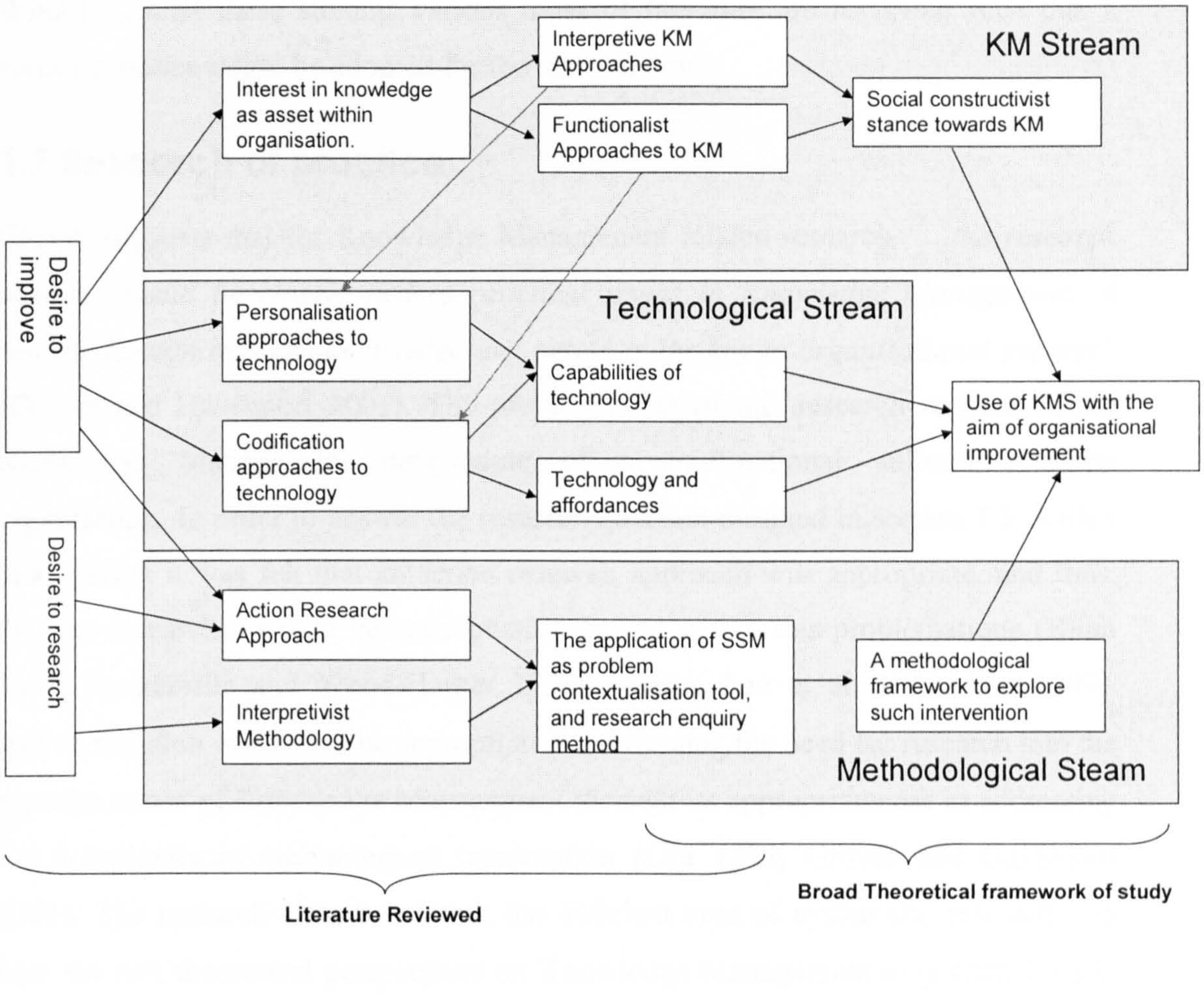

Figure 3: Theoretical Framework

The Knowledge Management stream sets out the study's adopted stance towards Knowledge Management. This does not directly align with the British Council's stance towards Knowledge Management, which is presented in section 5.6 , rather it forms the philosophical basis for design and presentation issues throughout the intervention. The technological stream explores the role of technology within Knowledge Management and develops a foundation by which technology is employed within the study. The methodology stream is included within the theoretical framework because the study is an action research study and hence the methodology informs the act of intervening by applying knowledge management technology within the British Council.

Within each of these streams various areas of literature are reviewed such that a coherent stance might be adopted for the intervention.

1.7 Research of practice

Grover suggests that for Knowledge Management related research *"...the research agenda should be closely tied to practical issues in Knowledge Management. A healthy tension between knowledge and action is the key to organisational success"* (Grover and Davenport 2001). The problèmatique of this research consists of the Knowledge Management programme of a multinational cultural relations organisation. In order to answer the research question outlined in section 1.5 within this context it was felt that an action research approach was appropriate, and thus, that the researcher would be conceptually located within this problèmatique (Blum 1955; Baskerville and Wood-Harper 1998; Avison, Lau et al. 1999; Lau 1999). Action research was felt to be appropriate in addressing the need for research into the practice issues of Knowledge Management through its appropriateness in addressing the complexity of technological intervention (Lau 1999; Grover and Davenport 2001). The research aims to address the deficient area of systematic research into how the rich theoretical perspectives on Knowledge Management may contribute to the "how" questions of practice (Grover and Davenport 2001). In adopting an action research perspective the research has drawn upon a clinical perspective on fieldwork (Schein 1987).

Criticism has been made that ICT driven Knowledge Management approaches generally employ the objectivist approach to knowledge while ignoring the subjectivist dimension (Blackler 1995; Tsoukas 1996; Hendriks 2001). In contrast to such approaches, this study argues that the development of effective Knowledge Management systems requires an understanding of the knowledge environment and context: *"Knowledge is analysed as an active process that is mediated, situated, provisional, pragmatic and contested. The approach suggests that attention should be focused on the systems through which people achieve their knowledge and on the process through which new knowledge may be generated"* (Blackler 1995). This suggests a research methodology highly appropriate to the study of the introduction and use of technology within the context of practice; action research is a candidate for such research (Baskerville and Wood-Harper 1996). Action research, and hence

this study, presents a significant opportunity for the research of Knowledge Management as it allows the observation of social processes embracing, and reflecting upon the effect such observation has upon the study (Venzin, von Krogh et al. 1998).

This approach extends previous ethnographic research undertaken into how knowledge workers interact with, and employ, knowledge and technology (Brown and Duguid 1991; Schultze 2000). However rather than an explicit focus on knowledge workers, this research is directed at the complexity of improvement and change through the concepts of Knowledge Management and the introduction of technology.

1.8 Research Resolution

The area of concern and methodological approach adopted imply an extremely wide research agenda. In practice such an agenda would be too large to effectively explore and hence it is necessary to define the resolution for the research. It is this research resolution which ensures the participant researcher is approaching a relevant topic with rigour (Beer 1984; Benbasat and Zmud 1999). The study hence selects not to address the issues of why the organisation should adopt Knowledge Management, or a specific Knowledge Management technology in general, rather the research focuses upon a particular organisational context, adopting a particular technology for use within this organisations Knowledge Management programme.

Technology is discussed only in relation to the Knowledge Management programme of the particular research problèmatique. Description and analysis of such technology is only provided where these aspects are perceived to impact upon the chosen area of concern. To this end the study does not provide a rigorous analysis of particular Knowledge Management systems.

The research does not discuss Knowledge Management programmes undertaken by organisations in general; rather activity concerning Knowledge Management is taken from the perspective of the Knowledge Management programme of the particular researched problèmatique. This programme is outlined in detail as it provides the framework into which the action research was undertaken.

A socio-technical approach was chosen as appropriate to the problèmatique of study. This chosen focus on the socio-technical aspects of intervention within an organisational Knowledge Management programme leads to conclusions concerning the socio-technical domain. Adopting an alternative approach, for example Marxism, would have led to different conclusions, based on power. It is thus necessary to reflect upon, and remain critical of the stances and methods adopted within the study, as these are simply interpretivist lenses (Schultze and Leidner 2002).

The study aims to provide a plausible coherent picture of a complex organisational change initiative, provided through the interpretive lens of a single full time Ph.D. researcher undertaking action research as part of a Knowledge Management team of a large multinational cultural relations organisation.

1.9 Organisation of the remainder of the study

Chapter 2 Literature Review of Knowledge Management

Relevant literature on Knowledge Management is reviewed in line with the research theme. This literature is then used in order to develop a coherent stance for the research.

Chapter 3 Knowledge Management and information and communication technologies

Developing the literature review from chapter 2 further this chapter explores literature that associates technology with knowledge management. It develops an approach to technology which is used within the action research.

Chapter 4 Research methods

Different traditions in research are described in order to situate the study within the field of Information Systems research. The chosen action research approach is outlined.

Chapter 5 Introduction and Overview of the Field Site: The British Council

The wider organisational context of the British Council is described in order to situate the cycles of action research within the broader context of the organisation and its knowledge sharing programme.

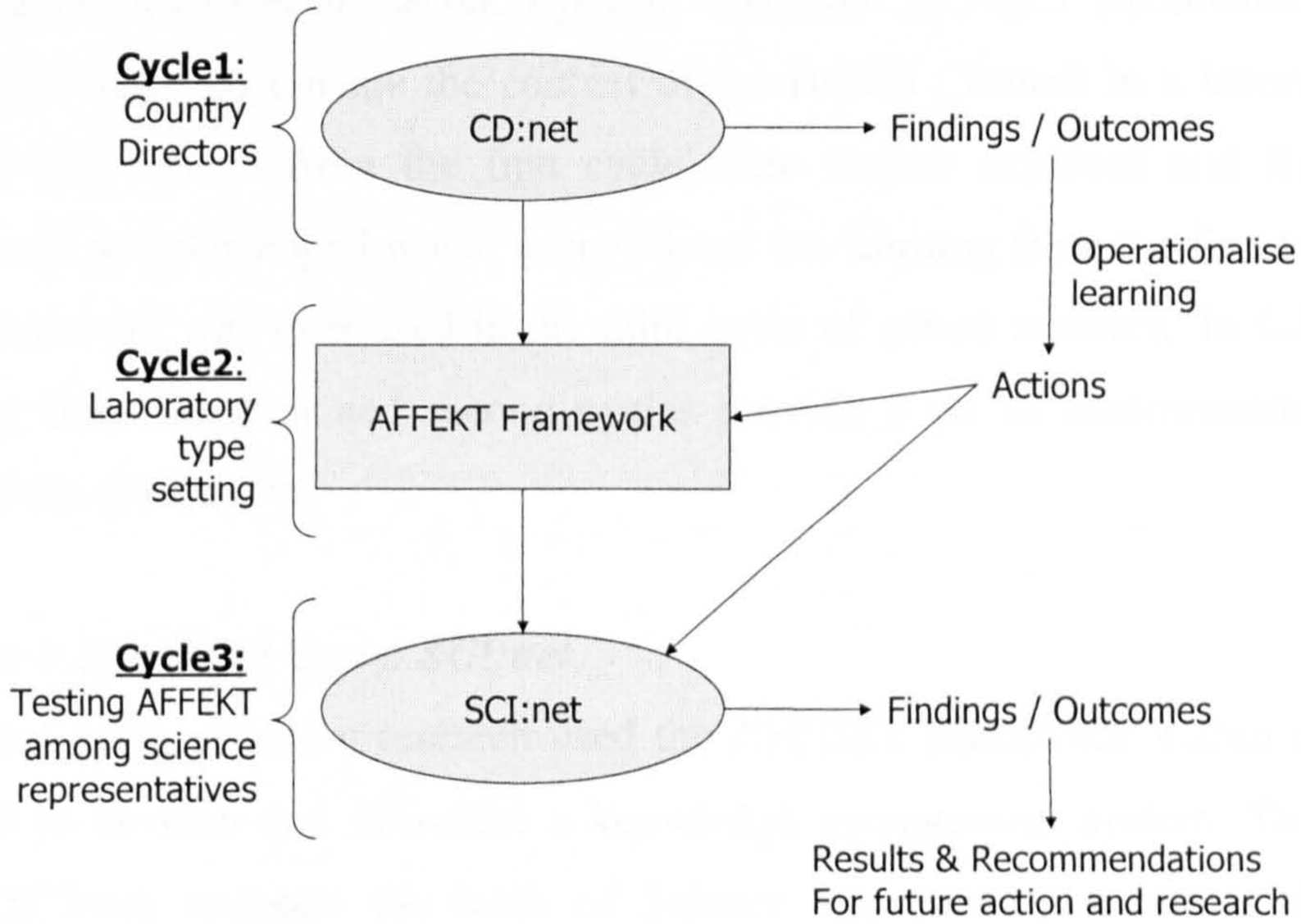

Figure 4: Structure of the three cycles of action research and the learning outcomes

The remainder of the thesis focuses on the outcomes of this action research, and is divided into chapters outlining the three action research cycles. Figure 4 describes the relationship between these cycles showing how the findings from the first cycle are operationalised as actions undertaken in the second and third cycle. Within the second cycle these lessons and the lessons from a laboratory type study are developed into the AFFEKT framework. Finally this framework is employed to structure the third cycle of action research. The findings and outcomes from this final cycle (which operationalised the learning from the previous cycles) form the results and recommendations for research and practice.

Chapter 6 The First Cycle: CD:net

This chapter presents the first cycle of action research to introduce a Knowledge Management system called CD:net for a high-level group of employees within the British Council's overseas offices. The theoretical framework developed within chapters 2 and 3 and 4 are used to structure this intervention. A set of findings and

outcomes emerge from this cycle and these are operationalised as actions to be undertaken in the second cycle.

Chapter 7 The Second Cycle: AKM

This chapter describes the second cycle in which the AFFEKT framework emerged. This cycle occurred outside the context of the British Council in a laboratory type setting. The actions from the first cycle were further explored and from this a framework was developed which encapsulated the learning from the first two cycles. The framework was then used in the third cycle of action research. In this way the learning from the first and second cycles provide a set of recommendations and directed the final cycle.

Chapter 8 The Third Cycle: SCI:net

This final cycle of action research used the AFFEKT framework within the British Council to develop and introduce a knowledge management system. This system, called SCI:net, supports the work of Science Representatives across the British Council. The findings from this cycle reflect upon AFFEKT and thus draw together the recommendations from all the cycles. These lessons represent the key learning from the thesis.

Chapter 9 Conclusions

Finally the conclusions from the previous three cycles are reflected upon in order to locate them within broader changes within the British Council. From this broader reflection the AFFEKT framework is argued as a contribution to discourse on knowledge management and on information systems.

CHAPTER 2 LITERATURE REVIEW OF KNOWLEDGE MANAGEMENT

"We must first decide what we can know about what is real and we must remain sceptical about what is real until we have discovered what we can know" (René Descartes).

2.1 Introduction

As described in the introduction (chapter 1) Knowledge Management is a highly contested concept with a large number of approaches and definitions. This chapter is a literature review which aims to explore the key themes within the academic debate in order to arrive at a coherent stance which may be used within the action research study. The aim of this literature review is also to explore literature in Knowledge Management in order that it may be applied for improvement of the British Council. While the study employs the term "Knowledge Management" when referring to the body of literature concerned with the role of knowledge within organisations, it does not ascribe to the belief that knowledge may be managed.

This literature review is concerned with the topic of Knowledge Management rather than the broader topic of the place of knowledge within society. Knowledge Management is viewed as a banner around which discussion may be undertaken regarding certain issues concerning practical knowledge related activity within organisational contexts. While a large number of definitions exist for what constitutes knowledge, this review steers a route through these epistemological concerns, accepting that various definitions of merit exist. Criticism of Knowledge Management for its failure to address this epistemological concern is discussed.

The structure of this chapter is presented in figure 5 within the top rectangle. Initially the review focuses upon the nature of knowledge within organisations and provides a short introduction to its place within modern society. Next, a stance towards Knowledge Management is explored through a framework that describes knowledge as interpretivist and functionalist. A constructivist perspective on knowledge is then presented for use within the action research. This perspective is used to outline the approach to technology presented in the following chapter. The perspectives employed in the literature review to assess Knowledge Management also inform the perspectives used to assess the use of technology for Knowledge Management.

The chapter concludes by presenting the stance towards Knowledge Management employed within the action research study. This stance provides a reconciliation of a variety of epistemologies, ensuring a rich foundation upon which the methodological approach of the study may be founded. The specific approaches to intervention are discussed within the action research cycles and technology's use in Knowledge Management is explored in detail within Chapter 3 .

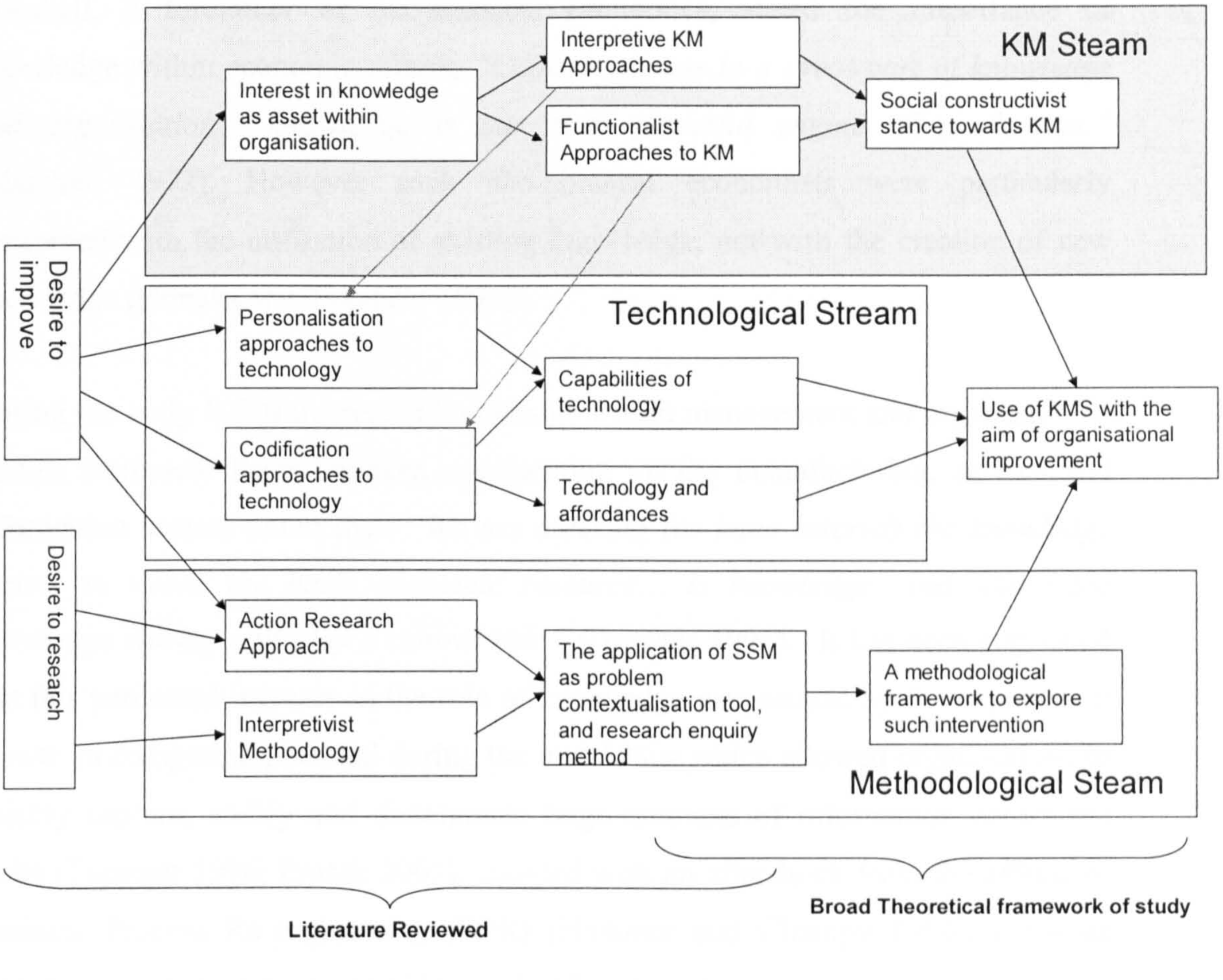

Figure 5: Theoretical Framework Highlighting Knowledge Management literature's contribution

2.2 Knowledge and the changing world: Background

The origins of the field of Knowledge Management are routed within the broader context of the enormous changes taking place in the global economic framework itself (Neef 1999). The emergence of knowledge as a distinct area of social enquiry occurred at the start of the twentieth century and, in particular, is linked to the emergence of neo-liberal theories through the 1930s. In Budapest, 1908-1919, the sociology of knowledge emerged as a pivotal issue in debates within the field of politics and social theory and the role of the proletariat in social change (Hull 2002). Interest in the topic of knowledge within the economic debate began to be seen during the early 1960s and was shown by economists such as Fritz Machlup (Nonaka and Takeuchi 1995). Machlup noted an increase in the proportion of workers associated with tasks which he defined to concern knowledge, coining the phrase "knowledge industries" (Checkland and Holwell 1998). Around this time Alfred

Marshell, a forefather of neo-classical economics, stated the importance of knowledge within economic affairs; *"Capital consists in a great part of knowledge and organisation... knowledge is our most powerful engine of production."* (Marshell 1972). However such neo-classical economists were particularly concerned with the utilisation of existing knowledge, not with the creation of new knowledge (Nonaka and Takeuchi 1995).

During the early 1990s interest in knowledge within management and organisational studies increased. Peter Drucker, commenting on the manufacturing, service and information sectors noted that: *"We are entering (or have entered) the knowledge society in which the basic economic resource... is knowledge...and where the knowledge worker will play a central role"* (Drucker 1993). It has been suggested that this perceived increase in the role of knowledge was caused by the exponential growth in computing potential during the mid 1980s which allowed organisations to quickly capture, codify and disseminate huge amounts of information across the globe (Tapscott 1996; Prusak 2001), coupled with an aftershock from the effects of Business Process Re-engineering (BPR) (Hammer and Champy 1994). Business process re-engineering can provide a valuable return on investment, but gained bad press in Europe and the USA because the changes were often too much for the culture of the organisations to handle (Neef 1999). This *"last breath of Tailorism"* (Snowden 2000) led to Knowledge Management as a reaction against the dehumanising and perceived de-skilling effects of BPR. However, early discourses on practical approaches focused on "Knowledge process engineering" where principles of BPR were applied to the knowledge of individuals (e.g. Knowledge-mapping, knowledge-stores, accounting for intellectual capital, (Davenport, Jarvenpaa et al. 1996; Stewart 1996; Stewart 1997)). Furthermore the development of Knowledge Management through developments in networked computing and computer based applications (discussed in detail in Chapter 3) indicates a regression to the technology focused principles of many business process re-engineering vendors (Davenport, DeLong et al. 1998; Sieloff 1999). While the aims of such technology may have been helping employees to respond to change, to encourage creativity, innovation and learning and to improve productivity (Neef 1999), this was achieved through conventional approaches.

As companies expand there is a limit to the effectiveness of the informal ways that knowledge has always been shared within organisations. It was suggested that companies above two to three hundred employees were too large for people to have a grasp of collective organisational knowledge (Davenport and Prusak 1998) and that they needed to identify a method to "know-what-they-know" (Sieloff 1999). If knowledge was to become a valuable corporate asset it must be accessible, developed and used (Davenport and Prusak 1998). The body of literature associated with Knowledge Management was born out of this desire. This literature is broad and often incoherent hence the following section presents a framework upon which this study's literature review of the topic is structured.

2.3 A route through Knowledge Management towards a stance for this study

The use of the term "Knowledge Management" is often problematic as there is little consensus regarding its definition (Neef 1999; Bhatt 2001). A recent study by Raub & Ruling outlined that there is not an accepted single area of discourse within either the academic or popular management literature associated within Knowledge Management (Raub and Ruling 2001). Many authors simply avoid the term completely, preferring to focus on specific aspects of the topic such as knowledge, innovation or learning (Costello 1996). This avoidance creates a number of problems when reviewing the literature on the field. In particular Knowledge Management's "faddish" status ensures many papers within the field do not employ the term (Swan, Scarbrough et al. 1999; Davenport and Grover 2001). Knowledge Management's close relationship to concepts such as organisational learning, organisational memory, information sharing, and collaborative work (Schultze 1998) also leads to a blurring of the boundary of theory.

As has been mentioned in section 1.5 it is possible to identify two areas of interest within Knowledge Management: IS/IT issues and issues concerned with general management (Raub and Ruling 2001). Those concerned with IS/IT issues have a greater representation in literature (70% of articles in 1999 appeared in the IT/IS literature (Scarbrough, Swan et al. 1999)). It may be the case that these statistics

suggest that the term "Knowledge Management" is considered more acceptable within the sphere of IS/IT than within management disciplines.

When exploring the issues of Knowledge Management there is a need to identify an epistemological perspective upon which to base one's approach. Many authors have avoided epistemological debate on the definition of knowledge by comparing knowledge with information and data (Alavi and Leidner 2001). A commonly held view is that data is raw numbers and facts, information is processed data and knowledge is authenticated information ((Dretske 1981), (Machlup 1980) from (Alavi and Leidner 2001)). However such a discussion is counter-productive for it highlights an objectivist notion of knowledge through the implication of hierarchy. Alavi and Leidner highlight that the assumption of a hierarchy from data to information to knowledge with each varying along some dimension such as context, usefulness or interpretability is inaccurate. However rather than adopting the argument that the effective distinguishing feature between information and knowledge is that *"knowledge is information possessed in the minds of individuals: it is personalized information (which may or may not be new, unique, useful or accurate) related to facts, procedures, concepts, interpretations, ideas, observations, and judgements"*(Alavi and Leidner 2001) it is suggested that such definitions fail to include the social dimension in which knowledge exists (Brown and Duguid. 1998). A significant implication of this view of knowledge for this study is that for individuals to arrive at a similar understanding of data or information, they must share a history or context (Alavi and Leidner 2001).

Within the literature of information systems there is a generally accepted assumption of a hierarchy between data, information and knowledge (Dahlbom and Mathiassen 1995). Information is considered to be formalised representations of data, and is essentially a charting of knowledge within a shared practice (Dahlbom and Mathiassen 1995). An alternative view suggests that the often assumed hierarchy from data to knowledge is actually inverse (Tuomi 1999); *"knowledge must exist before information can be formulated and data can be measured to form information"* (Alavi and Leidner 2001). "Raw Data" does not exist *a priori;* thought and knowledge processes are always employed in identifying and collecting even the most elementary data. Tuomi argues that knowledge exists which, when articulated,

verbalized and structured, becomes data. *"Critical to this argument is the fact that knowledge does not exist outside of an agent (a knower); it is indelibly shaped by one's needs as well as one's stock of knowledge"* (Fahey and Prusak. 1998) also seen in (Tuomi 1999; Alavi and Leidner 2001). In response to contradictions such as this, this study explores the issues of Knowledge Management through consideration of social practices rather than focusing on distinctions with information or data.

In general, definitions of Knowledge Management are linked to those "processes" attributable to knowledge. For example *"any process or practice of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance in organisations."* (Scarbrough, Swan et al. 1999). Terms such as storage, transfer, transformation, application, embedding and protecting (Hedlund 1994) are often employed in such definitions. These definitions, while encompassing many aspects of "process" around Knowledge Management, imply an essentially objectivist view of the subject, unquestioning of whether knowledge is capable of these processes.

This lack of rigorous definition of the topic and aggressive promotion from technologists has led many to argue that Knowledge Management is a fad. While the topic clearly has aspects of "faddishness" (Davenport and Grover 2001) and may even be analysed from a fashion perspective (e.g. (Swan, Scarbrough et al. 1999; Davenport and Grover 2001; Raub and Ruling 2001)), it is believed likely that the values and concepts of Knowledge Management practice will become embedded within organisations' core business processes (TFPL 1999).

In taking seriously calls to explore Knowledge Management principles (Alavi and Leidner 2001), there is a need to categorise the wide ranging literature on Knowledge Management such that the underlying epistemic and ontological principles may be identified and explored, and furthermore, that technological artefacts may be discussed in relation these approaches. Through a critical reflection upon literature within such categorisation a theoretical stance emerges which is employed as the foundation for intervention within this study.

A number of authors have provided approaches to categorising the extreme approaches to Knowledge Management existent within the field. One example proposes seven schools of Knowledge Management strategy: systems, cartographic, engineering, commercial, organisational, spatial and strategic (see Figure 6) (Earl 2001). These schools identify the types of Knowledge Management strategy undertaken by organisations. The approach categorises these seven schools into three broad types: technocratic, economic and behavioural. Technocratic schools approach Knowledge Management through information or management technologies that support and condition employees in their everyday tasks. Economic schools aim to explicitly create revenue through the exploitation of knowledge as an asset. The behavioural schools approach Knowledge Management from a behavioural perspective, stimulating and orchestrating managers and managements to proactively create, share and use knowledge resources (Earl 2001). While these schools provide a useful categorisation of specific approaches, particularly in regard to how technology is used within a Knowledge Management initiative, it is felt that they fail to emphasis the epistemological basis of Knowledge Management strategies, particularly failing to effectively categorise the social aspects. Within this model social interaction is only fully considered within the spatial school. This school focuses on the use of space within knowledge sharing, such as colleagues chatting around the water-cooler (Brown and Gray 1995) or buildings designed for knowledge sharing (Sclater 1999; Schultze and Boland 2000; Ward and Holtham 2000). However it is felt that social interaction for knowledge is more complex than this.

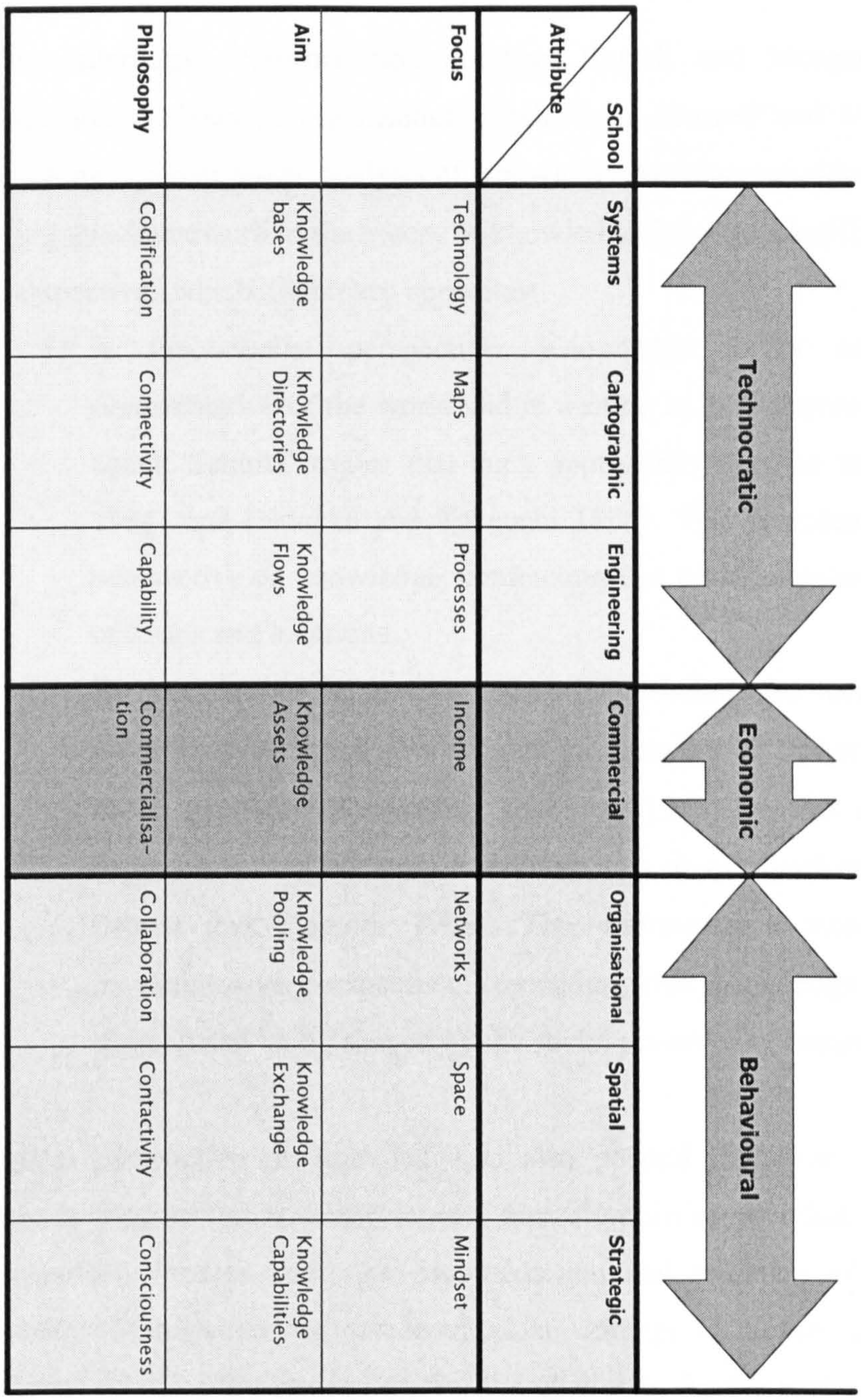

Figure 6: Schools of Knowledge Management from Earl (2001)

An alternative structure for understanding Knowledge Management (McAdam and McCreedy 1999; McAdam and McCreedy 1999) proposes three categories of model for Knowledge Management: intellectual capital models, knowledge category models and social constructionist models. This categorisation is simpler that Earl's, however it focuses on the definition of knowledge within approaches thus exploring in greater detail the philosophical foundations of the activity.

Another alternative categorisation employs Burrell and Morgan's sociological paradigmatic analysis of organisation's behaviour (Burrell and Morgan 1979) in approaching a paradigmatic analysis of Knowledge Management (Schultze 1998). In applying this framework to the theory of knowledge Schultze identifies the following two perspectives which are binary opposites:

1) A functionalist perspective: Knowledge exists as an objective representative of the world and is waiting to be discovered by the human agent. Schultz argues that such approaches may be seen in (Hedlund 1994) and (Nonaka and Takeuchi 1995). This represents an objectivist perspective on knowledge, contending that knowledge exists in a number of forms and locations.
2) An interpretive perspective: Knowledge cannot be located in any one place because it has no existence independent of human experience and social practices of knowing. (Schultze 1998) Schultz argues that such approaches may be seen in authors such as (Tenkasi and Boland 1996; Brown and Duguid. 1998). This represents a more subjective or intersubjective perspective, contending that knowledge is continuously shaping and being shaped by the social practices of communities.

A critical perspective on knowledge is also posited (Schultze 1998), in which concern is focused upon identifying the forces within society that are antagonistic. The approach focuses upon the deconstruction and criticism of the *status quo*. Knowledge Management is perceived as an attempt to control and constrict the knowledge work of the proletariat. So, the challenge for the proletariat is to thwart the efforts to manage their knowledge. This critical perspective on Knowledge Management suggests a research focus on the emancipation of these power relations. This critical perspective is inconsistent with the overall aims of this study as the support and improvement of knowledge sharing within the British Council is undertaking in line with their ongoing Knowledge Sharing programme rather than in conflict with it. The British Council's Knowledge Sharing programme is concerned with improving the use of knowledge, and this study is concerned with aiding and supporting this process without questioning its political basis and the impact of power. This critical perspective is thus not considered in detail.

In a more recent paper to the 1998 IFIP paper the categorisation has been developed to use a framework which aims to rethink Burrell and Morgan's original two dimensions (Schultze and Leidner 2002). This paper argues that Burrell and Morgan's framework of subjective-objective dualism results in an oversimplified classification that reifies and enhances a false dichotomy, thus denying an intersubjective "*socially shared, historically produced*" nature of phenomena (Deetz 1996). The more recent paper argues that an alternative framework should be employed with dimensions of emergent/local and elite/ *a priori* knowledge (Deetz 1996).

The simpler classification of the original paper is used in this review, however aspects of the later work are referred to where appropriate. In order that this study may approach organisational improvement through the introduction of technology, it is necessary to strongly identify the form of such intervention. Any categorisation of Knowledge Management theory is a necessary simplification; however the original classification presents a rational and usable framework for the purpose of identifying theory and technology for this study. The categorisation of functionalist and interpretivist approaches also proved useful within the action research studies, enabling the research to categorise and appreciate the differing perceptions of Knowledge Management within the British Council. The following two sections explore the literature on Knowledge Management though these perspectives on knowledge as either functionalist or interpretivist (Schultze 1998).

2.4 Functionalist perspectives of Knowledge Management

A functionalist perspective is founded in a realist ontology, assuming that knowledge about the world exists *a priori* and is waiting to be discovered. Knowledge is considered objective, neutral and reflective of a realist reality, thus suggesting that skill, performance, learning and action are assumed real and pre-existing facilities (Schultze 1998). Knowledge is viewed as "a separate entity, static property, or stable disposition embedded in practice" (Orlikowski 2002). Within Knowledge Management, such approaches manifest themselves in views of knowledge as an object which is existent either within individuals or organisations. Knowledge Management practices for such objectified knowledge are manifest in the capture,

manipulation, transfer and protection of such knowledge. In order to describe the impact of functionalist perspectives upon this study, two of the most influential concepts of Knowledge Management are described alongside the influence they have had upon practice.

The specific objectification of knowledge is evident in approaches to "intellectual capital". Initially conceived by Leif Edvinsson (Edvinsson and Malone 1997), the term highlights the value of knowledge as an organisational asset (Roos and Roos 1997). Intellectual capital models take a highly scientific functionalist approach to knowledge and its management. Such approaches view knowledge as an objectified "medium of exchange" which is assumed to have intrinsic value. By viewing knowledge as an object these approaches fail to ascertain the richness of human activity in creating and sharing knowledge (McAdam and McCreedy 1999). They are however useful in identifying the part organisational structures play in knowledge sharing within organisations. An example of this approach may be found in Davenport & Prusak's book "Working Knowledge" (Davenport and Prusak 1998) in which knowledge is seen as a commodity, marketed and traded by the knowledgeable (Davenport and Prusak 1998). Knowledge Management is thus seen as a method of exploiting the "knowledge" or "intellectual capital" of employees, or of capturing their knowledge in order to safeguard it as an asset for the organisations use (Stewart 1997; Miles, Miles et al. 1998). This "hidden gold" (Stewart 1998), is considered to be identifiable as the intangible assets of the firm– the talents of its people, the efficacy of its management systems, the character of its relationships with its customers.

Intelligence becomes an asset when some useful order is created out of free-floating brainpower – that is, when it is given coherent form (a mailing list, a database, an agenda for a meeting, a description of a process); when it is captured in a way that allows it to be described, shared, and exploited; and when it can be deployed to do something that could not be done if it remained scattered around like so many coins in the gutter. Intellectual capital is packaged useful knowledge." (Stewart 1998)

In the task of exploiting intellectual capital Stewart sub-divides intellectual capital into human capital, structural capital, and customer capital. Human capital is defined

as the capital value of the innovation of employees (Stewart 1998). Structural capital is defined as *"the knowledge that doesn't go home at night"* (Stewart 1998 page 108). Stewart based this idea on the work of Leif Edvinsson of Skandia AFS in which structural capital is seen as more important than human capital, as far as management is concerned, because it is the capital over which management has most options for change (Edvinsson and Malone 1997). As Peter Drucker says *"Only the organisation can provide the basic continuity that knowledge workers need in order to be effective. Only the organisation can convert the specialised knowledge of the knowledge worker into performance"* (Drucker 1994). Examples of structural capital include legal rights of ownership, technologies, inventions, data, publications, standards, machine settings, strategy, culture, structures and systems, organisational routines and procedures. The third form of intellectual capital identified in these works, customer capital, is defined as the capital value of an organisation's customers. Thomas Stewart suggests that increasing the return on this customer capital *"requires more than acknowledging that customer relationships are assets, not just events. It demands understanding the dynamics of managing this asset: what makes it grow or depreciate, what makes it more valuable or less?"* Interest in customer relationship management systems and their consideration as part of Knowledge Management programmes may be an indication of the perceived value of such capital. (Davenport 1996; Davenport and Prusak 1998; Leask, Seaward et al. 1999).

Functionalist approaches to Knowledge Management highlight a need to give strong emphasis to measurement associated with decomposed elements of knowledge. This implies an attempt to fit objective measurement to subjective elements (McAdam and McCreedy 1999), and to a focus on easily detectable, quantifiable information rather than complex ideas such as knowledge (Von-Krogh, Ichijo et al. 2000). The consideration of a human innovation as of capital value appears to simplify the differences in ownership and power of such innovation from other forms of capital. It is not possible to manage the level or quality of "innovation", nor to effectively consider innovation as an output of a formal process of innovating. The notion of knowledge as intellectual capital assets appears to suggest a static capability of a firm. It fails to reference the constantly evolving, changing and developing nature of knowledge. Intellectual capital is argued to be created through revolutionary forms of

innovation, however it could be argued that innovation is a constant process of continual change in which certain developments are perceived to be revolutionary (Feldman 2000).

Intellectual capital approaches remain appealing; in particular it is easier to justify budgets and investment with an analysis of intellectual capital (Edvinsson and Malone 1997). Many IT departments presently face budgetary and resource constraints and are under pressure to provide metrics such as returns on investment (Lesser and Prusak 2001; Williams 2002). While other philosophies about Knowledge Management challenge the possibility of such metrics, functionalist approaches to knowledge allow accounting measures to be employed to calculate an organisation's intellectual capital (Stewart 1996; Stewart 1998). It is then possible to register this value as a corporate asset in a balance sheet (Edvinsson and Malone 1997; Edvinsson 2000).

This notion of intellectual capital has been influential to this study as it was particularly influential on many of the early implementations of technological solutions for Knowledge Management. In this way it influenced the early approaches to Knowledge Management within the British Council (this influence will described in Chapter 5) and thus influences the action research of this study.

In addition to these intellectual capital views of knowledge, alternative functionalist perspectives may be identified which also categorise and classify knowledge as object. For example Max Boisot considers knowledge as either codified or uncodified, and as diffused or undiffused within organisations (Boisot 1998).

One of the most influential works on Knowledge Management is based on categories of knowledge. This is the 1995 book "The knowledge creating company" by Ikujiro Nonaka and Hirotaka Takeuchi (Nonaka and Takeuchi 1995). This book is based on an article by these authors in the Harvard Business Review, 1991 (Nonaka 1991) and outlines the role of knowledge and innovation within Japanese manufacturing companies.

These articles introduced a particularly popular model of knowledge derived from the work of Michael Polanyi. The model is based on two categories of knowledge; tacit and explicit knowledge (Polanyi 1962; Polanyi 1967; Routledge 2000). Polanyi believed that the "scientific" account of knowledge as a fully explicit formalised body of statements did not allow for an adequate account of discovery and growth. In his account of tacit knowledge, knowledge has an ineliminable subjective dimension: we know much more than we can tell. This knowledge is termed "tacit", while knowledge which we may tell is termed "explicit" knowledge (Routledge 2000). Polanyi introduced the idea of a "*tacit dimension*" (Polanyi 1967) to all knowledge as a strong response against the positivistic approaches evident in his time (Hull 2002) (see also (Hull 2003)) and thus did not intend the concept to be dichotomised as is evident in much of the functionalist applications of this concept. When knowledge is made explicit through language it can be focused for reflection. Polanyi also emphasised the functional aspect of knowledge, i.e. he regards knowledge as a tool by which we either act or gather new knowledge (Sveiby 1996; Sveiby 1997).

Sveiby outlines three main theses in Polanyi's concept of knowledge: (quoted as in (Sveiby 1997)); *"True discovery, cannot be accounted for by a set of articulated rules or algorithms. Knowledge is public and also to a very great extent personal (i.e. it is constructed by humans and therefore contains emotions, "passion"). The knowledge that underlies the explicit knowledge is more fundamental; all knowledge is either tacit or rooted in tacit knowledge. In Polanyi's world there is thus no such thing as "objective knowledge".*

Tacit knowledge is personal, context-specific and therefore hard to formalise and communicate. Explicit or "codified" knowledge, on the other hand, refers to knowledge that is transmittable in a formal, systematic language (Nonaka and Takeuchi 1995). Nonaka & Takeuchi extend these epistemological dimensions introducing "knowledge conversion" as the key to knowledge sharing. Tacit and explicit knowledge are not viewed as separate entities, but rather as mutually complementary entities. Knowledge is created through the social interaction between tacit and explicit knowledge, an interaction Nonaka & Takeuchi term "knowledge conversion" (Nonaka and Takeuchi 1995).

Nonaka and Takeuchi used a number of case studies to outline how they believed knowledge to be routed in innovation and in the essentially social processes employees engage in. This notion was highlighted within a theory of knowledge creation, which is based on a knowledge creation spiral shown in Figure 7 (known as the SECI model and expounded in (Nonaka and Takeuchi 1995)). This model considers knowledge to be created through an interaction of tacit and explicit knowledge at various levels of the organisation.

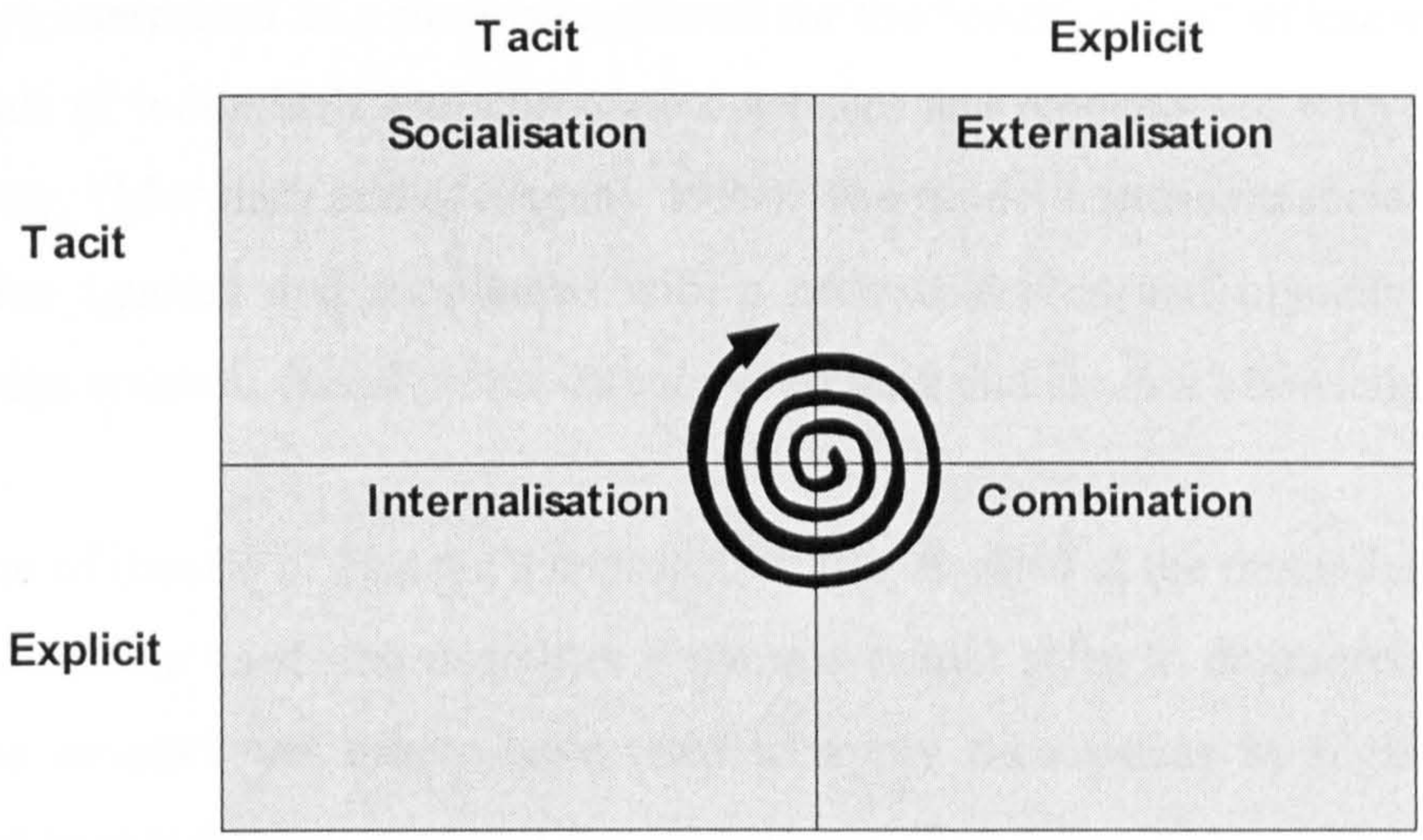

Figure 7: The SECI process from Nonaka (1995) cycling between tacit and explicit dimensions in order to broadly create knowledge.

Knowledge is converted through four processes which create new knowledge within an organisation. Socialisation is the process by which tacit knowledge is shared with others (e.g. apprenticeships). Externalisation is the process by which tacit knowledge is converted into explicit concepts, achieved through metaphors, analogies, hypotheses etc. Once made explicit such knowledge may be combined with other explicit knowledge through a process of systemizing, (through meetings, documents and communication). This explicit knowledge may then become integrated into the tacit knowledge of individuals through a process of internalisation – closely related to "learning by doing". These four elements form a spiral of knowledge creation; each iteration of this spiral creates further knowledge, and expands the ontological

dimension at which the knowledge creation is occurring, from individual through group to organisational wide knowledge creation.

Within the original texts this SECI model was not discussed as a process, but rather a reflection upon the process of knowledge creation. It is also worth noting that within the SECI process only the combination aspect specifically refers to computer technologies. The main "tools" discussed in the 1995 book are essentially social acts with externalisation undertaken through social dialogue and organisational level knowledge creation achieved through support for social interaction as well as information. However the knowledge creation cycle above has been widely (and wrongly) interpreted as a simplistic process for the "codification" of knowledge from the minds of individuals into corporate databases and repositories, with information technology (McAdam and McCreedy 1999). The model's intrinsic social dimension was often ignored and supplanted with a process driven and objective model of knowledge creation, based on the categories of *tacit* and *explicit* knowledge.

Criticism of the use of Nonaka's approach is also levelled at the misunderstanding of the case studies used; the examples from this model refer to engineering within a Japanese context, yet others have tried to apply these ideas in highly different domains to which they may not be appropriate (Snowden 2002). The knowledge conversion process in Nonaka's theory has also been criticised for ignoring the essential ineffability of tacit knowledge, which was presented in the original work by Polanyi (Tsoukas 2002). It is argued that the SECI cycle is simplistic as it does not consider the complexity of the interaction of individuals with the others around them (Tsoukas 2002). *"To split tacit knowledge from explicit knowledge it to miss the point – the two are inseparably related"* (Tsoukas 1996). *"Tacit knowledge cannot be "captured", "translated" or converted" but only displayed and manifest in what we do. New knowledge comes about not when the tacit becomes explicit, but when skilled performance is punctuated in new ways through social interaction"* (Tsoukas 2002).

The model of knowledge creation has been further developed to include the SECI process within a "unified model of dynamic knowledge creation" (Nonaka, Toyama et al. 2000). This model includes the notion of a shared context for knowledge

creation (termed *"ba"* (which roughly means "place")) in which individuals influence and are influenced by the environment with which they interact, and the notion of knowledge assets: the inputs, outputs and moderators of the knowledge creating process. The knowledge creation process is thus defined as a spiral which grows out of these elements requiring dialectical thinking to lead it. *"Using its existing knowledge assets, an organisation creates new knowledge through the SECI process that takes place in ba. The knowledge created then becomes part of the knowledge assets of the organisation, which becomes the basis for a new spiral of knowledge creation"* (Nonaka, Toyama et al. 2000). This final description appears to move towards the intellectual capital concepts defined previously, with knowledge assets being defined as firm specific valuable capital, indispensable for value creation within an organisation (Nonaka, Toyama et al. 2000). The notion of community and *ba* is similar to the concept of social capital (Prusak and Cohen 2001) defined as the *"relationships that make the organisation work"* (Prusak and Cohen 2001).

These three articles (Nonaka 1991; Nonaka and Takeuchi 1995; Nonaka, Toyama et al. 2000), written by the same primary author over a period of ten years have been highly influential in leading thinking in Knowledge Management. It is clear that each is based on categorising knowledge as either "tacit" or "explicit" and that, while the authors' emphasise the social action associated with knowledge creation, the aim has still been to define knowledge in terms of a process of knowledge creation.

The functionalist approach to Knowledge Management is rejected because it is considered to be too simplistic a model upon which to base a Knowledge Management intervention. In particular the notion that knowledge may be stored in repositories and "transferred" to others through information is challenged within the study's adopted approach to technology. The model remained influential within mainstream management literature on Knowledge Management and as a result was influential on the British Council's knowledge sharing programme (and referred to in a number of strategy documents). The functionalist approach, by favouring the storage and transfer of knowledge-as-object provides an easier to comprehend route to technology (with technology as a storage mechanism for such knowledge objects). The functionalist perspective appears easier to convey, discuss and conceptualise

than the interpretivist perspective described below and perhaps closer to the scientific influences of western education. This study's action research describes situations in which the Knowledge Management intervention within the British Council is interpreted by members of the organisation in functionalist terms. Furthermore, the adopted approach (described below) incorporates aspects of such functionalism, yet with the aim of continuing to consider knowledge through an interpretivist lens.

Functionalistic approaches to Knowledge Management suggest that knowledge is only useful in a formal and systematic form. These approaches frequently present knowledge as ahistorical (Schultze 1998), with knowledge considered as facts which are unaltered in use. Initiatives that capture and store knowledge fail to consider the effect of such intervention upon the knowledge itself. Functionalist approaches are generally based upon a rationalistic assumption, and so the concept of *"wilful coercive behaviours"* (Schultze 1998) is not considered. Concepts, such as that individuals may horde their knowledge or that more knowledge may complicate a situation and so reduce the ability to act, are left out of functionalist approaches (Schultze 1998). The following section introduces a set of alternative perspectives towards Knowledge Management which address a number of these issues by focusing on the part of individuals within knowledge creation.

2.5 Interpretive perspectives on Knowledge Management

From an interpretive perspective, functionalism, based on rationalist and empiricist approaches, may be relevant to knowledge about the rational world but fails to consider the role of individuals in knowledge's part in the social world. This builds upon Immanuel Kant's study that the mind is not a passive *tabula rasa* or blank sheet - void of all characters, but rather is actively engaged in the ordering of sensory experiences; direct knowledge of things in themselves (which Kant termed *"noumena"*) is argued to be impossible. *Noumena* are not knowledge in themselves, but rather our understanding of them is achieved through the application of our *a priori* knowledge to create phenomena which are knowable-to-us (Johnson and Duberley 2000). The perspective views human knowledge to be achieved through experience and "inherently indeterminate" (Tsoukas 1996; Davenport and Prusak 1998).

Interpretive views of knowledge also appreciate the works of Karl Marx (accepting that Marx's focus was upon action rather than knowledge), in which perception is viewed as an interaction between the knower (subject) and the known (object). In particular that truth is demonstrated in practice, this provides a link between the creation of knowledge and action (Russell 1961). Knowledge is not considered to exist *a priori* waiting to be acquired, either through experimentation or thought. Rather these approaches assert that an interaction is required between self and the outside world. This is evident in the works of Edmund Husserl on phenomenology, and in particular the work of Martin Heidegger, a student of Hursserl (Inwood 1997).

Heidegger's work applied a phenomenological method to analyse the mode of human "being in the world" (described as *Dasein*) (Heidegger 1962; Inwood 1997). In particular the notion that we are a "being in the world" by "having to do something" (for example "producing something" or "making something") resonates with this study's focus on action as core to Knowledge Management. For example, that our actions "must employ theoretical cognition" ((Nonaka and Takeuchi 1995) from (Heidegger 1962)). Our *dasein* is characterised by an active relationship with other things in the world; it is not a detached spectator (as argued in Cartesian dualism), but has a close relationship between knowledge and action. It is argued in this study that knowledge is not absolute, static and non-human, but, closer to the definition of Frank Blackler in which *"knowledge is multi-faceted and complex, being both situated and abstract, implicit and explicit, distributed and individual, physical and mental, developing and static, verbal and encoded"* (Blackler 1995). A major premise of this stance is that people act on the basis of their interpretation of the world, and thus enact particular social realities, endowing them with meaning (Orlikowski and Gash 1994). In essence knowledge and knowing exist within a generative dance in which knowledge is both practice (action) and object (Cook and Brown 1999). In particular such accounts view learning not simply as the acquisition of facts, but rather as acquiring the ability to act in the world in a socially recognised way (Brown and Duguid 2001). This emphasis on the social acceptance of one's knowledge is of crucial importance, and highlights the socially constructed nature of knowledge (Berger and Luckman 1966). These perspectives argue that all but the most simplistic learning involves a complex social process. Such social interaction shapes how individuals interpret the world and learn from it (Daft and Weick 1984).

Interpretivist approaches to Knowledge Management emphasise action within practice. "*Work practice... seems critical to understanding the acquisition of identify and knowledge at work*" (Brown and Duguid 2001); meaning is created through action within a specific social context (Cook and Brown). One particular interpretivist model of Knowledge Management emphasises the construction of knowledge within the organisation through a process of social interchange by which knowledge is embodied within the organisation's structures (Demarest 1997). Once embodied within the organisation, knowledge is disseminated through social processes (Demarest 1997; McAdam and McCreedy 1999). This emergent, practice led account of knowledge is similar to the interpretivist work on Knowledge Management by Orlikowski (Orlikowski 2002) in which knowledge is presented as "*emerging from the ongoing and situated actions of organisational members as they engage in the world.*". Orlikowski suggests that knowledge is enacted, every day and over time in people's practices, suggesting that discussion of knowledge must be intrinsically linked to practice. In her work the emphasis on practice indicates that knowledge is seen as "*at any given time, what the practice has made it*" with knowledge and practice seen as mutually constitutive.

The above works suggests that an interpretivist approach to Knowledge Management considers knowledge not as a static object, but rather as embedded in recurrent human practices (Venters, Cushman et al. 2002). The transfer of knowledge from one locale to another is not concerned with knowledge as an object to be made mobile when expressed, codified or commoditised. Rather knowledge is rendered mobile as an ongoing product of all human purposeful activity within a social context (Venters, Cushman et al. 2002).

Employing an interpretivist approach to knowledge emphasises the social nature of knowledge creation leading to approaches to Knowledge Management that focus on human interaction rather than on information. Knowledge is considered as a continuous accomplishment (Kogut and Zander 1996), a process rather than an object (Spender 1996). This study thus considers within interpretivist approaches to Knowledge Management the concepts of sensemaking and "community of practice" as they focus on the social practices of knowledge creation and application. The

concept of reflection-in-action is also introduced in order to conceptualise the creation of knowledge by reflection on practice. Finally this section considers the role of communication in Knowledge Management through the concept of an organisational conversation.

2.5.1 Sensemaking

Sensemaking is essentially the structuring of the unknown, it is the questioning of how individuals construct what they construct, why, and with what affect (Weick 1995; Weick 1996). In contrast to Herbert Simon's (Simon 1945) model of organisations as "information-processing machines" characterised in other Knowledge Management approaches, proponents of sensemaking emphasise the irrational and ambiguous nature of human problem solving and decision-making. For example a similar perspective adopted by Walsham suggests a *"human-centred view of knowledge, emphasising the deep tacit knowledge which underpins human thought and action, and the complex sense-reading and sense-giving processes which human beings carry out in communicating with each other and 'sharing' knowledge"*(Walsham 2001). The organisation is perceived as a system of perception, making sense of what has happened retrospectively. *"Reality is an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs... Sensemaking emphasises that people try to make things rationally accountable to themselves and others"* (Weick 1993).

The concept's origins in structuration theory (Giddens 1984), leads its proponents such as Weick to see *"cognitive maps and schemas as dynamically interacting and inseparable from the organisational environment in that they both determine, and are determined by, the decision maker's interaction with their environment"* (Swan 1995). This dynamic nature appeals to the socially constructed approach towards Knowledge Management (Thomas, Sussma et al. 2001), implying that sensemaking, and thus knowledge creation, are linked to ongoing interaction by individuals within the organisation (Cecez-Kecmanovic and Jerram 2002). It is suggested that such structurational approaches suggest the need for process-oriented research that may describe the emergence of cognitive processes over time (Swan 1995). Sensemaking has been outlined as a process consisting of a number of attributes (Weick 1995).

Each of these attributes is now considered and its influence on practical approaches to Knowledge Management discussed:

- **Grounded in identity construction:** The establishment and construction of identity on the part of the sensemaker is key to the sensemaking process. In making sense of a situation the sensemaker's notion of self is constructed. Approaching Knowledge Management with assumptions about the identity of the organisation is challenged; it proves problematic to assume that individuals assume the same identity over time.
- **Retrospective:** By definition we can only make sense of that which has already occurred; our view of reality is interpreted and historic. Our approach to understanding is not simply based on the information presented in a repository, but also upon our previous experience. Furthermore, repositories are interpreted differently based on time and context.
- **Enactive of sensible environments:** Within organisations individuals often produce part of the environment they face, once created these environments constrain the actions of these individuals. The environment is not a separate external body but something the individual is part of. Any approach to supporting Knowledge Management will form part of such an environment, and constrain the actions of its users.
- **Social:** *"Conduct is contingent upon the conduct of others, whether those others are imagined or physically present"* (Weick 1995). Decisions are made in the knowledge that others will see the outcome and be involved in its execution. Knowledge creation and sharing is thus dependent upon the perception of how others will learn or apply such knowledge.
- **Ongoing:** Sensemaking neither starts nor ends. People are always in the middle of things. People may retrospectively identify punctuation in this flow, and rationalise their actions around such punctuations. They seldom face a situation where observations are made, hypothesis formed and finally a rational course of action is consciously chosen (Winograd and Flores 1986). Knowledge Management approaches should form part of this ongoing sensemaking process, rather than support rationalistic, punctuated decision making actions.

- **Focused on and by extracted cues:** In order to make sense of a situation, individuals search for a cue onto which they may build sense. Such a cue is not necessarily a complete or correct piece of information, but the cue may be used to search for further cues to update the "sense" made.
- **Driven by plausibility rather than accuracy:** In order to make sense of a situation an individual needs plausible information in a sufficient quantity to undertake their work.

These seven qualities of sensemaking highlight the construction of an environment for knowledge creation and exchange; the knowledgeable will create their identity, express their knowledge based on the expressions they have previously made, and alter the environment they are part of by any decision to share their knowledge (Further consideration of the ideas on identity may be found in (Winograd and Flores 1986; Flores 1998)). Knowledge sharing is part of a social interaction; in particular the people involved will make sense of how the audience of the knowledge react. Many Knowledge Management approaches fail to appreciate such complexity. Functionalist strategies emphasise the storage of accurate complete information, while sense-making points to sufficiency and plausibility (Weick 1995). Hence, this study approaches the meaning and basis of information as routed in the individual, rather than existent *a priori* within the information. Drawing on the themes of hermeneutics, information is considered to require interpretation, and to be affected by the individual's actions.

While sensemaking emphasises the process by which individuals arrive at an understanding of an unfamiliar situation, it is also necessary to understand how such individuals may reflect upon ongoing breakdowns within their practices, to innovate new approaches. The following section described the concept of reflection, which is used within this study to complement the notion of sensemaking. These theories are not necessarily theoretically complementary; sensemaking is based on structuration, while reflection-in-action is based upon more rationalistic and systemic approaches. Within the intervention however they are employed together to frame and explore planned approaches.

2.5.2 Reflection in action

The notion of reflection-in-action is revisited throughout this study, as it resonated with the researcher's experiences of trying to improve the way professionals within the British Council could consider and improve their work. In this way it is both a methodological concern, describing the method by which the action research constructs meaning through reflection, and a practical concern as to how members of the British Council might innovate. This connection between the process of research and Knowledge Management is evident throughout this study, for both aim to create and disseminate knowledge through various means (e.g. (Bergquist, Ljungberg et al. 2001) describes the application of peer-review from academia for Knowledge Management).

The researcher used the concepts of reflection-in-action during discussion with individuals in the British Council and considered the concepts as core to the kinds of practice the study was attempting to improve. This underpins the idea that Knowledge Management is to be seen as *"the dynamic process of turning unreflective practices into a reflective one by elucidating the rules guiding the activities of the practice, by helping give a particular shape to collective understanding, and by facilitating the emergence of heuristic knowledge"* (Tsoukas and Vladimirou 2001).

Donald Schön (Schön 1982) studied professional practice and devised the concept of reflection-in-action to describe how professionals constantly re-evaluate their actions. In his study he asserts that professional practice is dominated by an epistemology of technical rationality; a view that knowledge exists objectively and that the role of the professional is to solve problems by the rigorous applications of scientific techniques (analogous to the approaches suggested within functionalist approaches to Knowledge Management). This rationalistic approach leads to a split between research (the creation of knowledge) and practice (the application of knowledge). Schön, in line with this researcher, believes that such positivistic approaches are valuable when a precise "problem" is defined, however in practice well formed problems are seldom given but must be constructed from messy problematic situations (Ackoff 1974; Schön 1982).

This study employs this concept of reflection-in-action to challenge the functionalist approaches to Knowledge Management employing the concept of *knowledge-in-action*. Knowledge-in-action is the *"kind of knowing which does not stem from a prior intellectual operation"* (Schön 1982) and refers to the knowledge employed during activity. Schön suggests that "knowing" has the following properties (Schön 1982):

- *There are actions, recognitions, and judgements which we know how to carry out spontaneously; we do not have to think about them prior to or during their performance.*
- *We are often unaware of having learned to do these things, we simply find ourselves doing them.*
- *In some cases we are once aware of the understandings which were subsequently internalised in our feelings for the stuff of action. In other cases, we may never have been aware of them. In both cases, however, we are usually unable to describe the knowing which our action reveals.* This notion challenges the "codification" of tacit knowing into repositories, highlighting (as actually Nonaka does (Nonaka and Takeuchi 1995)) that certain experience cannot be described and codified.

This knowledge-in-action is applied when the situation faced is familiar, however in a new situation, "breakdown" (Winograd and Flores 1986) occurs; individuals are forced to think about what they are doing. They must consider the new situation and the appropriateness of their knowing to it, they make sense of the situation and how they may act upon it. This is termed reflection-on-action: the consideration of what people do. In performing an action people may reflect upon it. This reflection-in-action is the process a jazz musician may undertake during improvisation – *"thinking about what they are doing and in the process evolving the way of doing it"*. Through reflection the individual is able to "*surface and criticise the tacit understandings that have grown up around the repetitive experiences of a specialised practice, and can make new sense of the situations of uncertainty or uniqueness which he may allow himself to experience"* (Schön 1982). These concepts lead to issues of improvisation

(Ciborra 2000), in particular the use and reflection upon existent tools which prove ready to hand (Winograd and Flores 1986)

In the face of a changing unique or unstable situation in which the problem eludes the individual's ordinary categories of knowledge-in-practice, the individual is required to respond. Schön terms this response a "theory response" (Schön 1982) which may lead to an abandonment of their earlier theories-in-action (the theories learnt and applied to action). Such a "theory response" requires reflection-in-action, that is, reflection upon the action undertaken and reflection upon the knowledge-in-practice and its suitability for the changed situation. Employees may feel uneasy in a changed situation because they cannot say what they know how to do, and cannot justify the quality or rigour of their actions (Schön 1982). Such a response will require the individual to appreciate the situation and consider different ways to frame the problem. This suggests that Knowledge Management initiatives should not simply provide "best practice" databases, but rather provide a variety of information by which individuals may frame problems.

2.5.3 Communities of practice

A "community of practice" is a group of individuals that collectively create and share knowledge through shared practice (Wenger 1998). The term practice emphasises the relationship between action and knowledge creation within these groups, as described previously. The notion of practice and identity within concepts of community are of particular relevance for this study, however as has been argued "*often too much attention is paid to the idea of community, too little to the implications of practice*" (Brown and Duguid 2001) as such this study focuses upon communities as structures of shared practice. Human activity is discussed in terms of negotiation of meaning, participation and reification with such communities, yet appreciating that *"Living is a constant process of negotiation of meaning"* (Wenger 1998) and that communities are socially constructed labels for emergent configurations of individuals (in many ways similar to notions of culture).

"Communities of practice" have many of the inherent properties of Nonaka's *ba* (Nonaka, Toyama et al. 2000). While a "community of practice" is a living place where the members learn knowledge that is embedded in the community, the

boundary of a "community of practice" is firmly set by its task, culture, history and identity. In contrast, *ba* is fluid and can be changed quickly as it is set by the participants. Instead of being constrained by history, *ba* has a "here and now" quality to it (Nonaka, Toyama et al. 2000).

2.5.4 Organisational Conversation

Both the functionalist and interpretivist perspectives emphasise communication in its various forms as key to knowledge creation and sharing. In addition the concepts of sensemaking and "community of practice" rely upon (and assume) communication between individuals within an organisation. Within organisations, language and conversation (both in voice and through documents or e-mail) are the main methods of exchanging meaning. *"Conversations are the way that knowledge workers discover what they know, share it with their colleagues, and in the process create new knowledge"* (Webber 1984). Within an organisation such conversations are maintained through history by their recording as information, for example in memos, papers and e-mails.

Conversation also forms part of the ongoing sensemaking process, it enables *"a calibration of our own mental models against those of others around us"* (Goleman 1985). Furthermore, given this study's focus on a socially constructed notion of knowledge, knowledge must be, in part, a *"social product accomplished in communication*" (Deetz 1992). This has led to suggestions that Knowledge Management focus in greater detail on communication (More 1998; Varey, Wood-Harper et al. 2002).

Within the final intervention associated with this study the focus is put upon one particular form of organisational conversation: the telling of stories. *"Stories infuse events with meaning ... through the magic of plot"* (Gabriel 2000). Stories are seen as a method by which individuals present events and experience as the storyteller wishes to believe they happened rather than as they actually happened. Their narrative and plot allow them to be remembered by others, altered and shared to allow meaning to defuse (Gabriel 2000). Stories can be used as knowledge sharing devices, to be created and shared to pass on experience and knowledge (Snowden 2000). It should however be noted that once a story is told control of the story is lost.

Its message may be altered and even reversed through subsequent telling (Gabriel 2000). This study explores the use of stories, presented through technology as a method of knowledge creation within the organisation, particularly in relation to the sensemaking process since stories do not imply an objective reality but rather challenge individuals to question and make sense of their meaning.

2.6 The stance towards Knowledge Management adopted within this study.

The ostensibly objectivist and subjectivist accounts of Knowledge Management outlined in sections 2.4 and 2.5 , should not be considered as binary opposites, but rather as part of a continuum of thought. This study recognises this continuum to be a crucial element of a coherent Knowledge Management approach (Hansen, Nohria et al. 1999) and hence employs a constructivist approach to Knowledge Management, suggesting that a position of either absolute subjectivity or absolute objectivity is untenable; rather these are relative positions in the intersubjective social consciousness (Berger and Luckman 1966; Schultze 2000). Subjectivity and objectivity are interlocked in a reciprocal relationship so that both are always necessary (Schultze 2000). In adopting such a position towards Knowledge Management it is accepted that society (encompassing Knowledge Management practice) is both a subjective and objective reality. Drawing on the philosophy of Hume, social reality is to be understood in terms of an ongoing dialectical process composed of an individual simultaneously externalising their being into the social world, and internalising the social world as objective reality; *"to be in society is to participate in this dialectic"*(Berger and Luckman 1966).

In contrast to the highly functionalist Knowledge Management approaches such as mapping knowledge (Seemann 1996; Vail 1999), or the highly subjectivist approaches, the adopted social constructivist approach suggests that through social activity individuals in the social setting constantly re-create knowledge in new forms (Berger 'and Luckman 1966). Such a perspective shifts interest from supporting, mapping, storing and disseminating knowledge as an object, to supporting (and creating or shaping) many possible activities undertaken by individuals engaged in social action.

This study still however argues that human knowledge is capable of some degree of objectification; that is, manifested as products of human activity, available to the producer and others as elements of their intersubjective world (Berger and Luckman 1966; Venters, Cushman et al. 2002). Within this stance objects are not argued to "possess" knowledge, as would be argued by the codification of tacit knowledge into explicit knowledge, nor does ICT simply act as a conduit by which knowledge may be shared. Instead, these elements are considered to contain, express and inscribe accumulations of meaning and experience (Berger and Luckman 1966). An act of objectivation, for example an answer to a request for information through a companies e-mail system, may make the requested individual's subjectivity appear to have greater reality, not only for the receiver, but also the producer (Berger and Luckman 1966). In writing information for location within a technological system aimed at supporting Knowledge Management, its author is not simply codifying a pre-conceived "picture", but making real a subjective thought (Schön 1982). It is argued that once located within such a system, information may contain a potential to knowledge, that is, a reader may learn from such information acquiring new knowledge, yet this knowledge is not "contained" within the informational artefact. Hence, the technological systems associated with functionalist approaches to Knowledge Management are considered as potentially supporting the aims of an interpretivist approach to knowledge.

This study considers knowledge to be a social creation, described through theories of the sociology of knowledge, in which knowledge is ordered by society. *"Sociology of knowledge, then, is the procedure by which the socio-historical selection of ideational contents is to be studied, it being understood that the contents themselves are independent of socio-historical causation and thus inaccessible to sociological analysis.... It is to throw a sizable sop to the dragon of relativity, but only so as to enter the castle of ontological certitude better"* (Berger and Luckman 1966). Sociologists of knowledge consider knowledge to be a creation of social action: Facts become facts when accepted by society, and are reinforced by that acceptance (for a lively account of this process within science see (Latour 1987)).

For this study and as the basis for exploring the intervention within the British Council, knowledge is considered as a **"socially constructed and emergent property of purposeful human activity"**. This definition stresses the interpretivist foundation of the approach, and in particular the necessity of purposeful action and emergence within the knowledge creation process. The definition is grounded in a notion of purpose and causality, suggesting that (while possibly unobservable) knowledge remains linked to human intent. Within this study, "unpurposeful" action is not considered in relation to Knowledge Management. However unpurposeful action which serendipitously leads to purposeful social activity and knowledge creation is considered. Unplanned and unbounded social interaction may lead to innovation and knowledge (through unplanned discussion or breakdown) and this in turn may lead to new forms of purposeful action. The study argues that serendipitous meetings should be fostered and structures put in place to "increase the probability of serendipity" (examples of fostering serendipity may be found in (Nonaka 1991) and (Ward and Holtham 2000)).

2.7 A focus on practice

This chapter has presented a description of Knowledge Management from within the existing literature. Through this analysis a social constructivist approach to Knowledge Management has been defined for use within this study. However, this study is concerned with intervention within the British Council and so requires a practical approach building upon such a theoretical stance.

This study identifies a need to appreciate the way individuals construct meaning (and thus knowledge) from experience. While functionalist approaches present an approach to the construction of knowledge, this study seeks an interpretivist notion of knowledge creation through sense-making and reflection-in-action. The notion of community is used as a mechanism to highlight the social nature of knowledge creation and the need to focus on groups and structures within the organisation, rather then homogenous knowledge sharing programmes for all. The theory of "community of practice" was introduced to the organisation early in the research cycle, and its influence is apparent with the British Council's "knowledge-sharing strategy" (Khalid and Marsden 1999) (See Chapter 5).

Within this study the term community (rather than "community of practice") is employed to isolate groups of individuals who share common elements of practice. Ideas and concepts from literature on "community of practice" are explored. Within the literature on "community of practice" too heavy emphasis has been made on supporting community rather than supporting practice (Brown and Duguid 1991). This study seeks to avoid this through its definition of knowledge as an emergent property of purposeful action. Furthermore, this study focuses on knowledge as inherently linked to social practice, suggesting that social structure remains crucial to the appreciation of Knowledge Management. While individuals may work alone, they rely upon the collective knowledge of groups of which they are a member. Within such groups knowledge is unevenly distributed between members; yet they can share such knowledge because of a common base of tacit knowledge (Orr 1996) which is in turn associated with practice. The notion of "community of practice" is thus used within this study to refer to social configurations of individuals in which shared practice and the knowledge of undertaking shared practice occurs.

During the length of the study, the researcher's approach to Knowledge Management evolved and developed. During the first year of research the researcher reviewed the key literature of Knowledge Management available at that time. This influenced the Knowledge Management strategy being written for the British Council, in particular increasing the focus from information repositories towards the encouraging the emergence of "community of practice". Once the cycles of action research began, however, the research was reasonably settled on the stance described within the conclusions to this chapter. However, the first of the three cycles focuses more on the engendering[4] of a sense of community (and hence literature on "community of practice"). Reflecting on the experience of this cycle, the researcher was led to consider sensemaking and organisational conversation in much greater detail within the second and third cycles of action research.

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[4] The word "engender" is used in this thesis to describe the process of supporting and encouraging an emergent process. In this way "engender" is used as a verb with the definition broadly: *"To produce by natural processes, develop, generate (plants, minerals, material substances) (obs.). b. To give rise to, produce (a state of things, a disease, force, quality, feeling, etc.)."* {Oxford English Dictionary}

2.8 Summary

This chapter has outlined the stance adopted by the study towards Knowledge Management. Within the fieldwork this stance is employed to inform the planning and introduction of technology within the British Council's knowledge sharing programme.

The next chapter of this study attempts to reconcile the described stance towards Knowledge Management with approaches to the use of technology within organisational Knowledge Management programmes. In particular, the capabilities of information and communication technologies are identified and explored relative to this study's stance towards Knowledge Management. It is through this comparison between the informational capabilities of ICT and the social constructivist approach adopted for this study that the research issues are explored. This comparison is a study of the interface between technological capability and human purposeful activity– the specific area of concern of this research.

CHAPTER 3 KNOWLEDGE MANAGEMENT AND INFORMATION AND COMMUNICATION TECHNOLOGIES

"Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information on it." (Samuel Johnson 1709 - 1784)

3.1 Introduction

This chapter builds upon the Knowledge Management stance presented in the previous chapter to introduce the potential use of technology as part of the British Council's knowledge sharing programme. Given the truly global nature of the organisation and its reliance on internet technology as its central communications infrastructure it is necessary to consider in detail the role of technology within Knowledge Management. The chapter explores various conceptions of technology, focusing upon the interaction between the individual and the technology within a social context. The concepts described in this chapter are then employed within the fieldwork in approaching the introduction of two technologies within the British Council's knowledge sharing initiative in the first and third action research cycles (chapters 6 and 8).

The relationship between the concepts from Knowledge Management in general and the concepts from technology are shown in the highlighted central section of Figure 8. The study begins from the British Council's desire to improve (on the left hand side of the diagram). The previous chapter has described literature in Knowledge Management in order to develop a social constructivist stance towards Knowledge Management (shown as the top line of the diagram). This chapter draws upon that literature in order to present two broad approaches to technology (personalisation and

codification) (the diagram includes arrows from the interpretive and functionalist approaches to demonstrate their relationships). Technology is then considered in terms of the underlying capabilities, and how such capabilities afford benefit to users. This stance towards technology is then drawn together with the social constructivist stance towards Knowledge Management in order to introduce a Knowledge Management system with the aim of organisational improvement (the final box on the right of the diagram).

This chapter explores how technological artefacts are employed within Knowledge Management interventions and discusses those aspects of the technology that are relevant to their use within these interventions. The discussion explores the conception of such technology in general, rather than upon any specific technology marketed as a Knowledge Management system (Alavi and Leidner 2001).

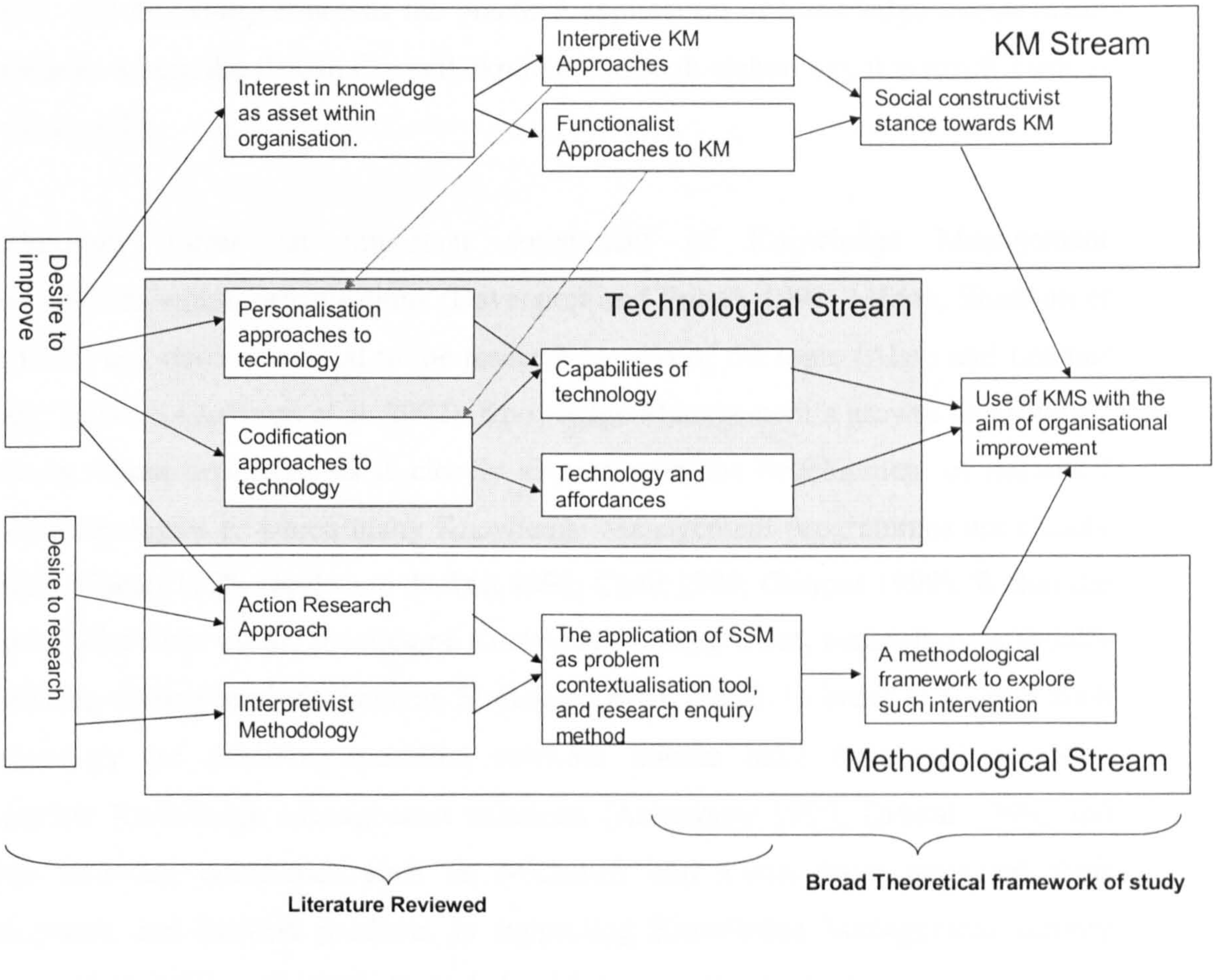

Figure 8: Vision of technology demonstrating the chapter's exploration of technology through personalisation and codification approaches. These approaches have a correspondence with the perspectives adopted in the literature review on Knowledge Management.

3.2 The role of technology in Knowledge Management

The central role of technology within Knowledge Management has received significant criticism: "*Writing embedded in this perspective is typically saturated in an optimism about how either an organisation's knowledge assets can be shared directly via information technology systems or that such processes can be supported and facilitated by information technology.*" (Hislop 2002). This has led to another body of literature which criticises the attempt to use technology within Knowledge Management, often arguing that the intrinsic character of knowledge precludes the use of technology for Knowledge Management (Cook and Brown 1999; Galliers and Newell 2001). This thesis explores such criticism within the action research. As technology remains central to the practice of knowledge management (Ruggles

1998), and this study concerns the practical application of knowledge management principles within the British Council explicitly through technology it is insufficient to avoid its role.

Technology forms an important component of Knowledge Management interventions within organisations (Davenport and Prusak 1998; Milton, Shadbolt et al. 1999) and remains central to the research agenda of the topic (Alavi and Leidner 2001; Venters, Cushman et al. 2002). Knowledge Management's growth as a topic of interest within organisations is closely aligned with the development of intranet / web technologies to which many Knowledge Management programmes are closely linked (Cohen 1998; Doyle and du Toit 1998; Chait 1999; Gillmor 1999). Within the general discourse on the practice of Knowledge Management, technology is usually central to discussions[5] (Stojanovic, Stojanovic et al. 2002). In order to support such technology led practice, specialist software houses have developed so-called complete Knowledge Management solutions (Autonomy 1999; Orbital 1999) and large software companies such as Microsoft and Lotus have marketed their groupware and Intranet products as supporting Knowledge Management activity (Lotus 1998; Microsoft 1999). Knowledge Management is being increasingly viewed as a product of these industries (Scarbrough, Swan et al. 1999). Furthermore, in many organisations, IS departments take responsibility for Knowledge Management activity in budgetary terms (KPMG 2000) (within the British Council the Intranet department took responsibility for Knowledge Management). It is thus unsurprising that technology remains central to the practice of Knowledge Management (Davenport and Prusak 1998). Yet, while such effort is expended developing and deploying technologies, little conception appears to exist as to the specific form such technology takes (McDermott 1999).

3.2.1 The nature of technology within Knowledge Management

Given the wide variety of definitions of Knowledge Management it is perhaps unsurprising that little consensus exists regarding the use of technology within Knowledge Management strategies (Hendriks 2001). There is a great diversity of

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[5] E.g. Etienne Wenger's Keynote speech at the 2002 BizMedia Knowledge Management conference concentrated on the application of technology to engendering "communities of practice".

enabling technologies applied within the Knowledge Management activity of organisations (Butler 2002) and so there is a need to identify a coherent picture of the role of technology within Knowledge Management and isolate the various forms such technologies take. This sub-section aims to do this.

Examples of technologies which have been considered to support knowledge aspects of work include decision support, groupware, expert systems, computer-mediated collaboration applications, data warehouses, video conferencing, and other communication technologies, intranets, the internet, intelligent agents, portals and artificial intelligence based applications (Davenport and Prusak 1998; Wilson and Snyder 1999; Alavi and Leidner 2001; Butler 2002). This list encompasses such a wide variety of technologies that it becomes clear that a coherent form of technology that may be described as a "Knowledge Management technology" does not exist. There are no intrinsic characteristics which define an ICT application as a Knowledge Management technology (Hendriks 2001). Yet technology's application within Knowledge Management activity suggests that organisations perceive the functionality provided by such varied technologies as complementary to their chosen approach to Knowledge Management. This suggests that in identifying forms of technology for Knowledge Management it is more relevant to identify a connection between the features (capabilities) of a particular technology and their application to the various perspectives on Knowledge Management theory. Subsequently the problem is not of identifying a particular form of "Knowledge Management technology" in general, but rather of identifying the features of technology which may support the Knowledge Management activity of an organisation.

In addition to the wide variety of generic technologies which may be employed for Knowledge Management there exists a number of packaged solutions marketed as specific Knowledge Management solutions. Such software is often based around internet portals and aims to provide a single point of access to easy and timely information to support knowledge activity (Mack, Ravin et al. 2001). An example of such a packaged solution is Autonomy's "Portal-in-a-box" system (Butler-Group 1999); a system which is claimed to provide *"an out-of-the-box solution that enable companies to easily create and automatically maintain an Enterprise Information Portal"* (Autonomy 1998). Microsoft also market such a Knowledge Management

portal product (Microsoft 1999; Microsoft 2000). These systems are indicative of the software industries general conception of Knowledge Management, and its technological requirements. However such systems appear embedded within the particular software company's conception of Knowledge Management, and the company's particular expertise (e.g. Microsoft's portal specifically focuses upon integration with their Office suite, Autonomy's "portal-in-a-box" product focuses upon their specialty in search engine technology, and KMS plc's product highlights customer relationship management, grounded in their background of call-centre software). As such identifying the requisite features of a Knowledge Management system from the features offered by such generic products may lead to an incorrect conception as these technologies are grounded in the software companies' conceptions of Knowledge Management, and their speciality in software development.

However it is useful to appreciate the general features which appear to be consistent amongst such products as they represent the capabilities such companies perceive their customers want. This provides a picture of the types of integrated solution considered relevant. Such packaged solutions generally include features of:

- Collaboration – including shared calendars and tasks, threaded discussions and conferencing /chat technology.
- Content management search and delivery – including personalised information on shared portal pages and the ability to search across databases, websites *etcetera*.
- Analysis – allowing the searching and analysis of external databases.
- Tracking and workflow – allowing the creation of process-based applications and workflow applications.
- Integrative applications (to link the solution to other systems) – allowing the systems to be linked with other software systems such as customer relations management, enterprise resource planning and on-line learning applications.

Such generic Knowledge Management solutions also highlight the necessity for an integrated coherent and easily usable interface for accessing the information content. This is perhaps one of the most valuable features of these integrated solutions, as Knowledge Management technology aims to support the individuals in their

knowledge related activity and so they should be inclusive and usable by all employees of the organisation (Milton, Shadbolt et al. 1999).

Within this literature review technology is explored through its relationship with the social and technical activities promoted by particular conceptions of Knowledge Management. Within this study's literature review of Knowledge Management two broad perspectives on Knowledge Management theory have been identified, and described as functionalist and interpretivist (see section 2.3). These perspectives towards Knowledge Management suggest differing forms of technological features; *"each [conception of knowledge]...suggests a different strategy for managing the knowledge and a different perspective of the role of systems in support of Knowledge Management."* (Alavi and Leidner 2001). The following sub-sections explore the application of various technologies' capabilities in support of these perspectives on Knowledge Management. These perspectives are not used to categorise particular technology or functionality, but rather to identify how such technology in general may be appropriate within each of the perspectives. A codification approach to technology, broadly within a functionalist perspective on Knowledge Management suggests approaches to technology which employ technology in the storage and retrieval of information as *a priori* facts. An interpretivist perspective, in contrast, suggests a broadly "personalisation" based approach (Hansen, Nohria et al. 1999) to technology in which the technology acts as supporter of social practices.

The features of technology are explored in the following sections in support of a codification approach (within a broadly functionalist perspective on Knowledge Management) and in support of a personalisation approach (within a broadly interpretivist perspective on Knowledge Management). Through this analysis a picture emerges of how technology might be employed within the social constructivist approach to Knowledge Management adopted in the study. It is noted that such approaches are not mutually exclusive and that Knowledge Management programmes within organisations may employ a variety of technologies from either approach (Hansen, Nohria et al. 1999). Supporting social practice is likely to require forms of information storage and retrieval and likewise support of "codification" will require certain social interactions to be supported (Hansen, Nohria et al. 1999). While it may be possible to identify indicative technology for functionalist or

interpretivist perspectives it is also how such technology is employed within an organisation that is important. Many of the technologies described demonstrate a range of capabilities which may be described as codification based, personalisation based or both. These categorisations are then used within the action research cycles in order to describe the Knowledge Management systems implemented.

3.2.2 Codification approaches

A codification approach is founded upon the concept of knowledge as being intrinsically capable of objectification, and thus of storage within an information system. The information systems may thus provide knowledgeable objects of capital value within an organisational context. Such approaches appear to the author of this study to be dominant within Knowledge Management activity, this is perhaps unsurprising given the chiefly functionalist orientation of IS practitioners towards systems development (Hirschheim and Klein 1989) and towards Knowledge Management systems (Butler 2002). *"The emphasis on codification in the KM literature probably reflects the dominance of the information systems view: many of the articles have focused on developing and implementing KM databases, tools (e.g. decision support tools) and techniques."* (Davenport, Jarvenpaa et al. 1996).

A codification approach suggests the use of technology in the storage and retrieval of information. Such a solution would be used *"for managing the gathering, organising, refining, analysing and disseminating of knowledge in all of its forms with an organisation."* (Jackson 1999). Many organisations have approached their Knowledge Management activity with such a perspective ((Davenport 1996; Seemann 1996; Cohen 1998)) and thus considered knowledge as a resource to be managed through technology (Edvinsson and Malone 1997; Stewart 1998).

The defining characteristic of technological approaches to functionalist Knowledge Management is the desire to capture and store information in order to develop repositories of knowledge. The technology is thus generally centred around a repository of information. The aim of such systems is to present answers (knowledge) to questions supplied by users. Technologies often employed in such approaches include decision support systems, which support individual decision making through the provision of information; data-warehouse applications to trawl

through data in order to identify knowledge; various forms of search and retrieval technologies with the aim of presenting users with coherent information in support of problems they identify and thesaurus applications employing taxonomies to locate particular knowledge objects among the corpus. In addition to these, many technologies are employed with the attempt of capturing the knowledge of employees and categorising it for its inclusion within these databases. Furthermore many online learning applications have been employed as repositories of "best practice" which individuals may learn from, and are thus congruent with a codification approach to Knowledge Management.

Such codification approaches are often founded upon Nonaka and Takeuchi's model of knowledge creation described previously (Nonaka and Nishiguchi 2001), and thus founded in a cycle of codifying tacit knowledge into an explicit form capable of storage and dissemination using such IT based solutions. Such approaches are considered by many to be flawed as, "*technology is limited to the transfer of explicit knowledge, this may relegate tacit knowledge to the background, in spite of the strategic importance of tacit knowledge hence leading to the mismanagement of knowledge*" (Johannessen 2001) see also (Von-Krogh, Ichijo et al. 2000; Hendriks 2001; Prusak 2001; Butler 2002). Examples of such technologies include cataloguing concepts such as taxonomy and ontology[6] in which an ontology serves as the backbone for searching and providing knowledge sources (Stojanovic, Stojanovic et al. 2002) and database applications, such as data-mining[7], document management systems[8] and Intranet applications which aim to codify and store static knowledge.

It is perhaps unsurprising that such approaches are adopted within organisations and promoted by members of the information systems community. Such approaches

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[6] Technology associated with the term ontology attempts to provide a vocabulary of basic terms complete with a specific description of their meaning such that codified knowledge may be sought and found. http://www.ontology.org/main/papers/faq.html

[7] Data mining is the use of large repositories of data to search for hidden patterns. Example technologies include http://www.spss.com/spssbi/applications/datamining/

[8] Document Management Systems aim to provide a searchable corpus of all documents in use within an organisation such that individuals can gain access to the knowledge of others.

simplify the problems of Knowledge Management into the automation and storage of information, in order to informate (Zuboff 1988) the organisation's employees; a task for which information systems is highly suited (Checkland and Holwell 1998; Butler 2002).

3.2.3 Personalisation approach

A personalisation approach to the application of technology within Knowledge Management is founded on the concept of knowledge as intrinsically linked to social action. This suggests a need to develop technological solutions which attempt to integrate with social activity rather than attempting to objectify knowledge. The limitations of codification approaches "*can be attributed, in part, to a lack of attention to the fundamentals of the phenomenon in question: the socially constructed, distributed and embedded nature of knowledge, and the process by which it changes*" (Pentland 1995). It is thus perceived necessary to explore the application of technology within an alternative interpretivist conception of Knowledge Management.

An interpretivist perspective highlights the importance of the social and cultural dimensions of knowledge and cautions against an over reliance on IT solutions as the expense of such social interaction (Davenport and Prusak 1998; McDermott 1999; Swan, Scarbrough et al. 1999). However ICTs play an important part in mediating and supporting the social interaction within organisations. Indeed, there is an increasing importance of technology within such "social and cultural dimensions" (Latour 1987). Personalisation approaches in support of an interpretivist perspective on Knowledge Management thus attempt to provide an agora in which knowledge may be collectively created and recreated and in which notions of community may be engendered (Wenger, McDermott et al. 2002).

Functionalist accounts of Knowledge Management view knowledge as a "*static entity, static property, or stable disposition embedded in practice*" (Orlikowski 2002), and technologies are considered necessary to provide a place of storage for such static stable entities. Interpretivist accounts challenge such perspectives arguing that knowledge is inherently indeterminate, and dispersed within the ongoing action and activity of individuals (Tsoukas 1996; Davenport and Prusak 1998; Orlikowski

2002); knowledge is enacted, every day and over time in people's practices, suggesting that approaches to Knowledge Management should also be intrinsically linked to practice (Orlikowski 2002) and provide a rich social interaction among users. This has led some authors to criticise the role of technology within Knowledge Management as too greatly emphasised (Hildebrand 1999), the application of technology to support such rich social interaction is less formalistic and procedural than the codification approaches argued previously, however as a proponent of an interpretive approach to Knowledge Management effectively argues *"The solution, however, is not to abandon the use of ICTs for Knowledge Management because the processes of creating and using "Knowledge Management systems" are not simply a matter of transferring objective explicit knowledge between different human beings. Rather, the challenge is to design systems and approaches to their use which recognise the tacit basis of all sense-reading and sense-giving activities, and try to make these activities more meaningful and valuable to all parties*" (Walsham 2001). Personalisation perspectives on technology for Knowledge Management attempt to reconcile the informational features of computer technology with the social needs of individuals engaged in knowledge work The approaches taken thus concentrate on the social actions through which this may be achieved, which Walsham identifies as sense-reading and sense-giving, but which this study explores as sense-making and reflection.

Knowledge Management technology will be shaped by and in turn shape the organisational context (Hendriks 2001). The action research considers that technology enables the co-creation or argumentation of meaning between those interacting with the technology and through such interaction shapes the nature of the technology within purposeful activity. The technology provides a "space" and history within which individuals may undertake such social activity. It is not argued that technology can store knowledge, but rather it can store only information (or even data). It is this processing of data or information and mediation of communication which provides the potential benefits of Knowledge Management. The fact that the technology within a Knowledge Management programme can only processes data (Galliers and Newell 2001) is irrelevant to this process; it is how the technology is employed within social context which leads to improvement through Knowledge Management principles.

Various forms of technologies have been employed within such personalisation based approaches. Technologies which enable mediation between individuals and support dialogue are clearly relevant. Applications which provide groupware functionality, and in particular applications which support the social mediation of groups and communities are characteristic of a personalisation based perspective on Knowledge Management (Wenger 2001). Technologies which provide the capability of threaded discussions over time, either through e-mail technology (e.g. mailbase mailing list applications), through alternative technologies (such as news-groups[9]) or via a web-site (using technologies such as WebCrossing[10]) are often employed. These technologies often form the central pillar of a collaborative approach to Knowledge Management. Many characteristic technologies provide capabilities for concurrent on-line discussions, allowing individuals to converse and thus collectively learn. Examples of such features may be seen in Microsoft's Netmeeting product[11], or Chat-room applications[12]. Extending such functionality has led to the application of video-conferencing applications within Knowledge Management activity (Cohen and Prusak 1996).

In addition technologies which attempt to capture fragments of information and support individuals exploration of problems without providing solutions are relevant to interpretivistic approaches to Knowledge Management (e.g. Banxia's Decision Explorer software[13]). In order to locate individuals within an organisation there is a general need to provide forms of directory services (for example LDAP technologies[14]). Such services often include taxonomies of domain expertise and are

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[9] A mailing-list application based on shared lists of members e-mail addresses.

[10] A configurable application to create websites which allow threaded discussion and posting of messages. See www.webcrossing.com

[11] A synchronous system which allows concurrent speech or video between individuals. See www.microsoft.com/netmeeting/

[12] A synchronous system which allows concurrent text based discussion, similar to the discussion technologies of multi-user dungeon (MUD) applications. See http://chat.msn.com/ as an example.

[13] This tool aids the building of qualitative models of concepts and ideas. See http://www.banxia.com/

[14] Lightweight Directory Access Protocol, used to access X.500 directories through internet based technologies e.g. www.openldap.org

thus partially functionalist in attempting to codify the plethora of expertise of individuals into specific keyword-searches. However their purpose may be used to engender social interaction.

The focus of Knowledge Management should thus be on enabling social interaction. This suggests technologies which provide personalisation and dialogue, rather than acting as repositories of answers or facts (so-called best-practice). The technologies focus on support for human processes, rather than organisational process (Walsham 2001) and thus aim to informate rather than automate (Zuboff 1988).

3.2.4 The relationship between codification and personalisation approaches.

By focusing upon the features of information technology and attempting to map these to perceived knowledge creation activities of individuals it is likely that an organisation will embody a misunderstanding of the nature of work within a Knowledge Management system (Suchman 1987; Kuhn 1996). In particular data within computer systems bears the weight of seeming objectivity and can be difficult to refute (Kuhn 1996). While systems may be in place which allow users to debate and discuss issues, the fact that such issues are presented through a technology which is usually considered as a definitive source may lead to acceptance of the dialogue as "fact", and thus reduce the propensity of users to debate. It is argued that the mechanistic and rigid nature of IT-based Knowledge Management is incapable of keeping pace with the dynamic needs of knowledge creation (Malhotra 1999).

Knowledge Management activity, in practice, will embody a variety of techniques which may support social interaction or objectify the notion of knowledge. This makes it easy to shift from an interpretivist perspective towards Knowledge Management to a more functionalist approach that appears to better reflect the nature of technology. Such a shift may damage the social structures in which knowledge is created and shared (Wenger, McDermott et al. 2002), yet is understandable given the complexity of attempting to engender social interaction through technology.

3.3 Exploring technology's application within this study

Knowledge Management technologies are introduced into the social context alongside other Knowledge Management related activity to form a Knowledge Management system: a socio-technical system of improvement for social knowledge related activity. Such social knowledge related activity is ongoing within an organisation whether such a system is in place or not. People create and share knowledge as part of their ongoing being (Swan 2001; Tsoukas and Vladimirou 2001). A Knowledge Management technology does not create a knowledge activity but either supports or damages it. In contrast to systems which aim to automate purposeful activity in order to ensure employees apply so called "best practice", an effective Knowledge Management system must support ongoing social action which enables innovation and development of such practices alongside their dissemination.

Improvement in knowledgeable action may be sought through a very wide variety of sources and technologies, and so the range of technologies which may be employed for Knowledge Management is very broad. It could be argued that any technology which engenders knowledge may form part of a Knowledge Management technology, hence the large list of potential technologies outlined above. Technological solutions provide an opportunity for individuals to improve knowledgeable action, however it is not requisite that they use these tools.

In considering the use of technology in support of Knowledge Management, the British Council are not faced with defined problems of knowledge, rather they are faced by a variety of complex situations in which the organisation considers improvement in its knowledge activity would lead to improvement. Such "wicked problems" (Rittel 1971) present no obvious solution, only potential for improvement. The problèmatique of such wicked problems is in constant change in response to external and internal influence. The requirements of a Knowledge Management technology hence constantly change. Knowledge is the product of purposeful human activity, and is neither objective nor subjective; knowledge is the result of interpretation which depends on the entire previous experience of the interpreter and on its situatedness in a tradition (Winograd and Flores 1986). Thus it is suggested that the aim of using technology within Knowledge Management cannot be the

automation of this process, since interpretation (and reflection) is a constantly evolving activity. Technology is a product of, and producer of, such situatedness.

The purpose of technology within Knowledge Management is thus to support and develop the constantly evolving knowledge practices of individuals. The technology provides capabilities which may be used by workers to improve their purposeful activity; however these individuals remain active participants in this process, capable of substituting alternative technologies or approaches (Ciborra 1996). Such individuals do not act in isolation, but are part of a social context; their application of these technologies is related to how others use and apply them.

In order to provide a Knowledge Management related approach to integrating technology within the human purposeful activity of individuals, this study explores technology for Knowledge Management through the capabilities for improvement afforded by a technological solution. This divorces the technologies features and structure from its use, focusing only upon the way the technology improves an individual's purposeful activity (Winograd and Flores 1986). A Knowledge Management technology is thus seen as an amalgamation of capabilities which have the potential to afford individuals with improvement to particular problems, as the individual appreciates them, at a particular time.

3.3.1 Capabilities and affordances.

In taking seriously the concepts of Knowledge Management, and in particular the necessity to support the tacit knowing of individuals, it is suggested that technology support both social interaction and such tacit behaviour. It is argued that it is not possible to think about "Knowledge Management" as a separate activity from the ongoing activities undertaken within the British Council. Individuals are engaged in a constant process of creating, disseminating and employing their knowing as part of their ongoing being. To think about a Knowledge Management system replacing or creating knowledge is inconsistent with the assertion that knowledge is not an object. Rather a Knowledge Management system should be designed to provide capabilities which are relevant to the knowledge activities of an individual. The technology should afford (Norman 1993) capabilities which may (or may not) be useful to knowledgeable action.

In order to explore the way in which such capabilities are employed by individuals within their purposeful action we use the term "affordance". Affordance is the perception by individuals of what a capability of a technology can do for them – the actionable properties between the world and an actor (Norman 1999). This notion of affordances provides a link between the capabilities of technology, designed for a purpose, and the actual purpose perceived by individuals in use. *"The world is a never-ending assemblage of affordances, rather than things or decontextualised objects; it is the realm of the how-to"* (Ciborra 2002).

Such affordances may not be apparent to the original designer, but only become apparent at a point of breakdown (Winograd and Flores 1986), where an individual may consider the capabilities of the variety of technology they have to hand, and identify affordances relevant to the associated breakdown. A breakdown is the point at which an individual, involved in a world of referential wholes, faces a situation in which such a whole fragments and intentiality comes to play (Introna 1997). At this point the equipment becomes highly apparent to the individual and they will reflect upon it. The individual may then undertake practical deliberation and innovate a solution to the breakdown (Heidegger also suggests they may simply carry on without thought, or alternatively remained concerned but unable to act (Heidegger 1962; Introna 1997)).

For example, the original post-it-note was originally designed to afford use as a bookmark. It was thus designed to be practical in this task (it does not fall out of the pages of a book because of the sticky strip). Subsequently, its capabilities (as a piece of yellow paper with a sticky strip) have afforded many other uses identified by users (during a point of breakdown). Post-it notes are used as a brainstorming technique, as simply signs, as memos placed on telephones etc. As users make use of technology in this way, so the developers of technology re-configure and re-design it to be more appropriate to these new uses. For example OvalMap[15] provide large oval post-it notes specifically for their novel brainstorming technique. Crucially however, the

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[15] A technique which uses post-it-note technology to explore issues through a brainstorming technique. See www.ovalmap.com.

problem of "not having a post-it note" is nonsensical. Were a relevant breakdown to occur, individuals would improvise with the tools available (Ciborra 2002); if post-its are unavailable alternative solutions may be used (e.g. to take a telephone message an e-mail may be sent, another piece of paper used, voicemail recorded, et cetera). The provision of a Knowledge Management system simply increases the available variety of capabilities afforded to an individual in their knowledge related purposeful human activity.

In designing such technological solutions for Knowledge Management there is a problem of effectively identifying the capabilities which should be provided such that they may be perceived to afford improvement in an individual's knowledge work. Individuals are likely to be incapable of expressing their needs effectively as they remain hidden. Prior to its invention people did not express a need for "yellow paper with a sticky strip", however now this capability is available, offices appear to require them to operate. Individuals naturally *bricolage* solutions with the capabilities afforded them (Levi-Strauss 1966; Ciborra 2002). This French term means *"to use whatever resources and repertoire one has, to perform whatever task one faces"* (Weick 2001).

In identifying the capabilities a Knowledge Management technology should provide, it is thus problematic to hold focus-groups or user-groups to identify the "needs" of a user community as these needs will remain hidden, since they are associated with tacit behaviour. It is thus perhaps unsurprising that Knowledge Management solutions are often similar to information technologies (Galliers and Newell 2001), as the necessary capabilities for such technology are already appreciated by users and thus easy to express. When asked what a Knowledge Management system should look like, users are highly likely to identify issues which they may make explicit. These are thus likely to focus upon the explicit issues of their work (e.g. lack of information etc). Furthermore such technology proves easier to market and sell as purchasers are capable of perceiving the afforded capability of such informational technologies.

In a Knowledge Management system the functionality afforded is intrinsically linked to the purposeful human activity of the user community and thus specific in form for

each separate user community. While certain explicit functionality may be obvious (such as the use of a chair for sitting upon), hidden functionality only becomes apparent at the point of breakdown (Winograd and Flores 1986) when individuals improvise new applications of the technology (Ciborra 1996). A chair may never have been used (or designed for use) as a weapon, yet upon a breakdown of needing a weapon, this use may become apparent.

In appropriating technology for use within a Knowledge Management programme we cannot assume that the individual knows the purpose of their task. The problems faced by a knowledge worker are often messy, complex and potentially tacit, requiring innovation and creativity (Newell, Robertson et al. 2002).

An individual may be unable to express the problem they face, or even perceive its existence. In this case the individual may draw upon affordances with which they are familiar rather than innovating new solutions. This leads to a reinforcement of previous actions (similar to the process described previously in the discussion of sensemaking (section 2.5.1)). An affordance [X] will only become apparent at a point of breakdown, e.g. in order to do [Y]. There is a need to both appreciate X and Y in order to undertake a task. In the case of innovative technology, capabilities may be available which afford new and potentially beneficial actions to specific messy problems of knowledge workers. However without an appreciation of the existence of such messy problems the knowledge worker may not explore the capabilities of the tool. Additionally an individual may appreciate the existence of a messy problem, yet be unaware that a capability of the technology affords improvement to such problems. There is a dance between the technology and the problem, as the user moves between their understanding of both. In the case of Knowledge Management technology this dance is compounded by the aim of supporting tacit behaviours which are intrinsically incapable of espousement.

3.3.2 Technology in support of sensemaking

In order to review the nature of such capabilities, this chapter employs the concepts, introduced in the previous chapter, that are relevant to a social constructivist perspective towards Knowledge Management.

A need for Knowledge Management to support sensemaking was identified in section 2.5.1 . Can technology support sensemaking actions? The use of information technology for sensemaking requires a redefinition of the "codification" approaches to knowledge "storage" and "presentation". Such normative approaches attempt to capture, codify and present large volumes of "best-practice" and "process" as *a priori* facts. *"Technology gives the illusion that face-to-face acquaintance and prior history are not essential...Programs tend to focus on what is judged* a priori *to be "controllable", which means that information needed for improvisation, reframing or repunctuation is not available"* (Weick 1995). The human's ability to comprehend the outputs of information technology is limited, and does not operate at the speed and complexity of the technology (Weick 1993). A search engine may be capable of indexing many millions of articles on a subject but it is clearly impossible for the individual to make sense of these. The individual sifts through these options until an article which "appears" useful is found, then concentrates on the value of such material, either employing its content or rejecting it and returning to the search engine list again. The individual's appreciation of such material is thus crucial; "*In many cases expectations can have a powerful effect on the way individuals filter information and interpretations, so much so that self-fulfilling prophecies become a fundamental act of sense making"* (Weick 1995; Choo 1998). *"Initially, prophecies provide the minimal structures around which new information can coalesce. People then actively connect data with their prophecies based on the beliefs that they hold. In doing so, people tend to seek our confirmatory evidence ignore or devalue contradictory new, and cling as far as possible onto their initial hypotheses."*(Choo 1998). Thus the provision of large, searchable repositories of facts can provide reinforcement of existing beliefs, rather than a challenge to them; this is particularly true when problems are "messy" (Mitroff and Linstone 1993).

Employing the ideas of sensemaking to identify technological capabilities to support Knowledge Management it is suggested that technology should contain a historic account of previous activity, distilled for use in further communicative activity. Capabilities are needed for groups to build new shared meanings and construct a collective identity through rich social interaction (Cecez-Kecmanovic and Jerram 2002). This requires a technology which supports a range of possible discourse, and feeds such discourse into further debate (Cecez-Kecmanovic and Jerram 2002).The

design of technology for Knowledge Management should includes a role for contradictory evidence, dialogue, discussion and argumentation, *"Arguing provides people with a socially acceptable procedure to debate the ambivalence and contradiction that is inherent in most issues"* (Choo 1998). Hence, users will benefit from a technology which engenders them to consider in detail the problem they are facing, by amalgamating pieces of information, stories and ideas to enable them to explore the problem and its potential solution. Through such exploration they will also aid others by enriching the ongoing discussions. Furthermore by reflecting upon a problem and seeking a route to improvement rather than a pre-digested answer, individuals may be engendered to reflect upon the very nature of the problem, and their approach to it. The following section discusses technological support for such reflection.

3.3.3 Technology in support of reflection in action

There is a need to focus upon the action in which individuals are engaged, and to challenge individuals to explore the way they think about problems, what information they employ and how it is used. Literature suggests that individuals should be provided with an opportunity to discuss their action with peers in order to share and create knowledge (Wenger 2000). There is a need to explore independent, qualitative judgement and narrative accounts of experience (Schön 1982). Rather than viewing the informational capabilities of a technology as an opportunity to centralise "knowledge", it is suggested that it should provide a collective voice, in which action may be shared and discussed while it is ongoing, both with peers, with those of more experience (as for example mentors) and those with less experience (as mentees).

There is thus a need to explore the capabilities of technology which may promote such approaches to learning and teaching. *"Because many professionals are almost always successful at what they do, they rarely experience failure, they have never learnt how to learn from failure"* (Argyris 1991). Thus when their pre-learnt problem solving strategies (so called single-loop learning) fail, they are lost and may become defensive and screen out criticism, closing their ability to learn at the precise moment of need – during the problematic action. Such single loop learning is promoted by codification based approaches which attempt to present knowledge for defined

problems. In contrast individuals should be engendered to reason about their behaviour in new and more effective ways (Argyris 1995). While such individuals may espouse a "theory-in-use" (their individualistic beliefs about the action they are undertaking), their "theory-in-action" (the actuality of their action) may be contradictory (Argyris 1995).

A user may request and value normative informational resources if these reinforce the user's theory-in-use, as the resources correspond to their espoused value of objectivity. However, if these resources do not actually correspond with the user's theory-in-action, the system is unlikely to become a success (Argyris 1995). Individuals need to be engendered to undertake "double-loop learning" which challenges their theory-in-action by focusing personal reflection upon their approach to action. *"Reflection-in-action tends to surface not only the assumptions and techniques but the values and purposes embedded in organisational knowledge"* (Schön 1982). The provision of an expansive database of process, procedure and knowledge is more likely to reduce such reflection-in-action. *"In contrast to normal bureaucratic emphasis on technical rationality, a reflective institution must make a place for attention to conflicting values and purposes."* (Schön 1982). This suggests the need for capabilities within technology that promote argumentation, as suggested in the analysis of sensemaking (section 3.3.2). Capabilities could also be introduced that provide a historical perspective on the action being undertaken, providing a potential for exploring previous approaches to action with the aim of causing reflection-upon-action to occur. These histories should attempt to capture the rationale for an approach and, in particular, the meaning ascribed by the individuals concerned. In order to present historical accounts infused with meaning the concept of stories is now explored.

A story serves as *"universes of meaning and values that integrate individuals into their groups, helps them make sense of everyday experiences and allows them to endure or make light of the hardships and injustices of life"* (Gabriel 2000). Stories are collective fantasy, with varying degrees of distortion, they are interpreted either from the viewpoint of an observer or a participant and so appear to be dichotomous with the "fact" storage of functionalist approaches to Knowledge Management. *"When much of the information traded in organisations is symbolically and*

emotionally impoverished, as impersonal paperwork and, increasingly data on computer monitors, stories, jokes, and gossip reintroduce a symbolically charged narrative to everyday life in organisations" (Weick 1995; Gabriel 2000). Stories are sense-making devices, presenting events not as they happened, but as people wish to believe they happened (Gabriel 2000; Gabriel 2001). While facts present information, they are devoid of interpretation, whereas stories may infuse facts with meaning, and with a notion of plot. IBM's Institute of Business Knowledge is exploring the use of narrative databases within Knowledge Management to capture and catalogue stories (Snowden 2001; DiMarco 2002). Yet the capturing and cataloguing of stories fails to appreciate the living and emergent nature apparent in telling stories (Gabriel 2000).

IBM are undertaking research which explores whether technology may support collective storytelling (McKenna 2000; Snowden 2001; DiMarco 2002). By providing capabilities which engender the co-creation and sharing of stories individual users will benefit in a number of ways. From their nature stories are accounts of history, distorted to highlight the important elements and infused with meaning and plot (Gabriel 2001), this lack of objectification means that individuals cannot see stories as "plans of action" to be followed, but rather as metaphor and simile to the problems they identify – they lead people to reflect on their purposeful action. This may, through conversation with others, lead to an increased sense of reflection-in-action. Additionally such stories will engender a sense of community among the participants with the system. The inclusion of people, plot, and narrative will heighten this sense of community.

3.3.4 Technology in support of community

In order to put the practices discussed in the previous sections into use as part of a Knowledge Management intervention there is a need to focus upon particular groups of individuals within the organisation. Storytelling, reflection, learning and action occur within a socially mediated context. Identifying groups and focusing the Knowledge Management initiative towards those individuals is a necessary approach; however identification of such groups can prove problematic if the form of the community is unrecognizable within the present structures (Wenger, McDermott et al. 2002). An organisation's hierarchy identifies structures, such as "middle

managers" and "the finance department". Although these structures can categorise people, they are problematic for Knowledge Management as they lead to assumptions of shared practice. Titles, roles, departments and lines of command do not necessarily represent the activity faced, or the learning and knowledge required. There is a need to identify structures which bypass such imposed configurations developing social structures which better represent the purposeful activity of groups, and their potential for knowledge sharing. "Communities of practice" are regularly considered as such structures (Brown and Duguid 1991; Orr 1996; Wenger 1998; Wenger, McDermott et al. 2002).

While a large amount of literature has focused upon "communities of practice" as effective knowledge sharing structures (Pan and Leidner 2003), engendering such communities is problematic (Wenger and Snyder 2000; Hayes and Walsham 2001; Wenger, McDermott et al. 2002), requiring evolution over time, and a rich appreciation of the functioning of the community. *"A good deal of new technology attends primarily to individuals and the explicit information that passes between them. To support the flow of knowledge, within or between communities and organizations, this focus must expand to encompass communities and the full richness of communication. Successful devices such as the telephone and the fax, like the book and newspaper before them, spread rapidly not simply because they carried information to individuals, but because they were easily embedded in communities"* (Brown and Duguid. 1998). This study focuses upon a global organisation in which the capabilities of a Knowledge Management system may be the only effective mechanism for engendering a sense of community for individuals who may not physically meet.

The requirement for technology within this study is based on the organisation's desire to improve. The organisation has defined groups (which it terms communities) of strategic importance which it believes would benefit from approaches based on Knowledge Management. So, it is necessary to consider the capabilities of technology that may either support an existent community, or engender the creation of a community.

In order for a community to exist there must be an effective social structure and repertoire of communication possibilities. In such a situation a technology to support the community would simply add to this repertoire of potential substitute conversational options. The capabilities of this new technology must provide improvement if they are to be used. Without technology for Knowledge Management a pre-existent community will continue to exist. However in situations where the repertoire of communication is deficient, and community tends to be organised around friendship lines or within local geographical or organisational contexts (Wenger, McDermott et al. 2002) the opportunity for improvement is greater. Within widely distributed organisations with complex hierarchies this focus on locality or friendship is likely to be evident. It may be possible that a technology for Knowledge Management engenders a community which then relies on the system to maintain its existence. In engendering such communities seven principles have been suggested (Wenger, McDermott et al. 2002). Applying these principles to technology suggests the following desirable capabilities:

- The technology should be able to evolve alongside the evolution of the community, rather than creating a community from scratch and should catalyse existent aspects of community built on personal networks. The technology should not impose structure and should enable others to be introduced to the community.
- The technology should enable the community to open a dialogue between inside and outsider perspectives – outsiders to the community should not dictate the issues of interest or topics to focus upon – these should be owned by the members. Information and experience from outside the community should be presented, yet insiders should take responsibility for the form of such presentation.
- The technology should invite different levels of participation. An individual's participation in the activities of the community should not be dictated; while some individuals may take coordination roles, active participation with the community should not be a requirement. A large number of members may be peripheral, taking only a limited part. This suggests a technology which affords different levels of engagement and allows those outside the community to participate in peripheral activity. A capability to isolate areas of dialogue is suggested.

- The technology should develop both public and private community spaces. The community should have a public space which invites membership or displays outputs from the community, and a private dimension in which the community may coordinate their activity and organise discussion in safety.
- The technology should combine familiarity and excitement. The structure of the technology should remain relatively consistent, while the activity or information is current, relevant and interesting
- The technology should create a rhythm for the community. The tempo of interaction, and thus the use of the technology is dictated by the rhythm of the community. Milestones, ongoing events and regular action dictate such rhythm, and thus affect the community's development. (Wenger, McDermott et al. 2002). The technology should support such rhythm through regular change in line with the development of the community. If the technology is successfully integrated into the community, the community should dictate and feel comfortable with the rate of development.

3.4 Conclusions: The application of technology within this study

This chapter has introduced various approaches to the use of technology within a Knowledge Management change initiative. In particular emphasis has been placed on the potential of technology to support a constructivist notion of knowledge which encompasses social dimensions, derived from sensemaking and "communities of practice". While it has been argued that IT solutions in Knowledge Management are focused on the management of explicit knowledge (Alvesson and Kärreman 2001), and that IT technology is incapable of capturing knowledge (Galliers and Newell 2001), technology remains an important artefact in our social world. This chapter has presented a number of approaches to the design of technology for Knowledge Management, and explored approaches to configuring and designing technology for Knowledge Management. This discussion has highlighted a need to effectively appreciate the human activity individuals undertake, and the context within which this activity takes place.

The next chapter outlines the research methodology employed within this study. As this study employs action research, such methods are used as both research enquiry methods, and problem contextualisation tool. Thus the research methods presented are used to appreciate the problem context within which the technology is to be used, and thus to configure and tailor the capabilities of the technology for the user community. This process of configuration and tailoring form the basis of the intervention exercise and are explored in detail.

CHAPTER 4 RESEARCH METHODS

"Without changing our pattern of thought, we will not be able to solve the problems we created with our current pattern of thought" (Albert Einstein)

4.1 Introduction

Within Chapter 1 the area of concern for this study was introduced. The area of concern is the interaction between technology conceived for use in Knowledge Management programmes and human purposeful action. Within chapter 2 the study's adopted stance towards the issues of Knowledge Management has been described, and the role of technology in supporting intervention through Knowledge Management has been discussed in Chapter 3 .

These previous chapters have described the contested nature of the Knowledge Management debate. They describe the underlying misrepresentation of the concept of knowledge and explore a framework based on the work of Burrell and Morgan in order to locate the relevant literature within the broader debates within information systems. Drawing on these previous chapters this chapter presents an ontological basis for the study which is coherent with the adopted stance towards Knowledge Management and from this derives the epistemological approach for the study.

From this epistemological stance a methodological framework is developed which is used within the action research intervention within the British Council to plan and undertake action.

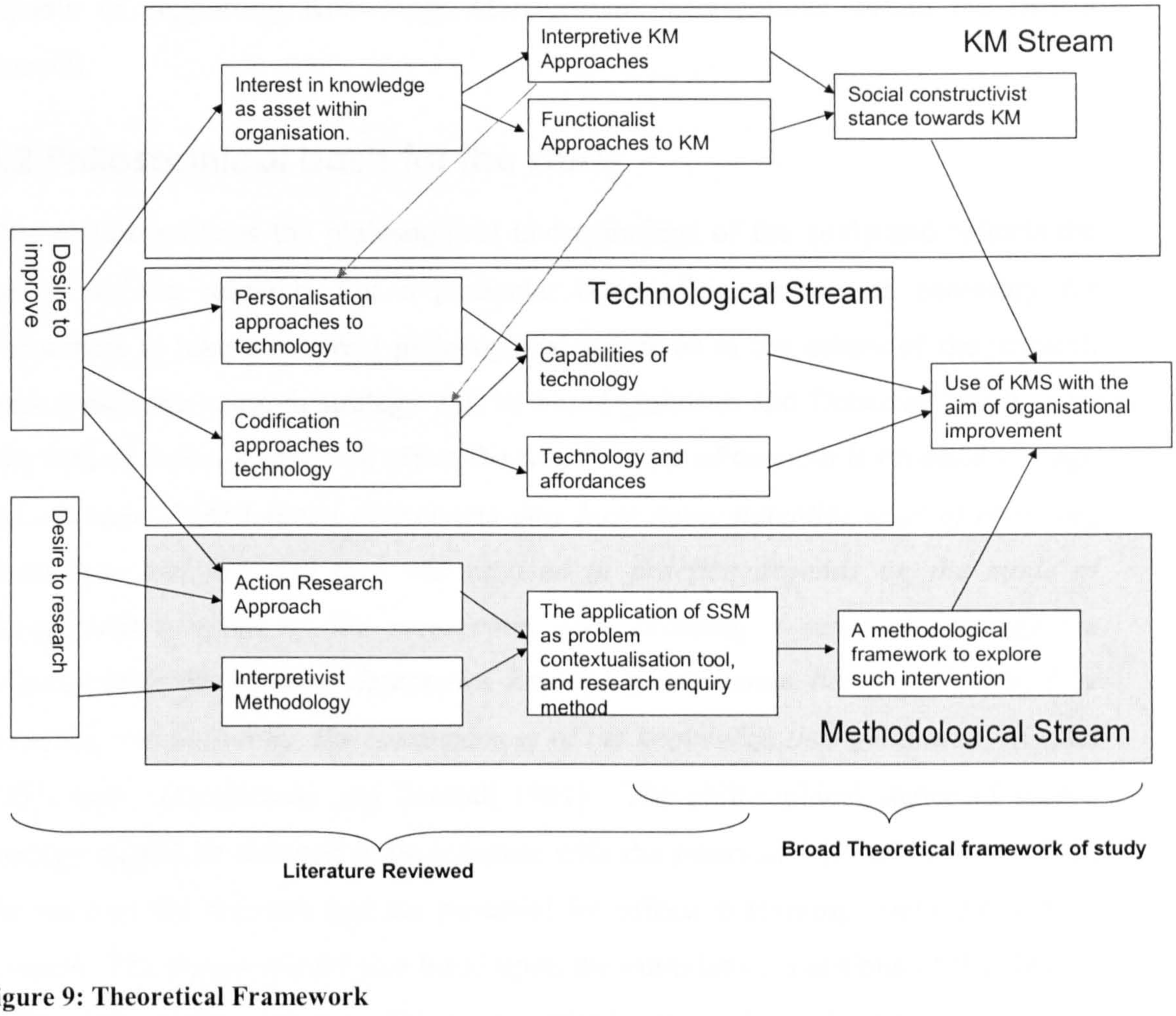

Figure 9: Theoretical Framework

The methodological vision of the theoretical framework is described in a number of stages (See figure 9). Firstly the philosophical background to the study is explored (section 4.2), identifying the ontological basis of the research exercise (section 4.2). An epistemological basis for the study is considered (section 4.3) which is consistent with this ontology. A methodological approach, consistent with such ontology and epistemology, is then discussed (section 4.4) in relation to the problem domain. The area of concern of this study may be considered to reside within the field of information systems, as such the described methodology is considered in terms of its use in this field. Methods by which understanding may be reached are then discussed (section 4.6) such that the nature of the research activity may be presented.

In contrast to non-participative research methodologies, the aim of this chapter is both to identify the basis for learning from the research and to plan a coherent approach to action. The researcher thus required a methodological approach that was

capable of supporting Knowledge Management interventions within the British Council.

4.2 Philosophical basis for the study

This section outlines the philosophical underpinnings of the study and reflects the "spirit" of the research. For a particular body of research it is necessary for researchers to take a coherent philosophical stance as to the nature of the research upon which the research strategy will be based (Johnson and Duberley 2000). The adoption of such a stance will affect the way the area of concern is revealed through the research: *"[A]ll social phenomena may have many potential ways of revealing themselves and the way they are realised in practice depends on the mode of engagement adopted by the researcher...[I]n choosing a research strategy the scientist in large measure determines how the phenomenon being studied will be revealed, and indirectly, the consequences of the knowledge thus generated"* (Godel 1962) from (Orlikowski and Baroudi 1991). The philosophical stance of such a strategy should be selected to be coherent with the personal style of the researcher, the aims of the research and the potential for effective learning about the area of concern. The stance should also build upon the cumulative traditions of the field of study –information systems. The choice of this stance determines the approach to rigour and the relevance of the study, a key issue within information systems research (Applegate 1999). This choice will also affect the results of the research and, subsequently, their credibility to the target audience (Trauth and O'Connor 1990).

The adoption of a philosophical stance is a response to the nature of a study. This study considers the social reality of the British Council, including the domain of human action, as socially constructed by human actors (Chapter 1). The researcher's early experience of serving in the British Council's Knowledge Strategy Group (see section 5.6) exhibited the messy complex situation faced. These discussions highlighted the problematic nature of the organisations knowledge-sharing programme. It is thus suggested that no objective reality of knowledge sharing exists within the British Council. The area of concern assumes and acknowledges the social construction of facts. As the essence of the phenomenon under study is the product of individual consciousness the philosophical approach to ontology is

nominalistic; that reality is a product of minds with no independent status, therefore denying the Platonic and realist notions of the existence of abstract entities (Loux 2000); *"There is nothing universal but names, and without words we could not conceive any general ideas. Without language there would be no truth or falsehood, for true and false are attributes of speech"* ((Russell 1961) quoting Hobbe's Leviathan). The study rejects realist based perspectives because they seek to identify a single given reality for the area of concern, rather than viewing such a reality as a social construction in which people create and associate their own subjective and intersubjective meaning as they interact with the world around them (Orlikowski and Baroudi 1991).

Such a nominalistic ontology is consistent with the sociological nature of the object of study, the studies exploration of structure within social interaction, and the researcher's sociological perspective towards issues of Knowledge Management. In researching such a socially constructed reality, theories are simply ways of making sense of the world and shared meanings are forms of intersubjectivity rather than objectivity (Checkland and Holwell 1998) from (Walsham 1993).

Such an ontology *"recognises that knowledge about human means and ends is not easily obtained because reality is exceedingly complex and elusive"* (Hirschheim and Klein 1989) and considers that "*there is no single reality, only different perceptions about it. Business does not deal with an objective economic reality, but one that evolves through changing traditions"* (Hirschheim and Klein 1989).

4.3 Research Epistemology

Having identified the broad philosophical basis of this study as grounded in nominalism, it is necessary to identify a basis upon which a claim to knowledge may be argued. Such an epistemology should be both consistent with and relevant to the identified ontology, and furthermore, consistent with and relevant to the purpose of the study.

This study uses a framework that was developed by Burrell and Morgan (Burrell and Morgan 1979) in order to provide a paradigmatic analysis of epistemology within the social sciences. The concepts of this framework have been used in the field of

information systems to analyse information systems development (Hirschheim and Klein 1989).

The framework of Burrell and Morgan uses two dimensions: "*It has been suggested that assumptions about the nature of science can be thought of in terms of what we call the subjective-objective dimension, and assumptions about the nature of society in terms of a regulation – radical change dimension*" (Burrell and Morgan 1979). Burrell and Morgan apply the notion of paradigm (drawing on (Kuhn 1996)) in a very broad sense to refer to mutually exclusive social constructions. Their central study is shown in Figure 10, a matrix of four paradigms that may be used to understand social theory (and in particular their study of organisations). The axes of this matrix are based on different meta-theoretical assumptions about the nature of social science and the nature of society. They argue that all social science theory will make explicit (or implicit) assumptions along these dimensions and they assert that all social science research is represented within these paradigms (Johnson and Duberley 2000).

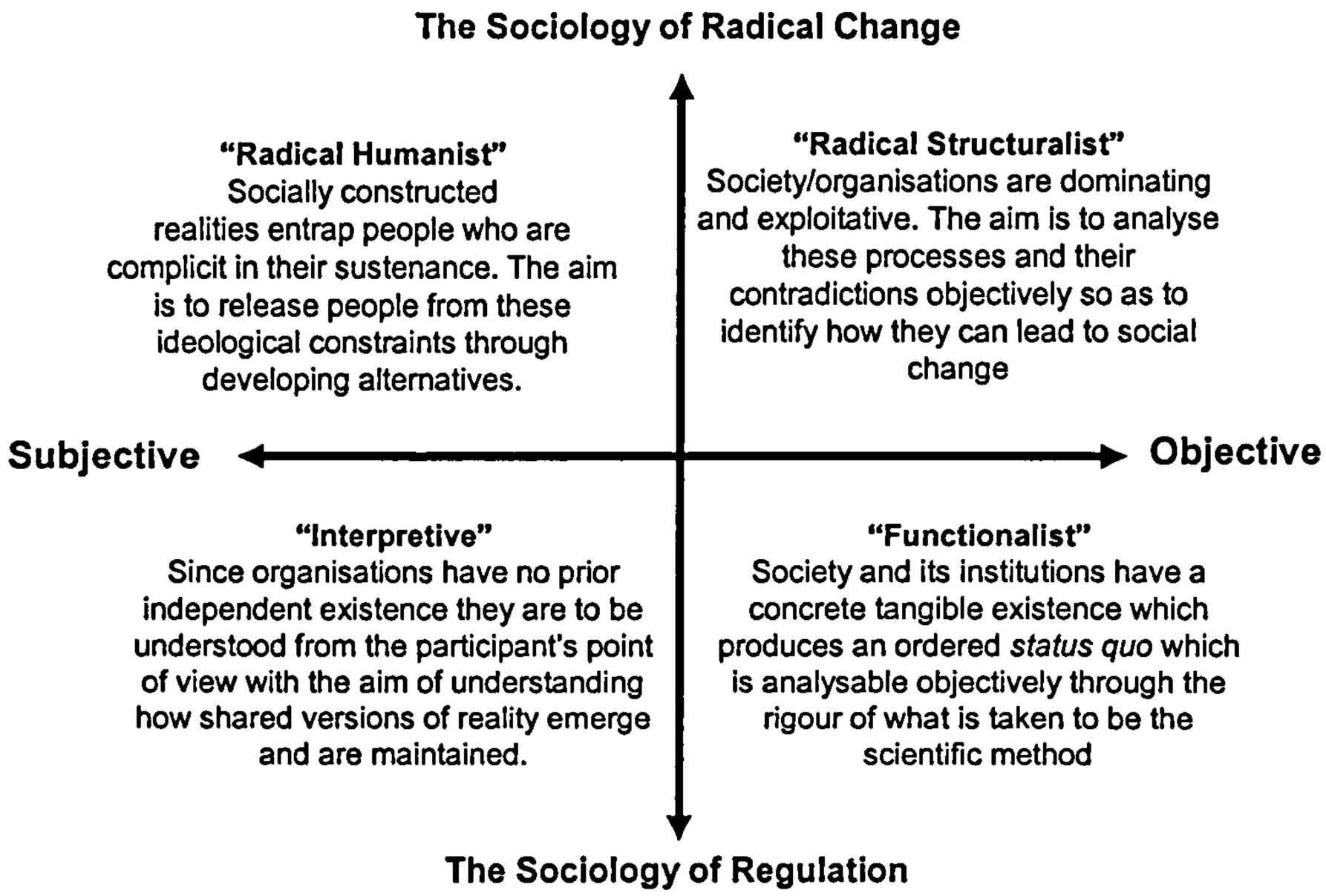

Figure 10: Four Paradigms for the analysis of social theory, showing the two dimensions identified in Burrell and Morgan's theory (combination of (Johnson and Duberley 2000) and (Burrell and Morgan 1979)).

The four paradigms (Figure 10) should be viewed as contiguous but separate. They define the *modus operandi*, the epistemological commitment of a researcher. This is not to imply a complete unity of thought, but rather a set of underlying, taken for granted, assumptions which define groups of theorists at a fundamental level. To be located within a particular paradigm is to view the world in a particular way for the purpose of a study. This matrix provides "*a convenient way of locating one's own personal frame of reference with regard to social theory, and thus a means of understanding why certain theories and perspectives may have more personal appeal than others...it provides a tool for establishing where you are, where you have been and where it is possible to go in the future*" (Burrell and Morgan 1979).

The horizontal axis constituted by social science meta-theory, expressed in the assumption about the nature of the social world and how it may be studied. This axis represents the choice between the incommensurable alternatives of subjective and objective meta-theory concerning ontology, epistemology, human nature and

methodology (see Figure 11) (Burrell and Morgan 1979; Johnson and Duberley 2000). Burrell and Morgan argue that acceptance of one denies the alternatives.

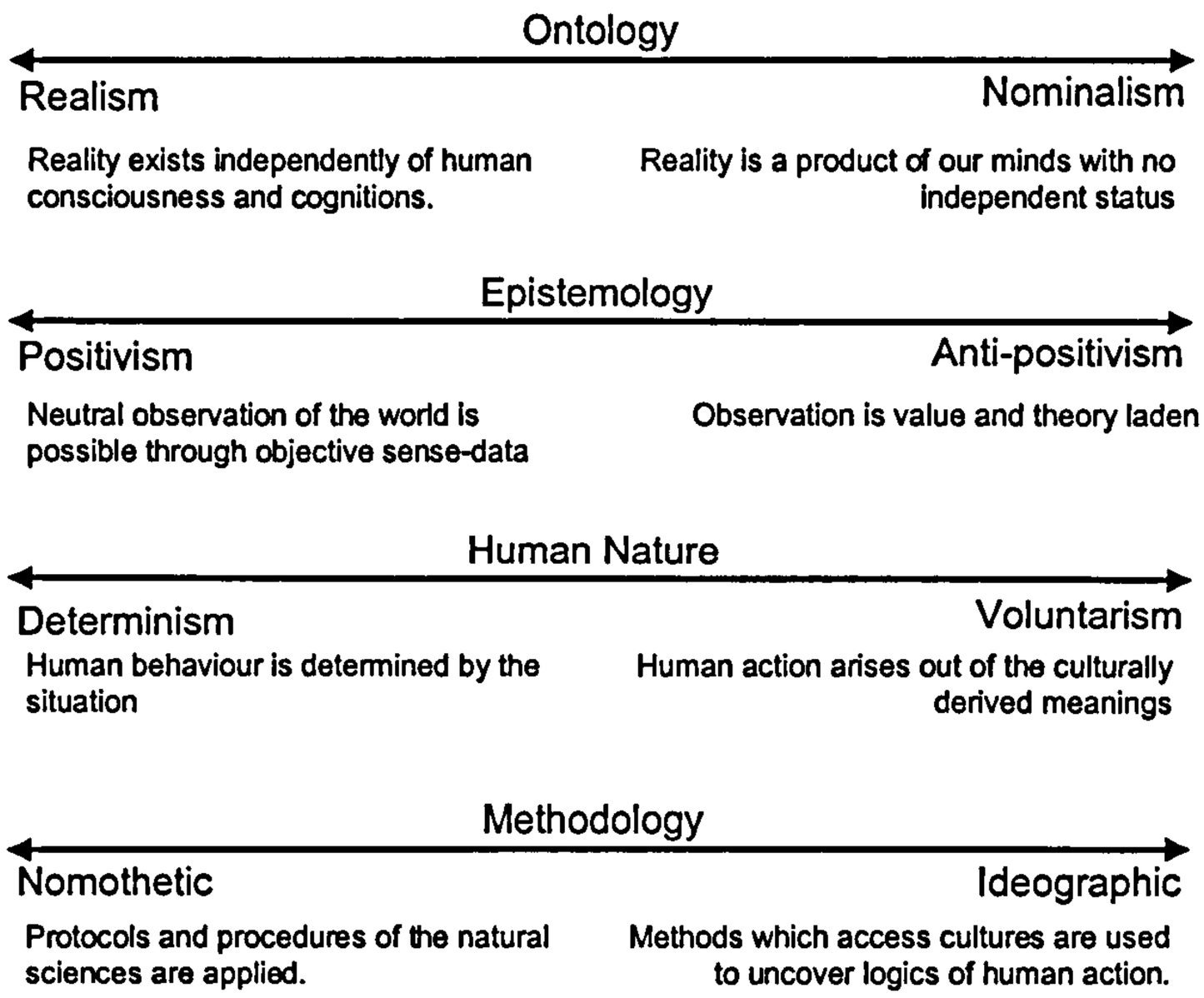

Figure 11: Burrell and Morgan's meta-theoretical assumptions about the nature of social science (Burrell and Morgan 1979).

This study's stance towards Knowledge Management (see section 2.6) ascribes to the nominalist perception of organisational reality, arguing that knowledge is socially constructed, and that the creation of knowledge lies through value and theory laden approaches, derived within the culture and meaning of the organisational context. It would thus be inconsistent to adopt an objectivist ontology for the study. Only subjectivism provides the epistemology relevant to such an adopted stance.

Having identified the study as within subjectivist meta-theory, it becomes apparent through the framework of Burrell and Morgan (Figure 10) that for coherence the underlying social theory of the research should be within either an interpretivist or radical humanist paradigm.

In identifying between the interpretivist and radical humanist paradigms and thus the approach adopted towards the nature of society, it is necessary to return to the study's theoretical framework. The theoretical framework focuses upon intervention to improve the existing organisational processes of the British Council. The research aims to support or improve the existing *status quo* of the British Council through improvement in its Knowledge Management programme. The research is thus inconsistent with the radical humanist paradigm designed to critique the *status quo* through a focus upon the *"ideological superstructures which ...drive a cognitive wedge between [individuals] and true consciousness"* (Burrell and Morgan 1979).

Within the field of information systems the emancipatory perspective of radical humanism may be seen to be taken by those adopting a critical stance towards subjectivist social research (for example (Ngwenyama and Lee 1998)). Such studies involve social critique, allowing restrictive and alienating conditions of the *status quo* to be brought to light (Klein and Myers 1999). Such a critical research perspective (Habermas 1972) would imply criticism of the dominant mode, suggesting an aim of emancipation through research. Emancipatory aims are not a feature of this study as it aims to support and enhance an existent Knowledge Management change programme within the British Council. This study is therefore located within the interpretivist paradigm.

Interpretivist studies draw upon hermeneutic and phenomenological study, in which events are understood through the meanings people place upon them (Boland 1985, 1991, Deetz 1996 from (Klein and Myers 1999) and (Orlikowski and Baroudi 1991)). Interpretivist epistemological perspectives draw upon Kant's notion that one can only infer causality *"though all our knowledge begins with experience, it does not follow that it all arises out of experience"* (Kant 1965). In adopting such an interpretivist paradigm the study rejects the use of positivistic methods which *"posits beliefs (emerging from the search for regularity and causal relationships) and scrutinises them through empirical testing"* (Hirschheim 1992). *"IS research can be classified as interpretive if it is assumed that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools and other artefacts. Interpretive research does not predefine dependant and independent variables, but focuses on the complexity of human sense*

making as the situation emerges; it attempts to understand phenomena through the meanings that people assign to them" (Klein and Myers 1999).

Positivism is the dominant epistemological foundation of western science and has been argued to be so ingrained in western thought that it is virtually impossible to distinguish from common sense (Johnson and Duberley 2000). Having rejected positivism as the epistemic foundation of enquiry for this study, it is necessary to present reasons for the rejection of the underlying demands of a positivistic rationale. Peter Checkland identified these demands as repeatability, reductionism and refutability (Checkland and Holwell 1998). Each of these issues is complex and an analysis of the rejection of each could be very large. This study provides a short consideration of each.

Within a positivistic methodology, reductionism is employed to isolate the specific part of the area of concern necessary for the experiment. Other factors are removed from the research as they are considered independent or relatively insignificant. Within this study's interpretive approach the use of such reductionism is challenged. The social reality of the British Council is considered to be messy and complex such that isolation of factors would change the environment and thus affect the study. The study attempts to understand the externalities and context of the research and this holistic approach provides the background to understanding.

Positivistic research requires that experiments be capable of repetition and that a single challenging case disproves a theory. Such a notion is incoherent with study of the British Council as it is relatively unique in nature and under significant change during the period of this research. Furthermore the research's associated intervention aims to change the organisational context – to lead to improvement; repetition would thus be impossible.

In order to approach refutability there is a requirement for a statement or theory which may be disproved (Pearsall 1998). However this study does not aim for generalisation, but rather to present a coherent plausible story of understanding. It is thus appropriate to adopt an epistemology which challenges the nature of reductionism, repetition and refutability (Galliers 1991). The study thus employs a

post-positivistic methodology which attempts to provide rigour through method rather than imposing rigour upon the world. As Sir Geoffrey Vickers outlined, in order to gain an understanding of human affairs within organisations, there is a need to reject the goal seeking model of human behaviour as it is too poverty-stricken to match the richness of life as we experience it (Checkland 1981).

4.4 Research methodology

When taking an interpretivist stance, the process of research and the scholarly knowledge which forms the outcome of the research are both seen to be socially constructed. *"Research is not an entity that has an existence independent of knowing subjects; research is a human creation and social activity"* (Lee 1999). Hence, it is necessary to adopt a research methodology[16] that is capable of addressing the socially constructed nature of the research problem and that can reflect upon the socially constructed nature of the research exercise. In order to be coherent with an interpretivist epistemology, the methodology adopted should be grounded in the ideographic approach rather than the nomographic approach. That is to say, the methods employed are aimed at uncovering the internal logic that underpins human action through exploring culture.

The study accepts the assertion that there is no singular correct method of knowledge discovery, but many appropriate methods (Hirschheim 1992). Kuhn argues that: *"The pull towards a single methodological perspective, with its clearly defined tools, needs to be resisted because this single perspective designed for research in the "normal science", overlooks the anomalous quality of human experience. The difficulty for human science arises not from the need to change from one paradigm to another but the need to resist settling down to any single paradigm"* (Kuhn 1996). Subsequently this study does not argue that either the tools of positivism or interpretivism are *correct* for research within organisations, but rather that in the

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[16] Within the field of information systems *"the term 'methodology' is pragmatically well established... to mean the same as 'method'"* (Jayaratna p.35 1996). However in order to provide a description of this thesis' relationship between methodology and method, the term is used to describe the underlying theory of method, that is, the approach to research method.

particular case of *this* study, the approaches adopted are appropriate in form. The assumption that quantitative methods should only be used for positivistic research, and conversely, that interpretive research should only employ qualitative methods is a fallacy (Nandhakumar and Jones 1997). This study abandons the mindset that a single suitable methodology is all that is required, rather approaching the problèmatique through a belief that elements of method and methodology are employed and used as and when necessary (Introna and Whitley 1997). However such employed methods must be consistent with the philosophical approach and the theoretical framework of the study.

An interpretivist viewpoint acknowledges that a researcher will have an effect upon the research setting and analysis. As the researcher attempts to understand what is observed their personal understanding will invade the recording of the observation and the deductions that follow (Kant 1965; Baskerville 1999). In undertaking interpretivist research within a social setting, the aim can be to either reduce (but not remove) the intrusion of the researcher (for example ethnographic methods (Hammersley and Atkinson 1995)) or to embrace this intrusion as a core part of the research process. The research within this study takes a participatory approach as the nature of the research process is an intervention. This approach embraces the researcher's place within the research process making it possible to incorporate *"the observer's values and* a priori *knowledge that invariably intrudes upon the observation"* (Baskerville 1999).

Bearing these ideas in mind, action research was chosen as an appropriate approach for this research. This appropriateness may be demonstrated by reference to an information systems taxonomy of methods (Galliers 1992) adapted from (Galliers 1987) (see Figure 12). Galliers' taxonomy is used only as a guide, outlining the choices of adopted approach, rather than as a prescriptive method to suggest the "right approach" (Galliers 1992). This taxonomy is not employed to identify or discuss the epistemological basis of the study, but simply to describe the appropriateness of the adopted approach to interpretivist research.

Modes for newer post-positivist approaches (interpretations)

	Forecasting and Futures Research	Simulation and Game/role playing	Subjective/argumentative	Descriptive/Interpretive (inc. Reviews)	Action Research
Society	Yes	Possibly	Yes	Yes	Possibly
Organisational /group	Yes	Yes	Yes	Yes	Yes
Individual	Possibly	Yes	Yes	Yes	Possibly
Technology	Yes	Yes	Possibly	Possibly	No
Methodology	No	Yes	Yes	Yes	Yes

Figure 12: A taxonomy of information systems research approaches. Amended from Galliers and Land 1987; Galliers 1991 to show only the post-positivist approaches.

In order to avoid incorrectly comparing Burrell and Morgan's objectivist-subjectivist dimension, with Galliers' taxonomy's scientific and interpretivist distinction, only the post-positivist categorisations of Galliers framework are considered. This taxonomy identifies approaches to research through a differentiation between the object of study and the mode of approach employed to carry out the study.

The taxonomy suggests that action research is appropriate to this study's focus on organisational and individual socio-technical factors with particular focus on methodological frameworks for such socio-technical intervention. *"Action research is one of the few valid research approaches that we can legitimately employ to study the effects of specific alterations in information systems development methodologies in human organisations"* (Baskerville 1999) of (Baskerville and Wood-Harper 1996). It is appreciated that the taxonomy outlines other potentially appropriate approaches; however for the purpose of this study action research was selected.

4.5 The Research Approach: Action Research

Action research is an approach to study founded upon the premise that action brings about understanding and further that the social setting is irreducible (Checkland and

Holwell 1998; Baskerville 1999). These key assumptions of action research are appropriate to this study in which interpretivist methodological approaches such as idiographic study and the exploration of qualitative data are employed.

Identifying a single coherent definition of action research is problematic (Checkland 1981); "*There probably are as many definitions of action research as there are authors on the subject*" (Jönnson 1991). It has been suggested that the term action research was first used by members of the London Tavistock Institute in the early 1950s in their attempts to change industrial practice through research and therapy (Mumford 2001). Since this time several streams of action research with different emphases have been reported (Rapoport 1970; Hult and Lennung 1978; Reason 1993). This study employs the frequently cited definition of Hult and Lennung (1978) which asserts that "*action research assists in practice problem solving, expands scientific knowledge, enhances actor competencies, is performed collaboratively in an immediate situation, uses data feedback in cyclical process, aims at an increased understanding of a given social situation, is applicable for the understanding of change processes in social systems and is undertaken within a mutually acceptable ethical framework*" (Hult and Lennung 1978).

Action research is applicable to the understanding of change processes in social systems (Baskerville 1999). In particular, action research is appropriate to the study of the impact of the introduction of technology within such social systems; "*The primary laboratory for information systems research is the organisation, where the development and use of technical artefacts can be studied in-context*" (Ehn, Meggerle et al. 1995). The introduction of Knowledge Management technology within a complex organisational context is a highly applied subject of study, Baskerville and Wood-Harper (Baskerville and Wood-Harper 1996) suggest that such highly applied fields, with strong vocational elements require an approach which mixes theory and practice in order to produce usable and relevant knowledge of which action research is an example (Baskerville and Wood-Harper 1996; Lau 1999). "*With the increasingly complex role of information technology as a key enabler of social change that can lead to new forms of practices, organisations and communities, the use of an action-oriented methodology should improve our*

understanding of such social phenomena through "doing" and learning through "experience"" (Lau 1999).

Action research requires the building of theory and description within the context of practice itself (Braa and Vidgen 1999). Such theories are then tested through intervention within the *"organisational laboratory"* (Braa and Vidgen 1996) that is, in the case of this study, the British Council. This researcher was participant within interventions and observant of the outcomes (Baskerville and Wood-Harper 1998). *"[Action research] is a protest against the separation of thought and action"* (Blum 1955). This approach to the study of intervention identifies the multivariable nature of social interaction as requiring interpretation within a social context. *"Action research is a method that could be described as a paragon of the post-positivist research methods. It is empirical, yet interpretive. It is experimental, yet multivariable. It is observational, yet interventionist. Enticingly, the research subjects are often quite willing to pay the cost of being studied, especially since they may influence the outcomes of the project. To an arch positivist it should seem very unscientific. To the post-positivist, it seems ideal"* (Baskerville and Wood-Harper 1996).

It is necessary to provide a methodological structure to the action research intervention through an approach to research. *"If descriptions of action research were to be more than merely anecdotal accounts of what had happened it seemed an essential requirement that the researcher declare in advance the intellectual framework within which knowledge in the research situation will be defined. In other words, the research must set out the epistemology in terms of which research findings will be expressed"* (Checkland 1995). Having previously outlined this study's epistemology, the following section outlines the study's use of Soft Systems Methodology for researching and expressing the research findings.

4.6 A Soft Systems Approach within Action Research

In considering an enquiry for this study it is necessary to consider the nature of research in general. Any piece of research has four essential elements, shown in Figure 13 (Checkland and Holwell 1998): a framework of linked ideas, a

methodology for exploring these ideas, a context within which such exploration occurs, and an approach to learning.

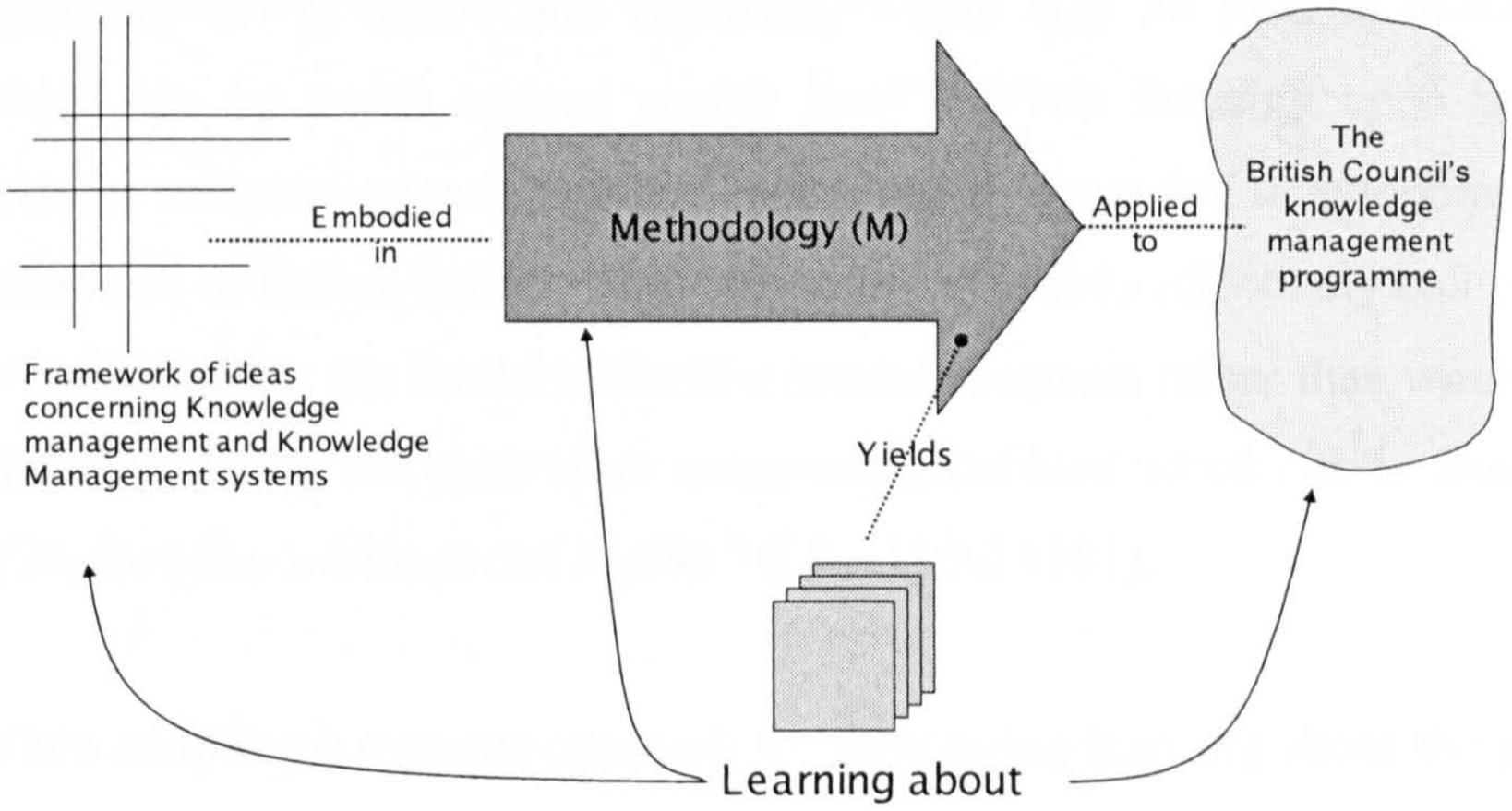

Figure 13: The nature of research (from Checkland 1981) as adopted for this study.

Within this study the framework of ideas concerns the use of technology within a Knowledge Management intervention (see section 1.4). This framework of ideas is applied within the context of the British Council's Knowledge Management programme. Interpretivist approaches to learning and methodology were selected, with action research forming the basis for the research exercise. Action research requires intervention within a context in order that learning may occur. There is thus a need for a methodological approach to structure the intervention, and the learning about such intervention.

The area of concern of this study relates to unstructured messy problems (Ackoff 1974). In order to explore such a problèmatique it is necessary to gain structure through the enquiry method, rather than attempting to seek structure within the world. The world is complex and interacting and the best we can do is to employ systemicity in our approach, rather than imposing such systemicity upon the world (Checkland 1981). This study asserts that systemicity is not existent within the world (as may be considered in objectivist approaches to systems thinking – so called

hard systems thinking), but rather systemicity is shifted to the process of enquiry into the world (Checkland and Scholes 1990).

Within this study such systemicity is explored through the identification of systems of purposeful human activity. Systems thinking is used to explore these notions of human activity systems (Checkland 1981). Such systems concepts *"constitute one particular set of intellectual constructs which may be used to make descriptions which can be tested against reality itself".* When focusing upon human activity systems such testing may produce anomalous findings due to autonomous real-world behaviour of human beings. Thus we cannot expect to effectively compare the model to reality; rather the model remains a mental construct rather than would-be accounts of reality. *"They are tools of an epistemological kind which can be used in a process of exploration within social reality"* (Checkland 1981).

When adopting a systems approach for structuring learning about the problèmatique the identified methodology should be appropriate to the application of systems concepts to a messy social situation and to organisational improvement. Within this study Soft Systems Methodology (SSM) is adopted as this method. Soft systems methodology may be considered as a structured process of enquiry which has been neatly summarised thus: "*SSM is a methodology that aims to bring about improvement in areas of social concern by activating in the people involved in the situation a learning cycle which is ideally never-ending. The learning takes place through the interactive process of using systems concepts to reflect upon and debate perceptions of the real world, taking action in the real world, and again reflecting on the happenings using systems concepts. The reflection and debate is structured by a number of systemic models. These are conceived as holistic ideas types [relevant to] certain aspects of the problem situation rather than as accounts of it. It is taken as given that no objective and complete account of a problem situation can be provided"* (Bulow 1989) (addition between brackets made in (Checkland 1995)).

The method is highly suited to action research as it was developed through a series of action research studies and incorporates action research within its approach. The method is interpretivist in nature (Holwell 2000) and therefore not inconsistent with this study. The methodology adopted for this study should be capable of supporting

intervention and development, however most methods of requirements analysis are objectivist rather than subjectivist, and unitary rather than pluralist. It has been argued that soft systems approaches, including SSM, are the only approaches which are subjective and pluralist (Galliers and Swan 2000). This study argues that Knowledge Management systems are socially constructed and pluralist (Galliers and Swan 2000) and thus that SSM is particularly appropriate to the study of the introduction of Knowledge Management systems.

4.6.1 Soft Systems Methodology

This study employs SSM as a research enquiry method within the action research intervention, and also as a problem contextualisation tool in order to make sense of the context within which the intervention occurs. *"If SSM is used reflexively rather than just as a tool, it enables approaches to the production of knowledge about ourselves and our research process that would otherwise be unreachable providing we pay continuing attention to the analysis of the intervention, the social system and the political system"* (Checkland and Holwell 1998).

Checkland expands upon the model of research presented in Figure 13 by describing action research as a cycle of activity. The progression from fuzziness to clarity is the essence of the spirals of action research cycles (Gummesson 2000). Within SSM such spirals of actions within a real world problematic situation are reflected upon in a systematic way (Checkland and Scholes 1990). It is this process of reflection upon the research themes which provides the findings of a study. In approaching the area of concern, SSM suggests the building of holons that are systemic in nature. These holons are *"entities which are wholes at one level of a hierarchy while simultaneously being parts of higher level entities"* (Checkland 1981). These holons are models relevant to the debate about the area of concern, and simply stimulate, feed and structure that debate (Checkland 1999).

The use made of SSM within this study is highly linked to the approaches and conceptions of the action researcher: *"Any methodology, which is, as the word indicates, the logos of a method rather than simply a method of technique, is not independent of its users"* (Checkland and Haynes 1994). Hence this study's use of

SSM will be in some way unique, and reflections on the use of the methodology are subjectivist interpretations.

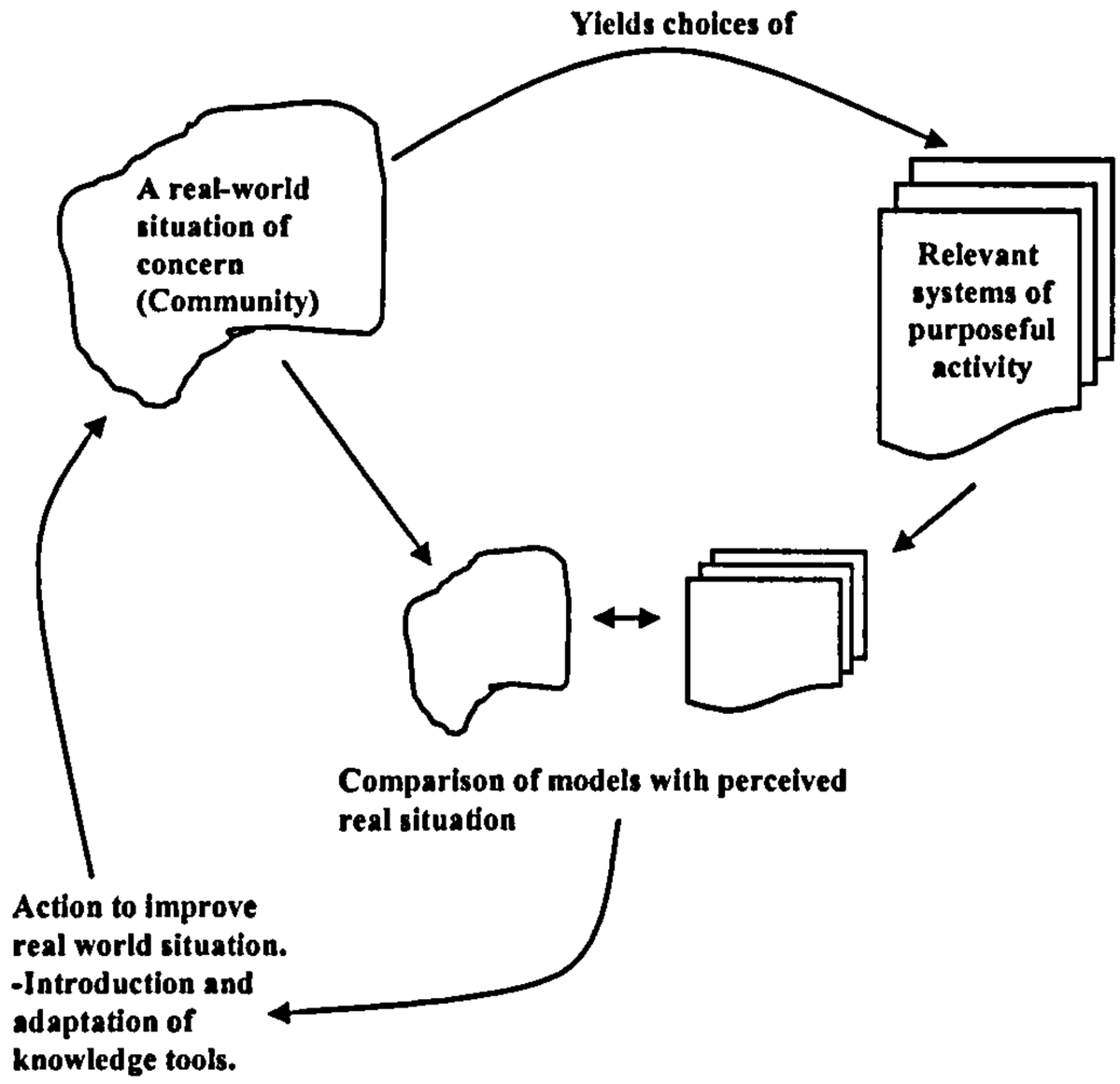

Figure 14: The shape of SSM use within this study (Checkland 1994).

Figure 14 outlines the approach taken within this study for the action research (adapted from (Checkland and Haynes 1994)) and shows the role of SSM within the study. The situation of concern (the problèmatique of the British Council) is appreciated (using approaches from SSM). This provides a set of relevant systems of purposeful activity, described through the methodology. These models may then be compared with the perceived real world situation such that action aimed at improvement may be suggested. Such action is then (potentially) undertaken within the context of the problèmatique, leading to a further changed situation which may be further explored. This cyclical nature of methodology is in keeping with the cyclical nature of this action research in which learning occurs through an ongoing sequence of action and reflection. The approach to inquiry thus employed within this study is an integration of theory, action and reflection employing a methodology such that the systemicity lies in the process of enquiry.

Soft systems methodology provides structure to the process of enquiry by the provision of a variety of tools and techniques through which models of human activity systems may be constructed and compared to the problèmatique situation. The basic process of the methodology has been shown in Figure 14. The analysis aspect of this cycle has been elaborated into a richer model of soft systems methodology as an inquiring system shown in Figure 15 (Checkland and Scholes 1990).

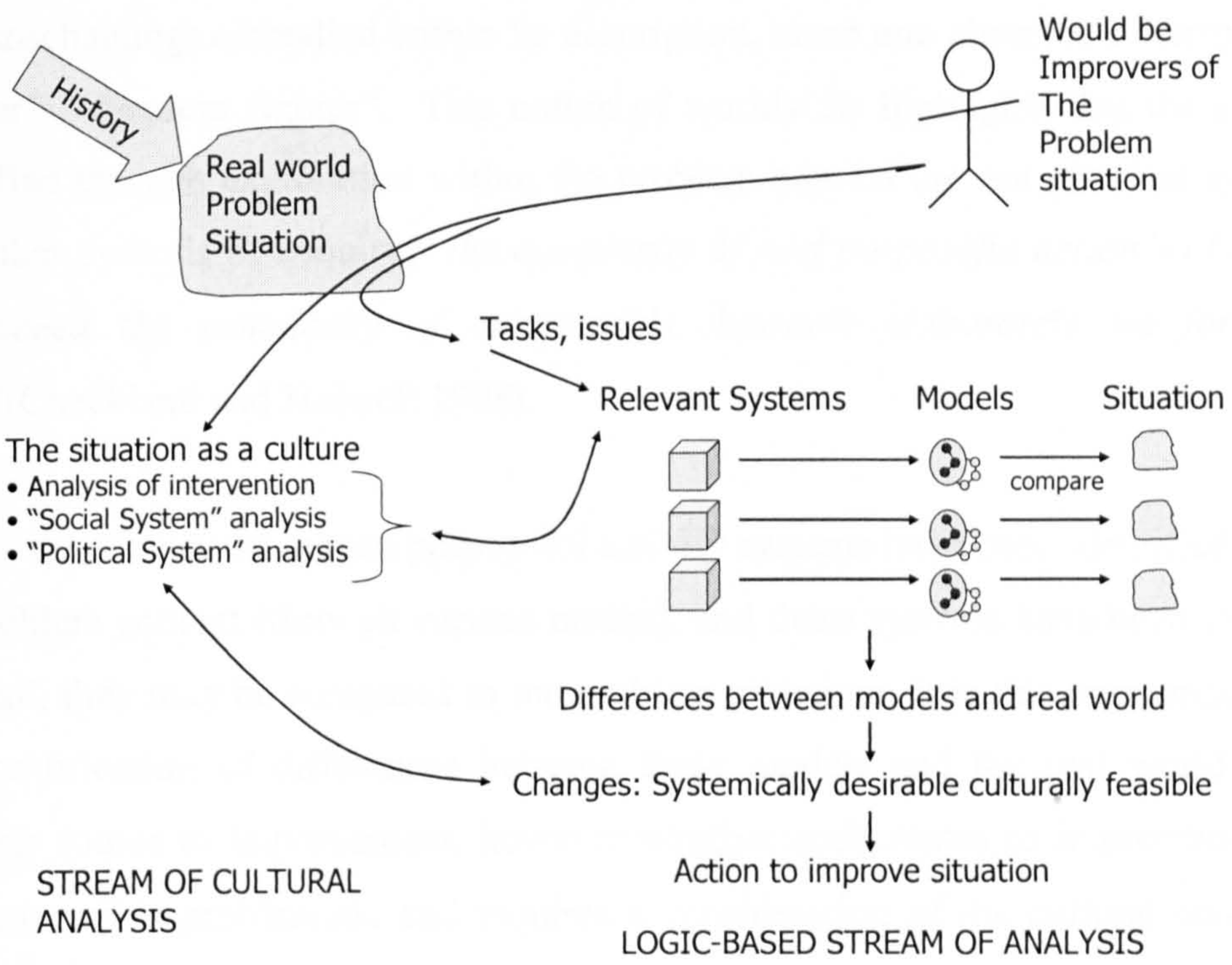

Figure 15: The process of soft systems methodology as an inquiry system (from Checkland and Scholes 1990).

Figure 15 shows that SSM focuses upon a problem situation within the real world (which is affected by a history). This problem is explored by a researcher acting to improve the problem situation. This research interacts within the problem situation in order to explore both the cultural and logical aspects of the problem. Within this study such exploration is undertaken through ethnographic methods of participant observation as part of the British Council's Knowledge Management team, and through semi-structured interviews (Hammersley and Atkinson 1995). In order to make sense of this problem situation rich pictures are drawn in an attempt to capture

and explore the problem. One of the aims of this modelling is the development of relevant systems of purposeful human activity which may be used to learn about the problematic situation.

The relevant purposeful activity systems (holons) are characterised as a whole entity identified by emergent properties, structure and processes of communication and control. SSM uses this concept of holons to treat purposeful activity as, in principle, a system type (Checkland 1981; Checkland and Scholes 1990). However, any account of purposeful systems requires a declaration of the world-view (weltanschauung) embodied within its description, since one observer's "terrorist" is another's "freedom fighter". This notion of worldview highlights that the systems identified through exploration within the problem context are not physical systems, but rather systems of enquiry; "*the complexity of real purposeful action will always far exceed the complexity of our models, however elaborately we formulate them"*(Checkland and Holwell 1998).

Once a set of relevant human purposeful activity systems have been identified within the problem context (through various means), and these systems have been explored in detail, they may be compared to the problem situation. It is this comparison, and the identification of differences between these models and the real world which suggests routes to improvement, however whether such routes to improvement are implemented is problematic and requires a consideration of the cultural context of the problematic situation by considering the aspects identified within the cultural stream of analysis.

The cycle continues when perturbation occurs within the problem context. It should be noted that such perturbation may be the result of intervention by the researcher into the problem context, or may originate from outside the research. The research in this study is located within the ongoing Knowledge Management programme of the British Council so it may be that while a proposed intervention, suggested by the SSM analysis, is systemically desirable for the context it may prove to be culturally unfeasible to implement(Checkland and Scholes 1990). Furthermore the proposed approach to improvement may not necessarily be undertaken as it suggested, rather external influence may be brought to bear upon the situation. In order to take this

into account this study does not base its conclusions or explorations upon the outcome of the intervention, but rather on the process of the intervention.

4.7 Approach to the collaborative process of action research: ethical and practical considerations

Action research involves an intervention into a real life context aimed at both improving the context and at the same time providing relevant knowledge. It is based on the tenet that providing improvement fosters involvement, co-operation and information exchange with organisational members, which leads to a deeper understanding of the context (Fox 1990; Gustavsen 1993; Kock 1997). The process of defining the research is thus a negotiated process, requiring an understanding of research and of organisations. Furthermore there is a need to consider in detail the practical aspects of undertaking the research, in particular "getting in", "staying in" and "getting out" of the research situation (Mumford 2001).

Within this study entry into the problèmatique did not require excessive negotiation as the British Council had undertaken to sponsor the Ph.D. study. One of the central differences between action research and ethnographic approaches concerns the negotiation of access to the setting, and the subsequent relationship between the researcher and actors within the setting (Schein 1987). Within ethnography the researcher initiates their introduction, while within action research a negotiation is required between those in power on the nature of an intervention. For action research entry into the problem setting thus requires a negotiated invitation. Within this study such an invitation consisted of a contract to sponsor the researcher for the period of their study.

The existence of this contract to a certain extent negated the possibility of the researcher acting as passive ethnographic observer within the organisation as it led senior managers to take an active interest in the research exercise (both positively in introducing the researcher to others, and negatively in discussing the potential disturbance and danger of the research). These negotiations occurred prior to the appointment of the researcher and so the research caused breakdown within the

problem context prior to the researcher's entry into the problèmatique. Furthermore this breakdown was unobservable to the researcher.

The impact of such immediate intervention led the researcher to be unable to *"ensure that both the researcher and all contacts in the company have a clear, specific and agreed knowledge of what is to take place"* (Mumford 2001) from the start of the research. This clear, specific and agreed knowledge was only evident on beginning the action research cycles. In accommodating such affect this study includes description of the historical context within which the action research takes place, and in particular emphasising the affect of the researcher upon such intervention.

This research was sponsored by the British Council and so there was a perceived expectation that the research outcome should contribute in some positive way to the organisation. The definition of the area of concern thus requires consideration of the organisational goals. The initiative dilemma between defining a research problem then searching for client organisations or tackling problems a known organisation faces was problematic (Rapoport 1970; Kock 1997). While the organisation was predetermined, the researcher faced the problem of finding a research problem within this organisation which was of research value, and of practical benefit. The British Council were reluctant to identify such problems themselves, preferring to suggest that the researcher *"get involved in"* the work of various departments and work out what would be of interest to the researcher and the British Council. In negotiating a mutually acceptable research topic, there are two views of the activity. The researcher is in search of a relevant opportunity to generate knowledge, while the organisation is in search of a relevant opportunity for improvement. These views change as the negotiation proceeds, until they converge on an agreed action research topic that matches the expectations of the research within the expectations of the organisation (Kock 1997) as shown in Figure 16.

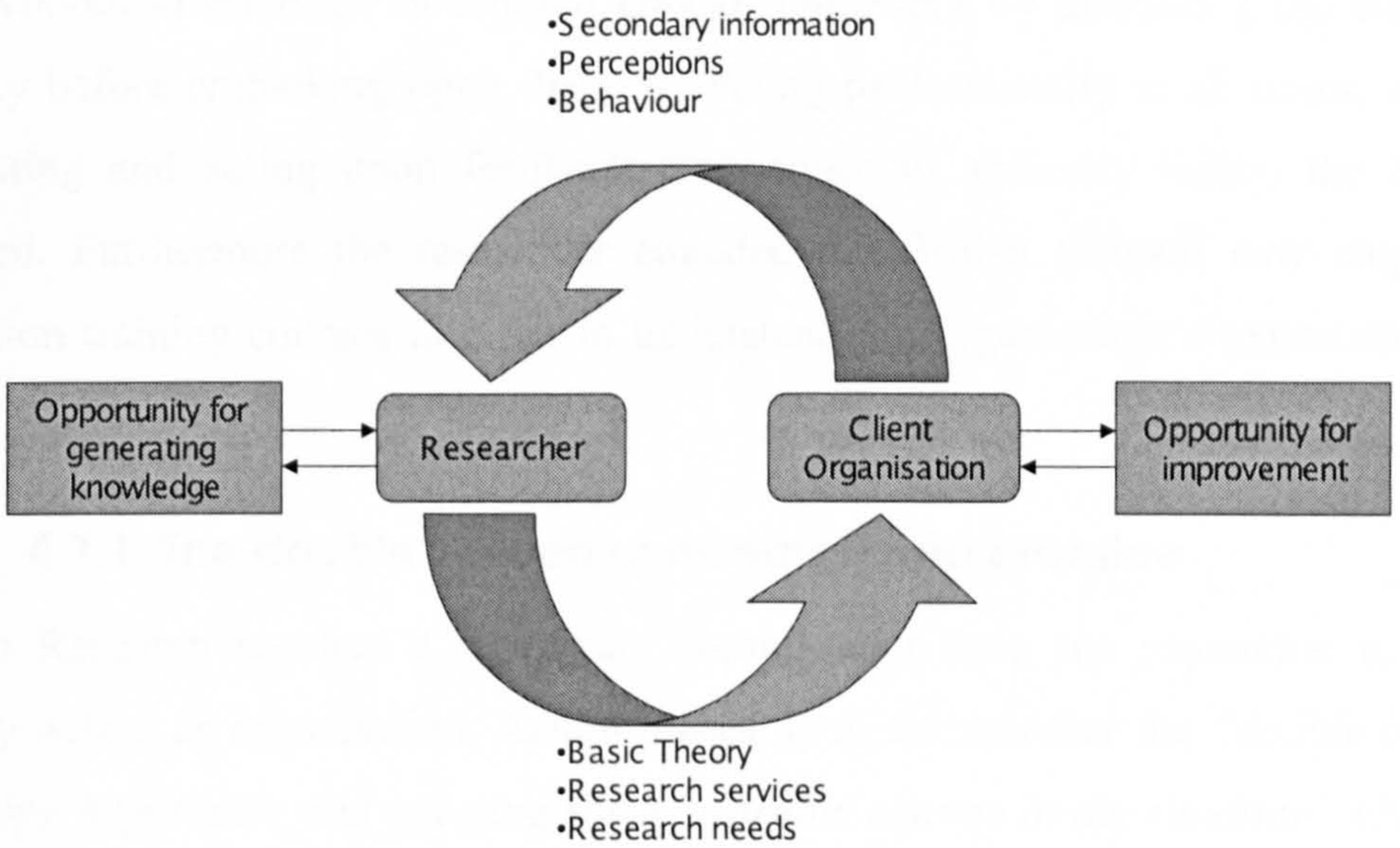

Figure 16: Identifying area for research through an interaction between researcher and client organistion (Kock 1997).

This is a time consuming process, which involves the development of trust. Within this study a period of around a year was taken to develop such trust, with regular meetings at the British Council concerning the research activity, and regular interaction between the researcher and the key representatives of the Knowledge Management team of the British Council.

The action researcher is participant within a complex social environment and situations may occur where the researcher is aligning with one group at a cost to another. It is thus necessary to consider ethics closely during engagement (Galliers 1991). Within the definition of action research presented previously there is emphasis for a mutually acceptable ethical framework (Rapoport 1970). Such a framework is required to ensure that the action is acceptable to all parties involved. The negotiation for such an ethical framework for this study proved impossible. Attempts were made to define such a framework, but by this point the researcher's involvement within the organisation was well established. The development of an explicit framework was thus perceived as unnecessary by the sponsor, and furthermore, appeared to be perceived as an attempt to renegotiate the existing sponsorship contract. As such, while an explicit ethical framework was developed by the researcher, it was not formally adopted within the study. The researcher thus

endeavoured to establish an implicit ethical framework by discussing the ethics of activity before embarking upon them, by acting professionally at all times, and by requesting and acting upon feedback from those in authority within the British Council. Furthermore the researcher attended the British Council new employee induction training courses in order to understand the organisation's expectations of staff.

4.7.1 The double burden of research and practice

Action Research requires a significant commitment from the researcher to work closely within an organisation. Action places upon a researcher the *"double burden of testing hypotheses and effecting some desirable change in the situation"* (Argyris and Schön 1991). *"As action research manager-researchers engage in their project, they need to be prepared to work the political system, which involves balancing the organisation's formal justification of what it wants in the project with their own tacit personal justification for political activity"* (Coghlan 2001). In addition to this there is the practical need to work to timescales, quality and deadlines of the organisation.

In undertaking the action research studies this researcher was also afforded a wide number of opportunities to undertake ethnographic forms of research within the organisational context, away from the particular focus of the action research cycles. The researcher sat in on meetings not associated with the specific action research projects outlined, attended various workshops, participated in discussions and authored documents. Such interaction provided a rich understanding of the organisation which contributed to the understanding of the action research. It is questionable whether either a "consultant" or "ethnographer" would have been party to such situations.

In undertaking action research the researcher is faced with a goal dilemma (Rapoport 1970) of managing the expectations of the researched organisation, and gaining sufficient action research findings. The action research must provide a *quid pro quo* such that the organisation does not feel it has been subjected to a *"smash and grab"* type of research (Rapoport 1970). However the researcher must also remain mindful that their research aims should also be achieved. The value of the action may be good, but the value of the research may be poor. In embarking on this study the

researcher remained mindful of this criticism, devising the previously outlined rich methodological approach to aid in the task.

In action research the researcher provides a helping role, this can create confusion with consultancy, both on the part of the researcher and the researched, such that it has sometimes been branded "*consulting masquerading as research*" (Baskerville and Wood-Harper 1996). Role dilemma (Rapoport 1970) is a major issue for action researchers; however defining specific roles for the participants may also be problematic (Baskerville and Wood-Harper 1998). While the consultant is expected to operate solely for the commissioning manager (essentially the paymaster), as academics we have a wider responsibility. There are four identified factors which differentiate action research and consulting, which are considered in relation to this study (Baskerville and Wood-Harper 1996) (cf. (Gummesson 1988)). (i) Researchers require more rigorous documentary records than consultants – in this study interviews were transcribed, rich pictures produced and a research diary kept. (ii) Researchers require theoretical justification rather then empirical justification - this is outlined through the theoretical framework. (iii) Unlike consultancy, the researcher was not limited by personal time and budget constrains other than the need to complete the Ph.D. research and to work within the travel budgets provided. (iv) While consultants usually operate in a linear fashion, this research is based upon a cyclical approach. In essence, action research is a balance between three elements: research, participation and action, each of which must be present (Greenwood and Levin 1998). This study aims to ensure that a balance is achieved between these elements.

Action research may give access to parts of the organisation hidden to research approaches such as ethnography (Schein 1987). This research required trips to overseas British Council offices; the cost of these trips being met by the British Council. It would have been difficult to justify such trips on the basis of ethnographic research, without providing explicit organisational benefit thus affecting the research aims of the ethnography.

4.8 Identification of improvement: SSM within the action research process.

The fundamental aim of this research is improvement; that, through the application of Knowledge Management principles to the use of technology, the British Council may improve. However the notion of organisational improvement is socially constructed and is based upon the desire to improve and the belief in an effective route to such improvement. In certain industries, such notions of improvement are culturally accepted, for example through increases in sales or changes in share prices, however within the British Council, a publicly funded cultural relations organisation, such improvement is difficult to identify. Historically the identification of improvements in cultural relations has been difficult for the British Council to identify (White 1965; Donaldson 1984).

If this research is to explore improvement through technological intervention it is necessary to explore methods and approaches for identifying this improvement within the objectives of the British Council, and the group within the British Council impacted by the intervention. This suggests a necessity to explore the context within which the intervention is undertaken to identify where improvement may be made. Quantitative measures (such as "number of exchanges arranged" or "number of grants allocated") may provide an indication of improvement to the existent practice, these approaches are empirical (either perceptions of improvement, or quantitative observations such as the "Through Other Eyes" Mori polls commissioned by the British Council (Ratcliffe 2000)). However this study forms part of a Knowledge Management programme aimed at supporting a wide-ranging organisational change programme. Within each of the cycles of research, external change and alteration had a large influence upon the group within which the intervention is undertaken. It is suggested that empirical methods would prove inappropriate within a situation in which such external change is ongoing. Thus a theoretical approach to identification of improvement is sought through SSM and a reflective framework.

The researcher thus reflects on whether they perceive the action research intervention has led to improvement using supporting evidence. This reflection points to improvement which is perceived to have occurred as a result of the intervention.

Considering this further, the researcher may also be able to reflect on whether they feel an improvement which is considered systemically desirable, yet is culturally unfeasible at present in the organisation may potentially lead to improvement were the culture to change.

4.8.1 Action research operationalised

The study demonstrates that action research is not a straightforward process similar to scientific experiment. Each action research study is in some ways unique (Avison, Baskerville et al. 2001) with problems and changes imposed by its participatory nature. Within this study the researcher took a collaborative role within the organisation, undertaking field research as part of the ongoing change initiative (Avison, Baskerville et al. 2001) however the powers over the projects structure was retained (particularly in the first cycle) by members of the organisation. Influences from within the organisation thus shifted the arrangement of the cycles such that subsequently they were not as neatly arranged as had been planned. The attempt to undertake distinct and separate cycles of reflection and action in practice overlapped and interacted. The last few weeks of the first cycle of action research were undertaken during the first weeks of the second cycle, and the final weeks of the second cycle overlapped with the initial analysis associated with the final cycle. In reporting this process one could attempt to sanitise the experience in order to better demonstrate the results, essentially emphasising the findings at the expense of the process. This study however attempts to emphasise and lay bear the problems in the process as suggested by Avison (Avison, Baskerville et al. 2001).

Whether or not problems occurred with the action research the findings of the research are highly significant for they explore a unique organisational intervention; learn from the breakdowns experienced in that intervention; then through deliberate process of reflection (Argyris, Putnam et al. 1985) operationalise these findings to develop a framework which may be of benefit to others (drawn from the reflective learning). These operationalised concepts explore head-on the significant debate over rigour and relevance within the IS literature, epitomised by the special issue in MISQ in 1999 (Applegate 1999). While action research may be close to the antithesis of the dominant model-in-use of rigorous research approaches based on reductionism and

rationality (Lee 1999), it presents results which are highly relevant and which present significant questions for further research.

4.8.2 Constructing learning from the action research

Figure 17 describes how learning is constructed from the ongoing action of the action research within the British Council. Firstly within the action research the researcher experiences a set of events. Such events might simply be the use of a phrase and are defined as events which lead the researcher to experience breakdown in their ongoing actions. From such breakdown the researcher is led to reflect and thus learn. This learning is then also carried forward into the future action. In particular the researcher may construct conclusions from such learning which are then recorded for carrying into the latter cycles.

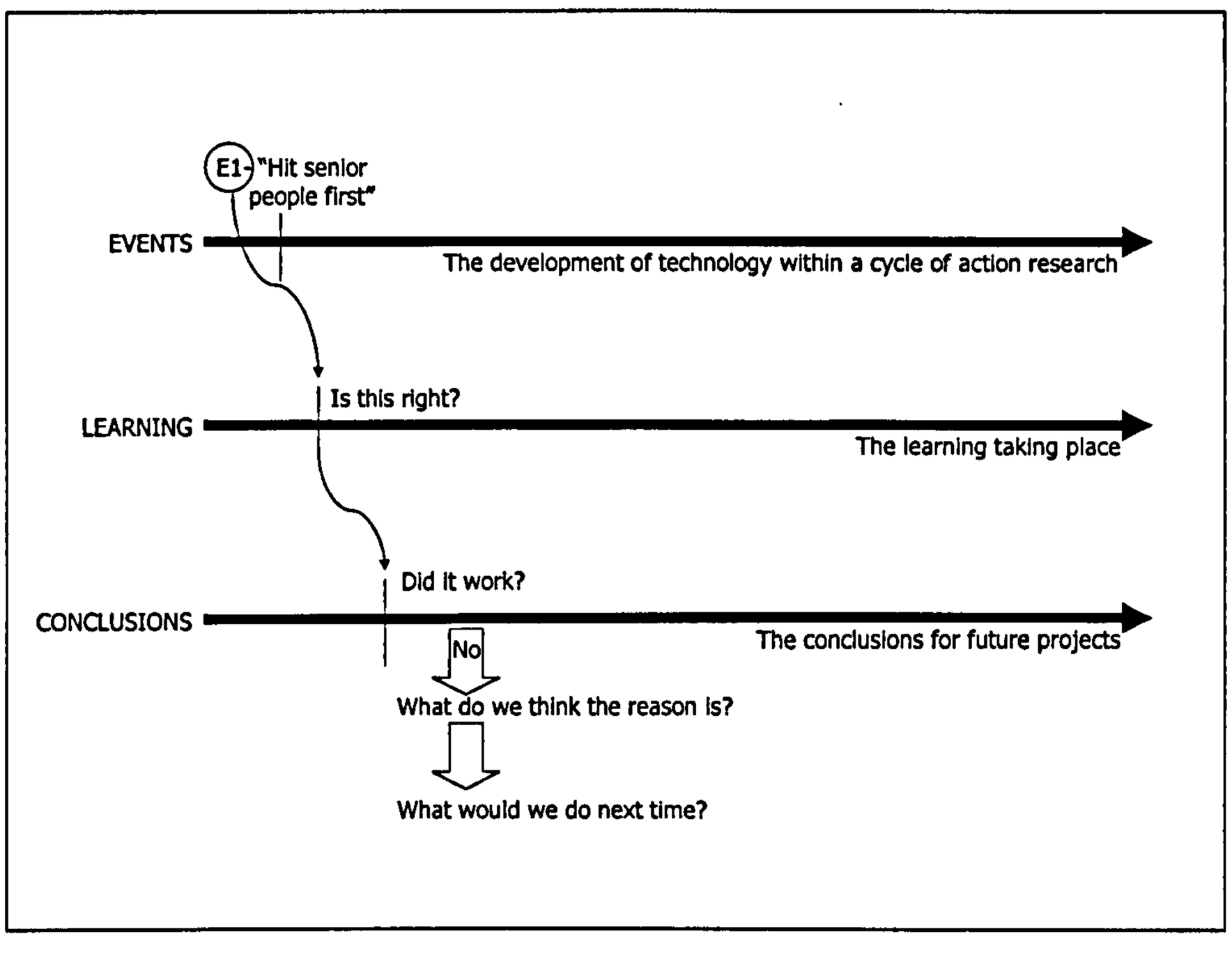

Figure 17: Action research as an interplay between events, learning and planning for future action.

For example within the first cycle of action research, the Knowledge Manager uses the phrase *"hit senior people first"*. This led the researcher to reflect on and thus raised questions such as: Was this an assumption? What makes Country Directors senior? Why focus on this group initially? Is this phrase relevant to the study?

Through reflection on similar "events" a series of learning takes place. The nature of the phrase *"hit senior people first"* would then be explored during a further interviews and participation.

Such learning, while potentially interesting in itself, becomes of value when it is further reflected upon such that the conclusions of the learning may be applied to future action, in particular the further cycles of action research of this study. For example, following the first cycle of action research one can ask if the strategy of *"hitting senior people first"* was indeed appropriate. Did this strategy fail? If so, what were the reasons for this failure, and what would be the advice for the next cycle of action research? The issue is then whether it is felt that the failure is attributable to this particular event, or unconnected. Such learning is then presented as a table at the end of each cycle of action research. These tables contain a column of learning from such events and experiences, and a column of how such learning should change the actions of the following cycle. In this way the separate events and activities within each of the cycles builds throughout the study in order to provide a coherent set of learning from the complete action research study.

4.8.3 An approach to reflective learning through the action research cycles

This section outlines a framework adopted to structure this study's process of reflective learning. This framework was drawn upon in the analysis, however for ease of presentation it is not described within the action research cycle chapters. It is used to structure the conclusions to the study.

The previous sections have outlined the process of enquiry employed for the action research and described the approach adopted towards the collaborative action of researcher and context. Following from this there is a need for an approach to reflexive learning within this study's action research. While SSM provides a structure for inquiring into the problem situation and exploring action to improve this situation, this study identifies a need to holistically reflect upon the action research such that learning about the process of the action research may be gained. In essence the researcher identifies a need to provide a "meta-level" framework of epistemology

to make sense of the act of the research, and in particular to emphasise the researcher's place within this.

In undertaking research within a complex organisational setting such as the British Council it is necessary to provide a framework for rigour which is cognitively maintained rather than structurally maintained. That is, rigour be provided through the approach to reflecting upon the action undertaken, rather than through imposed structure within the action. It is thus possible to draw conclusions from the messy situation faced by the researcher whether or not the situation can be controlled and structured.

4.9 Reflective framework for the action research activity

During the fieldwork of this study there emerged a need to critically reflect upon the part of the researcher, the chosen research methods and the problèmatique in relation to the wider research problèmatique consisting of the desire by the researcher to achieve a Ph.D. qualification within the context of the GEMISIS project at the University of Salford.

In order to construct and explore this reflection a model was devised. This model is presented in Figure 18. This reflective triad is based upon an ongoing reflection by the researcher upon their role, the action research problèmatique and the methods employed, appreciating that these elements are located within a wider problèmatique of the research context. It is the reflection upon these, and the reflection upon the interaction of these that provide the study with a *"guarantor of truth"* (Beer 1984). The model was used as an analytical and reporting "lens" for the researcher to make sense of the situation faced. It is not argued that this is a complete model of research action, but simply a cognitive tool to make sense of the complex situation faced.

The diagram shows how the researcher cognitively reflects upon each of these elements, and how the findings are presented in terms of these reflections. For example when the researcher employed SSM to devise an intervention and subsequently introduced a technology within the British Council's Knowledge Management programme, the model was used to make sense of this process. The research could reflect upon the problèmatique, and the effect of this intervention. The

research could reflect upon their place in the intervention – had they said anything or done anything which may have affected is success? They could reflect upon the research method – was it appropriate to the intervention planned, did it identify the pertinent issues. Finally these reflections may be amalgamated in order to plan the next cycle of the action research, for example changing the researchers approach, altering the method or focusing upon a different set of problems within the problèmatique.

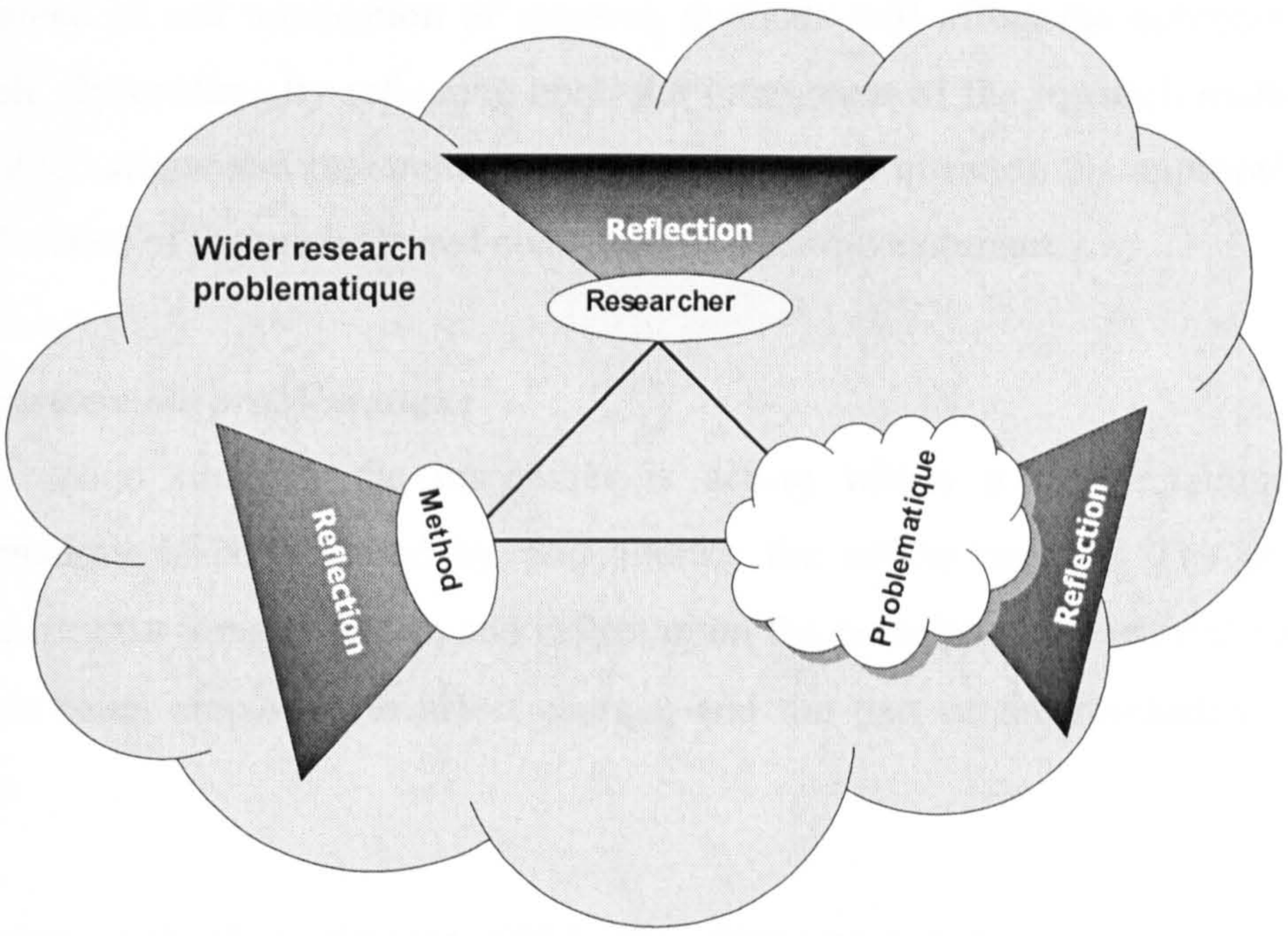

Figure 18: Triad of research showing the process of reflection upon the method, researcher and problèmatique and the interaction of these.

In presenting such a framework for reflexivity this study aims to address the concern raised at the 1997 IFIP panel discussion on the impact of action research in IS (Lau 1997). This panel argued that researchers need to make the action research design, process and outcome explicit in order that the quality of studies may be assessed. This framework aims to achieve this by explicitly reflecting upon these elements.

Reflection on the Researcher

Action research emphasises the researcher's involvement and affect upon the problem situation (Avison, Lau et al. 1999). If this study is to contribute understanding of the role of the researcher in action research and outline the researcher's personal learning and skills developed there is a need to reflect upon the role of the researcher in the research process. In reflecting upon the role of the researcher the framework aids in ensuring that researcher-bias is accepted and is made overt in undertaking and reporting the research, as suggested by (White 1985).

Reflection on the method

The choice of and application of research methods will affect the outcome of the research. By continually reflecting upon the interaction of the research method and the problèmatique and researcher, the research aims to question the appropriateness and relevance of the methods and contribute to their development.

Reflection on the problèmatique

Within action research the researcher is acting within a problèmatique. This problèmatique is both altered by, and altering the action research. The presented framework thus aims to isolate and reflect upon the problèmatique in relation to the methods being employed to affect change, and the part of the researcher in such change.

Reflection on the three elements within the wider research context

The reflective triad is presented within the wider research context to highlight that the action research was constantly affected by the desire to gain a Ph.D., by the pressures of work within GEMISIS and by the culture of the University. These pressures are acknowledged and so provide a context for many of the actions undertaken. Why is the researcher undertaking the research at all, if not for his part in this wider context of seeking a Ph.D.? Why does the researcher seek to complete the research by a particular date, but for the funding constraints of the Ph.D. This context has an affect on the action research and, where relevant, is also reflected upon in the findings chapters.

The framework explored

The research was undertaken within a situation over which the researcher did not have complete control. The research was at the behest of individuals within the British Council. It is this dynamic in the research that potentially provides the richness of contribution; however it also makes it difficult to undertake rigorous research and compromises occasionally have to be made. For example within the action research there were situations in which the researcher needed to reflect the wishes of a key stakeholder rather than follow the accepted wisdom of the academic literature. Documenting them then reflecting on their effect in hindsight reconciled such situations. The aim of the framework is to enable the researcher to reflect upon this potentially fragmented and partially unstructured problèmatique in order to provide a plausible coherent story of the research. This reflection ensures that difficulties in the research process, such as breaks, delay or forced change are reported and enhance the research by emphasising the embedded nature of the research within organisational practice where individuals operate in ambiguous ways.

The framework thus aids the relevance and coherence of the research by enabling the researcher to retrospectively rationalise their experience (Weick 1995) in a coherent and complete way. The framework provides a structure upon which to undertake such rationalisation and for communicating this within the study. The structure aims to ensure that rigour which is impossible to impose through experimental design, may be introduced and aspired to through structured *post hoc* reflection.

By reflecting upon the part of the researcher within the intervention, the use of methodology and the problèmatique of the research a form of systemicity is imposed upon the complex and changing context. Reason (Reason 1993) notes such double loop learning (Argyris 1995) (the challenging of the underlying mechanisms of the research) is critical to action research since without reflection on the "governing variables" it is possible for individuals to produce self-fulfilling systems of action which may lead to escalating errors. It is hoped that this framework presses the researcher to undertake an ongoing dialogue with their action, their methodological framework and the action research being undertaken. Through this dialogue the action researcher moves from anecdotally considering their experience to reflectively

exploring it in detail and critically. There is thus an identified need for researchers to *"think and act more deeply and more reflectively"* (McKay and Marshall 2001).

The need for a reflective framework for action research has been suggested (McKay and Marshall 2001), however existent approaches have included a temporal dimension for a framework as part of the existent action research cycle (McKay and Marshall 2001), suggesting that action research be considered as two cycles imposed upon each other in which one cycle considers the research interests, while the second cycle (concurrent with the first) considers problem solving interest through other mechanisms. In contrast the framework presented in this study does not include a time dimension and considers reflection as an ongoing process throughout the natural cycles of enquiry identified during the research. McKay's suggestion that the research aims of action research may be segregated from the aims for intervention does not fit with this study's research aims, which intend to marry theory and practice such that they cannot be considered separately. The researcher cannot divorce themselves from the practice or the research in order to reflect upon each separately; they are part of the researcher being an "action researcher". This study's framework accounts for this by focusing upon the role of the researcher, method and problèmatique in the ongoing action of the research cycles.

In addition McKay's consideration of formal cycles in the action research and in the theory development do not fit with the experience of this study. While it is valuable to impose, and reflect upon action research as cyclical, within this study the intervention was not clearly identifiable as having a specific start, end or cycle during the research. For the purpose of this study the cycles were imposed through *post hoc* reflection upon the research exercise and through the use of SSM which may be considered a cyclical system of enquiry (Checkland and Scholes 1990). The imposition of a purportedly separate cycle of reflection, separate from the methodology denies the ongoing reflection-in-action which this study's framework aims to engender and support.

The provision of this framework will contribute to calls for an effective method of making explicit the design, process and outcome of action research (Lau 1999) by highlighting the reflection within the enquiry process and making it accessible to the

reader (Champion and Stowell 2003). In particular this framework is intended to segregate the potential systemically desirable contribution of the intervention from its potential cultural infeasibility. Through participation within the problèmatique it may become apparent that, within the theoretical framework of the study, the most desirable change would prove culturally unfeasible. However as researcher, rather than consultant, it is necessary to continue to explore such potential intervention whether the organisation is able or unable to undertake aspects of the intervention in practice. Through reflection upon the research, the researcher is afforded a position of being able to criticise the dominant mode, even if the intervention which challenges such mode was unfeasible (an aim called for by Geoff Walsham during the 2001 Critical Research in IS workshop (Walsham 2001)).

This model is being used to ensure holistic reflection of the research. During recent debate on the need for rigour in information systems research (Applegate 1999; Applegate 1999; Davenport and Markus 1999; Lee 1999; Lyytinen 1999) it has been suggested that there is a need to educate practitioners to become "reflective practitioners" (Schön 1982; Davenport and Markus 1999). By reflecting upon this research through this presented framework it is hoped that the contribution to practice, methodology and researcher will be isolated and then integrated to provide coherent rigorous findings.

4.10 Summary

This study employs a subjectivist ontology, leading to the adoption of an interpretivist epistemology. Considering the problem context faced, action research is selected as an appropriate method, with soft systems methodology employed to structure and make sense of this problem.

A reflexive framework has been presented which is employed within the research to structure the use of SSM and the action research findings of the conclusions. The development of this framework faces head-on the criticism levelled at action research of lack of rigour (Baskerville and Wood-Harper 1996), by providing rigour through methodology, through method and through reflection on method.

CHAPTER 5 INTRODUCTION AND OVERVIEW OF THE FIELD SITE: THE BRITISH COUNCIL

"Indeed I do not exaggerate when I say that I regard the prosecution and development of the Council's activities as of urgent national importance." (N. Chamberlain. 10 Downing Street. 17th November 1937)

5.1 Introduction

This chapter is not intended as the beginning of the case study, but rather as a prologue to it. It describes the field site, the British Council, beginning with a history of the organisation using sanctioned historical material as interpreted by members of staff commissioned to produce an official history for the organisations twenty fifth and fiftieth anniversaries. Following this official history the present day British Council is described, again from an official standpoint, drawing upon material from the corporate induction training day and from the organisation's Intranet.

This introductory material is followed with a reflection upon the entry of the researcher into this context. The significant impact of the researcher's previous industrial experience, coupled with the decision to undertake action research are described.

Finally the conception, initial development and launch of the corporate Knowledge Management initiative are described. The actors involved in this programme are also discussed from the official perspective of role and membership, and from the interpreted action researcher's perspective.

The researcher's involvement in the overall Knowledge Management strategy and the place of the two action research cycles undertaken in the British Council within this strategy is described.

The chapter is relevant to the study in three ways: firstly it defines the scope of the studies field site; secondly it outlines the link between this site and the research question; thirdly is provides background material necessary to understand the cycles of action research which underpin the study's contribution and to understand the underlying pressures faced by the organisation at that time.

5.2 The choice of organisational context

The British Council sponsored the researcher to undertake research within their organisation on its use of internet technology. The researcher was responsible for identifying a topic which was of mutual benefit in this area. As the organisation was beginning to be concerned about its Intranet and as senior management were starting to see Knowledge Management as a potential benefit this was identified as a key concern. The research was thus defined by the concerns of the organisation matched with its significant potential to provide a useful research context in which to explore these issues (Hammersley and Atkinson 1995).

The British Council provides a relatively unique organisational context in which to explore Knowledge Management. As a truly global organisation that aims to connect overseas individuals with the knowledge, culture and expertise of the UK the British Council could conventionally be described as a knowledge organisation (Newell, Robertson et al. 2002). Its not-for-profit status also increases its relevance within Knowledge Management research as such organisations have been less researched in this area (Capozzi, Lowell et al. 2003). Its global presence means that Internet technology forms the most significant communications infrastructure within the organisation. The organisation specialises in knowledge related activity such as individual networking, teaching, organising conferences, promoting the arts and sciences. The activities undertaken were intended to be innovative and unique. Furthermore the organisation has many similarities with the World Bank in which a widely influential Knowledge Management programme was underway under the leadership of Stephen Denning (Denning 2000).

The researcher decided to only focus on this single research site in order to observe, in the words of Pettigrew (Pettigrew 1985), *"the social dramas longitudinally [in order to] provide a transparent look at the growth, evolution, transformation, and conceivably decay of an organisation over time."* Any attempt to select another field site would detract from the ability to undertake this, and further present problems of comparing another organisation with the arguably unique context of the British Council.

The researcher was directly involved with the British Council for a period of around three and a half years between September 1998 and November 2001. Throughout this time he was referred to as a "researcher", however he was also treated in many ways as a member of staff for example having a desk, phone, e-mail address and business cards. During this time the involvement with the organisation shifted from intense periods in which he was within the organisation full time to periods of less frequent interaction.

5.3 The British Council

This section draws on the corporate induction training workshops, attended by the researcher, the induction material on the organisation's Intranet (British-Council 1999) and officially supported biographies of the organisation's history (White 1965; Donaldson 1984). This official view is complemented by interview material, published works and other internal documents which provide alternative perspectives on the organisation in order to provide a coherent view of a highly complex organisation.

The British Council began life in 1934. It has been argued by one of its founders (Sir Harold Nicholson, writing in the 21st anniversary Annual Report (White 1965)), that the organisation arose, despite *"a British...distaste for self-advertisement"* as a response to a feeling that *"our best markets were being invaded;... the suspicion that foreigners did not invariably regard us as either so charming or so intelligent as we seemed to ourselves... It was then that we first realised that our foreign competitors had been devoting effort, skill and large sums of money to rendering their languages, their type of civility, their scientific or technical resources and inventions, and the*

desirability of their exports, familiar to students and buyers overseas". In essence the British Council thus arose in response to the loss of empire, and remains closely linked to the Commonwealth countries.

The British Council secured its status as an independent public body, guaranteed by Royal Charter in 1940. From this point on the organisation operated at arms length from government, however government remains its primary source of funding.

The British Council (the Council) of today, according to its "brand statement" is the UK's cultural relations organisation with a purpose to *"win recognition abroad for the UK's values, ideas and achievements, and to nurture lasting, mutually beneficial relationships with other countries."* The *"organisation connects people worldwide with learning opportunities and creative ideas from the UK and builds lasting relationships between the UK and other countries."* As a not-for-profit organisation it is against these aims that the organisation is judged, and thus receives funding.

As Baroness Kennedy, the organisation's chair, outlined in the 2001-2002 annual report: *"We create space for dialogue. Debating the difficult but most meaningful questions and encouraging cross-cultural engagement... In this process we create genuine trust and understanding between peoples of the UK and other countries. ...Trust rests upon demonstrable honesty, commitment and openness to difference. The British Council, with the diverse tools as its disposal, works very hard at making these values the bedrock of [its] relationships"*. The overall purpose of the Council is to enhance the reputation of the United Kingdom in the world as a valued partner, and this purpose is achieved by creating opportunity for people on a worldwide basis (British-Council 1999).

The organisation offers these opportunities in six core subject areas in which it works (British-Council 1999; British-Council 1999):

1. Education: In particular the promotion of university education opportunities in the UK.
2. English language teaching: This focuses upon high quality English language schools, linked to English language support services such as libraries.

3. Information exchange: This includes libraries and information centres.
4. Arts, literature and design: UK works of art, literature and design are promoted through exhibitions, conferences and exchanges.
5. Science, engineering, technology and the environment: The promotion of the UK's science and engineering capabilities through events, science exchanges and web technology.
6. Governance and human rights: This includes consultancy and promotion of human rights issues.

The Council has headquarters in London and Manchester administering a network of offices overseas (Lee 1995). In 1999 the British Council had 257 such offices, based in 110 countries. It also operates a network of student support offices in the UK, and offices to represent devolution in Cardiff, Edinburgh and Belfast. These offices may also be a response to the need for promotion of the Council's activities within the UK where historically the Council has been relatively unknown (Lee 1995).

5.3.1 Operating Environment

The British Council employees around 7000 staff, of these around 6000 work in the 110 countries in which the British council is represented. The majority of these staff are so called "locally appointed" staff, that is people recruited in the country where they live. However most of the senior positions in overseas offices are held by "London appointed staff", UK citizens paid in the UK and working in the overseas offices. The different terms of employment for these types of staff create animosity, in particular due to the lack of career progression available for locally appointed staff. For example a long serving English teacher working in Europe complained in an interview that he could not progress into management within the organisation as he was locally appointed. Another senior manager had been forced to resign and reapply for a UK appointed position to progress his career. Locally appointed staff were often considered as lower status and of lower ability than their UK appointed counterparts, for example one interviewee when talking about a problem with an overseas member of staff used the phrase *"I don't think with a more experienced UK-based colleague that would have happened"*. His emphasis on *UK-based* appears significant.

Within the United Kingdom the majority of staff work in headquarters located in London and Manchester. The main purpose of the UK headquarters is to co-ordinate policy and resources, and to deliver services. This involves linking the overseas network with Britain's educational, technical, scientific and cultural resources.

To give some idea of the scale of operations of the British Council, during the year 1999-2000 they worked in 243 towns and cities in which they:

- ran 222 information centres and libraries, with 370,000 members borrowing over 8 million books and videos;
- managed and supported some 3,000 arts events globally;
- implemented over 350 projects;
- co-funded around 700 new science collaborations;
- administered 625,000 professional and academic examinations;
- dealt with over 1.9 million enquiries;
- supported exchange programmes for over 14,000 young people;
- organised and ran 46 international seminars, conferences and summer schools;
- raised over £9 million in business sponsorship;
- received 1.5 million hits per month on their web site;
- employed more than 1,800 teachers in 136 overseas teaching centres.

Faced with such a diverse and geographically distributed operation, it is not surprising that the Council perceives the sharing and development of knowledge to be of paramount importance to its future success.

5.4 Corporate Funding of the British Council

The Council's objectives support the objectives of the organisation's sponsors, in particular the Foreign and Commonwealth Office (FCO) who provide a significant portion of the organisation's funding and have overall management responsibility for the organisation. The Council has two main types of funding: grants from the British government mainly through the FCO and the department for international development and self-funded work.

The largest single source of funding is government grants. In this was the largest donor, the FCO, has a significant impact on the organisation's objectives.

A relatively recent development in the organisation has been its increasing ability to sell services to individuals, corporate clients and overseas governments This self-funded work includes the management and administration of contracts on behalf of the British Government, international aid agencies and development banks and other self-funded activities, such as English language teaching and administration of examinations.

The massive growth of English as an international language had led this area of work to become a major item in the Council's annual turnover, and subsequently led it to have a dominant power base in internal negotiations. The value of this work lead to more commercially orientated thinking about activity and in some cases challenges the "independent" nature of the organisation (for example there have been issues regarding the tax status of the Council in countries where its diplomatic nature has led it to gain an unfair advantage over local English language schools). There is "*doubt about the value of selling English teaching resources in the countries of the European Union and in Eastern Europe. The Madrid School has 140 teachers. Those countries which can afford to pay for Council services may not always be the countries or the clients which the British government wishes to influence*" (Lee 1995).

In order to manage the Council a group of senior managers (the senior management group – SMG) in London act on behalf of the organisation's board. The board is made up of public figures and representatives of the governmental funders (including representatives of the key funders: the Foreign and Commonwealth Office and the Department for International Development) (Donaldson 1984). The Chairman of the board (Presently Baroness Helena Kennedy) deals with the Prime Minister and Foreign Secretary; while on day-to-day matters its director general (presently David Green) liaises with other Foreign Office ministers and Whitehall permanent secretaries.

As part of the government planning process the Council undertakes strategic reviews every five years. In 1995 the organisation undertook such a review. The effects of this 1995 review and planning and implementation of the 2000 review had a significant impact on this study, in particular the affect of the 1995 review was experienced at the start of the research in 1998 and the 2000 strategy review greatly affected the action research cycles which began in October 1999 and continued until October 2001. The most significant affects of the 1995 review which impacted the context in which the action research was undertaken are listed below. The 2000 strategy review is discussed in detail within the findings chapters.

The most significant impacts of the 1995 review were:

- A division of the organisation into three business streams, corresponding to the Council's three principle sources of income: grant-in-aid (GiA), agency contract (DATS) and revenue-raising enterprise (ENTS) (Lee 1995). This separation represented a general acceptance of a shift from being an entirely grant-in-aid organisation (as the organisation had traditionally been) to gaining significant revenue from other sources (Lee 1995). This creates tensions overseas as the ENTS operation is profit focused unlike the GiA or DATS activity.
- A restructuring of the organisation with the loss of 25 per cent of the Council staff in the United Kingdom (Lee 1995). This led to a significant reduction in the ability of headquarters to support the overseas offices.
- The relocation of (and subsequent reduction in) staff from London to a purpose built office in Manchester, followed by a further relocation to less expensive rented offices in Manchester and some additional staff reductions (Lee 1995). Many staff in these offices thus felt undervalued.
- A shift of emphasis towards providing greater autonomy to regional teams with regional directors (Lee 1995). This meant that responsibility was shifting to the overseas offices with headquarters acting in a more supportive role.

5.5 An example of an overseas operation

While the headquarters of the British Council are located within the UK, the vast majority of staff and operations occur in its network of overseas offices. In order to

fully appreciate the work undertaken by the British Council it is necessary to consider the typical operation of an overseas office.

The following general description of an overseas office is based on the researcher's experience visiting overseas British Council offices to interview staff and on a review of various internal literature. It is noted that the sizes, functions and strategies of offices are different, based on the relative significance of the country, the strategy for the region, the demographics of the country and the size of operation.

The main British Council office is typically located within the capital city of a country, in a prestigious area close to the centre of government and commerce. Within the office there is likely to be an information centre, containing a collection of British books, some audio and video materials and equipment, and often computers connected to the internet. In addition to information managers (responsible for the centre) their may be staff responsible for promoting UK education and helping individuals complete school or university application forms. The information centre and possibly some exhibition space are the public-facing "off-the-street" operation of the office. The English school is a profit generating arm of the office, charging fees to educate students in English to various levels. These schools are prestigious, teach children and adults, and undertake corporate contracts (for example during the research for this study, the school in Korea was tendering to teach English to the Korean police in readiness for the 2002 World Cup).

A significant part of many offices' activity is the management, on behalf of the FCO, of the Chevening scholarship programme. This programme funds and arranges "successor generation" students (broadly those people expected to have significance within their country in the future) to the UK to study. The office must also maintain contact with existing scholars.

The "back office" operations will usually consist of a number of managers for the various operations and people responsible for the cultural relations activities of the various sectors. For example someone may be responsible for the promotion of British arts, organising events for British artists and works of art to be shown in the country. The office may employ a public relations officer to promote its work, and an

office manager to manage the staff. The most senior person in the office will be the Country Director, who acts as overall manager of the operation, diplomatic representative of the British Council, and liaison with the local ambassador and with the Headquarters in London. (Country director's responsibilities are further described in detail in Chapter 5). Through these core staff the office is expected to build relationships with key individuals in government, universities and sectors (e.g. science, arts and governance), and act "*as a facilitator, an intermediary, an agent, a promoter and an expert advisor*" (Lee 1995).

These offices do not however aim to be specific experts in areas, but rather have a broad ability and knowledge, and a strong network of contacts. They also rely on the field specialists in the UK headquarters to assist on specific matters. The lead for such contact remains with the overseas office, meaning that specialists in the UK act as services to the overseas network rather than directors of their activity. This often means that the headquarters does not have a significant control of, or even knowledge of, what is going on in the overseas country. A headquarters manager said in an interview "*Hell will freeze over before [a particular overseas deputy director] tells us in advance that [some event is happening]*". Such lack of dialogue often means that resources and support provided by headquarters are out of line with the requirements of overseas. This can lead to significant problems. For example in an informal meeting with one overseas Country Director during a research trip the researcher was asked what he thought of the dance theatre he had been invited to by the director the previous evening. Upon the researcher expressing his dislike of this form of dance, the director responded suggesting that he didn't know why London sent out such dance to his region of the world as it was seldom appreciated.

A further example of such lack of discussion was highlighted when the researcher discussed information packs produced by the Information Services Management (ISM) department. ISM is responsible for the library network overseas as well as corporate informational resources such as the Intranet, website, and weekly office bulletin. ISM appeared very proud of the effort that went into digesting large amounts of relevant material into short digest, however one overseas information officer commented that they were left un-open in a store room as overseas they needed to provide the full original sources.

5.6 Knowledge Management within the British Council

The Knowledge Management ideas initially entered the British Council through the authoring in January 1999 of a position paper by two senior managers within ISM titled *"Just what is all this I read about Knowledge Management?"* (Roman and Edwards 1999). The paper considered the impact of Knowledge Management on ISM's services, concluded by calling for a corporate wide Knowledge Management strategy. These senior managers had been influenced by writings on this subject within their fields of information management and librarianship, and particularly from the work of the World Bank (Denning 2000). They had also experienced the issue from the consultancy company TFPL with which they had worked (TFPL 1999), and through a pressure to develop a new approach to the promotion of the UK from the greatly influential Demos report on UK identity (Leonard 1997).

This paper introduced Knowledge Management as a potential response to the challenges of globalisation, downsizing and information technology- key issues for the British Council at that time. It drew on broadly functionalist (Schultze 1998) agenda's defining Knowledge Management as *"the interplay of culture and technical tools which keeps colleagues sharing the answers to business-critical questions about our services, customers and competitors"*. British Petroleum's virtual teamwork programme was cited as an exemplar in this area (Cohen and Prusak 1996). This led the paper to call for an IT led approach and called on the organisation to establish a working group to approach the issue of Knowledge Management.

In response to this call one of the most senior managers (a member of SMG) within the organisation called a panel meeting to discuss its impact. This meeting was held on 28th January 1999 in London to discuss how the British Council should approach the exploitation of the ideas of Knowledge Management as a way to develop and improve the organisation. The meeting included the authors of the position paper, representatives of the Intranet department, senior management of the CIT (Corporate Information Technology - the department responsible for the IT infrastructure), various other interested parties and senior managers and the researcher who was invited to provide an external academic perspective.

The output of this meeting appeared inconclusive; however it was the first serious concerted effort to approach the concepts of Knowledge Management within the British Council.

The meeting was founded on the realisation by the organisation that the concepts and ideas of Knowledge Management presented an opportunity to deal with the organisational change required by the current spending review. This dictated that the Council must shift from a primary focus on influencing strategic decision makers overseas through creating close relationships with individuals, to an approach which embraced new technologies and techniques in reaching a "wider public".

Rapidly following this meeting a number of structures were put into place to approach Knowledge Management within the organisation. Firstly, the Intranet Manager was promoted to the position of Knowledge Manager and the senior manager who chaired the meeting organised a six month sabbatical to take the role of Chief Knowledge Officer (CKO) for 80% of his time (see (Earl and Scott 1999) for the description on which this post was based). This manager was a member of the Senior Management Group and so this sabbatical would underline the strategic importance of the knowledge sharing programme, and provide the "high level" support argued as necessary for success in Knowledge Management (Sveiby and Lloyd 1987; Davenport and Prusak 1998; Von-Krogh, Ichijo et al. 2000). The aim of this sabbatical (and thus the role of CKO) was stated as "*To design and implement measures which will encourage people working in the Council to generate and share information and knowledge in ways which advance our purpose and strategic objectives and will become a permanent feature of the way we work*" (Internal memo April 1999).

The CKO established a "knowledge strategy group" consisting of the Knowledge Manager, the CKO, the two authors of the position paper, a representative of the World Bank[17], and this study's researcher. The aim of this knowledge strategy group

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[17] The British Council had recently signed a memorandum of understanding with the World Bank Group. This person's attendance on the committee was part of this agreement, with the aim of imparting the experiences of the World Bank's knowledge sharing programme. (see

was to devise a consultation process to develop a knowledge strategy (and promote the ideas of Knowledge Management to gain support for this strategy). The membership of this group (see the table below) shifted the emphasis on Knowledge Management from the functionalist perspective advocated by the ISM managers in their paper to include issues of a more interpretivist nature. The manager from the World Bank introduced the work of Steve Denning from his organisation; work based on storytelling and the value of communities (Denning 2000). The researcher brought the concept of "communities of practice" into the discussion (Wenger 1998) along with ideas on sensemaking (Weick 1993; Weick 1995) and serendipity. His background in developing Intranet applications for ICL also contributed to the understanding of the role of intranets (see (Jackson 1998) for a description of the ICL Intranet and Knowledge Management strategy). The Knowledge Manager's background in psychology led to his interest in social issues of knowledge. Furthermore the CKO saw a more balanced view of Knowledge Management as both social and yet, given the British Council's global nature, mediated by technology. He was however focused on the functionalist view of knowledge as asset through the influence of Thomas Stewart's work on Intellectual Capital (Stewart 1996; Stewart 1998).

From these various perspectives the strategy would focus on "knowledge sharing" rather that Knowledge Management, as the knowledge strategy group believed the aim was collective empowerment rather than external management.

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http://www.britishcouncil.org/sharingknowledge/mou.htm) or Denning, S. (2000). The Springboard: How Storytelling Ignites Action in Knowledge-era Organizations, Butterworth-Heinemann..

Key actors in the knowledge sharing programme:

- **The CKO:** the CKO was a senior executive and very well respected within the organisation. Known for being very studious and reflective he saw Knowledge Management as key to the organisations future.
- **The Knowledge Manager:** The Knowledge Manager was promoted from his previous role as Intranet Manager. He saw Knowledge Management centrally in terms of personalisation and discussion. He had a background in Psychology.
- **The Researcher:** Terms of reference: *"provide the British Council with an understanding of the effect of introducing Knowledge Management software into its organisation; provide the British Council with two pilot projects introducing tools to support communities within the British Council;"* (Job Plan objectives for the researcher). The researcher had worked for a number of years developing Internet and Intranet technologies for a large IT services company, and had undertaken consultancy on Knowledge Management technologies. The researcher holds a Computer Science degree, and was the most technically skilled in web technology among the Knowledge Management team of the British Council.
- **Two managers from ISM:** With backgrounds in librarianship these managers were focused on the codification and dissemination of information within the knowledge strategy.
- **Manager from the World Bank on secondment:** As part of an agreement a member of the senior management at the World Bank was assigned to work on the Knowledge Management programme of the British Council.

The Knowledge Strategy Group, and in particular the CKO were tasked in finding significant funds to implement a knowledge sharing programme across the organisation. In order to achieve this there was a plan to present a knowledge sharing strategy to the Senior Management Group in late October of 1999. This strategy would need to represent the views of a wide constituency within the Council, thus requiring a consultation process. This consultation was undertaken with a global discussion using a mailing list system from the 20th September to 15th October 1999. It appeared to the researcher that a primary aim of this discussion was to promote the necessity of Knowledge Management within the organisation, rather than a consultation on needs. This discussion was based on a number of themes, which represented closely the CKO's draft strategy on knowledge sharing:

1. making the most of the technology,
2. building teams,
3. access to information,
4. improving quality,
5. putting your ideas into practice,

6. values and behaviours which support knowledge sharing.

5.7 The British Council's "Knowledge-Sharing" strategy

Through the Knowledge Strategy Group's analysis of the relevant literature on Knowledge Management and through the global consultation exercise, a knowledge sharing strategy paper was written and presented to the Senior Management Group on 22nd October 1999 (SMG are responsible for the interface between the top management and the Council's Board). The paper was accepted and the majority of funding provided to achieve the short term aims outlined.

The strategy was founded upon two pressures for change in the operating practices of the Council, which it was believed Knowledge Management could improve. The first of these was an internal pressure, highlighted in the consultation exercise, for a greater sense of engagement and inclusion of staff in the organisation. "*They want to know about the important things that are happening. But they also want to feel that their experience and knowledge is valued. They require the support, motivation and tools to share knowledge more effectively with others, starting with their own immediate work group*" (Khalid and Marsden 1999).

The second pressure for improved knowledge sharing was a necessity to respond to an ongoing pressure to change (this was highlighted in the strategy paper). The overall operating environment of the British Council required organisational change which it was perceived could be achieved through concepts from Knowledge Management. There was pressure from the FCO and DFID to shift from a strategic focus of cultural relations activities with small groups of important influencers (often termed the "*authority generation*"), to a focus on a wider target audience for cultural relations, in particular the young "*successor generation*" who were likely to become important influencers in the future. It was seen that this shift would translate into a significant and lasting change in the nature of work within the British Council, requiring the organisation to innovate new practices using new technologies (such as the internet) in the delivery of its services both to the existing "narrower public" of important influences and to the wider public overseas.

This pressure was highlighted clearly within the Council's knowledge sharing strategy: *"Our assumptions are that we are entering a period of experimentation with this wider public and that our involvement with Internet-based services will grow rapidly. We also assume that these will complement and not replace our direct engagement with smaller groups through educational and cultural exchange programmes for the so-called authority generation, future leaders and opinion formers"* (Khalid and Marsden 1999).

"If these assumptions are correct, it is clear that we will be on a steep learning curve. We will need to master new skills, including the use of new technology in the delivery of our work; market research on a larger scale; opinion research; developing systems to cope with a much larger customer base; working with a growing network of partnerships and alliances, and so on. In addition much of our work will be new and experimental. The need rapidly to share, analyse and learn from our day to day operational experiences already acute today, will become an essential requirement tomorrow" (Khalid and Marsden 1999) .

"This seems to us the compelling business case for giving more attention to knowledge sharing. There is just too much happening too fast for our existing, not very effective procedures for information exchange to cope with. As we develop new services and continue with most of our existing ones, our operational profile is going to become even more complex. This will appear to run counter to the principles of focus and quality that inform our present corporate strategy...Additional funding through the Comprehensive Spending Review to support engagement with wider foreign publics will place additional pressure on us to improve our rate on innovation, tackle quality problems and account for impact" (Khalid and Marsden 1999).

The approach to knowledge sharing within the Council was based upon these strategic needs, in particular the need to innovate new corporate practices. The ongoing focus by the CKO and knowledge strategy group on the pressures outlined above, and the concern as to how Knowledge Management would contribute to the organisations objectives suggested that Knowledge Management was not approached as a fad, as it has been suggested that many organisations approach Knowledge

Management (Swan, Scarbrough et al. 1999; Davenport and Grover 2001; Galliers and Newell 2001), but rather that some of the concepts of Knowledge Management appeared to resonate with the CKO's appreciation of the problems the organisation faced.

The knowledge sharing strategy was a response to these needs. It consisted of three stages, employing concepts from Knowledge Management and relating these to the operating context of the organisation, and the necessity to change. Assuming acceptance by the SMG, the first and second of these strands would be begun immediately through the Knowledge Manager, while the third stage would need incorporating into the corporate planning approach. These stages were:

- **Stage 1:** making the most of a new technology infrastructure being introduced into the organisation.
- **Stage 2:** a knowledge sharing programme to support the current organisational goals of the organisation.
- **Stage 3:** a knowledge and learning strategy with the aim of transforming the organisation such that Knowledge Management practices were core to the organisations principles.

5.7.1 Stage 1: Exploiting the existing technology infrastructure

During the writing of the knowledge sharing strategy the Council was in the process of upgrading and standardising its global IT infrastructure. This Global Technology Infrastructure (GTI) programme begin in October 1998 (a year prior to the knowledge sharing strategy) and was planned to run for three years, providing all staff with standard machines and Microsoft's Office software. The GTI initiative was partly a response to the year 2000 bug and partly to standardise IT management, support and maintenance, and software and file formats globally. It closely resembled the similar technologies changes within the FCO (Foreign-and-Commonwealth-Office. 2001). This initiative was based within the department responsible for IT infrastructure (Corporate IT), rather than the department responsible for Information (Information Service Management), and thus the focus was primarily on the infrastructure rather than its business application.

Historically the introduction of new ICT within the British Council had greatly altered the practices and structure of the organisation. As a senior member of staff outlined the effect instant communications: *"I do remember many years ago – you would get something from Nigeria and [if] they hadn't given you the information you asked for you would just send off an [internal memo] back. You would say can you clarify this for me please and you would just bang it off in the out-mail and you would know that by the time the [diplomatic post] has got to Kano you could forget about it. By the time a written reply has come back [you could deal with it]. These days because communication is instant – the fact that Nigeria can now e-mail me instantly and say I want to know this, they seem to think you are waiting for them – and think [you are going to say] oh great I'll get right on to it. So that actually puts pressure on them. In some ways it has increased stress levels rather than reduce them because people do expect instant responses now, whereas before, people didn't expect that there would be a reply the same day."* This suggested that technologies introduction had shifted the centre of power to the overseas offices. The action research also outlined the significance of this shift as a consequence of the introduction of Knowledge Management technology.

The knowledge sharing strategy identified a need to ensure business benefit from this multi-million pound investment for individual businesses and users. As one person within the British Council stated about initiatives like GTI *"80% of the effort goes into technical design and implementation, and 20% only to user needs, including training design and delivery. Once the system is live, 80% of the problems are user problems and only 20% technical fixes"*[18] It was thus suggested that the organisation invest around £500,000 in training in the use of the GTI and in providing groups with *"knowledge-sharing tools"* using this new infrastructure. The significant investment such global training would require was argued as potentially profitable as *"a one per cent improvement in the efficient use of staff time represents an annual saving of £1.3 million"*. This simply equation was often used in justifying investment and time spent for the knowledge sharing programme, yet without any approach to measuring the actual efficiency savings.

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[18] This was quoted by a staff member during the global discussion on knowledge sharing.

5.7.2 Stage 2: A new Knowledge-Sharing programme

This second strand would run concurrently with the first stand and is the most recognisable as a Knowledge Management programme. The action research interventions of this study would be undertaken as part of this strand of the strategy. The strand's aim was to develop new habits of collaboration throughout the Council within one year. The strand would build upon the existing examples of cross-departmental, inter-regional and cross-sectoral collaboration and extend such behaviour across the organisation. The strand aimed to promote the creation of a *"comprehensively networked organisation"*.

In order to achieve this strand a dedicated knowledge team was established within ISM. This team would be directed by the CKO, but managed by the director of ISM. It would consist of the Knowledge Manager, the Researcher, the Intranet Manager and her assistant, an administrator and various other contract staff.

This team would work closely with CIT and the "Web Team" (responsible for the Internet web site) to "*find the best ways of supporting group activity"* and to develop new services using the Internet and Intranet. "*The main feature in the immediate future will be a growth in the use of the Intranet and...e-mail"*.

This strand called for the support of the senior management team to provide a consistent message of collaboration, in particular a Director General led programme to promote consistent knowledge sharing practices across the organisation.

The strand would be achieved by *"working alongside existing work groups and other (some of them still unformed) groups with shared interests, and with problems to solve or new services to develop. Support would be in the form of help with analysing the groups' knowledge needs and encouraging access by others to their skills and knowledge". "The focus in this strand is on groups whose contribution is of particular importance in achieving the current corporate plan goals... This strand will encourage shared ownership of the Intranet which will expand significantly as the main working knowledge tool for the council worldwide."*

The primary aim was to identify and develop key groups for knowledge sharing in support of the corporate plan's objectives. The researcher was tasked, through discussion with the Knowledge Manager and Chief Knowledge Officer, to run two pilot projects to provide technology to support two groups of particular importance within the organisation: a Country Directors group, and a science representatives group.

The strand would be supported through training for users and managers in developing knowledge sharing programmes for their work groups, investment in best-practice databases and global events calendars. This would build on the first strand's training in the use of and exploitation of the GTI technologies. Of particular relevance to this study, this strand would be supported by the *"development of a range of knowledge stores, accessible through information gateways (portals) on the Intranet, to support group-working"*. The Council's Knowledge Manager saw this study's research as instrumental in assessing the use of such technology for Knowledge Management.

5.7.3 Stage 3: Transformational Aims

The final stage of the strategy had a longer term focus than the other two strands and aimed to *"develop a more comprehensive plan for knowledge sharing and learning in the Council"* (Khalid and Marsden 1999). This strand, which would be developed through the lessons of the first two strands, would form a planned response to the need for the Council to *"redefine its business to meet the requirements of the successor generation and to make full use of team working and new technology both in the delivery of new services and to drive the Council's internal processes"*. The strategy argued that expanding the boundaries of cultural relations would require the organisation to gain new knowledge and skills and make the capacity to effectively innovate and learn a core capability of the organisation (Khalid and Marsden 1999).

"This [stage] will set out the steps necessary to ensure that the Council's organisation and business processes adapt and transform in accordance with the changing demands of our work and external conditions. This strand supports planning to equip the Council with the knowledge, expertise and processes required

to support a greatly increased customer base and the capacity to maintain contact with large numbers of people over time" (Khalid and Marsden 1999).

This stage would integrate closely with the strategy planning process of the organisation, in particular the planning for the development of information systems for the decade 2000-2009 and would place knowledge sharing with the organisation's approaches towards technology, information systems, personnel processes, recruitment and staff development.

5.8 The Knowledge Sharing Strategy in practice

The knowledge sharing strategy of the British Council presented the organisation's aspirations for Knowledge Management; however it was left to the Knowledge Management team to implement practical action. Led by the Knowledge Manager and provided with *"a council wide remit"*, the knowledge sharing strategy was interpreted into a wide variety of practical steps to improve knowledge sharing. One of the primary aims of these steps was *"bringing people overseas more closely into the [general] debate"*. This was seen as particularly relevant as the overseas council appeared poorly represented in headquarters' discussions. At this time the council was experiencing *"lots of culture change"* which was perceived to require improved knowledge sharing such that the organisation would improve. Much of this culture change concerned drawing together the fragmented sections of the organisations; *"the council has been talking about "Unity", acting as one, rather than two, three arms"*.

One of the early aims of the knowledge sharing strategy was to travel overseas in order to promote the agenda and *"create an atmosphere of empowerment"* in which staff would take part in knowledge sharing activities. Yet there were, even initially, a number of criticisms and issues with the knowledge-sharing programme. The Knowledge Manager described these during an interview at the beginning of the programme: *"The resistance to Knowledge Management that I have felt so far is the term, the label, the idea that - here's something new that the organization is trying to get its teeth into*. This seemed an early indication that the organisation was averse to new initiatives. Those who were most predisposed to the ideas of Knowledge Management were most open to the programme. As the Knowledge Manager

outlines *"What I have found up until now is that the people who are more willing to talk about it are the ones who are already doing it"* throughout the programme and this research study this proved to be the case, the programme only reached those who had some level of interest.

Furthermore the Knowledge Manager did not appear sufficiently influential to gain access to the senior mangers of organisations or to gain time on the agendas of the organisations main meetings *"...the biggest problem [with implementing the knowledge sharing programme] is... the organisation is just too busy... that trying to find space on big meetings where I can preach as it were, or talk about [the] Knowledge Management agenda is proving very difficult. Far harder than I thought or expected. So... I don't know whether that's because the people I have to go through are resistant to the idea of Knowledge Management, or they are just too busy."* This issue would plague the knowledge sharing programme, and is apparent in the first cycle of action research.

Technology was seen as integral to the activity from very early on in implementing the knowledge sharing strategy. One of the first activities undertaken was to research the *"existent electronic mailing lists and see how they were being used for knowledge sharing"*. The Knowledge Manager was keen to see *"why some work and some don't"*. Through this interest in the use of technology in implementing the knowledge sharing strategy the Knowledge Manager was provided responsibility for the intranet; line managing the intranet manager. As such the knowledge team had a wide remit to implement internet-based knowledge tools and the Knowledge Manager was keen to support the researcher in piloting such tools as part of the knowledge sharing programme.

5.9 Conclusions: This study's part in the Knowledge Sharing Strategy of the British Council.

Following the successful call for funding from SMG, the knowledge sharing programme began. The researcher was required to support the first two strands of the strategy by providing intellectual input to the programme and by participating in running two initiatives within the second strand of the strategy. The study was

undertaken full time supported by the British Council's Knowledge Manager and working within the organisation's new knowledge team. The researcher was not paid for this involvement other than travel expenses and the previously arranged sponsorship of his Ph.D. programme.

The researcher was asked to undertake these pilots as action research based on his previous experience developing Intranet and Internet solutions for ICL (now Fujitsu Services). The researcher had also undertaken a number of consultancy projects for other organisations relating to Knowledge Management. The organisation and researcher both saw such an action research study as beneficial in contributing to academic theory and providing technical expertise into the knowledge team. It was also envisaged that the papers authored during the work would contribute to the analysis of the success (or otherwise) of the knowledge sharing programme.

The researcher's involvement in the knowledge team contributed to both the research being undertaken and the practical benefits sought by the organisation (this form of action research is discussed in detail in Chapter 4). However in undertaking the pilot projects the researcher was provided relative autonomy; only needing to justify his ideas to the Knowledge Manager. Hence, the researcher was able to marry the academic theory reviewed with the practical action undertaken as research using an action research method. The researcher's review of the literature on Knowledge Management meant that he acted as a resource for the Knowledge Manager. This meant that the theories outlined in the literature review fed into the overall Knowledge Management activity of the organisation.

This integration of theory and practice included drawing the Knowledge Manager into academic discussion. He attended a number of regular workshops at the university discussing Knowledge Management issues; jointly authored a paper on Knowledge Management (Venters, Khalid et al. 2000) and talked as a keynote speaker to the GEMISIS conference in 2000. This interest by the Knowledge Manager in academia aided the researcher in undertaking the action research within the organisation.

The following chapters describe the action research experience undertaken as part of the second strand of the knowledge sharing strategy.

CHAPTER 6 THE FIRST CYCLE: CD:NET

"It's funny what's happened to this word knowing . . . The actual act of apprehending, of making sense, of putting together, from what you have, the significance of where you are—this [now] oddly lacks any really reliable, commonly used verb in our language,...[one] meaning the activity of knowing ... [Yet], every culture has not only its own set body of knowledge, but its own ways of [knowing]." (Sir Geoffrey Vickers)

6.1 Introduction

This chapter presents an action research intervention within the British Council in order to empirically explore the outlined area of concern of this research. The researcher was tasked to implement a pilot Knowledge Management technology as part of the second strand of the British Council's knowledge sharing strategy. While he was aware of the contested nature of knowledge and Knowledge Management, the intense levels of criticisms levelled at the subject and the significant number of Knowledge Management systems which fail he remained compelled to act and implement a Knowledge Management system.

Having explored the literature on Knowledge Management systems the researcher was aware that the relationship between Knowledge Management and technology consisted of a reflexive relationship in which the technology is socially constructed in use. The research thus aimed to operationalise these concepts in order to act in an informed way.

The chapter is significant to the developing study for the following three reasons. First the chapter explores the problematic nature of Knowledge Management intervention exposing the messiness within. Second the chapter provides the

foundation for the developing concern with methodology for such intervention. Third the chapter raises many issues evident in the action research such that they may be explored in the next cycle in a laboratory setting.

Within this first cycle of action research the story is messy, for it reflects upon the battling of an action researcher in the face of a problematic user community. This cycle of action research was undertaken as part of the British Council's knowledge sharing strategy and the intervention undertaken aimed to provide benefit in line with the organisation's strategic objectives. It involves the action researcher working with the Knowledge Manager and an external consultant to introduce a Knowledge Management system for the Country Directors working overseas.

The intervention provided a significant opportunity to explore the implementation of Knowledge Management systems in practice. Working with such a strategically important group raised a number of issues pertinent to the study; however it also imposed significant constraints on the action research. For example the Knowledge Manager imposed a deadline for the launch of the project which placed the researcher under significant pressure. This pressure is reflected upon later in the cycle. The role of Country Directors is described in detail later in this chapter.

Key actors in the CD:net cycle

- **The CKO:** The CKO initiated the CD:net project and launched a questionnaire to explore these issues, however prior to the forming of the CD:net development team his sabbatical as CKO ceased and he moved to the role of Country Director in India.
- **The Knowledge Manager:** The Knowledge Manager took on the overall project management role for CD:net however he did not significantly influence its technical direction. He imposed deadlines on its development.
- **The researcher:** According to a Job Plan drawn up by the Knowledge Manager the researcher was responsible "*To provide the British Council with pilot tools to support the knowledge sharing needs of [the Country Director] community*". His technical expertise was relied upon to achieve this.

- **A retired policy director acting as consultant:** This person would act as facilitator to provide "*expertise in understanding the needs of the Country Director community... to edit, produce and publish information to be provided to the community and to support the community in its knowledge sharing*", and further to *"support the rest of the [development] team in understanding the community"* (from the Terms of Reference for the consultant).

6.1.1 The desire to improve

The intervention of this cycle introduced a knowledge sharing technology for the 110 Country Directors of the British Council's overseas offices. These directors were identified by the CKO and knowledge strategy group (see section 5.6) as the most strategically significant group within the British Council and a high priority for the knowledge sharing programme. In an interview with the Knowledge Manager, the importance of this group was further highlighted as part of a need to *"hit senior people first"* and to support this *"overloaded and pressured group"*.

The focus on Country Directors was also considered of strategic significance as the organisation was in the process of embarking on a major strategic change initiative (known as strategy 2005). This initiative would alter all areas of the Council's operation and it was seen by the CKO as imperative that the Country Directors be capable of discussing its implications. This may have been in part due to the CKO's imminent move to the post of Country Director for India following the end of his sabbatical as CKO (one Country Director stated in a discussion "*...it relieves me that there will be something in place when [the CKO] quits HQ to keep CDs up to speed!*"). The Chief Knowledge Officer believed that Country Directors should be provided with an *"information and knowledge sharing facility"* through which they could share experience and discuss issues in privacy; in particular avoiding the risk and the politics perceived in those discussions to which policy directors were party.

6.1.2 Strategy 2005

Every five years the British Council undergoes a strategic review for the next five years. Thus during the CD:net development the organisation was undergoing its 2005 strategy review with all Country Directors expected to participate. This strategy was

launched to the organisation at a conference in Edinburgh which was attended by the entire organisation's senior management, including all Country Directors. Prior to this conference it was known within the organisation that a number of overseas offices might close (particularly in Western Europe) with a subsequent shift in funding to transitional countries. Following this cycle of action research the strategy 2005 document was published and such restructuring become apparent. The strategy described *"The re-structuring of overseas operations, particularly in Western Europe, Africa, and South Asia, will result in job losses in a number of countries. However, in others, new posts will be created as activities expand or new programmes are created"* (British-Council 2000). It should be noted that the majority of staff overseas are locally appointed and thus immobile between countries.

The FCO, who have a significant influence on strategy, were keen to see the organisation use IT technology (Foreign-and-Commonwealth-Office. 2001). One of the most significant aspects of this developing strategy was a focus on exploiting *"new media and strategic partnerships to reach wider audiences and deliver new services."* (British-Council 2000).

6.1.3 The desire to improve from a Country Director's perspective

The Knowledge Manager was concerned that it would prove difficult to get Country Directors to *"talk to each other"* partly due to the pressure and overload they suffered, and partly to the *"hub and spoke"* mentality evident within the organisation. The phrase *"hub and spoke"* was used widely within the British Council to describe the general communications and control structure of the organisation in which the overseas offices generally communicate with the headquarters operations in the UK, rather than having significant contact with other overseas offices. This type of control structure has existed since the founding of the organisation and is highly evident in the FCO. Among Country Directors the policy directorate acts as the hub. This problem was also highlighted in an early interview with a Country Director who suggested the majority of his contact was with London, and that he would only maintain a close contact with a small group of other Country Directors and ignore the remainder.

It was decided by the CKO and the knowledge board that ICT technology should be used to improve knowledge sharing for Country Directors. While the researcher highlighted the significant issues with employing technology for Knowledge Management, the decision was made on the basis that such technology was the only effective way of quickly sharing information and receiving information from all Country Directors. The technology would be titled CD:net.

The CD:net project was initiated by the CKO who issued a questionnaire by email to all Country Directors soliciting their support. The results of this questionnaire were positive, with 35 of the 36 Country Directors who responded (out of 110) replying 4 or 5 on a scale of 1 to 5 to the question *"What is your overall level of interest in the [Knowledge Management technology for Country Directors] proposal"*. As the questionnaire needed to be completed on a web site the results would only reflect the views of Country Directors who already regularly used email and the web. It was also known however that a number of Country Directors relied on secretaries to print e-mail and then dictate replies.

The researcher was also sceptical of the results of the questionnaire which appeared to suggest great support for an Intranet based Knowledge Management system for Country Directors. One Country Director in Europe had previously suggested that he had *"not been caught out by not using the Intranet"* by which he meant that he did not use the Intranet in his work and no one had suggested any problems with this approach. Subsequently this Country Director was sceptical of the need to communicate with all Country Directors and thus the need to use such a system. Another interviewee closely connected to the GTI IT infrastructure project argued that among Country Directors there were generation gaps between those regularly using the Intranet and those unable or unwilling to access it. It was suggested that Country Directors were *"high-risk"* for the knowledge-sharing programme as there would be little need for knowledge to be *"shared horizontally"* between Country Directors – the real need was argued by this director to be vertical knowledge sharing between headquarters and Country Directors, and between Country Directors and their staff. This appeared to be an argument for a reinforcement of the *"hub and spoke"* structure which existed.

The CKO however was undeterred and used the results of this questionnaire widely in support of the knowledge sharing programme. The results were posted on the Intranet to provide legitimacy to the Knowledge Management team's actions. Whether or not there was overwhelming support by county director's for the service, there remained a clear organisational need for improved knowledge sharing among this important group. Furthermore the researcher was asked by the Knowledge Manager and the CKO to participate in the development of a Knowledge Management system for Country Directors in order to exploit his technical expertise around internet based systems.

The desire to improve was expressed as a root definition:

A Knowledge Management system to transform British Council Country Directors into a community and maintain such a community in order to alter the organisational conversation from "hub and spoke" and thereby reduce the pressure on Country Directors and Policy Directors and increase knowledge sharing.

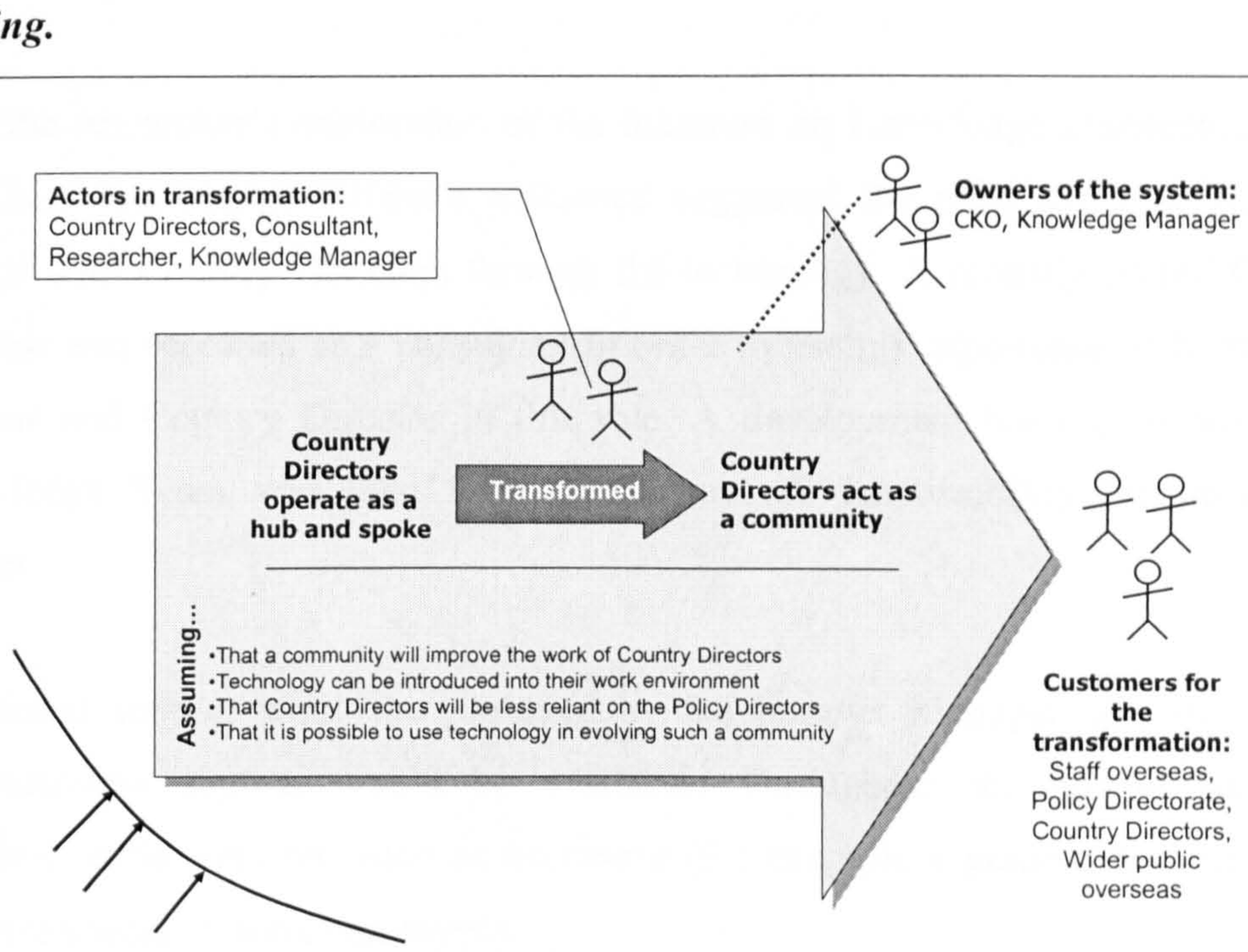

Figure 19: CD:net Root Definition CATWOE expressed in diagramatic form.

6.2 The researcher's involvement in the project

An implicit mutually accepted ethical framework (Avison, Lau et al. 1999) was devised for this cycle of action research between the researcher and Knowledge Management in the form of a job plan. This set out the researcher's responsibilities and outlined the basis upon which the research would be undertaken. It was agreed that interviews would form the most significant method of data gathering and that SSM would be used as the methodology for the research and intervention.

SSM would be used to model the purposeful activity of Country Directors, and through this analysis explore a technology that may be beneficial in improving their knowledge related activities. This would be founded upon the researcher's belief that while Knowledge Management was a contested issue, it could provide a route to improvement in operationalising the issues outlined in the literature review. Based on this literature review however the researcher suggested that *"Knowledge Management technologies, as they are currently conceived, fail to account for the richness of personal interaction with the tools themselves"* (Venters, Khalid et al. 2000).

Both the researcher's exploration of the literature on Knowledge Management, and the Chief Knowledge Officer's influence suggested the need for a facilitator to engage with Country Directors through the technology. A recently retired Country Director was recruited as a consultant in order to use his experience as both policy director and Country Director in this role. A development team from within the Knowledge Team was then formed with overall responsibility for developing CD:net.

Additional support would be provided by the Intranet Manager, and in addition administrative support would be available. Throughout the project additional technical skills were recruited as necessary (for example a graphic designer and a database specialist were employed).

6.3 Gaining an appreciation of the problèmatique

6.3.1 Appreciation of the work of Country Directors

Each Country Director is responsible for managing all British Council activity within his/her particular country. They will generally be UK citizens and be appointed by headquarters. Their role varies depending upon their country's operation; in terms of budgetary responsibility, staff number, region of the world, political significance to the FCO and thus contact with central government. For example, the Country Director in India is responsible for four offices and seven libraries and commands a staff of over 200, while in Ireland the Director manages only 2 staff in a small office.

Country directors face a significant number of challenges. In many ways they resemble managers of small businesses in that they take responsibility for the overseas office and its smaller subsidiaries. While they liaise regularly with staff in the UK they generally take responsibility for many matters themselves. The Director will need to visit the UK a number of times a year, and will also attend regional meetings with their Policy Director and other Country Directors from their region. They are also expected to support other areas of government when specific help is needed. For example one Director recounts: "*We supported the High Commission with advice and logistical support for a trade mission by the British Educational Suppliers Association... we arranged for discussions between then and the [countries] MoE [Minister of Education] ...on the use of ICT in education.*

The general form of purposeful activity undertaken Country Directors (gained through interviews and review of Country Plans) includes:

- Authoring a Country Plan for their Policy Director prior to the November expenditure round in which budgets are allocated. This plan defines the work of the overseas office for the next year.
- Line management of senior staff in the office. For example one Country Plan defines an objective to "formulate and implement a staff training and development strategy".
- Maintain contact with senior ministers in the overseas government, particularly in the area of education.

- Maintain effective budgetary control, managing IT projects (e.g. Y2K compliance).
- Carry out or manage distinct projects – e.g. "Modernise the Council's premises and infrastructure" or "develop the market for British qualifications, especially in English language and professional subjects, and increase turnover on behalf of British examining bodies.

Their activity is highly varied and includes liaising with government, entertaining VIPs, organising high-level events, general planning and management (Lee 1995). They are expected to gain entry into the professional circles of the country to which they are posted (Lee 1995) for example attending ambassadors functions, being well known among the relevant overseas government ministers, and the significant figures in education and arts. They are thus expected to maintain a high status, for example most offices employ a chauffeur and all the Country Directors visited had large offices usually with art from the British Council's collection on the wall. The Country Director will employ a deputy.

Country directors often need to deal with government crises and FCO issues, for example during the UK's "foot and mouth" crisis, telegrams were sent by the Prime Minster, through the FCO, requiring that Britain be promoted as *"open for business"*. The relevant Country Directors were then required to immediately alter the office's activity to promote this message.

Due to the high level nature of their work many Country Directors have diplomatic status. The British Council forms part of the FCO's "UK mission" within the overseas country and so the Country Director also reports to the FCO's ambassador. Each ambassador must provide the FCO with a yearly assessment of the British Council activity, in which they often express strong opinions. This assessment is then fed into the British Council's planning and review process for each country. Pressure from the FCO can create tension for the Country Director when the desires of the ambassador diverge from the policy aims of the British Council. For example one Country Director said *"I need to focus on those things of high profile to ambassadors because they have strong opinions"*, he then cited the creative industry and

education. Another director said their ambassador simply didn't want the British Council to surprise him.

Within the British Council, Country Directors report to the Policy Directorate in London. The Policy Directorate act as line management to these overseas operations with each Policy Director managing a number of Country Directors within a particular region of the world. Policy Directors maintain significant financial control over the overseas operations through the planning process, and the Policy Directors provide the main contact between headquarters and the Country Director.

The Policy Directorate is generally very busy and therefore unable to talk at length with individual Country Directors. For example, one member of the Policy Directorate complained of "*constantly treading water- with no thinking time*". As the Directorate form the main method by which information and knowledge is distributed to Country Directors globally, this lack of time means that Country Directors often act autonomously and make decisions which *"reinvent the wheel"*. Furthermore the reliance on Policy Directors has proved problematic in an organisation which has undertaken significant downsizing (Lee 1995). One Policy Director expressed this problem: "*In a 5 year period in headquarters we have lost something like 3 or 400 jobs in downsizing. So headquarters is much smaller than it used to be, and [a] number of people overseas fail to understand this, and they think that Headquarters should still offer a wide range of support services that they were used to in, not so very long ago my job was done by 3 people. And there are people in the region who still treat me like I am 3 people.*" This downsizing was also raised as a reason for the development of CD:net. In particular that Country Directors were facing increasing challenges from the strategy, but that support from HQ was often insufficient.

A highly significant aspect in the careers of Country Directors is their regular rotation. Country Directors are appointed to a particular country for a period of about 3 years, after which they are either moved to a new country or back to the UK to work at headquarters. This rotation is also common within the FCO and is seen as ensuring that the director doesn't run out of ideas or, in the words of a Country Director *"go native"*. Notice that this quite offensive phrase hints at the underlying

value system within the organisation. The staff rotation also ensures that Country Directors involved in difficult or dangerous commissions are not required to remain too long. As each country office is different these rotations are seen (both formally and informally) very much in terms of either being a promotion or a demotion.

According to one Country Director, this rotation causes Country Directors in general to be continually planning their next career move, and they are thus reticent to criticise the Policy Directorate. This was also reiterated by the Knowledge Manager who remarked "*Every three or four years senior managers have to move post. People are always succession planning and as a result people are always looking at their next move, they are trying to place themselves to get what they want in their next move*".

6.3.2 The desire to develop a sense of community: the application of Knowledge Management theory within CD:net

Given the pressures to improve knowledge practices among Country Directors, the CKO suggested that the central focus of CD:net should be the development of, in his words, a *"community of Country Directors"*. This use of the term community was drawn from the CKO's reading of the Knowledge Management literature, and the belief that, given the ability to effectively interact, Country Directors would quickly form a self-supporting community. This development was suggested as a response to the *"hub and spoke"* mentality discussed previously, this relied on a large knowledgeable policy directorate that was no longer available. Such a community could potentially distribute more power to the Country Directors and away from the centre, aligned with the adage that *"knowledge is power"* (Davenport 1996; Sveiby 1997).

The CKO's use of the term community did not directly align with the literature on "communities of practice" within the academic Knowledge Management discourse. It is drawn from an interpretation of such literature through the management discourse, and from a genuine desire not to impose what might be termed a functionalist perspective of "managing the knowledge" of Country Directors. Rather the CKO wished to engage Country Directors in improving the way they undertook their work through encouraging them to form a "community".

The researcher was thus asked by the Knowledge Manager to translate the desires of the CKO into a coherent approach to a Knowledge Management intervention based on the literature. While critical of the potential to develop a simplistic technological "solution" for Knowledge Management for Country Directors, the action researcher felt ethically compelled to provide a practical contribution as part of the intervention, since this was the basis for research access to the knowledge sharing programme.

The academic discourse on Knowledge Management presents it as a highly contested issue, in particular between those approaches that decontextualise knowledge, and those that are concerned with humanising it (Hansen, Nohria et al. 1999; Hendriks 2001). The researcher thus drew on that literature which suggested emergent support social structures and individual action, as described in the literature review (Chapter 2), in order to mitigate the suggested problems from such contested issues.

While functionalist accounts remain dominant within the Knowledge Management literature (Schultze 1998; McAdam and McCreedy 1999), the researcher drew upon the concept of "community of practice" as it *"draws attention away from abstract knowledge and cranial processes and situates it in the practices and communities in which knowledge takes on significance"* (Brown and Duguid 1991). In discussion with the Knowledge Manager and the consultant, the researcher introduced the concept of "community of practice" in order that it be decided that the service should not simply provide a repository of "known facts". The term "community of practice" was thus quickly adopted by the knowledge team as the aim or aspiration of a variety of Knowledge Management initiatives.

Drawing on the literature describing "communities of practice" (Wenger 1998), it was hypothesised that providing a technological infrastructure to better support the "organisational conversation" between Country Directors could lead to the emergence of a "community of practice" for this group. Country Directors were thus conceived of as a *"yet to emerge"* community of practice. Within other organisations, "community of practice" had been cultivated through the provision of meeting room space or by giving time to attend meetings (Hackett 2002). It was suggested by the Knowledge Manager however that within the British Council the

existence of such a community had been prevented by the lack of an effective communications infrastructure. The design of CD:net would therefore focus on providing such a communications infrastructure. This infrastructure would be conceived as a *ba* in which Country Directors could privately converse (Nonaka, Toyama et al. 2000). A form of personalised discussion group would provide the foundation for such a *ba.* The concept of *ba* implies a shared context in which knowledge creation, sharing and use can occur (Nonaka, Toyama et al. 2000), it is not a physical space instead it is a *"time-space nexus, or as Heidegger expressed it, a locationality that simultaneously includes space and time."*(Nonaka, Toyama et al. 2000) of (Heidegger 1962). It is similar to a "community of practice" in that "members" of *ba* cannot merely look on, but are committed through action and interaction (Nonaka, Toyama et al. 2000). Yet unlike *ba* the CD:net tool would be private with a "boundary" set for Country Directors alone. By considering the concept of *ba* in addition to the concept of a "community of practice" it was hoped that the development team would infuse a *"hear and how quality"* (Nonaka, Toyama et al. 2000) onto CD:net.

Developing a sense of community was however likely to be problematic. "*Communities of practice are difficult to manage because...here we have a social grouping which is not formalized and is not sanctioned by management."* (Newell, Robertson et al. 2002). The researcher was aware that as communities are essentially organic in nature the provision of a technological infrastructure alone was unlikely to bring about the communities development and that a "catalyst" would be required. The term catalyst was used to imply that such a role would increase the rate of interaction and discussion among the Country Directors without actively participating in such discussions (see also (Von-Krogh, Ichijo et al. 2000)). This draws on the definition of catalyst in chemistry: *"a substance which when present in small amounts increases the rate of a chemical reaction or process but which is chemically unchanged by the reaction"* {OED}. The consultant was thus tasked with the role of attempting to catalyse Country Directors to become more like a "community of practice" through the CD:net tool.

6.3.3 Leadership for CD:net

It was collectively decided by the CD:net development team that the consultant's role would be as catalyst rather than as leader and that he would not direct the conversation on the service but rather encourage an emergent sense of community, simply prompting questions to keep discussion going, deleting redundant material, commissioning those reports felt to be needed by the users and acting as a facilitator in the discussions. This lack of direct leadership, while supported by the literature on "community of practice" (Hackett 2002; Wenger, McDermott et al. 2002) contrasts with some of the management literature on Knowledge Management. Such literature points to the need for an imposed sense of purpose and leadership in Knowledge Management interventions (Van-De-Ven 1986; Allee 1997; TFPL 1999). It is suggested that such purpose should be imposed by a significantly influential member of an organisation. However the researcher, consultant, Knowledge Manager and CKO agreed that in this case a central leadership role could prove problematic for Country Directors who were already led strategically by the policy directorate and by local ambassadors, and yet were used to relative autonomy otherwise. It was felt that the knowledge team did not have sufficient power to dictate or lead Country Directors and that Policy Directors would have to be called upon to impose this. Such a use of the Policy Directors would reiterate the hub and spoke structure of the organisation and lead to pressure to allow Policy Directors access to the service. Furthermore the CKO was keen that the system should be "owned" by the Country Directors rather than imposed.

The notion of leadership in the Knowledge Management literature appears in many cases to refer simply to the power of an individual to impose compliance with the intervention (e.g. a much cited Buckman Laboratories case study involved the CEO imposing significant pressure on employees to comply (Allee 1997)). With the British Council only the SMG and the Policy Directorate possessed such power. The consultant was thus tasked with acting as a facilitator for rather than as a leader of the CD:net service.

The CKO reiterated this view in an internal memo in which he wrote *"Research findings indicate that successful networking in organisations focuses on areas of*

need identified by the community itself, rather that by others outside the community. I suggested to (the consultant) that as community facilitator he should concentrate on assisting members to analyse their own needs and to decide what measures they need to take to mobilise their combined knowledge and skills to optimum benefit to members individually and to the Council corporately" (internal memo).

6.3.4 Privacy and safe enclave within CD:net

A "community of practice" requires a collective sense of identity and that its members perceive it to be a private space in which to discuss issues pertinent to them in safety (Wenger 1998). It was therefore decided that the service would be open only to Country Directors. Policy Directors and the SMG were thus excluded from participating in CD:net lest they impose their own leadership on the service, so moving the service to be a Policy Directorate led Knowledge Management system rather than a Country Director led system. Furthermore as the Policy Directorate held large amounts of power over Country Directors (particularly in assigning their next posting) then were they to be included it would be unlikely that the Country Directors would share their concerns or discuss their failures. However, if the community of Country Directors were to collectively wish to communicate as a group to others then this would be mediated through the consultant acting as a "boundary spanner" between CD:net users and other groups (Wenger 2000).

As Brown and Duguid (Brown and Duguid 1991) suggest, members of a "community of practice" should be *"allowed some latitude to shake themselves free of received wisdom"*. This is further supported by the work of Hayes and Walsham on safe and political enclaves (Hayes and Walsham 2000) and further extended in Hayes' later work on groupware in which it is suggested that *"safe enclaves were characterized as being shared electronic and non electronic social spaces that allow for underlying views to be expressed, and for discussion and reflection to take place on the different ways of participating within and between communities"* (Hayes and Walsham 2001) The decision to keep membership closed and provide a safe enclave had significant implications for the success of the service, and these are discussed in section 6.8 .

6.4 Developing the CD:net service

Once the CD:net development team had become established the initial analysis work could begin. The researcher interviewed two Country Directors prior to their posting overseas (only one of whom had acted as Country Director before), visited the Madrid office to attend a British Council run Knowledge Management staff seminar and had a discussion on Knowledge Management with its Country Director. A number of interviews were also carried out with members of the Policy Directorate (some of whom had been Country Directors previously); the CKO's initial questionnaire was reviewed and over eight hours of taped discussion and interviews were held with the consultant.

The researcher followed the approach to SSM, drawing upon the structure of the well known seven stage model (Checkland 1981). As it was necessary to work closely with the designated consultant, the seven stage version of SSM was chosen because it was easier to teach and demonstrate (Checkland and Scholes 1990). The researcher used rich pictures drawn from the interview material in order to express the problem situation and then devised some initial Root Definitions of relevant systems. It was intended that from this initial analysis further interviews would be planned, following which a set of conceptual models could be devised and taken into a second round of interviews with Country Directors. Finally, as suggested by SSM's seven stages, feasible and desirable change would be identified in order that action could be undertaken. However such change could only be undertaken if it called for Knowledge Management practices and a Knowledge Management systems as this was the aim of the knowledge team. Once such change had been introduced these models would also inform the consultant about the areas of purposeful activity which could be discussed on CD:net. The analysis would then continue, further exploring the problem situation in order to understand the impact of CD:net. This would be achieved through a second round of interviews with Country Directors while the system was being used; through observing the use made of CD:net; and through discussion with the consultant.

6.4.1 Problems with this initial analysis: A parallel experience with Country Directors

Once development began the role of the researcher appeared to shift. The Knowledge Manager, while leaving the researcher unhindered during the development of the system, set a tight deadline for its launch of the 31st of September. This deadline was imposed in order to fit in with the work activity of Country Directors, in particular to avoid a clash with their preparations for the year-end reports required in December. Furthermore the deadline was set such that the launch would be towards the end of the time Country Directors were writing reports for Strategy 2005 for October, and to launch prior to the Strategy 2005 conference in Edinburgh in early November in order that CD:net could be promoted at the event to all Country Directors in person.

Suddenly the researcher was propelled into a similar situation to the Country Directors themselves who were also desperately trying to complete the country strategy reports required for the October deadline. As the researcher struggled to explore the problèmatique in order to make sense of the purposeful actions of the directors with the aim of developing CD:net, so they were undertaking a similar analysis with the aim of writing their report for Strategy 2005. Problems of lack of information and communication infrastructure plagued both side's activity. The researcher needed to be flexible in order to survive within this complex socio-political situation in which both Country Directors and researcher were entwined.

The researcher's time was highly in demand during this period, particularly due to the difficulties involved in programming a complex system, in analysing the needs of Country Directors, in documenting the action research and in dealing with the general day to day difficulties of systems development within a complex organisation.

At this time the researcher was also attempting to gain access to a number of Country Directors overseas in order to complete the initial SSM analysis. Gaining this access however proved highly problematic. While those Country Directors contacted continued to express support for CD:net, none of them could commit time to support either a visit to their country, or even a telephone interview. It was also suggested by

the Knowledge Manager that they may have been reticent to be interviewed at a time when the organisation was discussing Strategy 2005 and the resultant possible closure of offices, and when many Country Directors were preparing defences of their budgets. The Knowledge Manager mentioned that other members of the organisation were also having significant difficulty in arranging meetings with Country Directors. This further highlighted the politically sensitive nature of Country Directors at this time. In addition to the problems contacting Country Directors, the consultant was relatively unconvinced of the need for such a detailed analysis as he felt that his extensive experience as a Country Director in Africa would be sufficient. This proved to be a very difficult time for the researcher.

The system development was thus forced to proceed on the basis of the information that the researcher was able to gain through the initial analysis, without the ability to further review the conclusions drawn by interviewing or observing overseas Country Directors directly.

The researcher was concerned that the views gained were at odds with the future users of CD:net who would be based overseas and facing the unique challenge presented by Strategy 2005. In particular the researcher had only been able to gain views from non-acting Country Directors, (e.g. Policy Directors, those awaiting posting and the retired consultant) and that the views of the consultant in particular had been strongly represented. This concern was supported when a Country Director later mentioned that, for example, the consultant *"comes from a particular tradition within the Council, and has very strong views"*. Indeed during an interview the consultant himself described how in the late nineteen eighties he had been responsible for initiating a Foreign Affairs Committee inquiry into cultural relations whose report was, by his own admission, *"described by unions as the most damaging report ever written by the British Council."* Another Country Director suggested that the consultant had *"[his] own axe to grind"*, and that since retiring in 1999 he had become out of touch with the present work of Country Directors (i.e. the strategy 2005).

The researcher thus relied on SSM in order to try to develop a coherent picture of the purposeful activity of Country Directors. This was further complicated by the

difficulties of working with a consultant whose long experience in Whitehall, including working as a scrutinizer of policy within the Thatcher government's policy unit, meant that he was focused primarily on delivery rather than process and was unreceptive to the need for reflection rather than action. A choice was made to focus on implementing a system as a prototype (Pressman 2000) based on the analysis gained in the hope of continuing the research and then evolving the CD:net system after its launch.

This decision thus formed part of the action research, for it was in essence the point at which theory and practice met in a problematic way. Action researcher's *"must pay attention to the congruence between qualities of participation which we espouse and the actual work we accomplish, especially as our work involves us in networks of power dynamics which both limit and enable our work"* (Bradbury and Reason 2001). The study could not continue to be an action research project were the researcher to negate the need for action at the first hurdle. Furthermore, this dilemma of being unable to gain a wide ranging insight presented clear evidence of the problems of implementing a Knowledge Management system, as its users failed to perceive its value prior to the launch (the cynicism of overseas staff towards initiatives is discussed below), and were too busy to participate in its development although this was a clear necessity for such systems. Rapoport's notion of goal dilemma (Rapoport 1970) between the aim of research and of action is thus realised, for in this case the goals were mutually exclusive. The researcher could either continue to try researching this unreceptive audience and thus fail to meet the agreed deadline for the organisation, or choose to focus on delivery at the expense of research. It was thus a pragmatic choice to continue to focus both on development and on achieving the necessary deadline by developing a prototype system.

6.4.2 Appreciation of the problèmatique: Pertinent issues for the development of capabilities by Country Directors

This section introduces the pertinent issues identified during this initial analysis, and includes three relevant root definitions.

Example Root Def 1

A system to provide Country Directors with short summary information of pertinent material held by other British Council departments, in order to reduce the amount of information they receive and increase discussion around the information by means of a consultant reviewing and summarising the material presented on CD:net to Country Directors.

The initial analysis suggested that Country Directors receive far too much information from headquarters, for example, large volumes of e-mails concerning policy, events, training courses etc; the Intranet structured around the corporate hierarchy with information on every aspect of the organisation; mailing lists on various topics which the Country Director must keep abreast of; letters from across the organisation; information packs on specific topics; the weekly on-line staff bulletin. Often this information is not actually for the Country Director, but sent to them by default. One Country Director complained that you needed an excellent PA who could pass on such information to the correct person. He complained that *"only 10% of the information on my desk is for me- the Country Director"*. This Country Director also felt that it was laziness and a tradition of sending all post to the Country Director which perpetuated this practice. It was thus decided that the development focus should be on a service that would have very short messages, and that all members of the community would be able to add messages and comments, rather than simply the headquarters group.

The consultant suggested that the main issues of importance to Country Directors were *"People, Policy and Money"*; that is, issues concerning staffing; issues concerning British Council policy and how to implement it; and issues concerning the budget for the overseas operation. Country Directors must balance these conflicting issues and achieve the aims of the Policy Directors and ambassadors to whom they reported.

It was therefore decided that these issues would form the underpinning of the CD:net service; that it should focus on reducing the amount of information that Country Directors were required to view, and that it should focus on the issues of people, policy and money.

It was suggested that CD:net should be designed to be flexible, with little structure imposed. This feature was requested in particular in a meeting with the Country Director for Singapore; *"the danger of imposing something [structured around specific views] is that you channel the way people think, within a medium which should be liberating"*. This Country Director argued that the service should not impose a structure on the discussions, rather that a simple structure should only be imposed when the service became too "*anarchic to be useful and user friendly. If straight away you put a structure on it, then you might stop people thinking laterally"*.

Country Directors wanted the CD:net service to provide an open, unstructured forum; one person requested in the CKO's questionnaire that the service be an "*open forum where staff can post ideas, complaints, rants, brainwaves etc without fear of retribution, regulation or sanction."* and further that the service *"cannot be seen to be regulated. It must be owned by us all"*. This suggested that the service should be provided as a secure private resource for Country Directors in which the purpose and approach should be dictated by the members. This was further supported by the literature on "communities of practice" which also highlighted the need to provide *"infrastructure in which communities can thrive"*, but that the community should not be mandated by outside parties (Wenger and Snyder 2000).

Example Root Def 2:

A Country Director owned system to provide flexible unstructured discussion among Country Directors, by means of a collective online discussion in order to develop lateral thinking and liberating dialogue.

Example Root Def 3:

A Country Director owned system to enable private discussion by means of a

Since overall the aim of CD:net was to engender a further sense of community among a group which was assumed to act as a community already, it was felt that the service should be highly informal. As one Country Director put it; "*I hope also that CD:net will give us plenty of space to kick around new ideas.*" Not all potential users of the service however felt that it should be provided as an open forum for all to contribute, in particular one Country Director suggested that there was a worry that certain Country Directors would use it to undertake self-publicity, while others were concerned about the quality of the material placed on the service. One Country Director suggested that such self publicity had been evident on the CKO's initial questionnaire, and that some Country Directors felt that posting messages on things like CD:net would help their career.

password protected discussion in order to enable complaints, rants and brainwaves to be discussed.

6.5 Appreciation of technological capabilities and constraints: The development of the CD:net technology and its introduction

Having carried out the initial research the researcher proposed a number of models of purposeful human activity in the form of Root Definitions. The design of the CD:net service then consisted of a process of designing a system which would have the potential to provide benefit to the Country Directors. These Root Definitions provided broad outlines of the issues facing the Country Directors and did not provide a basis for going on to develop Conceptual Models. Rather the researcher entered the design stage of the system's development appreciating the various constraints placed on the design.

Technology is experienced differently by different individuals, and differently by the same individuals depending upon the time or circumstances. This is termed by Wanda Orlikowski as "technology in practice" (Orlikowski 1998); *"what the "technology" is at any time is what the practice has made it"* (Orlikowski 1998). Such experiential differences affect the way technology is appropriated and used. Given that CD:net was intended be an interactive tool such technology-in-practice would come about through a social process influenced by all users. Such technology *"... is in some respects a public durable entity. It is a physically, economically,*

politically and socially organised object in space-time. In this aspect it may be called an "artefact" with which activity takes place... At the same time, for individual users, technology is a repeatedly experienced, personally ordered and edited version of the artefact. In this aspect it may be termed a "technology-in-practice"" (Lave and Wenger 1991). The researcher was thus highly concerned as to how CD:net could be designed such that it would provide benefit (and engender participation) for a disparate group of Country Directors. The researcher thus decided to develop a technology and focus on adapting the technology to be ready-to-hand for Country Directors in order that it would become integrated into their practices.

Once this technology had been installed it was intended that further research would be undertaken to explore how CD:net was being used. On the basis of the findings the technology would then be altered to better suit the purposeful activity of Country Directors. This form of incremental development (Avison and Fitzgerald 1999; Pressman 2000) was deemed appropriate as only through an individual's engagement with technology-in-practice does it become meaningful, useful or consequential (Orlikowski 1998) and since knowledge Country Directors apply in their work develops and alters over time (Lave and Wenger 1991; Nonaka, Toyama et al. 2000; Nonaka and Nishiguchi 2001).

Designing a Knowledge Management system is not comparable to an engineer who identifies a problem and then designs a solution, but it is more like a gardener to provides the right conditions in the soil and hopes that something useful will grow (Snowden 2000; Johnson 2001). The "growing conditions" for Country Directors were suggested to be the capabilities of the Knowledge Management technology, with the users left to grow their exploitation of these capabilities over time (with the support of the consultant and the researcher). These capabilities offer affordances to users, where *"the affordances of an object refer to its possible functions. A chair affords support, whether for standing, sitting or the placement of objects. A pencil affords lifting, grasping, turning, poking, supporting, tapping, and of course writing"* (Norman 1993). The tool will thus direct (to some extent) the use made of it, whether it is designed to be neutral or not. The researcher could thus only provide a set of capabilities which were perceived (on the basis of the earlier analysis) to offer potential benefit for Country Directors. However once introduced the actual use

made of the technology could be very different, as the directors perceived different benefits from the affordances provided.

In this way the aim was to promote Country Directors exploration of the technology's affordances in order that they may deconstruct the standing possibilities (Searle 1995; Kallinikos 2002) of the technology in order that they may become reified and hence inscribed within the Country Directors purposeful activity.

The notion of affordances was valuable in identifying the multiple uses to which CD:net could be put. The idea has however been criticised for focusing simply on the attributes of the artefact, so reducing human agency to a situated choice among inherent affordances (Winograd 1999). In focusing upon the design of CD:net there was a need to devise a technology which complemented the variety of purposeful actions that the Country Directors engaged in. This study thus considered the capabilities of the technology alongside the affordances these capabilities provided. It is the role of Country Directors to identify such affordances from the capabilities offered, and the role of the researcher to provide a relevant set of capabilities for this to happen. These capabilities should thus enable the co-development of both practice and of technology-in-use (Orlikowski 1992).

Success in designing such capabilities into the user interface of a technology is therefore based on *"understanding the user, the user's tasks, and the context in which the user accomplishes tasks and goals"* (Karat, Karat et al. 2000). Technology designers, however, frequently underestimate the impact of introducing tools within such a work context (Karat, Karat et al. 2000), and need to be supported in their focus on the human activity that takes place in the workplace. *"At the core of this is the difficult and multifaceted task of understanding the users, their work context, and the tasks to be accomplished"* (Karat, Karat et al. 2000).

The researcher was aware that the system should be ready-to-hand for Country Directors such that they could integrate it into their ongoing sensemaking practices (Winograd and Flores 1986). Its design was thus focused on an anticipation of breakdown, and the way in which CD:net's design might direct purposeful action. He was concerned that the system be designed to afford use, and so employed user-

centred design approaches (Norman 1990; Norman 1993). The mobile phone was used as a metaphor in order to explain this concept of affordance to the consultant and development team. It was suggested that CD:net should become like a mobile phone in that Country Directors could use it without real thought in a huge variety of ways to make life easier for themselves.

The actual design was constrained however by the way in which the technology needed to be developed for use within the British Council. These constraints included issues of security, network bandwidth availability and corporate standards for Intranet sites. These constraints were identified in various meetings with the security manager, the network manager, the intranet manager, and with various members of the corporate IT department.

The service would have to be run entirely using internet technology and be accessible through a web browser. This meant that Country Directors without access to the web would be unable to use the site (e.g. the Myanmar government does not allow internet access and the British Council can only access e-mail once a day via an international telephone call). The intranet site would have to conform to the organisations standards, imposing a series of constraints on the graphic designer employed to specify the sites colours and to design the icons and layout of the service. Given that the service was intended to be separate from the Intranet as a private resource for Country Directors, this constraint led to significant discussion between the researcher and the graphic designer who wished to impose an obviously different look-and-feel and the Intranet manager who needed to maintain standards. It may also have led Country Directors to consider the system to be a part of the Intranet and thus as something managed and populated from the UK.

The service would have to run on a web-server located in the British Council's secure server room in London. As the British Council used two Microsoft products to provide its interactive Intranet services (Microsoft SQL server and Microsoft Internet Information Server), the researcher needed to develop a system within this particular software platform.

The global nature of the British Council also imposed constraints on all its web-based information systems. The organisation relied on the Internet as the central communications infrastructure for its overseas offices since a private network would have been prohibitively expensive. This meant that in order to ensure security all its online services needed to be password protected. Therefore in order to access any Intranet web-site the user was required to enter a password.

The use of website technology itself constrained the provision of capabilities to develop a sense of community. HTML (and the underlying HTTP protocol) is designed for rendering hypertext information and is thus more suited for simple information provision than for complex interaction (Berners-Lee 1998), thus leading to systems which support a more functionalist approach to knowledge (Sørensen 2002). Given these constraints the researcher still attempted to design a service which would, wherever possible, promote social activity through discussion. The researcher was thus tasked with producing a highly interactive system through the use of advanced database applications.

The CD:net system was based on a mixture of SQL and VB-ASP (a web programming language) code developed from code for a web-based collaborative discussion system produced as part of the GEMISIS project at the University of Salford. This reliable system had been programmed by the researcher previously who then undertook to alter and configure this software for CD:net. The software was selected because it provided a simple user-interface which would require little learning by the Country Directors. The service would also be capable of extensive tailoring during the British Council project.

The software was developed with the following technical capabilities:

- the ability to start a new discussion (the discussions were hierarchical thus a discussion could be created within another discussion);
- the ability to add comments to an existing discussion;
- the ability to search (by author, date, person or word);
- the ability to link to and comment on other web based information;
- the ability to maintain one's personal details and view other peoples details.
- the ability to view all comments made by a particular person.

These capabilities are all relatively straightforward, and are almost always included in generic Knowledge Management technologies (see section 3.2.1). They were selected in order to support the development of a "community of practice" as outlined in the literature review (see section 3.3.4) and yet also to be appropriate to the needs of Country Directors. In line with Wenger's recommendations (Wenger 2000) this would then enable different levels of participation through both its structuring and the actions of the consultant; for example by providing areas for comments on a proposal, areas for general questions and areas for discussion. The system would be familiar because it had been designed within corporate standards, and closely resembled the file explorer of Microsoft Windows. The systems would be made to change regularly by the consultant posting regular messages and commissioning articles. The provision of a public space in which the "community of practice" could promote their activities was to be coordinated through the consultant (for example by his presenting accepted documents to the SMG). In general, however, the CD:net system would remain private(Wenger 2000).

Given the heavy work load of Country Directors the system would need to be very easy to learn. Thus the system was developed within accepted HCI principles (Dix, Finlay et al. 1997) with each page having a "Help with this page" link which provided context dependent help. The Country Directors were personally registered for the service and received a personalised e-mail inviting them to access it. This e-mail included a personal software token which would ensure the security of the service, whilst mitigating the need for new usernames and passwords to enter it. Country Directors would then enter the site in the same way as they entered the corporate Intranet, through the use of the standard Intranet Password. CD:net would then recognise them.

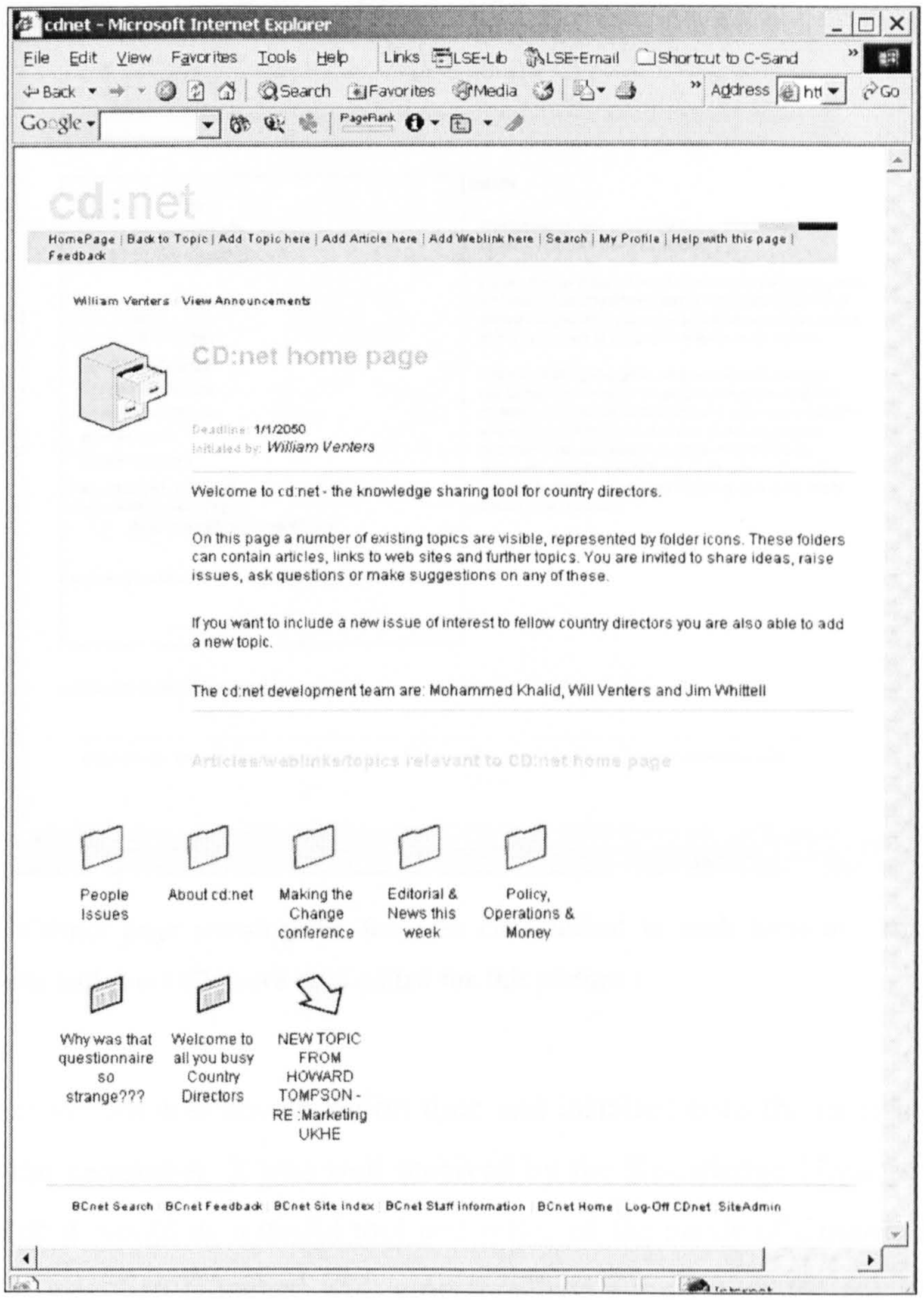

Figure 20: CD:net page: This shows the home page with folders and discussions at the bottom of the page. The author's name (in this case the researcher) is associated with the page.

In order to promote contact, discussion and sharing knowledge each article, folder or topic was connected automatically with its creator's details. These were linked to a page containing the person's details and a short amount of text describing their role and experience (see figure 20).

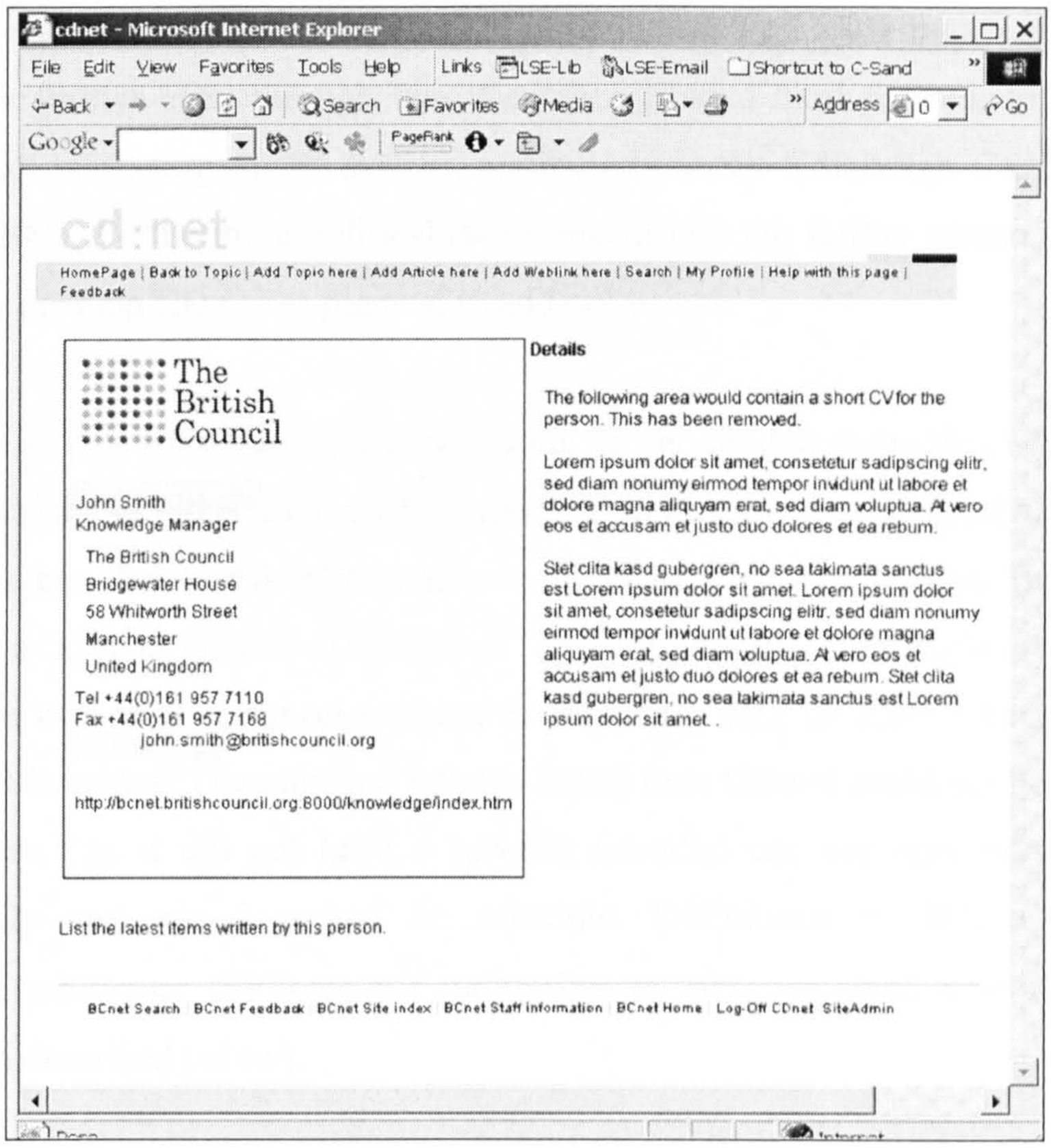

Figure 21: CD:net page showing the Business card linked to each issue or comment. (The person's name and short CV have been edited for this picture.)

The CD:net system was developed on time and installed onto the British Council's server by the researcher. It was well received by the Knowledge Management team who felt that it would be a useful tool and reflected the needs of Country Directors. The service was then launched with a personalised e-mail from the researcher with the access details and software token, followed by an introductory e-mail from the consultant.

6.6 CD:net in use

The system was launched just prior to the agreed deadline and it had an immediate period of high use followed by low use towards the end of its third week. Whilst some Country Directors used the service for a number of weeks, the service did not become embedded in the routines or human activity of the Country Directors; and a "slow death" (as the consultant described it) occurred. The Knowledge Manager

became concerned that the system would never be used and was thus unprepared to promote it further even through the researcher pressed hard for him to undertake some direct marketing of the system, particularly at the Edinburgh Conference on Strategy 2005. Furthermore political issues meant that the further research intended to directly develop CD:net as planned would not occur.

At this stage it is possible to identify CD:net as yet another example of the 75% of systems which are either cancelled, or never used (Lyytinen and Hirschheim 1987). Yet one is also led to ask what a failure might be for a Knowledge Management system. If a "system failure" is defined as "*an information system that either does not perform as expected, is not operational at a specific time, or cannot be used in the way it was intended*" (Laudon and Laudon 2000) then CD:net could not be described as a failure, as it did not have a specific intended use nor operation, operated successfully and was launched on schedule. Definitions of failure based on dissatisfaction (Sauer 1993) are not appropriate as users remained supportive of the system (as described below).

CD:net clearly suffered an "*interaction failure*" (Lyytinen and Hirschheim 1987) by only achieving low levels of use and examples of such interaction failures are well known within Knowledge Management (Miles, Miles et al. 1998; Schultze and Boland 2000; Hendriks 2001). However as the developer of CD:net the researcher wished to explore the reasons for such lack of use relative to the Knowledge Management aims.

The researcher thus used the initial interviews undertaken during the first month of the third cycle of action research in order to undertake further interviews with Country Directors. These interviews were concurrent with the second cycle of action research. This research was with Country Directors who did, and who did not, try the CD:net service. It was intended that through this later research the reasons for the interaction failure could be gleaned, and then applied into the later cycles of action research being undertaken.

As predicted, once the Strategy 2005 conference was over it became much easier to meet with Country Directors. The following section explores the interaction failure

of CD:net drawing on interviews undertaken during the development of CD:net, on interviews undertaken with Country Directors following its development and on some interviews undertaken as part of the initial research for the third cycle of action discovery. Given that the initial interviews for the third cycle ran concurrently with the second cycle of action research the findings of these interviews thus fed into both remaining cycles of action research.

Given the nature of interpretivist research, these conclusions should not be perceived as the "results" of the intervention, but rather as emergent interpretations and observations from the intervention (Johnson and Duberley 2000). Where possible, these interpretations are linked to the existing theory outlined in Chapter 2 such that conclusions may be drawn. The rich pictures associated with this analysis may be seen in appendix 1.

6.7 Discussion of the CD:net project

6.7.1 Introduction

Overall, the main problems experienced with CD:net appeared to be socio-technical in nature, since they concerned the interaction between the human purposeful activity of Country Directors and the CD:net technology. The development of CD:net had approached the issue of technology through a focus on its readiness-to-hand (Winograd and Flores 1986). In particular questioning how a technology may be developed to become ready-to-hand within the Country Directors' purposeful activity such that it becomes used as part of the repertoire of tools. In the case of CD:net however the tool did not achieve such readiness-to-hand, but constantly led to breakdown such that it remained present-to-hand (Heidegger 1962; Winograd and Flores 1986; Inwood 1997) in that the difficulties users experienced with the tool led them to be constantly aware of its nature. In their use of the tool they were led to reflect upon its purpose, value, background and potentially its political significance.

These breakdowns appeared to the researcher to broadly correspond to those breakdowns associated with the design of the service (e.g. problems inherent it its design as a technology), with the external social factors around the intervention (e.g. the impact of organisational change), and with issues associated with the CD:net tool

itself (e.g. problems of using the web-site). These areas of breakdown are discussed in the following sections 6.7.2 , 6.7.3 and 6.7.4 . Although the description of these areas of breakdown may appear incoherent, contestable, messy or dichotomous, this is intentional as the aim is to capture the problems the researcher wrestled with during the reflection on the CD:net project carried out in order to proceed with further research in the second and third cycles.

6.7.2 Breakdown in the use of the CD:net tool

6.7.2.1 The process of analysis and the use of the tool

By inviting Country Directors to use the CD:net technology, and subsequently interviewing them on their reflection, they may have been led to reflect upon the tool, its purpose, and their role as part of a potential "community of practice" of Country Directors. Such interviews altered their perception of the purpose of the tool, and to cause them to reflect upon their work in general. For example, during an a interview with a Country Director he first reflected on the nature of the tool and its capabilities saying "*you can see where everyone is coming from...*" this then led him to reflect on the potential value afforded by such capabilities, suggesting that it would *"remove the possibility for extreme action"* – that is, reduce the propensity for people to promote extreme opinions within the network. He reflected further on this to say that it would be *"useful in getting feedback from all colleagues – could save time"*. Finally he improvised how such affordances could support his purposeful activity, suggesting that it *"could support personal problems, for example on investments"* suggesting that CD:net's capability of seeing where everyone is coming from could be useful in discussing *"personal problems"*, that is problems in his personal life as a Country Director of which organising investments is an example. This type of reflection on the capabilities of the tool, followed by appreciation of its affordances, followed by improvisation or design of problems which the tool might afford benefit, occurred regularly in discussions with Country Directors on the CD:net technology.

In the language of Heidegger, the act of interviewing the Country Directors appeared to have led to a "breakdown", an interrupted moment in the Country Directors *"habitual, standard, comfortable "being-in-the-world""*(Winograd and Flores

1986). Being-in-the-world, characterised as absorbed involvement, is broken when the referential whole fragments (i.e the interconnected construction of the world in which one is in) (Introna 1997). *"When the referential whole is broken the equipment leaps out and becomes an object placed in front of a subject"* (Introna 1997). Essentially, in the occurrence of such a *breakdown* the equipment becomes the object of reflection (Introna 1997), with the Country Director being led to reconsider the nature of the tool. Such *"breakdowns serve an extremely important cognitive function, revealing to us the nature of our practices and equipment, making them "present-to-hand" to us"* (Winograd and Flores 1986). In this, Winograd and Flores argue further that *"new design can be created and implemented only in the space that emerges in the recurrent structure of breakdowns"* (Winograd and Flores 1986). During the interviews the researcher's questioning may have caused a breakdown for the Country Director such that he was led to consider both the technology of CD:net, his social position among other Country Directors and the pertinent problems within this work. The Country Director went on to suggest how the technology could be reconfigured to support these pertinent problems. The Country Director appeared to be innovating and designing how the CD:net system could be employed to support his work. The Country Director was essentially improvising improvements in his work practice by reflecting on the CD:net technology within the interview (Ciborra 1999; Ciborra 2002).

Such improvisation within the interview appeared to suggest a benefit in encouraging the Country Directors to reflect on the technology, and communicate such reflection to the researcher (as occurred during the interview). However such reflection tended to focus on the provision of pertinent information for that particular Country Director. For example one director requested CD:net support his making sound investment decisions (something that is problematic for Country Directors working overseas who have complex tax arrangement and whose investments are located in the UK). Another Director suggested the service should provide details of speakers which others had found of benefit. However such suggestions appeared to focus on one particular aspect of the Country Director's work or life and thus suggests the provision of a set of information which would benefit them, without concern for where such information would be produced.

The interview questions appeared to provide a breakdown in the ongoing activity of the Country Directors work; a breakdown which forced them to reflect on their work activity and the capabilities of CD:net and then innovate new uses for the technology. Given that CD:net aims to develop a community of Country Directors such breakdown may be a valuable part of the process of raising issues of importance and then suggesting how the community and the CD:net tool might help.

It is such processes of breakdown and subsequent reflection that the CD:net service should encourage. *"It is only when a breakdown occurs that we become aware of the fact that "things" in our world exist not as the result of individual acts of cognition but through our active participation in a domain of discourse and mutual concern."*(Winograd and Flores 1986), and through such breakdowns knowledge emerges. *"Knowledge and understanding...arise from the individual's committed participation in mutually oriented patterns of behaviour that are embedded in a socially shared background of concerns, actions and beliefs."(Winograd and Flores 1986).* As a user becomes aware of the capabilities that a Knowledge Management technology offers he/she can begin to question his/her actions, and so alter their practices in order to incorporate the use of the technology, and thus subsequently alter the technology to suit the new practices.

The suggestion that CD:net should support problems, such as investment, that are not directly connected with the work of Country Directors but rather the life of being a Country Directors appeared significant. Another Country Director had proposed that CD:net support them in selling their houses when they move on, or in finding good hotels in London. Such comments suggested that CD:net should extend beyond the boundaries of the practice of being a Country Director as seen from the perspective of the British Council and their job role. Rather that the CD:net technology should support all aspects of the life of a Country Director. The SSM analysis of Country Directors' roles also suggested that there is little boundary between work and leisure time. For example when visiting a Country Director his life appeared to rotate around the British Council. He attended functions and dinners where work merged with his social life (for example two authors visiting the country on a lecture tour were taken to lunch where a number of the Country Director's personal friends were invited to help with the conversation). The director drank at the embassy bar and

socialised with people from both the British Council and Embassy communities. The SSM analysis appeared to suggested that Country Directors do not make clear distinctions between the various aspects of their job, *life on the job is looking more like life off the job"* (Peters 1992). One is led to wonder whether the assumptions implicit in most Knowledge Management interventions into a work environment are perhaps similarly constraining.

6.7.2.2 Technical constraints

The CD:net system had been designed in order to operate within the operating constraints of the British Council as described previously. These constraints however then also proved problematic in the way the system was used. The very slow connection times for some countries led to criticism of the service, in that as one Country Director reported: *"the speed was so slow that the technology just got in the way of opening it, and I haven't got time to sit around for five minutes waiting for a web page to be timed out."* In fact a regular complaint from across the world was the speed of connection, yet CD:net was as quick to load as pages on the Intranet. Such constraints on CD:net would reduce the potential for CD:net to become ready-to-hand, thus causing a breakdown in its use. Constraints such as speed were often given by the Intranet Department as the reason for users not engaging with technologies such as CD:net. This appeared to suggest that the Country Directors were not prepared to invest time on CD:net, and further that they were in a position to be able to choose to avoid using the system. CD:net clearly did not afford (and was not seen to afford) sufficient benefit to this particular individual to invest in *"five minutes waiting"* time. One wonders how such analysis of time investment was arrived at, but perhaps it was because of the plethora of available alternatives discussed in the next section.

6.7.2.3 Substitute technologies and CD:net

There is a need to appreciate the plethora of alternative or substitute technologies available to Country Directors in their work. Technologies such as telephones, e-mail, the water cooler, and even post-it-notes and the margin of manuals have been suggested as "Knowledge Management" technologies individuals may rely upon (Brown and Gray 1995; Orr 1996). In using CD:net one Country Director complained that his *"first impression [was] that it was, something separate,"* that is

separate from his other regularly used technologies such as the telephone, Microsoft Outlook and the corporate Intranet on his PC, and his diary and calendar. This Country Director further stated that *"I won't use CD:net if it is something separate from the e-mail system"*. This suggests a need to identify and explore the substitute technologies which individuals could employ instead of using an introduced system (Ciborra and Patriotta 1998). Had this been undertaken for CD:net it may have been possible to design and introduce a service that worked closely with the substitute technologies, such as the e-mail system, within the technical constraints described.

In many ways the benefits of using a Knowledge Management system are realised socially (i.e. the collective provision of information and materials benefits other users of the service rather than necessarily benefiting the publisher). There is a particular need to explore the reasons why users employ such substitute technologies if services such as CD:net are to succeed. This was emphasised by a number of Country Director who said that if they faced a problem they would simply *"pick up the phone"* or e-mail someone they knew rather than using a Knowledge Management system like CD:net where the discussion on the problem may benefit others.

6.7.3 Breakdown in the external social factors

6.7.3.1 "Information Overload" and "Initiativitis"

In further considering the lack of engagement with CD:net the informational and communicational context within which the technology was used was identified as a possible factor in the breakdown. Country Directors often complained of *"information overload"* (Moad 1998) and received large volumes of material which they were compelled by their Policy Directorate to read.

It is possible that those messages associated with and promoting initiatives such as CD:net were simply ignored as they were not deemed to be urgent. One Country Director outlined how he relied on his PA to pass information irrelevant to his work on to others to reduce his burden. As the Country Director in Azerbaijan commented "*I am already besieged by hundreds of emails, URLs, list servers, forums, questionnaires, good ideas, unmissable offers etc. every day from every quarter that to add another information source would simply be the straw that breaks the camel's*

(or at least my) back!". Given such a situation the likelihood of an invitation to a new service being ignored would appear to be high. Could it be that the introduction of CD:net within this context also suffered from a general *"initiativitis"*- an overload of initiatives (Venters, Khalid et al. 2000), in which Country Directors were faced with many such initiatives all aimed at improving their work, particularly new budget changes and those associated with strategy 2005? This issue was further highlighted by the consultant who wrote that *"we must take note of the considerable cynicism that exists about HQ driven projects."* Ironically the emancipatory aim of CD:net to reduce the informational burden on Country Directors and so enable them to reflect upon and discuss issues may have suffered from one of the very problems that it aimed to reduce; in that its introduction may have become yet another demand on the time of Country Directors. Whether or not CD:net could succeed in reducing information overload was never explored by a Country Director given that such an exploration would be in itself an additional (and possibly pointless) activity.

There is thus a need to explore how to promote to users that they explore the tool and the propensity for such a tool to afford initial tangible benefits to the user; noting that the individual's perception of such benefit will depend on the way the individual reflects upon their own activity. Furthermore since engagement with a Knowledge Management system requires an investment of time and effort then how can such an investment be achieved when an employee cannot be compelled to engage with such a system?

6.7.3.2 Assumptions of community and identity

The initial SSM analysis suggested that Country Directors had little direct contact with other Country Directors, and that such contact tended to be directed only to specific individuals. Yet the Knowledge Manager appeared convinced that a "community of Country Directors" existed. From the CKO's initial description of the service as a community tool, the word "community" was frequently used to describe the Country Directors among the Knowledge Management team. However in the design meetings that took place between the researcher and the consultant it became apparent that in the consultant's experience the majority of contact and interaction of Country Directors was not with other Country Directors, but with the Policy

Directorate or their staff. This form of contact was reiterated within many interviews with the regular use of the phrase *"hub and spoke"*.

One Country Director stated that he would only really contact CDs from countries within the same region, and preferably easy travelling distance but that such contact was sporadic. This Country Director suggested that his interests lay in a series of smaller networks of County Directors with similar interests, activities, locations, or experiences. By employing the terminology from the literature on "communities of practice", assumptions were made as to the nature of the group of Country Directors. It appeared that the concept of a "community of practice", and of community in general is highly appealing (Williams 1976) and led the Knowledge Manager to assume more cooperation among Country Directors than actually existed.

The nature of communities, and in particular of "communities of practice", to which the knowledge sharing strategy of the organisation aspired, defined a community as a cooperative participation in social action (Wenger 1998). The approach towards CD:net appeared to assume such participation was existent among a group who appeared only to be connected by a shared job title. While many of the activities may be common (for example each Country Director had to undertake planning and budgeting processes) these were often focused on the particular structure of the type of overseas offices being run and thus had little common ground. Their plans differed depending on their previous activities such as events, countries importance to the UK government, the way the office has previously operated (for example the Madrid office has a full school which cannot easily be closed), and the local laws (for example a countries labour laws may prevent staff changes).

Country Directors did not appear to maintain the consensus of meaning (Choo 1998) that can lead to actionable consensus. Historically the overseas operations were run autonomously, with any major issues resolved through discussion with the Policy Directorate and the HQ function in London (this model historically had grown out of the FCO model for embassies). This *"hub and spoke"* arrangement meant that there were few shared histories, values or styles of operations between Country Directors. For example two Country Directors admitted that they did not contact their predecessor other than for specific questions, and that, in the word of a Country

Director *"The organisation is spread across the globe, but local directors must focus on local issues"*. Such comments were regularly made by overseas staff and appeared to reinforce the view that the organisation operated hierarchically.

One Country Director talked about searching for countries with similarities; either of action, situation or location. He suggested the Country Directors act as series of little networks, which self-configure, and maintain sporadic contact. Country Directors' perceptions of the British Council, and their ideas concerning the organisation often appeared dissimilar, and their activities were seldom aligned, with many running very different forms of operation from their peers (for example Country Directors talked about others being of the "old school", and running "traditional programmes"). While activities occasionally occurred in which a number of countries participate, these tended to be at an operational level (e.g. science staff within a country organising a project with another country) rather than at director level.

The feeling of overload and pressure among Country Directors may however have led them to continue to act autonomously in order to fulfil the HQ strategy thus seldom needing to contact other Country Directors. The role of Policy directors in line managing Country Directors may have further encouraged this view, with one Policy Director stating that they acted as a *"hub"* in order to make things happen, and viewing their role as that of outlining *"clear objectives for the region"*, which Country Directors would then *"make happen"*. Where Country Directors did contact each other, such contact tended to be calls requiring an answer to a specific issue rather being for a general discussion, as one said; "*I tend to contact my predecessor with specific questions, usually quite weighty questions,[we are] not chatty"*.

Their appeared to be a general assumption that given the correct infrastructure (i.e. CD:net) a "community of practice" of Country Directors would simply form, and once formed would remain. This suggested the need to further investigate the notion of "community of practice" and the ways in which users identify with such communities, within the further cycles of the action research. As Fernando Flores has argued (Flores 1998) we are in danger if we consider computer systems as virtual communities, without considering the notions of "identity" by which we make sense

of them. In particular, the change in some users' perception of the nature of a community may lead to its disintegration (Wenger 1998), an issue forcefully demonstrated in the following two sections.

6.7.3.3 Divergent conceptions of the purpose of CD:net

One issue which appeared particularly relevant to the development of CD:net was the lack of predefined purpose and a lack of analysis of the cohesiveness of the group. The CD:net development team's initial description of the service was to improve the knowledge sharing activities of Country Directors, by providing a service to develop a sense of community, in order to *"obtain, exchange and discuss"* issues pertinent to their work. The invitation to enter the service described it thus: *"The tool allows Country Directors to share information, and discuss topics of interest"*. In part this overall lack of a definite purpose was to highlight the fact that ownership of CD:net resided with the Country Directors, rather than being imposed by Headquarters.

This emphasis followed recommendations from the Knowledge Management literature that the function of such services should reflect closely the purpose ascribed by users rather than be imposed (Brown and Duguid 1991; Wenger 1998; Wenger, McDermott et al. 2002), and from comments from Country Directors. *"Rather than start in a complicated way can we just have a bulletin board that is self moderating..."* (Country Director). However, without a definite purpose the tool appeared to be in danger of being taken hostage by a particular perspective, or of failing to be used at all since the Country Directors could not appreciate its afforded benefits. This perhaps occurred during the initial weeks of CD:net in which a number of messages were posted on the service which were critical of "Strategy 2005". At the same time other Country Directors posted messages asking for help in their work. Later such messages for help stopped being posted giving way to more political messages. On reflection it now appears that both the designers and the users of the CD:net service conceptualised the service differently.

This lack of an effective conception of the purpose of CD:net is perhaps unsurprising since the system aimed to improve human purposeful activity through the application of Knowledge Management principles. The problems on which the system was focused had been identified as *"messy"* (Ackoff 1974), to which no systemic

solution could be sought, and for which no objectives were easily defined (Checkland 1981). Yet the development team's belief in Knowledge Management appeared to lead them to ignore this lack of clarity in the objectives and problem definition and to suggest that the problem be to "*create a community of Country Directors*" or to *"provide the information and dialogue necessary"*, neither of which presents an effective definition. While the researcher remained concerned as to the lack of defined purpose, he was unable to convince the other members of the group of the necessity to explore the issue further.

6.7.3.4 The significant impact of organisational change on CD:net

In implementing the CD:net service, its focus was upon affording improvement to the knowledge activities of Country Director through a technology which supported discussion. Such an approach did not focus upon the wider corporate strategies of the British Council at that time, rather leaving Country Directors open to direct the purpose of the service as previously described. Yet as Strategy 2005 would prove a significant influence on Country Directors it was quickly posted as a topic.

One of the crucial aspects of strategy 2005 was a reduction in ongoing costs of running an extensive overseas network, in achieving this office closures were *"considered inevitable"* (Quote by Director General in internal newsletter). At the launch of CD:net a broad strategy had been agreed by the board and the senior management were in the process of drawing up action-plans for achieving the strategy's aims. The strategy's impact on the organisation would not become apparent until the "Making the change" conference attended by all Country Directors in Edinburgh UK soon after the launch of CD:net. One requirement of this strategy was a significant change in the skills base of the organisation, and a reduction of staff through redundancy. These issues were clearly highly charged among Country Directors.

The CD:net service was evolutionary in nature and lacked a precise definition of purpose. The service also provided the ability for any Country Director to suggest an area for discussion. Within the first week of its launch a highly critical discussion area was suggested. This was not surprising given that the CKO (by now a Country Director in India) had intended the service would have *"particular reference to the*

need for close co-operation over the design and implementation of the five-year strategy..." (memo from CKO).

Almost overnight thinking concerning CD:net, both externally to its members and among the development team shifted to considering its part in the conference related activity. While the researcher argued that the focus of the system should be innovation and learning, not political issues, the consultant was concerned that the political aspects not be ignored, that CD:net "*handle dissent*" by providing an unregulated mechanism in which Country Directors could "*come clean*" particularly regarding the strategy.

The consultant stated in a memo to the researcher and Knowledge Manager *"We need an instrument [CD:net] which will allow...CDs to discuss issues of concern to them and to produce an output which leads to a resolution of their concerns"*. Both the researcher and the Knowledge Manager were concerned during the initial week of launch that this rapid change in the direction of the service would be detrimental to the overall knowledge-sharing programme's aims, and worried that, having lost the support of the CKO's power through his move to India, they would be unable to politically maintain the independence of CD:net. Essentially they were concerned that it would either be closed or taken over by the policy directorate, quickly becoming another information distribution mechanism. Indeed these concerns were reinforced during an interview with a Country Director who stated that the Director General and Policy Directors should be included as members of CD:net *"because otherwise, there is a danger of creating an underground movement. An underground movement is essentially a movement of opinion which is not communicating with the authority... And if you don't have that communication then you might get conflict."* While literature on Knowledge Management and "communities of practice" suggests the necessity for privacy in order to create and share knowledge (Gammack and Goulding 1999; Hayes and Walsham 2000; Ward and Holtham 2000) and (Wenger, McDermott et al. 2002), this quote implied the provision of such privacy may be problematic.

Other research with a number of Country Directors, however suggested that they wished to discuss the political issues "*if it is accessible to all Country Directors, [it]*

needs to focus on things that are of interest to most Country Directors. So, things like the "making the change conference", how people feel about it etc, because everyone is going to be interested in that because they are all going".

When the first political message was posted indeed the policy directorate were concerned. Interestingly the message was leaked to them and they became very concerned that the service was being used as a subversive element to the strategy. The policy directorate then put significant pressure on the CD:net development team (including the researcher) to provide them access to the service; a move which would have immediately altered its nature.

The regular rotation of Country Directors and the ongoing succession planning they undertake ensures that Country Directors remain in a constant state of concern for the stability of their work, and as such considered unlikely to undertake actions which offend the policy directorate who decide their next move. It is perhaps for this reason that distrust developed among Country Directors of being associated with CD:net, as it began to be perceived as a political service by the policy directorate.

Soon after the messages critical of the new strategy were posted on CD:net the researcher was told that it was discussed by the senior management group, which included the Director General of the British Council, as a possible subversion to the strategy. While no attempt was made to turn off the CD:net service, it is possible that individual Country Directors were warned of the impact such discussions could have on them personally and they quickly avoided the service. One Country Director said to the researcher *"I would not trust CD:net, I know many people will send things straight to [SMG]"*. This Country Director was cautious of even discussing political aspects through any electronic medium *"I would not trust any electronic medium, every time you send an e-mail you have in your mind that the message may get out to other peoples hands."* It was becoming clear that CD:net's aim to provide a knowledge sharing environment was shifting (and more consequentially being perceived to shift) towards being a political tool, and perhaps more significantly for Knowledge Management, that Country Directors were unprepared to engage in such debate. Furthermore the assumptions of community and open sharing projected by the CKO and others were clearly problematic.

The system had been provided as a safe enclave for Country Directors, free from the negative impacts of surveillance and control (Hayes and Walsham 2001). Yet by visibility to senior managers, and lack of trust among Country Directors it was not perceived in this was by the Country Directors but rather perceived as a dangerous space. Similarly to Hayes study, many Country Directors avoided a shared discussion forum among all Country Directors (CD:net) instead participating in smaller safe enclaves generally through telephone communications; one Country Director said that he shared his political discussion with those people who he knew very well from a intensive training session all Country Directors attend. He contacted these people by telephone, or through private e-mail.

Considering the role of drift in use and perceptions of a service (Ciborra 2000) suggests emphasis be placed on how to effectively design technology in which designers may either support such drift, or challenge it. Such an approach should encapsulate the call for bricolage that *"Transcends the orthodox, centralised and staged view of software development by replacing it with a distributed and evolutionary approach"* (Ciborra 2002).

6.7.4 Breakdown in the design of the service

6.7.4.1 Espoused interest verses actual use.

During the first month of CD:net only thirty six of the invited 110 Country Directors actually undertook the single mouse-click required to enter. There was a difference between the espoused need for CD:net and its actual use. While every indication was given of Country Director's desire to access a service (through feedback from the CKO's questionnaire and through the interview materials) it was not even entered by the vast majority. For example the director of New Zealand e-mailed the researcher with the following: *"Having had an initial scan through CD:net it looks tremendous and I am looking forward to using it regularly - great idea and well done to all involved"* yet this director did not post any messages. Within the questionnaire prior to launch of the service, when asked what level their interest was with regard CD:net, all responses supported the service with the majority supporting it strongly. Some of those questioned included notes of support such as *"Overall I think the CD:net*

proposal is an excellent idea" and *"This is an excellent and most welcome facility".* One Country Director interestingly noted that Country Directors often felt isolated from the decision making and social processes of the organisation and that "*Anything which can help counter the sense of isolation that CDs sometimes (often?) experience...*" would be beneficial.

It was thus concluded that users' espoused support for the service was not being played out in practice. When asked whether they had used the service one Country Director in Paris responded; "*Well I have to confess that I haven't. [But] I approve of it".* And yet another "*I think CD:net and contributing to the debate on cultural relations is something that I would like to do...But, as I haven't got into using it, I feel a little bit, er, un-sighted on it".* This is reminiscent of the work of (Argyris 1991; Argyris 1995) where senior executives would espouse a theory-in-use of their activity, yet in practice undertake a different theory-in-action. When Country Directors were asked about their support for CD:net they were "brought out" of the ongoing action of "being a Country Director" (as observed in the effect the researcher's interviews had on Country Directors) such that they can consider and reflect upon the benefit of the service, however when presented with the service as part of their ongoing action their theory-in-use of not spending time on such initiatives came into play. This appears to indicate the need for the researcher to focus on the purposeful activity of the user rather than listening to their espoused desires and support for Knowledge Management. Yet identifying such purposeful action with the complexities of the work of Country Directors proved highly problematic.

6.7.4.2 Problems with tool evolution and director level employees

It is often difficult to identify how a tool is likely to be used in practice prior to its introduction. It has been suggested in recent literature that Knowledge Management technology which aims to support "community of practice" should be grown in an evolutionary nature (Davenport, DeLong et al. 1998; Stojanovic, Stojanovic et al. 2002; Wenger, McDermott et al. 2002), with a trial and error type approach.

In designing CD:net it was decided that the service should evolve this way, an approach also suggested by a Country Director in the initial questionnaire

"I...suggest we start with a very simple limited service and develop it as it becomes a normal means of knowledge sharing and needs become better identified." (Country Director- Argentina). This was attempted with CD:net, however on reflection there is a concern that for strategically important groups such approaches may be ineffective.

As Country Directors are regularly invited to participate in initiatives (see the conclusion above concerning information overload) they are unlikely to re-visit a project or initiative which they feel has failed previously. They appear unlikely to invest time in aiding the development of a service of social benefit – particularly as they are under significant pressure to succeed in targets which do not reflect such social or collective improvement (their targets are judged against their own country's achievements alone).

The Country Director in Spain said during an interview *"I've not been caught our not using the Intranet"* highlighting that his not using the Intranet did not appear to affect his performance; the director was only prepared to invest his time in using a service when he really needed to. He further added that his job was to run a £20millon business, and that time to invest in creative thinking about his job was hard enough, without focusing on creative thinking for others. This presents a dilemma for developing systems like CD:net in which the value and benefit of the service should emerge through use, yet for this group such emergence would prove highly problematic. When the system is launched it needs to afford benefit immediately, yet it needs to be grown and nurtured to this stage with the participation of the user community.

6.8 Conclusions:learning from this cycle

Within this cycle of research the researcher explored a route through the highly contested area of Knowledge Management in order to undertake an intervention on behalf of Country Directors. The nature of the "community", however, appeared highly fluid with Country Directors regularly re-interpreting both the nature of the "community of practice" and the intervention itself. The CD:net development experienced these barriers in terms of information overload, *initiativitus* and time pressures.

The issues described in the previous section are drawn together in order to make sense of the development of CD:net holistically. The aim is to step outside the breakdowns and to identify the contradictions at the heart of the CD:net development in order to draw lessons for the subsequent cycles of research and action.

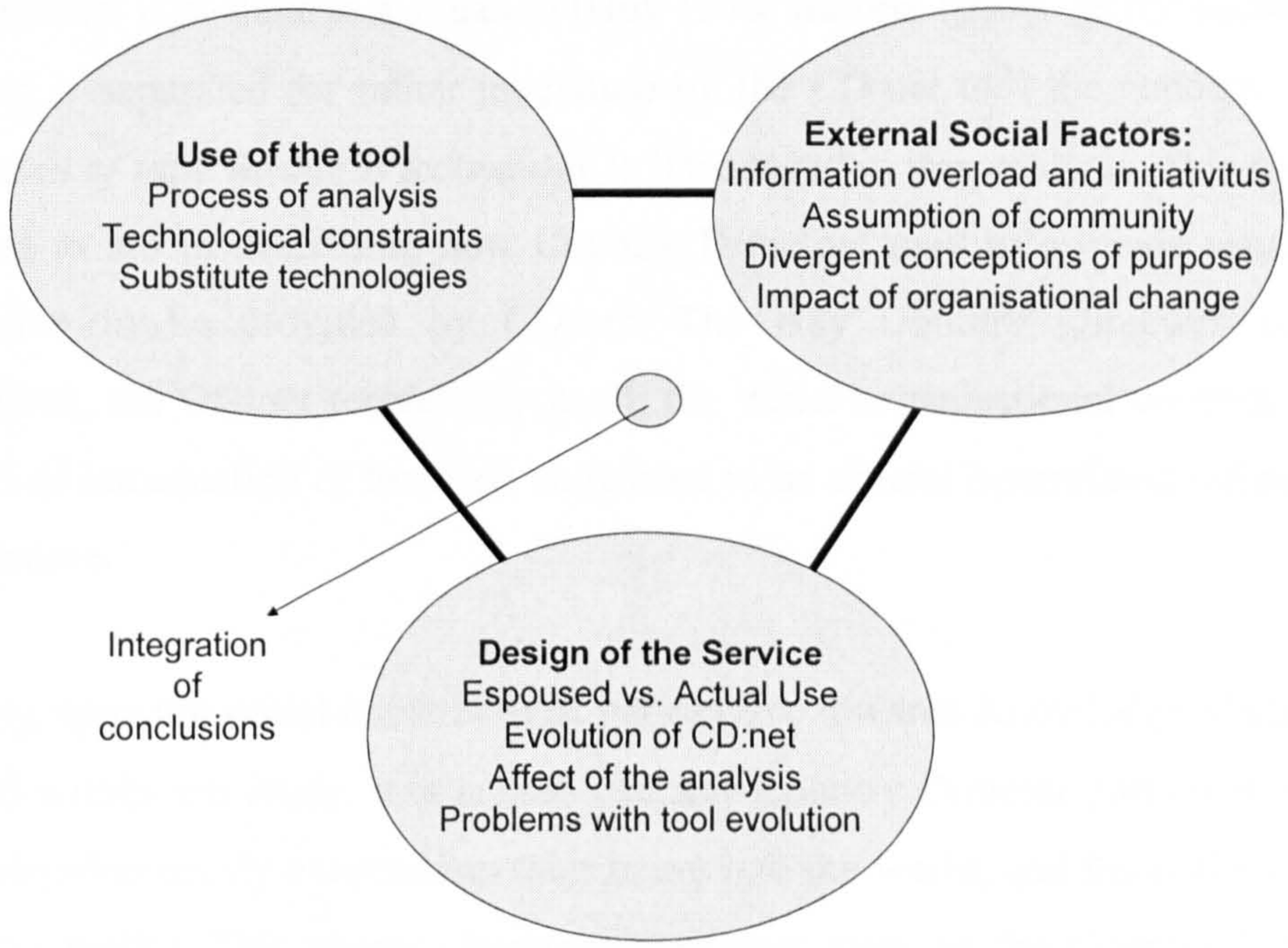

Figure 22: Integrating the learning in order to plan for future activity.

Returning to the initial assumptions upon which CD:net was founded, one can describe the action research in the following manner: the cycle of action research was founded upon the belief that an intervention among a group of people identified as Country Directors would lead them to act more like a "community of practice", and through this interaction be led to learn from each other and to reflect upon their work. Such a change in their work was assumed to be beneficial, and hence the intervention was desirable. In order to achieve this benefit a technology (CD:net) was introduced which was perceived to be capable of providing a space (*ba*) to enable such a "community of practice" to emerge. A person who recently retired from this group was appointed as a catalyst in order to draw upon an understanding of the activity of group members and act within this *ba* to bring about dialogue and conversation. The researcher also agreed to develop CD:net in light of the use it afforded to members of the "community of practice".

Reflecting upon this description, and upon the lessons identified from the interaction failure of the intervention it is argued that the Country Directors' perception was a significant influence on the outcome of CD:net. The term perception is used here not as sense perception of colours, sounds, taste etc, but rather as a method of making sense of what is at stake in a situation (Hoy 1978; Introna 1997). As the perception of meaning is separated (or rather mediated) by the CD:net tool the concept of *inter-perception of (and through) technology* is introduced in this analysis. This concept is intended to aid in describing how Country Directors may have made sense of the interaction to be provided by CD:net. The way Country Directors perceived themselves, the CD:net technology itself, the wider organisational context, and the method of introduction of tools are suggested to be crucial interrelated influences on the outcome.

Drawing upon the social-constructivist perspective towards Knowledge Management adopted within this study, it is argued that any Country Director participating in the world simultaneously externalises their being into the world, and internalises it as an objective reality. This process is undertaken over time, as the Country Director is inducted into a particular social dialectic. For one Country Director the subjectivity of another director is available, becoming meaningful for them, whether or not the subjective processes (and thus suggested meanings) of each align. *"We not only understand each others definitions of shared situations, we define them reciprocally."* (Berger and Luckman 1966). The country plans produced yearly for the Policy Directorate, for example, provide an externalised view of the Country Director's subjective internalisation of the organisation's requirements of them and of their offices capabilities. This goes beyond the formally recognised policy statements for their country to include their perceptions of government policy, of overall funding priorities, of pressure to improve and, perhaps most significantly, of the work of other Country Directors as expressed in their country plans and in discussions.

We therefore draw on the concept of an intersubjective world (Berger and Luckman 1966), in which the natural attitude of an individual corresponds to the natural attitude of others. Within such a world each individual maintains different perspectives upon the world (analogous to SSM's Weltanschauung). Yet according

to Berger and Luckman there must be a correspondence between an individual's meaning and the other's meaning of this world in order that the two individuals may share a common sense of the reality (Berger and Luckman 1966). These two individuals are attempting to interpret their experiences in order to recover such meaning. The words of the messages on the CD:net system may be meaningful only to the Country Director in *"concerned understanding"* (Introna 1997), yet such Country Directors were separated in location with different life experiences. The meaning they constructed was thus a hermeneutic process of meaning construction on the basis of the text posted on CD:net (Winograd and Flores 1986). The Country Director would have an understanding of the author of the posting (they may have met them in the past, they may have known the office they worked in, they may have had an understanding of the issues they faced). They would thus interpret the posting on the basis of their perception of its author, coupled with the meaning they gleaned from the text.

They were also provided with other clues as to the meaning, for example, where and when the text was posted on CD:net, and to what it was referring. Each of these clues were used in order that the Country Director (and similarly all other Country Directors engaged with CD:net) would socially construct some sense of the meaning, identity and purpose of the posting. *"Communication is not merely the expression of knowledge, experience and identity"* but rather *"it is the very basis of their social construction"* (Varey, Wood-Harper et al. 2002). Yet the perception of the tool was also affected by the interpretation of the messages posted on the system. Drawing on the example in section 6.7.3.4 in which a number of political messages were posted which shifted the way CD:net was used: Once a message was interpreted as political, CD:net was quickly perceived by many as a politically charged tool; other postings on the service were thus viewed with a political slant.

At this level the analysis is simply descriptive, drawing on hermeneutics and the social construction of knowledge. However as a Knowledge Management system such as CD:net aimed to simply provide an online sense of place (*ba*) in which Country Directors dictated its "purpose", this interpretation is argued to be highly significant. Since the interpretation was linked to action (Schön 1982). A Country

Director upon perceiving CD:net as political will then act upon the tool as though it is political further reinforcing its "politicalness".

Certain Country Directors appeared to believe that a single highly political message on CD:net was sufficient to perceive the whole service as subversive. It is this interpretation, through technology, of the purpose ascribed by others and the subsequent potential reinforcement (or challenging) of this perception which is central to the concept of inter-perception. This concept has parallels with the structurational aspects of Weick's concept of sensemaking (Weick 1995), yet it also focuses upon interactive systems in which meaning is constructed through an organisational conversation enabled by technology.

This alteration in the perceived identity (or identified purpose) of the CD:net service was further affected by the nature of the knowledge-sharing tool. In developing a Knowledge Management system the developer should appreciate the inter-perception of the users. From this appreciation they may be able to influence such inter-perception by providing alternative views, discussing the services purpose, or even restricting messages in order to stop the system becoming self-destructive as appeared to occur with CD:net. Since stories are beneficial in aiding their writer to make sense of their experience and then expressing such sensemaking in a meaning rich way (Gabriel 2000; Gabriel 2001), and also as stories are beneficial in infusing meaning into the Knowledge Management system (Snowden 2000; Snowden 2002) this study suggests that they are used as a mechanism to strongly identify the purpose of a Knowledge Management system, and thus as a potential counteraction to self-destructive perceptions of the technology.

It should also be noted that the overall perception of a system will not be homogenous. During the political discussions on CD:net messages were still being posted requesting support for events, describing recent activity etc. One could speculate that this would mean different areas of a Knowledge Management system could take on very different purposes and develop in different ways. One might see a fragmentation in the system as various groups no longer interact.

The CD:net system provided each Country Director with the same information. Many packaged Knowledge Management systems however provide a personalised view of the information based on the registered characteristics of the user (e.g. (Autonomy 1998; Microsoft 1999; Orbital 1999)). This *personalisation* technology (Riecken 2000) is based on the mantra *"our purpose is to serve you"* (Karat, Karat et al. 2000) allows users to either opt-out or opt-in to particular discussions or information, or alternatively allow a software agent to undertake the selection on their behalf based on a description of the user (Riecken 2000). A number of authors recommend personalisation within Knowledge Management systems (Davenport and Prusak 1998; Milton, Shadbolt et al. 1999; Bowman 2002). The technology has been criticised for selecting information which it perceives as relevant thus reducing the probability of serendipitous information being read (Brown and Duguid 2000). While such technology may increase the afforded benefit of the technology to the user (Winograd 1999), the concept of inter-perception suggests that such personalisation would provide different views into the system and would thus complicate the relationship between such objectification and internalisation. This study thus suggests that such personalisation may have a limiting affect on Knowledge Management systems focused on communities.

From the area of concern of this cycle of action research a set of findings and outcomes can be described. These findings are then carried into the second and third cycles of this research.

Area of Concern	**Learning from findings**	**Action to be taken in next cycle**
The design and introduction of Knowledge Management systems	Designers must appreciate the technological constraints, substitute technologies, and organisational change initiatives during development as these are likely to impact on the systems perceived purpose and use.	The researcher must undertake a detailed analysis of technology intended to be used in the intervention and presently being used by the users.
	Users may support the system and suggest necessary features; however these should be considered in relation to their human purposeful activity as	The researcher should design the systems based on an understanding of purposeful activity

	users are presenting their espoused theories towards technology rather than their theories in action.	rather than necessarily being led by requests for particular technological capabilities.
	The way a system is developed and introduced will impact upon users' perceptions.	The researcher must consider users' perceptions of the service during design and undertake actions which lead or influence such perceptions. Personalisation technologies should not be employed. Stories should be used to counteract "negative" inter-perception.
	Users need to be actively engaged in the development process in order to evolve the tool in use; however such engagement may be difficult if the system does not already afford benefit.	The researcher must engage users in the development process. The systems should be provided in a vanilla form and developed through such engagement.
	The intervention will be affected by users' perceptions towards previous change initiatives within the organisation.	The researcher must appreciate previous initiatives during the design.
The design of Knowledge Management technology	It is suggested that the underlying Knowledge Management technology in the further cycles of research be capable of being rapidly reconfigured.	The researcher should be capable of rapidly reconfiguring the Knowledge Management technology.

Table 1: A summary of learning points from the CD:net cycle of action research.

6.9 Summary

This chapter has presented a unique intervention within a complex organisational setting. The intervention did not prove successful but upon reflection it highlighted a number of significant issues, which formed the basis of further action research cycles. The chapter identifies three particular areas of breakdown which are believed to have contributed to the failure of the system. These areas are related to the CD:net technology itself, the way in which it was designed, and the wider issues of the

organisational environment. Drawing these areas together the chapter introduced the concept of the *inter-perception* of CD:net within its social context as a significant impact upon its success. Such *inter-perception* is an issue studied further within the following action research cycles.

CHAPTER 7 THE SECOND CYCLE: AKM

"We have to abandon the arrogant belief that the world is merely a puzzle to be solved, a machine with instructions waiting to be discovered, a body of information to be fed into a computer" (Vaclav Havel, playwright, political dissident, and eventual President of Czechoslovakia).

7.1 Introduction

The CD:net cycle of action research (chapter 6) captured the complexity involved in implementing a technology for Knowledge Management within the British Council. It raised a set of issues pertinent to the area of concern; in particular it raised the need to consider both the social context within which such a technology is used together with the socialisation and intersubjectivity of its users (captured through the concept of inter-perception). Problems such as information overload and barriers of time investment were identified. The first cycle provided a rich insight into the complexity of implementing a Knowledge Management system within a complex organisational setting.

This second cycle of research describes the researcher's participation in a commercial Knowledge Management system's development through involvement in a laboratory type setting away from the British Council. The cycle was not originally intended to form part of the doctorial action research project, nonetheless it significantly crystallised the researcher's reflections and enabled the development of a methodological framework which re-conceptualised Knowledge Management in terms of an emergent process. This cycle also re-conceptualises the introduction of the technology, suggesting that a rhythmic cycle be employed in which Knowledge Management systems evolve alongside the emergent Knowledge Management process. A framework which outlines this cycle is presented and described at the end of this chapter.

This framework is then used as part of the methodology for the final cycle of action research. The commercial technology developed through this cycle was introduced into the British Council during the final research cycle. The methodological concerns of including an unplanned cycle of activity are also debated.

This research cycle contributes to the developing thesis in the following ways. Firstly the chapter crystallises the messiness exposed in the previous cycle of action research. Secondly it develops the concerns described in the previous cycle into a framework capable of application in the third cycle of action research. Finally it is included as it demonstrates the honesty of a researcher living his/her action research in areas of life unprotected by the "blanket" of methodology (Wastell 1996). This is considered in detail in the section on "lived" methodology (Scott 2000) (section 7.1.1) so as to lay bare the problematic nature of this cycle's inclusion, before claims for its contribution to the study can be made.

7.1.1 Lived Methodology

This cycle was not entered into with the intention of including it within the action research cycles of the study. It was not undertaken in a truly methodologically rigorous way, nor recorded in meticulous detail. Rather the researcher was asked to help with the implementation of a technological solution within a university setting and this experience proved so significant to the researcher's interpretation of the previous cycle that it forced itself into the consciousness of the study and thus could not be avoided.

At one level such a lack of methodological rigour could be considered abhorrent, challenging the very nature of academic research. Yet within this study's action research cycles the contribution is grounded in reflection and interpretation by the researcher based on the experiences of intervention. The term "lived methodology", introduced by Susan Scott (Scott 2000), and inspired by the work of Hans-Georg Gadamer, is used in this chapter to describe the involved nature of the researcher in the world (Introna 1997): this infers that researchers are actors interpreting a world and involved in its social construction. In reality research is a messy exercise, and

action research even more messy due to the requirement for action and reflection (Ackoff 1974; Schein 1987).

This cycle presents a lived experience (Marshall and Rossman 1999), which without conscious design, fundamentally altered the researcher's approach to Knowledge Management systems by focusing attention upon the previous research acts. This chapter aims to describe the serendipitous connections between the lived experience and the previous action research; with the researcher acting as reflective practitioner (Schön 1982). Individuals tend to draw upon all aspects of their life-world during interpretation (Introna 1997), yet within research such interpretation is generally left out. As an action researcher already challenging the claims to neutrality and objectivity made by the traditional social sciences (Marshall and Rossman 1999) this researcher aimed to present and reflect upon such a life-world.

It is, however, incorrect to say that the cycle was undertaken totally devoid of a concern with methodology. Whilst it was not planned in a hypothetico-deductive format, the researcher and professor who worked to develop the Knowledge Management system for doctorial students were extensively trained in the use of SSM and drew upon its approaches in a mode 2 fashion (Checkland and Scholes 1990) in order to provide "rigour to the subjective"(Checkland 2002). Similarly to Introna's experience (Introna and Whitley 1997) the researcher drew upon elements of both method and methodology as and when necessary. The language of soft systems was used in the dialogue between the actors involved in the research cycle, and various SSM methods were employed to make sense of the actions (for example, drawing a number of Rich Pictures to explore the use of AKM). Furthermore, as the researcher was committed to both a predefined philosophical approach and the theoretical framework (described in chapters 1, 2, 3 and 4) these were drawn upon in implementing the Knowledge Management system.

7.2 The desire to improve

The GEMISIS project, based at the University of Salford, was a multi-million pound collaboration of institutions from the public and private sectors. The project developed and delivered advanced online applications in the fields of business, education, health and the local community. In addition to employing business

analysts, technologists and graphic designers the project funded around a dozen Ph.D. students. These students were expected to undertake research within the remit of the GEMISIS programme and contribute to the intellectual and developmental direction of the project. Within the University of Salford, the GEMISIS Professor of Information Systems was interested in supporting the research activities of these GEMISIS sponsored researchers. In particular he felt that the students could benefit from a Knowledge Management system that would enable them to share research materials, discuss issues and co-author documents. Such a system would also act as a pilot for decisions on providing a research institute wide Knowledge Management system.

Another area within the university had already purchased a commercial Knowledge Management systems (this product will be referred to as AKM, produced by KM Systems plc), and thus in order to reduce costs the purchase agreement was extended to include licences for the GEMISIS students. The Professor then coordinated the development, with the researcher taking responsibility for the technical development. Given that the researcher was also a GEMISIS sponsored student, this gave him a good understanding of the group.

Following the purchase the researcher was invited to discuss the work with the Chief Technology Officer (CTO) of KM Systems who proved to be very interested in the ongoing action research. The company was in the process of developing a new version of AKM and he felt it would be useful to gain an insight into how the product was being used in practice, complete with recommendations for possible improvements to the product.

KM Systems plc also proved to be interested in the next cycle of the action research within the British Council which was being planned at this time. It was thus agreed that the analysis of the use of the AKM product within GEMISIS would be used by KM Systems in order to improve the design of the new version of the product. This second version would then be made available for use as a pilot for the final cycle of action research within the British Council. In this way the researcher was provided with an opportunity to influence the design of a commercial product, and then to explore this altered product within the real-world context of the British Council.

The aim of this activity was set out by the CEO of KM systems plc within an agreement contract between GEMISIS and his company: *"The aim is to influence the forthcoming [Version] 2 release of [AKM]... GEMISIS and AKM plc will form a longer term relationship to research and develop [the] product..."*(Heads of agreement letter from CEO (chief executive officer) of KM Systems plc to GEMISIS). This process would thus take the learning from the previous cycle, explore it in the laboratory type setting of GEMISIS, and then re-inject the learning back into the practices of both the British Council and of KM systems.

7.2.1 The Generic KM software product

The original AKM software was described as being capable of *"enabling organisations to instantly capture, distribute and channel internal and external information. It provides organisations with the ability to collaborate and share knowledge, without time or geographic constraints"* (AKM's sales brochure). The solution provided a modular structure within which the majority of features expected from a so-called Knowledge Management solution were provided (see section 3.2.1). In particular the product provided the following technical features:

- An integrated modular intranet publishing and collaboration system through a personalised portal interface.
- Automatic conversion of generic file types into the format required for the system.
- Discussion groups, with subscription and e-mail updates.
- Project workspaces to enable the sharing of documents, discussion and knowledge around projects.
- Directories for users of the service.
- Customised directories for data, contacts, or events.
- A search capability based on natural language and inference.

(AKM's sales materials)

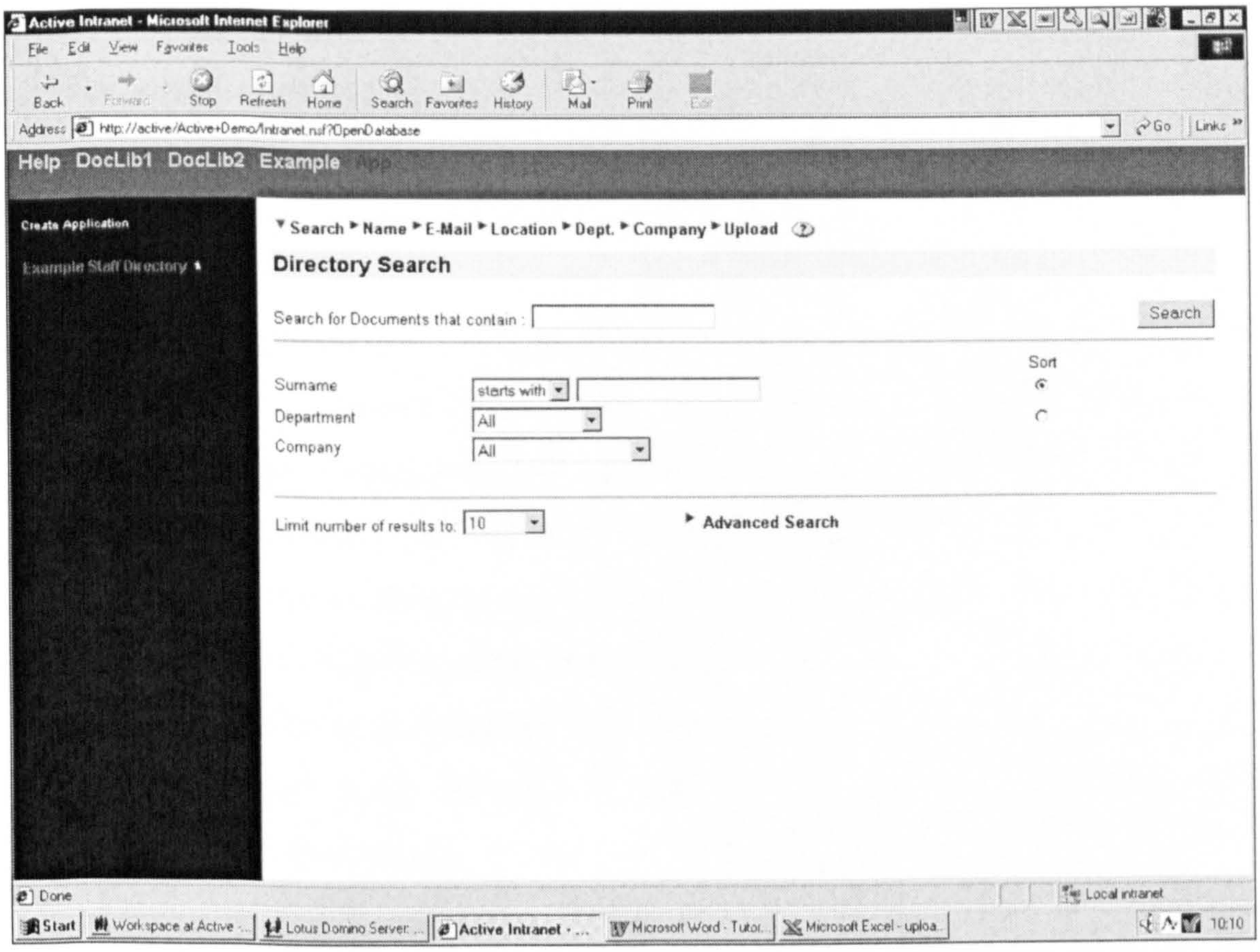

Figure 23: Example of a generic (untailored) AKM page showing a directory search.

The technology was seen to be a generic Knowledge Management system which was capable of being effectively tailored for use by the GEMISIS students in supporting their research activity.

7.3 Overview of the intervention

The aim of this research cycle was to implement a Knowledge Management technology which would support doctoral students in their research and through this develop more of a community of researchers who could collectively support each other.

The intervention was far shorter than the other two research cycles taking place over around six months. The period began with the researcher attending two days of training in administering and using the AKM product at KM Systems headquarters. Having understood how to administer the system, the researcher then undertook a systematic analysis of the AKM product's capabilities and its graphical user-interface. A form of state transition network diagramming (a technique that makes sense of user interfaces) was used in order to describe and evaluate both the

capabilities and the user interface (Dix, Finlay et al. 1997). Rich Pictures were also used to explore how the researcher had interacted with, and had made use of the AKM product. Their use was consistent with reported recommendations of their benefit in the design of user interfaces (Monk 1997; Monk and Howard 1998).

A number of discussions were undertaken with the doctorial students in order to explore how they undertook their research and to consider possible uses of AKM. Following these discussions a one day meeting was then held between the researcher, professor and consultant (see the table below for a description of the significant actors in this cycle) in order to highlight specific problems with the existing user interface which KM Systems could improve and to consider how the system could be employed to benefit the doctorial students. In addition to this analysis the researcher attended AKM user group meetings in order to gain insight into the use of the product by other organisations.

The actors most significant in this cycle:

- The researcher tasked with developing the Knowledge Management system by configuring the AKM product.
- Around 12 Ph.D. students, with various backgrounds and levels of specialty in information systems. These students would be the beneficiaries of the system. Although the students had desks in GEMISIS's open-plan office many chose to work at other locations for the majority of their time.
- A Professor of Information Systems; the researcher's supervisor and champion of the Knowledge Management systems purchase and use.
- The CTO (Chief Technology Officer) of KM Systems plc, who held a keen interest in research and was keen to see the findings of this development incorporated in the second version of his product.
- An external consultant in performance support and HCI, recruited by the researcher. He was used for a one day workshop to look at the HCI issues of the AKM product. This analysis would support the recommendations made to the CTO for the further development of AKM, and influence the use made of the product by the students.
- KM Systems' HCI specialist. This specialist was interested in the research and tasked to implement the findings in the second version of AKM.

Drawing on the initial discussions with the doctorial students and on the HCI analysis the researcher and professor began to configure the underlying AKM technology in order to provide a "vanilla" Knowledge Management system. A "vanilla" system is a system that has been installed and configured for use, including its user interface design, but which has not had any information or discussion added. However being conscious of the fact that CD:net had been introduced to Country Directors with very little information within the system, and that this had led to significant problems both of how it was perceived and used, it was decided that a series of workshops should be arranged through which the students could work with the researcher to evolve the system in order to better represent their needs. These workshops were also to be used to develop a coherent perception of the purpose of the tool (as proposed in the conclusions to the CD:net cycle) by discussing how it might collectively be used to support the students' research. Additionally the workshops would also train the students in the use of the AKM product.

The workshops began with a brainstorming session on how the doctoral students perceived the technology and how the AKM product could support their work. This was followed by a breakout session in which the students explored and configured the product in line with the initial brainstorm. The students were provided with a checklist for the breakout to ensure that they reflected upon all the major capabilities of the AKM product. Finally a further brainstorming session using post-it-notes was undertaken to consider the results of the breakout session and to plan future activity. These workshops were immediately followed by sessions where the students worked at their desks to configure the AKM product as agreed in the collaborative sessions.

The objectives for these workshops were described to the students thus:

- to develop a consensus view of AKM
- to explore the potential impact of AKM on:
    - individual research
    - group collaboration
    - the GEMISIS program
- achieve competence in the use of AKM
- to gain a commitment to the way forward

(Agenda for first workshop)

These objectives are closely aligned with the conclusions in CD:net, in particular by gaining a consensual view of the purpose of AKM and by developing an understanding of the technological capabilities.

Following these workshops the researcher worked to implement the recommendations made by the students such that they could begin to use the system in their activity.

7.4 Reflections from the action: developing a framework for Knowledge Management intervention

The learning presented from this cycle is based on a reflection of the materials gathered during the workshops, upon discussions of the product with the KM systems HCI specialist, and upon detailed analysis of the AKM product.

As the researcher had been asked to present findings from this analysis to the CTO of KM Systems, and also to make recommendations of the systems potential benefit for wider Knowledge Management within the University of Salford, he was led to reflect in detail on the experience. Since the recommendations would be used in further developing AKM the researcher wished to better understand the development processes adopted within KM Systems and thus worked closely with the HCI designer during the writing of the report.

According to the HCI specialist and the CTO, KM systems plc perceived their product developing in the future to become a workspace portal. They used a Butler-Group report to define the term thus; *"A workspace portal is a single coherent*

integrated portal that presents its users with all the information they need to carry out their jobs" (Butler-Group 1999). This focus for the development of their product thus provided synergy for the existing features and increased emphasis on the personalisation of the user-interface, provided increased search and navigation, and a focus on all the information that an employee uses including task automation and workflow.

In addition to writing a report for KM Systems' CTO, the researcher and the HCI specialist described their approach to the development of the product by jointly authoring a conference paper (Brophy and Venters 2001). Within this paper the researcher drew on the concept of requisite variety as a potential model for systems development (Ashby 1956; Espejo 1993) *"We hypothesise that workspace portals may provide the structures which are needed to involve all employees in the creation of possibilities and responses to external environmental disturbances"* (Brophy and Venters 2001).

Norman's concept of the "Invisible Computer" (Norman 1999) was proposed as a concept for the development of the AKM product into such a portal. The "Invisible Computer" acts as a set of tools based around the activities users are engaged in. This suggests the need for Knowledge Management systems targeted at the activities that individuals undertake (a theme drawn from the CD:net research). The HCI specialist and the researcher were thus led to identify *"a need to provide such software with the ability to "adapt" to the activities users engage in"* (Brophy and Venters 2001). KM Systems plc however was unable to develop such adaptive systems as the company did not possess the required skills or resources. Furthermore the lessons from CD:net had suggested that simply introducing a system capable of adaptation would not necessarily succeed; As Zuboff commented as quoted in the Brophy paper "*it is a mistake to regard the new generation of information and communication technologies as neutral tools that can merely be grafted onto existing work systems"* (Zuboff 1988). The researcher hence suggested that a methodological framework was required by which adaptation could occur through participation with the user community in order to overcome such difficulties.

By observing the relationship between AKM and its customers through attendance at AKM User Group meetings and through a training course provided by KM Systems it became clear that such a framework would not simply be a conventional information systems development methodology. KM Systems plc only had control over the underlying technology, not over how it was configured and used. The various different customers of AKM were employing the software in a wide variety of ways ranging from cataloguing a university's academic expertise to providing an intranet and Knowledge Management system for a large manufacturing company. The underlying AKM Knowledge Management software was thus forced into being a generic product. Furthermore the HCI specialist stated that *"in introducing workspace portals it must be realised that lengthy and expensive analysis is unlikely"* (Brophy and Venters 2001).

7.4.1 The technical capabilities of AKM to support such a framework

The CD:net research cycle identified a need for Knowledge Management systems to be adapted rapidly in response to changes both in the way users are employing the system and in the way that the underlying Knowledge Management technology is capable of being rapidly reconfigured, so that capabilities can be added and removed.

The AKM product, whilst marketed as a complete system, actually appeared to consist of a set of individual standardised components which could be integrated in order to provide a consistent software package. The researcher was also struck by the way in which the students discussed the product during the workshops; in that when they were discussing the system they were essentially designing a solution by collaboratively assembling the components of the product together with the documents and materials that they used in their work into a structure. This is similar to the process of reflection and design observed during interviews with Country Directors for CD:net. This appeared to be a design process through which users conceptually assembled both the information and the component technology. The modularity of the AKM product appeared to aid in this design process.

For example, the students identified the need for the discussion of research papers as a potential action that AKM could support. They then talked about what this would

require both in terms of information (e.g. a set of relevant papers and a way to share notes and discussion on the papers), and technically (e.g. the discussion module of the product which offered the capability of threaded discussion and e-mail notifications and was thus selected). Such design appeared to be associated with improvising solutions by "making do" with the capabilities available (e.g. their information resources and the AKM software) (Weick 1993), and the modular nature of AKM aided in such improvisation (Ciborra 2000). The students would essentially bricolage changes in their purposeful action by configuring and assembling components such that these were perceived to afford benefit. Such assemblies were not simply designed to improve existing practices, but to change them fundamentally; *"Artefacts do not enhance human abilities; they change the task. Computer-based artefacts are no exception"* (Norman 1991).

The students appeared to be designing their Knowledge Management system through a *"conversation with the materials"* (Schön 1982), where the components of the AKM product were configured and altered in an intimate conversational relationship with the designers in that the students worked with the researcher in configuring the AKM product to suit their needs. This conversation was described however using the language and concepts that the students understood concerning knowledge and information.

It is argued that ICT should be appropriate to a generally adopted perspective towards knowledge within the organisation (Hansen, Nohria et al. 1999; Earl 2001). Whilst it is said that the *"important questions to be asked when valuing ICT as a Knowledge Management tool are what actions the introduction of ICT will affect and in what way these actions will be affected"* (Hendriks 2001), this is an emergent outcome from the use made of the system by the users (as demonstrated in the CD:net cycle) as well as being based on the users perception of the purpose of the tool. It is therefore suggested that technology should be designed to enable alteration and adaptation by a systems developer observing the emergent use made of the system. This suggests that a component-based technology such as AKM could prove beneficial in providing the systems developer with a variety of technological configurations that can respond to the variety of emergent uses to which a system may be put (Ashby 1956).

Such an evolutionary approach to developing systems also implies a less traditional approach to information systems development. If, as Cibbora suggests, bricolage, "*transcends the orthodox, centralised, and staged view of software development by replacing it with a distributed and evolutionary approach*" (Ciborra 2002), then any framework for supporting such bricolage must reflect the need for evolutionary change and alterations to the system both prior to its introduction, and during use. The role of the systems developer is thus to encourage users to bricolage improvement to their purposeful activity using the system, and to bricolage changes to the system which would reflect its use. It is thus suggested that a Knowledge Management systems should be a modular system consisting of various components (such as those provided by AKM) that would enable the bricoleur to assemble new arrangements of capabilities in order to provide improvement (Weick 2001).

Furthermore, packaged Knowledge Management systems such as AKM may be configured in such a way that they better fit the requirements of an organisation's working practices (Suchman 1987). This is somewhat different from the enacted perspective which focuses on users "integrating" received technologies *into* their situated work practice, with such technologies and work practices being seen as separate. The latter focuses on users constituting technologies (as technologies-in-practice) *in* work practices, with technologies and work practices being seen as interdependent. This further reinforces the call for a participatory approach to the design of Knowledge Management systems.

7.4.2 The informational content of the Knowledge Management system

The CD:net action research cycle suggested that the relationship between the information contained within an information system and the capabilities afforded by that system was far more complex than that suggested in most systems development literature (Avison and Fitzgerald 1995; Pressman 2000). The students' use of AKM and the Country Director's use of CD:net both confirmed the assertion that for users the distinction between the content contained in the system and the system itself becomes blurred (Brown and Duguid 1996). For example, when the students discussed how they might employ the system to improve their research they

discussed both the technical capabilities and the information content simultaneously. One talked about needing to gain an *"understanding of its semantics"* where 'it' clearly referred to both the underlying AKM technology and the content that the students were posting on the service. The students went further in considering how they might employ information as a part of the system, and how a document could provide a central piece in a developing discussion. If the effective design of a Knowledge Management system requires a clear understanding of the users mental model of the system (Norman 1990; Kramer, Noronha et al. 2000) then this appears to suggest that such mental models will also include the information or discussion which might be contained within the system.

Having already argued through CD:net for the need to consider the substitute technology available to a user, it is further asserted that consideration also be given to the information contained in the system. This is central to the use of a Knowledge Management system. It is thus suggested that to consider the design of a Knowledge Management system in isolation from its ongoing use will prove problematic since one would only be considering the technology for the system and not the content. This supports the need to evolve systems in use, for the information contained in the system cannot be separated from its use. Furthermore the information placed within the Knowledge Management system will need to evolve (Fahey and Prusak. 1998; Hendriks 2001; Venters, Cushman et al. 2003) as the benefit it affords will alter over time; for it should constantly reflect the purposeful human activities of the users.

Clearly such a regular evolution will require a trade off against maintaining the affordances of the system, and possibly confusing the users with schema and user interface changes (Dix, Finlay et al. 1997). A rhythmic evolution should enable users to be prepared for such changes by providing periods of change (which might be supported by discussion) and periods of stasis.

These issues led to consideration of another set of problems with the interaction between users and the information within the AKM system. Part of the workshops' discussion focused on the development of the students' knowledge, with many of the students already aware of Knowledge Management concepts through seminars as part of the GEMSIS Ph.D. study programme. The students' appeared to redefine the

problem of improving their knowledge actions as a problem concerning information storage and retrieval. They therefore considered how AKM could improve the sharing or production of information, but not knowledge.

They argued in the workshops for informational uses of AKM, such as *"sharing papers"*, *"providing details and papers that are relevant to one or more researchers' areas"* with little consideration of how these might educate them. This is not to say that sophisticated Knowledge Management issues and uses were not suggested, for example one person asked for a service to gain *"understanding [of the] tacit knowledge of others"* but rather that in practice they had difficulty developing sophisticated knowledge related uses of the service, and tended to employ the technology for relatively simplistic informational tasks.

This is perhaps not unexpected as the concept of knowledge is difficult to conceptualise (Nonaka and Takeuchi 1995; Davenport and Prusak 1998) but it might explain why Knowledge Management has been argued to be little more than "Information Management" (Galliers and Newell 2001). Perhaps the students perceived the system to afford benefit in terms of information and were thus excited to be able to improve their information management. Knowledge Management, which they had difficulty conceptualising, did not appear to the users to afford such benefit and thus was not considered. Whether the technology is capable of storing or supporting knowledge appears to be immaterial if the students (in designing their own system) were incapable of conceptualising the technology's use for improving this. One is left however with the thought that since the users clearly perceived benefit in terms of Information Management from a Knowledge Management solution, then Galliers criticism does not ring true. For Information Management through aspirations of Knowledge Management is surely a benefit and thus a potential improvement.

The researcher was interested in discovering whether using problem structuring methods, such as SSM, with users would enable them to appreciate Knowledge Management related issues which could be improved through the use of a technology such as AKM. This would require a consideration of the various Weltanschauungen of users (and potential administrators) of the service such that an accommodation of

the knowledge impact and use of the service could be arrived at. Alternatively such methods might be used to enable the designer to gain an appreciation of the human purposeful activity and to suggest how Knowledge Management might suggest improvement. As Bhatt argues; *"to manage knowledge, an organisation will need to shape and redefine interactions between its people, technology, and techniques. The techniques employed by the operators or the users will determine how adroitly the technology is used and how the meanings of information are comprehended"* (Bhatt 2001).

7.5 HCI issues for Knowledge Management systems

Reflecting on the conclusion that for users a Knowledge Management system does not have a clear distinction between its information content and the system itself, then the underlying system should be developed to reflect this. It should therefore be developed through an ongoing rhythmic process which focuses on the content to be contained within the system, and on integrating the various capabilities of the system in order to provide an underlying technological infrastructure for Knowledge Management.

Difficulties in using the AKM user interface would therefore severely impact upon its likely success in becoming integrated into the students' work practices by constantly leading users to suffer a breakdown with respect to the underlying technology and the information content.

As the AKM technology was very complex to use this issue was highly significant, with a number of students complaining about the difficulty of using the system. For example, one student stated *"[AKM's] not easy to use, [it] tends to be user hostile"*. The students were often lost amongst the plethora of features available, and felt that the system operated in very unexpected ways. The students felt that not only was training required to use the system, but that there was also a *"need to build up a personal capability to use it"*.

After reflecting upon the complexity of the user interface, discussing it with both an HCI consultant and with the HCI specialist from KM Systems plc, and by comparing the design with published good practice in HCI (Dix, Finlay et al. 1997; Norman

1999; Winograd 1999), it was possible to identify a number of HCI issues which appeared particularly relevant to the AKM product. While the product's modularity helped to a certain extent by encapsulating certain features when not in use (for example when a discussion was not available all associated links disappeared from the interface), one of the most significant problems was the lack of a relevant metaphor or language for use within the system's user interface.

The AKM product was promoted as a generic Intranet development system (with a focus on Knowledge Management), and could be used in a wide variety of ways by a wide variety of users. Existing heuristics for good HCI design argue that a system should *"speak the user's language"* and use concepts from the user's world in a consistent way that matches the task that the user is attempting to undertake (Nielsen 1994). However for AKM the type of user and their task remained undefined. This led the AKM programmers to employ a design metaphor based on Intranets and web publishing since that was their domain of expertise. The product was designed to serve users who took roles such as "Authors, Publishers, Supervisors and Users" and understood terms such as "HTML, gif and link". For students co-authoring collaborative research documents however such metaphors proved problematic, because they perceived themselves to have all of these roles depending on the particular situation. The product had the notion of "Documents" to refer to all HTML pages and document types, yet for the students only PDF or Word files were seen as documents since all research papers are published in these formats. This misunderstanding prevented the students from exploring other possible document types within the system.

In the CD:net cycle it was suggested that the inability of the users to conceptualise the purpose of the tool, and the inability to identify with the capabilities of the tool, contributed to the problems with the use of CD:net. The AKM tool conceptualised users as "authors, publishers etc." and so they adopted these phrases as clues to the identity (and expected identity) of their interaction. The use of such phrases then leads to a specific way of interacting. This further confirms the need for Knowledge Management systems to provide capabilities which are tailored by the developer for the particular community, and that such tailoring should include the consideration of an HCI interface that would employ a "language" which the users could align with.

This would aim to reduce the "*gulf of execution and evaluation*" between users task-language and the language of the system (Norman 1990; Dix, Finlay et al. 1997).

7.5.1 Leadership

In considering the use of the service to support their research, the students were concerned that there needed to be a sufficient quantity of material on the site in order that they could find something of value. If presented with a sparse service they felt that they would be less prepared to invest time in adding their documents and participating in discussions; "*If nobody uses it so why should I bother*". Yet without the active participation of a number of community members it was argued that the service would have to be initially developed by one or more dedicated champions (TFPL 1999). Furthermore users felt unable to conceptualise how the service might support their work through simply posting their own material onto the site; "*why would I want to invest time. I have this material, why do I need to share it?*" One student in particular highlighted the difficulty in conceptualising the benefit afforded by using the service: *"I don't know its benefits"*. The users appeared to be unprepared to envisage the potential benefit of the tool, preferring to rely on others to develop the system to better afford benefit to their work. The students appeared to be requesting two separate things; the site to be populated prior to its introduction, and the site to have a champion in order to maintain its appeal.

Populating the site prior to its introduction had been avoided with CD:net because of the desire that the Country Directors should direct its potential use. The site was thus launched solely with content that had been written by Country Directors, prompted by the consultant, together with a few initial discussions posted by the Knowledge Manager. This proved unsuccessful partly because the Country Directors did not have a clear perception of the purpose of the tool. In this action research cycle, by way of contrast, the entire user group was assembled to collectively consider the content which could be put on the site. Yet even these meetings appeared to leave the students reticent to propose a purpose for the site, arguing that the project champion should be responsible; "*the content needs [to] address the interests, issues and problems of the intended audience, - you need to make [AKM] appealing to people or where people "want to go""*". This requires the champion however to have a detailed appreciation of *"where people want to go"*.

The researcher thus suggests the use of SSM Root Definitions of purposeful activity in order to identify the information (as well as commissioning content from among the users) relevant to such purposeful activity and thus of potential use on the site. Furthermore since SSM explicitly explores the Weltanschauungen for such Root Definitions (through CATWOE) the perspective adopted towards the activity will be explored at the same time. With CD:net the commissioning of content by the consultant reflected both his weltanschauung and that of the potentially unrepresentative friends he approached to write content. This approach to developing content for CD:net had proved problematic because of the consultants personal biases – *"his own axe to grind"*!

Yet much of the literature on Knowledge Management suggests the need for such a champion to take responsibility for the development and introduction of the technology for Knowledge Management (Davenport and Prusak 1998; Wenger 2000; Newell, Robertson et al. 2002). It is suggested that the champion should instil a sense of vision into the group, and so stabilise the purpose of the Knowledge Management programme (Von-Krogh, Ichijo et al. 2000). Yet such a champion could dominate the developing inter-perception by providing a strong centre of mass which might then dictate an inappropriate purpose. SSM is suggested as a way of supporting the mediation of a sense of purpose, such that the "champion" can then act as a facilitator aware of the purposeful action of the users.

7.5.2 Rhythmic development

The CD:net research cycle highlighted that since Country Directors had the choice of whether or not to try the Knowledge Management system, it would be beneficial for the system to be developed in such a way that users perceived a clear benefit for their participation early in the development. CD:net therefore attempted to demonstrate such benefit through the provision of the CD:net tool. In this later cycle the workshop sessions were used to engage the users in initially reflecting on the AKM system and on how it might benefit their work, moving then to configure and develop the system in order to support their research. The workshops appeared to bring the system present-to-hand (Winograd and Flores 1986) and in so doing developed enthusiasm for the development. Between these workshops however the enthusiasm

wore off and reflection ceased as the system became taken for granted or ignored. *"As tools become more taken-for-granted than they are already, the ability for [users] to reflect on them and hence act without or beyond them becomes more remote"*(Orlikowski 1992). The workshops appeared to punctuate the ongoing activity of being a student, forcing the students to reflect on their actions and to consider the Knowledge Management system.

The success of such workshops in bringing the system present-to-hand to the students suggests that they should be held regularly in order that users appreciate the development of the system, and be led to reflect on its benefit for their work, given that *"the challenge in designing and assessing Knowledge Management interventions...lies in coming up with an appropriate mix of measures that allows for an adjustment of the organisation's position with respect to both tensions in a reactive and proactive sense"* (Hendriks 2001). It is suggested that the designer-facilitator undertake his/her development as a rhythmic series of participative activities with the users since such sessions could engender the development of a collective perception of purpose towards the tool.

Finally the CD:net research cycle suggested that within interview situations the users may espouse a different perception of the use of the service from the actual use that they are likely to make of it. Any approach to undertaking such workshops should, as has already been suggested, focus on the reflection on purposeful activity rather than on reflection on the tool or on Knowledge Management *per se*.

7.6 Review of the learning from the developing thesis

This section provides a review of the learning which has been developed up until this point in the study. It describes the conclusions from the CD:net research cycle and the learning developed during this cycle. The conclusions from CD:net are shown in grey while the lessons from this cycle have been added as black text. These lessons are used in the next section to develop a framework for introducing the AKM product into the British Council in the third cycle of action research.

Area of Concern	Learning from first two cycles	Action to be taken in the next cycle

The design and introduction of Knowledge Management systems	Designers should appreciate technological constraints, substitute technologies, and organisational change initiatives during development as these are likely to impact on the systems perceived purpose and use. This analysis should include consideration of information which the system could contain.	The researcher must undertake a detailed analysis of technology intended to be used in the intervention and presently being used by the users. In addition analysis should be undertaken to acquire content for the system. SSM might aid this by focusing on purposeful activity through various Weltanschauungen.
	Users may support the system and suggest necessary features, however these should be considered in relation to their human purposeful activity as users are presenting their espoused theories towards technology rather than their theories in action.	The researcher should design the systems based on an understanding of purposeful activity rather than necessarily being led by requests for particular technological capabilities.
	The way a system is developed and introduced will impact upon users perceptions. A champion must consider this by exploring the perceptions of users. Such a champion may also mediate extreme changes in the perception of the product through their privileged position.	The researcher must consider users' perceptions of the service during design and undertake actions which lead or influence such perceptions. Personalisation technologies should not be employed. Stories should be used to counteract "negative" inter-perception. This person will require a rich appreciation of the various weltanschauung of the users. SSM may be appropriate for this.
	Users need to be actively engaged in the development process in order to evolve the tool in use, however such engagement may be difficult if the system does not already afford benefit.	The researcher must engage users in the development process. The systems should be provided in a vanilla form and developed through such engagement. A methodology should be used for such development.

	The intervention will be affected user's perceptions towards previous change initiatives within the organisation. It is suggested that a rhythmic set of participant research activities be undertaken both to align the champion with the users and to bring the system present-to-hand for users. Such rhythm would also ensure the system remained relevant.	The researcher must appreciate pervious initiatives during the design. The methodology used for the development of a Knowledge Management system should be incremental through a series of cycles of reflection and action, similar to action research and SSM.
The design of Knowledge Management technology	It is suggested that the underlying Knowledge Management technology in the further cycles of research be capable of being rapidly reconfigured. This may be better undertaken if the Knowledge Management technology is in modular component form. The technology should also not impose a specific purpose or metaphor through its HCI design.	The researcher should be capable of rapidly reconfiguring the Knowledge Management technology. Modular packaged solutions enable such rapid reconfiguration. The researcher should be well acquainted with the package. The package should have a configurable user interface.

7.6.1 A framework for introducing AKM during the third cycle of action research

This cycle of research provided an opportunity to consolidate the learning so far in the study and from this learning to prepare a relevant methodological framework for the final cycle of action research within the British Council.

Within globally distributed organisations, such as the British Council, running participatory workshops in order to develop a Knowledge Management system would have been both expensive and impractical. The researcher however still wished to develop a potential framework which would structure the use of SSM for the final research cycle based on the previous experience of CD:net and AKM.

There was thus a need to support such an approach to participatory design among a globally distributed community within with final cycle of action research. Since the final cycle would use the AKM technology any proposed framework would therefore need to support the AKM Knowledge Management technology's configuration and evolution. This would support the emergence of a sense of community and subsequent knowledge creation and dissemination among members of the British Council.

A framework was thus proposed as a learning cycle in which an appreciation would be developed of the problèmatique and action taken to evolve both the technology and the informational content of the Knowledge Management system in use. This would be achieved by participating with users in order to align their expectations and perceptions with the technology. In this way the approach responded to Hendricks challenge: *"[T]he challenge in designing and assessing Knowledge Management interventions...lies in coming up with an appropriate mix of measures that allows for an adjustment of the organisation's position with respect to both tensions in a reactive and proactive sense"* (Hendriks 2001).

7.6.2 Framework for use in the final cycle of action research

The framework emerged from reflection on the first two cycles of action research. It was further developed through its use in practice within the final cycle of action research and is evaluated in the conclusions to the thesis. The framework began as a hand-drawn diagram used to communicate with the CTO of KM systems plc about how his product could be configured using SSM (Figure 24). This diagram described Knowledge Management in terms of providing improvement from a messy problèmatique to an improved messy problèmatique through a learning process. It drew upon the cyclical learning process provided by SSM. Beginning with a desire to improve through the introduction of a Knowledge Management technology, it consists of a cycle in which the problem is explored and compared with history. This was followed by a tailoring or configuration of the Knowledge Management solution as an amalgamation of components (represented by the network in the bottom right of Figure 24). This configuration would then be introduced into an organisation as a rhythmic alteration in their working practices (a proxy for the participative workshop

design sessions where users are forced to consider their technology). Finally the cycle begins again with the altered organisational context.

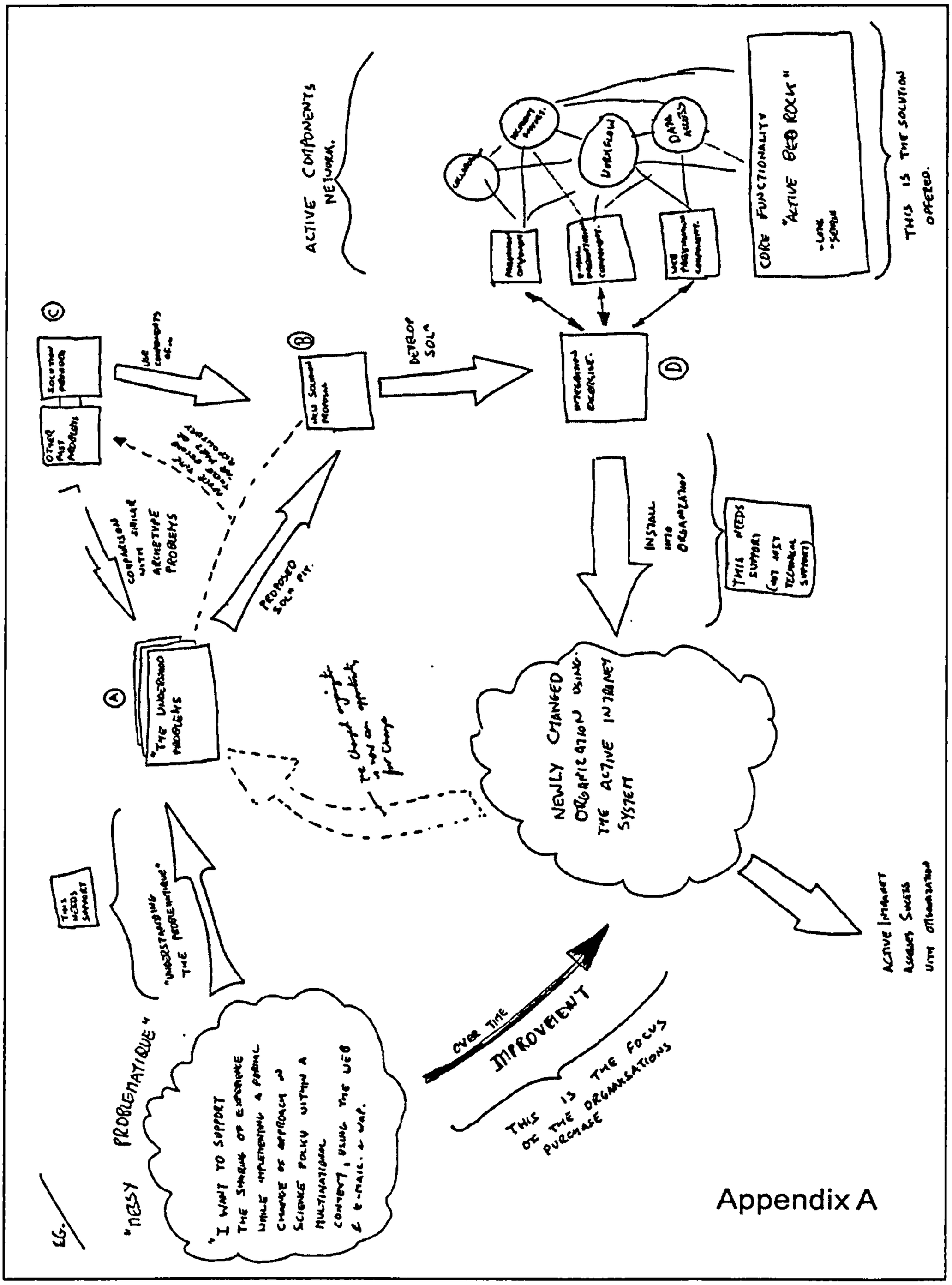

Figure 24: An approach to tailoring tools using SSM.

Although the diagram (Figure 24) was not intended as a formal framework, but rather as a communication tool, it became central to the researcher recommendations for improving the AKM product for the CTO. Upon discussing the diagram with the HCI specialist in AKM, with the Professor and with members of the British Council, and by reflecting upon the CD:net experience the researcher became convinced that a similar framework should be developed in order to structure the final cycle of intervention within the British Council.

By returning to the literature on action research, systems development and Knowledge Management such a framework emerged. The framework which emerged is presented in the next section and was applied in the final cycle of action research.

7.7 The framework which emerged

The framework was designed by the researcher to provide a structure for the final cycle of action research intervention. It considers the introduction of a Knowledge Management technology, not as a solution or as a project, but as an ongoing process within which the Knowledge Management technology evolves in use. Similarly to the first cycle it was based on the assumption that the technology should engender the development of a community and that the members of that community should be involved in populating the system with information and discussion as part of their ongoing purposeful activity.

The framework was heavily grounded in SSM and the action research approach attempted in the CD:net cycle. The framework was then refined during the final cycle of action research. Its aim was to be a coherent approach to developing and introducing Knowledge Management technology as an ongoing process of intervention within the British Council based on a social constructivist perspective towards knowledge. Whilst the framework may be relevant for other similar interventions, generalisation of the framework would require further research in different contexts, and this is beyond the scope of the thesis.

Contradictions remain at the heart of the interventions associated with this thesis; this is the very nature of both Knowledge Management and Action Research in which

poorly described concepts and ideas are applied in practical ways. The principles of Knowledge Management are all problematic yet if the desire to improve through Knowledge Management is to be realised, and if one accepts that Knowledge Management appears to resonate as relevant to such an improvement then the aspiration of improving the process still remains. SSM is thus considered appropriate in this task of evolving technology in use (Checkland and Scholes 1990).

Since SSM provides a potential route through such complexity by developing models which may be compared to reality (as outlined in the conclusions of Chapter 5) it is suggested that it is appropriate for such Knowledge Management interventions and thus as the basis of an intervention framework (Checkland 1981).

It has been suggested that iterative action research (Baskerville and Wood-Harper 1998), with its link between action and reflection, is appropriate for information systems prototyping (Baskerville and Wood-Harper 1998; Chiasson and Dexter 2001) and the lessons from this thesis suggest that an action research approach was also appropriate for the development of the AKM based Knowledge Management system within the British Council. The framework thus reflects action research through its use of SSM.

Retrospectively the framework was entitled AFFEKT (Appreciative Framework For Evolving Knowledge Technologies). In common with Mutiview (Avison and Wood-Harper 1990) the term "framework" rather than "methodology" is used (Avison and Wood-Harper 1995) as AFFEKT aims to provide constantly evolving support for developing a specific form of information system (a Knowledge Management system derived from a social constructivist perspective).

7.7.1 A brief description of the AFFEKT framework

The framework drew on the significant lessons of the research so far. It was an extension of SSM which considered the innovation of practice, and the engendering of a "community of practice" through the participative development of a Knowledge Management system. In essence the approach involved a cycle of gaining a rich appreciation of the problèmatique, communicating that appreciation to the participants in order to better understand their intentions to improve, providing a

component technology configured as considered appropriate to provide those capabilities that should afford benefit in improving practices, and finally repeating the cycle taking into account the previous experience. It was employed by the researcher during the final cycle of action research and was further developed in that cycle, particularly through reflection on improvisation and divergence from the suggested approach; *"methods can be successfully assimilated and used by practitioners in a critical and flexible way; evidence suggests that this adaptive reaction is common, especially in experienced designers"* (Wastell 1996). These alterations and improvement were then included in the description, and reflected upon in the final cycle.

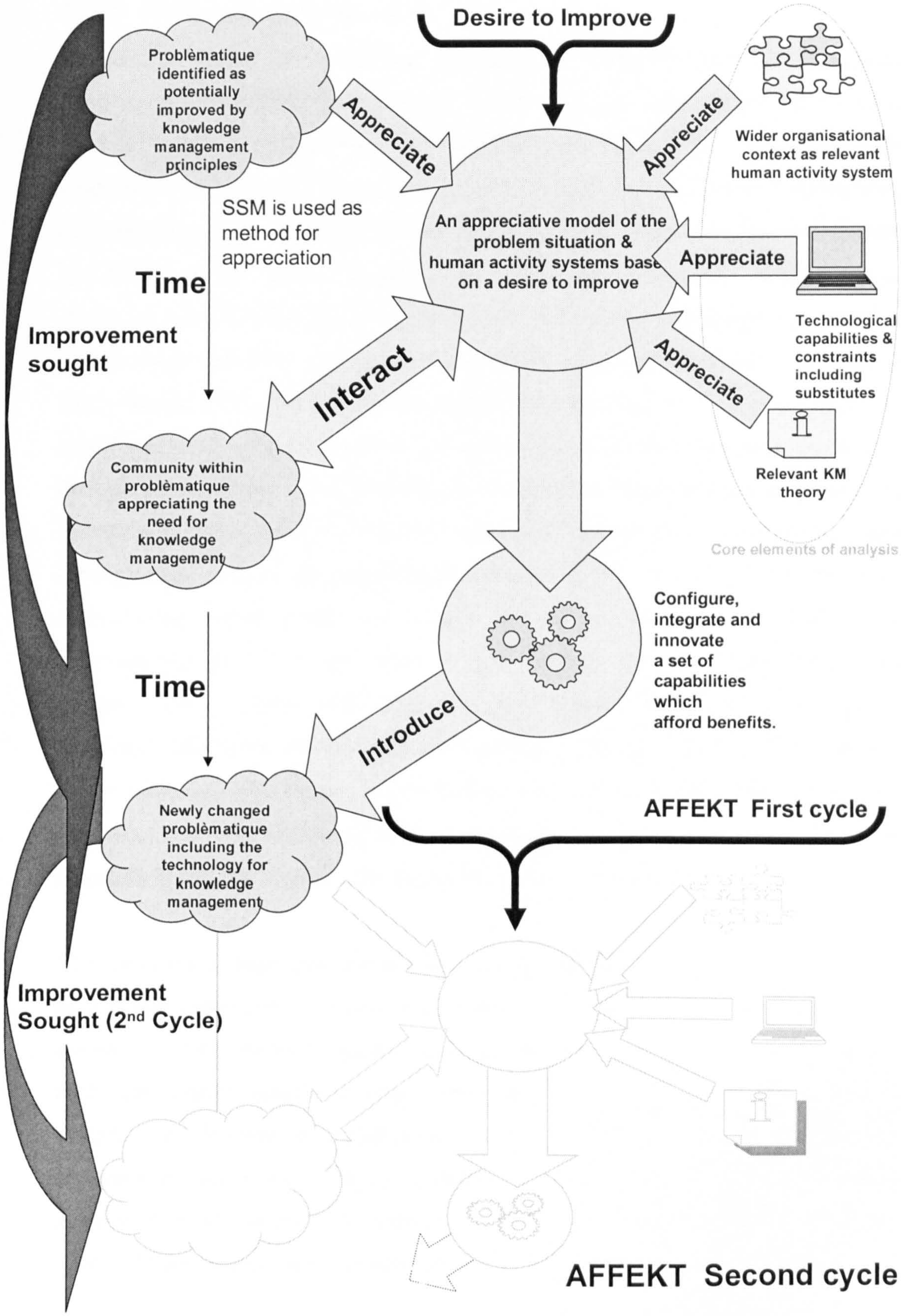

Figure 25 The AFFEKT Framework (Appreciative Framework For Evolving Knowledge Technologies).

7.7.1.1 The concept of appreciation

In order to extend the modelling techniques of SSM the AFFEKT framework employs the concept of appreciation, which strongly influences SSM's "social systems" analysis (Checkland 1981; Checkland and Casar 1986; Checkland 1999; Checkland 2002). Appreciation (Vickers 1970) emphasises relationships-maintaining and judgement rather than the *"poverty stricken notion of goal-seeking"* (Checkland and Casar 1986; Vidgen, Avison et al. 2002). The framework emphasises the researchers involvement in the world and the fact that he will employ a process of sensemaking based on tacit as well as explicit knowledge (Polanyi 1962; Weick 1993; Weick 1995). Within the framework the researcher is thus appreciating the problèmatique on the basis of this personal post hoc involvement, brought to hand through a thrownness which places the research in this involved state of appreciating (Introna 1997; Inwood 1997). Vickers' concept of appreciation aligns well with such Heideggerian notions of involvement (Inwood 1997) in that *"even the basic determinants which evoke our inquiry are the products of our appreciative development; for they are what I have called perceived regularities and irregularities"* (Vickers 1970). The researcher's actions cannot be divorced from the practices of the users, for they will affect such practices (as historically demonstrated by the Hawthorn effect (Huczynski and Buchanan 1991)). Rather than attempting to minimize such effects through the use of method, the framework draws on Action Research to suggest such actions should be used to influence the users' perceptions.

The concept also highlights the fact that such appreciation evolves and is composed of different viewpoints; "*(Vickers) describes as circular the process by which men appreciate their situation, because although experience revises their appreciations, their appreciation equally structures their experience. Thus the process cannot be described solely either as the discovery, or as the creation, of order or pattern. To recognise a pattern and to impose a pattern are inseparable aspects of one and the same process of knowing."* (Vickers 1970). This concept of appreciation is consistent with SSM and in particular the concept of weltanschauung (Checkland 1981).

Geoffrey Vickers argues that our human experiences develop within us *"readinesses to notice particular aspects of our situation, to discriminate them in particular ways*

and to measure them against particular standards of comparison, which have been built up in similar ways" (Vickers 1970). These readinesses may then be organised into an appreciative system, *"which creates for all of us, individually and socially our appreciated world"* (Checkland 1981). *"The appreciative setting conditions new experience, but are modified by the new experience"* (Checkland 1981). In gaining an understanding of the problèmatique this notion of appreciation (and its relevance to the adopted SSM methodology) resonated with the researcher's concerns. In developing CD:net and AKM, the researcher was not attempting to develop a structured description of the problem such that a solution could then be engineered (Avgerou and Cornford 1998). Rather the researcher had previous experience which had developed the "readinesses" to notice and take note of particular aspects of the problèmatique, the researcher aimed to *appreciate* aspects of the problem, to explore them and discriminate them in relation to the development of a potentially beneficial technological Knowledge Management system. In some ways the form of such technology was preordained, as it would necessarily be a web-based service founded on the capabilities afforded by the selected software technology.

The researcher was thus interested in employing SSM as a method of integrating the various aspects of the intervention, and of appreciating both their present state and the potential for improvement. The aim of this appreciation concerns the debate about possible courses of action which might be followed, and the relationships they will affect (Checkland and Holwell 1998). The framework thus suggests that those developing a Knowledge Management system should make judgements of potential actions through an appreciation of a wide range of different aspects of the problèmatique.

7.7.1.2 Gaining an appreciation of the core elements of analysis

AFFEKT was designed to focus the researcher's attention on gaining a rich appreciation of the problèmatique in which the knowledge management intervention is to be undertaken, to consider the nature of this problèmatique in terms of a broad desire to improve, and gain an explicit appreciation of three core elements of analysis (see Figure 25 which outlines how these elements fit into AFFEKT). The "desire to improve" is appreciated in terms of how it emerged and weltanschauung of its proponents. The separation of the analysis in this apparently reductionist way is only

to ensure that these core elements are individually reflected upon. The analysis should not be undertaken in such a separate way. For example, in CD:net gaining an appreciation of the wider organisational context highlighted a significant set of issues relating to the relevant influences from Knowledge Management literature (in particular the CKO's desire to develop a community of Country Directors as part of the knowledge sharing programme and the consultants background in science).

7.7.1.3 Appreciation of the problèmatique identified as potentially improved through the introduction of a Knowledge Management system

As outlined in the introductory chapter Knowledge Management is not in itself a reason for an intervention. Organisations are not presented with a problem of Knowledge Management *per se*, rather they have a *"desire to improve"* and, from the perspective of certain parties, Knowledge Management offers a potential for improvement. Such areas of concern have been labelled as messy problems (Ackoff 1974), to which an obvious solution cannot be sought. Knowledge Management does not of itself present solutions for messy problems.

The empirical work contained in this thesis has described the need to gain an understanding of the "desire to improve" and its associated problèmatique within which a technological intervention is to be undertaken. AFFEKT proposes that this should be expressed as a Root Definition from the weltanschauung of the sponsor(s) of the Knowledge Management initiative, in SSM terms the owner of the intervention.

The appreciation of this "desire to improve" in terms of relevant systems of purposeful action (the activity of intervention) is essentially the starting point of the intervention using AFFEKT. This desire is associated with the power to act upon such a desire, since such power must transcend the traditional power structures of the organisation in order to include issues such as influence and belief. For example the CKO for CD:net and Professor in the AKM research held some power such that the technology was introduced and yet they did not wield sufficient power to ensure the system was actually incorporated into work practices (indeed Snowden argues that for Knowledge Management systems such power cannot be held (Snowden 2001)).

Country directors, for all their support of the CKO, failed to use the service and the students remained sceptical of the AKM systems value.

Such a "desire to improve" cannot be expressed in purely prescriptive form, for example as part of a specification of the problem. SSM however provides an appropriate mechanism for exploring the desire to improve. Particular attention in the analysis of the desire to improve should be focused on identifying the problèmatique for the intervention. AFFKET's focus on the development of community required that the potential "membership" of such a community be appreciated as part of the problèmatique. The nature of such membership was dependent upon the weltanschauung of those identified within the "desire to improve". While the Knowledge Management technology may impose constraints on the nature of membership (for example by the necessity for members to hold a unique password) in reality membership of a community may be more transient and difficult to describe (Wenger and Snyder 2000). Individuals may be peripheral to the community, called upon by members who then represent their views etc (Lave and Wenger 1991). Such aspects needed to be considered. In addition those involved in developing the Knowledge Management system needed to be described and their weltanschauung expressed. During the period of a system's introduction and use they will interact with the "community" and thus hold a legitimate peripheral role. AFFEKT drew on the lessons from CD:net to suggest the need to develop an appreciation of the purposeful activity of the identified user community. SSM is used in a conventional fashion to develop models based on such purposeful activity (Checkland 1981).

Later iterations of AFFEKT should also appreciate the inter-perception evident among the user community from their use of the introduced system. Factors which influence how the users construct their personal perception of purpose for the service should be appreciated. Examples of such factors include users' general perceptions of organisational interventions (hence the *initiativitus* described in CD:net); users' perceptions of those developing the system (e.g. perceptions of the consultant in CD:net); users' views towards knowledge management and users' general epistemological approach. By considering such factors it is more likely to be possible to influence these perceptions in future cycles of AFFEKT. For example, it might be

possible to undertake the following for the actions suggested above: a debate might be initiated using the system to discuss the problems of too many initiatives within the organisation; the development team might be changed; training might be arranged introducing alternative approaches or incentives introduced.

7.7.1.4 Core element 1: An appreciation of the wider organisational context as relevant human activity system

CD:net highlighted the significant influence of the wider organisational intervention on the problèmatique. Learning from this, part of the AFFEKT framework included the need to continually appreciate the boundary for the problèmatique and how the wider environment might affect the Knowledge Management System's success. AFFEKT described the need to explore how the desire to improve might be expressed in terms of the organisation's overall objectives.

7.7.1.5 Core element 2: An appreciation of the technological capabilities and constraints associated with the intervention

The interrelationship between technology and practice forms a significant part of this study. It is thus suggested that the nature of the technological capabilities offered by the available technology (either to be developed or to be purchased) be considered in terms of modularity, constraints, and, in particular, substitutes available to the users.

AFFEKT required the chosen technology to be capable of being rapidly reconfigured and changed. Within CD:net this was possible due to the Researcher's intimate knowledge of the software's code. AKM in contrast enabled this by providing a modular system which could be reconfigured through a web-browser interface. Each of these technologies enabled such evolution; however they also imposed constraints as to the form it would take. For example in CD:net the underlying database schema could not be easily changed (although attributes, tables and views could be added); for AKM the system was constrained in the way users and documents were stored. Furthermore the existing technological infrastructure in use within the problèmatique needed to be considered. AFFEKT thus highlighted the need to appreciate all technological aspects of the systems development. This would include reflection on how the modular structure of the selected KM system might be configured such that it can afford benefit, and also be capable of reconfiguration in future cycles (it is

assumed that either a packaged software system or previously developed system is to be used – AFFEKT does not support the initial creation of such complex technologies).

7.7.1.6 Core element 3: An appreciation of the influence of relevant theories

The development of a Knowledge Management system involves the tailoring and configuring of both technology and information in order to develop a system which is perceived to afford benefit. Yet the design process also involves a significant degree of innovation and artistry (Schön 1982). As the problems of Knowledge Management can be described as being essentially messy in nature there is likely to be a wide variety of forms of systems which could be introduced.

AFFEKT thus suggested that the influences upon which such innovation is based should be explicitly appreciated. In the case of CD:net the innovation was closely associated with the cultivation of *"communities of practice"* (Wenger 1998; Wenger, McDermott et al. 2002) and focused on encouraging users to develop their own technology (with the development teams support). AKM by contrast was more significantly influenced by the concepts of participatory design (Suchman 1995; Blomberg, Suchman et al. 1996). These influences however are also affected by the organisations theoretical influences. For example, in CD:net the CKO's understanding of community based on the World Bank's studies (Denning 2000), translated through a generally conduit perspective on communication (e.g. the "hub and spoke") (Boland and Tenkasi 1995; Varey, Wood-Harper et al. 2002). It is argued therefore that such influences from the literature are made explicit and reflected upon during the design process.

7.7.1.7 Interact with the user community

The previous section outlined that it was necessary to appreciate factors which might influence the perception of a Knowledge Management system's users towards the system. Within the AKM cycle this was achieved through participation with the user community in a workshop setting. The AFFEKT framework thus suggested the need for those developing the Knowledge Management system to interact with the potential community members throughout. Such intervention might take many forms, (some examples of which were outlined in the pervious section); however unlike

prototyping techniques or traditional information systems development techniques in which users are either passive within the design process (Bansler and Bodker 1993) or involved to better align the system with existing practice (Boehm 1988), AFFEKT approached such interaction as concerning the alignment of perceptions and practices towards the existing technology and towards the perturbation in the technology planned for the next cycle. The interaction concerns improvisation and bricolage by users (with the support of developers) of the Knowledge Management system. Users would be encouraged to reflect upon the system and its potential impact on their work practices, and through this look to change and improve both. Such improvisation is only possible if a Knowledge Management system does not represent or support business processes which might be damaged by such participation, and if the underlying technology is capable of being easily and rapidly altered. It should also be noted that AFFEKT did not promote the constant reinvention of the Knowledge Management system such that it would alienate users and confuse them (Dix, Finlay et al. 1997), rather the system would be changed in a regular and considered process with new capabilities added, and others which are no longer used or relevant removed.

7.7.1.8 Configure, integrate and innovate a set of capabilities which afford benefit

Having gained the understanding described above the next step is to "design" a Knowledge Management system or make changes to an existing system. Apart from the technical considerations, one of the most significant aspects of such design activity was suggested to concern the proposal of a metaphor for the system which would enable users to perceive its purpose. Such a metaphor extended beyond the suggested use of systems metaphor evident in much HCI literature (e.g. the "desktop" or "rubbish bin" of the Windows operating system) (Karat, Karat et al. 2000) to include the information content and information structure of the system (Brown and Duguid 2000).

The design of portal technology and websites have often drawn upon print media, in particular newspapers, to provide such metaphors (Brown and Duguid 2000; Brophy and Venters 2001). A newspaper metaphor is useful in that it has similarities to the Knowledge Management systems developed in this study, for example a newspaper's structure aims to be relatively well known and obvious among users (Tabloid or

Broadsheet editorial style is obvious by the paper's size, the day's main news is expected on the front page, the sport is at the back). Newspapers aim to accommodate substitute technologies (Ciborra 1996), (for example the Economist accommodates the Internet by including URL's within its text and providing a complete online and PDA copy for subscribers of the printed paper).

Similar to AFFEKT's suggested approach, newspapers change their format, style and content regularly to reflect changes in users needs or desires (for example the addition of a Food supplement in the UK Observer to represent contemporary interests in food and cookery). Newspapers also change to reflect external events and news (for example very significant news stories being spread across a large number of pages, or the addition of a special section on events such as the Olympics). As suggested by AFFEKT for Knowledge Management systems, the newspaper's technological capabilities (a printed volume) are configured and evolve to represent the needs of users, the wider environment and their sense of purpose.

Such metaphors are useful however they are not sufficient, newspapers are "new" every day whereas Knowledge Management systems are generally not, newspapers do not enable significant feedback (apart from perhaps the letters page), they are obviously complete in themselves (when a paper is purchased the buyer is provided it complete as a single artefact). To simply employ a print media metaphor for a Knowledge Management system is thus not recommended. Rather it is suggested that it is necessary to identify a coherent metaphor upon which to develop the Knowledge Management system. Such a metaphor can then be used in interaction with users and to direct the editorial actions of managing the information on the Knowledge Management system.

7.7.1.9 Rhythmic cycles of reflection and action

AFFEKT is a cyclical approach to intervening which aims to reach an accommodation between a knowledge management system and the human purposeful activity of users such that it improves users' ability to innovate and improve their practices. Since such an aim is impossible to reach, AFFEKT should continue to be applied throughout the life of the Knowledge Management system rather than simply at its conception and introduction. The concept of a "rhythmic

cycle" is used to highlight the fact that the intervention begins very much as present-to-hand and as a point of breakdown in the ongoing activity of the users, then it is suggested that cycles of reflection and action are undertaken and acted upon to shape both the technology and the purposeful activity such that the system becomes more ready-to-hand as part of the practices of the users (essentially it becomes "part of the way we do things round here!"). The system should essentially emerge as relevant to the problèmatique. Yet purposeful activity constantly evolves, for example through changes in the wider organisational context such as the significant influence of the Strategy 2005 on CD:net. In this way there should be no "end point" to the intervention, but rather an ongoing set of cycles. AFFEKTs development approach did not include the traditional "Handover" period in which the system moves from being in development to maintenance (Avgerou and Cornford 1998; Pressman 2000), rather features and capabilities to the system may be added, altered or removed throughout its use. This perhaps reflects recent end-user PC software. For example Microsoft's Windows-Update service includes significant systems enhancements, software additions and capability changes in addition to providing regular maintenance activity such as preventative patches, bug fixes and minor improvements (Pressman 2000). Similar ongoing evolution of software may be seen in many on-line application systems such as Yahoo-groups (www.yahoo.com) in which new features, capabilities and options are regularly added based an understanding of how users interact with the system.

7.7.1.10 Further cycles of AFFEKT

The framework was cyclical, with each cycle drawing upon the experiences of the previous cycle (See Figure 25). In this way it also takes the form of Action Research (Checkland and Holwell 1998), and applies the learning from the previous cycles as appreciation into the next cycle of AFFEKT. Yet caution should also be applied as significant change might have occurred among the user community since the previous iteration.

7.7.1.11 Final conclusions

The next research cycle outlines how AFFEKT framework was operationalised within the British Council. The chapter attempts to apply the draft AFFEKT framework in order to further develop it and critically reflect upon it. The lessons

from this final research cycle build upon the lessons from CD:net and AKM to provide a coherent set of recommendations for improving the practice of implementing Knowledge Management systems. The potential benefit of a refined AFFEKT framework to both IS theory and practice is reflected upon in the Conclusions chapter.

CHAPTER 8 THE THIRD CYCLE: SCI:NET

"As a human being, one has been endowed with just enough intelligence to be able to see clearly how utterly inadequate that intelligence is when confronted with what exists" (Albert Einstein 1932, Letter to Queen Elisabeth of Belgium)

8.1 Introduction

This third cycle of action research began shortly after the AKM action research cycle had finished. This cycle returned the researcher to the British Council in order to implement a second Knowledge Management system for a different group of employees within the organisation. By this time the Strategy 2005 change programme was underway, CD:net had been available for a few months and had ceased to be regularly used by the Country Directors. The researcher aimed to use this third cycle to explore and further develop the AFFEKT framework that had been devised through the action research carried out in the first and second cycles, and to test and explore the issues raised. The researcher was aware that the previous cycles of activity had raised many questions and could be open to much criticism; as such the primary aim of this particular cycle was to consolidate the learning achieved in the previous cycles into a coherent research exercise

As with the CD:net cycle of research activity, this cycle focused upon an internationally distributed group of employees within the British Council. This latest group consisted of all those employees of the organisation who were involved in the promotion of science, engineering, technology and environmental excellence within the UK. The researcher became involved with this group at the suggestion of both the CKO and the Knowledge Manager of the British Council. The Director of Science was facing significant pressure to change and improve the representation of science and the Knowledge Sharing programme supported this change. This pressure came

from within the organisation through the strategy 2005 and previous budget cuts, and from the Office of Science and Technology in government. It is outlined in more detail below. The researcher was therefore tasked to implement a Knowledge Management system for this group and the system was called SCI:net, using a name from an existing e-mail list.

This chapter describes the research work undertaken as a linear progression applying the AFFEKT framework. Within the first action research cycle of this study (chapter 6) SSM was employed in both mode 1 (in a formal stage by stage process) and also mode 2 (an internal mental use of SSM and a way of thinking (Checkland and Scholes 1990)) fashion, using principles from the methodology (such as drawing rich pictures, composing root definitions, devising conceptual models) to support the action in improvising change in the CD:net intervention, and in order to reflect upon this improvisation.

The third cycle of research draws together the themes elicited during the first two cycles in order to undertake a research cycle with greater methodological rigour by applying the AFFEKT framework that had emerged from the second cycle. AFFEKT forms an intellectual framework through which the researcher entered the problem situation of this cycle of action research (Checkland 1995). Within this framework SSM was used as both research enquiry method and as problem contextualisation tool. The contribution of this thesis is founded upon the operationalisation of theory through the emerging AFFEKT framework.

Since action research is argued to be a cyclical process in which findings emerge throughout each cycle (Checkland 1991; Baskerville and Pries-Heje 1999), the conclusion to this cycle forms the conclusions of the thesis. These conclusions are thus presented in the final chapter rather than in this chapter.

The next section describes the analysis approach adopted and outlines how the intervention is to be described.

8.2 Application of the framework

Any intervention undertaken within Action Research should be carried out through a structured approach in which problems are diagnosed, interventions are planned and implemented, and reflections take place (Chisholm and Elden 1993 from (Lau 1997)). In order to undertake such an iterative process there needs to be a structured methodology or framework for such an intervention (Checkland 1991). Within the first cycle of action research SSM has been employed as such an intervention framework although circumstances had prevented its effective application. The second cycle of research had not employed a specific methodological framework or intervention but had relied on rigour in interpretation and reflection in order to structure second order sensemaking (Argyris 1995). This cycle essentially formed a significant additional reflection on the experience of developing Knowledge Management systems.

This third cycle was undertaken in a rigorous structured way using the AFFEKT framework. It was the most extensive analysis undertaken as part of this research, and involved some 18 months of activity in which the first cycle of AFFEKT was undertaken in the first year, with the second cycle taking about a further six months.

8.2.1.1 Constraints on the research cycle

As with CD:net, the researcher had to work within the operational constraints of the organisation. It was only possible to visit the overseas countries on the invitation of the particular Country Director, with the country paying the subsistence for the visit and Headquarters paying for flights (the usual arrangement within the organisation). The researcher thus only visited countries with a significant interest in Science, and offices with very little Science activity (such as parts of Africa) were not visited. These offices provided only a small proportion of the overall effort towards Science representation, and the researcher was thus conscious of the bias towards larger operations and tried to mitigate this effect by interviewing the UKP Science team on their needs (the UK-Partnership Science team, led by the Director of Science, were responsible for Council wide science policy and were based in Manchester, and they were in regular contact with such offices).

8.2.1.2 The impact of conferences

Apart from an initial meeting with the Director of Science, the researcher's first significant contact with this particular community was his attendance at the annual conference on science within the organisation. This conference is only open to overseas science officers and those in the UK involved in Science. Around half of the most committed science officers attended and a freelance journalist was hired in order to report the proceedings back to those unable to be present. These events formed a core part of the planning and reporting process in Science, and the researcher's attendance enabled him to meet a large number of Science Officers.

The first cycle of the AFFEKT framework had begun with the researcher's attendance at this conference in Cardiff, and was completed a year later with attendance at the next conference in Guilford. The researcher had been invited to speak at each event. These conferences had thus contributed to the researcher appreciating the work and pressures of science promotion so enabling him to introduce Knowledge Management ideas to the Science officers, and hearing first hand the policy decisions.

8.2.1.3 Gaining community commitment and legitimacy

Within CD:net the legitimacy for the intervention resided in the commitment of the CKO and the Knowledge Manager. The researcher remained a relatively unknown party among the Country Directors with both the consultant and CKO being far more involved in promoting the service to them. Within the AKM cycle the workshops meant that the processes of promotion and analysis were concurrent and that the analysis was more central to the development. Thus the close relationship between the researcher's analysis and the students had been beneficial by enabling a closer alignment of perceptions and understanding. For example the researcher easily understood complaints by the students about the availability of papers, or about the need for the students to discuss methodology.

The researcher used his speech at the Cardiff conference to promote the concepts of Knowledge Management from a social constructivist perspective (Berger and Luckman 1966), drawing on the origins of science (in particular the move from secrecy associated with alchemy to discussion and debate on science at the Royal

Society in the 1800s (Morgan 1984)) to show the intention of the Action Research. The presentation was very well received and became a significant theme for the conference leading to a series of discussions on developing "*knowledge for science*" (Anderson 2000).

Within the journalist's report this view was outlined (Anderson 2000): *"Time and time again, delegates of the science update meeting became acutely aware that their knowledge was needed... There was general agreement that 'organisational shape and health' had led to ineffective knowledge sharing."* (Anderson 2000). Furthermore *"...SCI:net should allow a step change in knowledge sharing and management among the Council's science community"* (Anderson 2000). This also led the development of SCI-net to be included in the global science, engineering and environmental sector policy for the following year (as outlined in the following policy statement):

Policy item 24: SCI:net
- **Objective:** to support the exchange of knowledge and information around the British Council global science network, creating a virtual professional community.
- **Audience:** British Council staff with a science remit
- **Delivery:** a web-based Knowledge Management system.

(Anderson 2001)

The science team together with the research activity would need to deliver against this objective, and this provided legitimacy for the action research activity among the science officers. This formal commitment was in contrast to the espoused commitment evident in the CKO's questionnaire responses during the development of CD:net. This formal policy statement provided legitimacy for the researcher to interview science officers and provided legitimacy for the science officers to be actively involved in the action research. While the financial commitment from the organisation was far less for SCI:net than for CD:net, the projects legitimacy within the science group of the Council appeared far more secure.

The researcher used his attendance at the Cardiff conference as the first stage in beginning to influence the development of the science officers' community as suggested in the AFFEKT framework. Within the AKM cycle the students' perception of Knowledge Management and knowledge had influenced their

conception of the nature of the tool and with CD:net the consultant's experiences in government and his background in science had led him to adopt a broadly functionalist perspective. The science officers were either scientists or had some experience with science, and as such adopted a broadly positivistic epistemological approach. The researcher thus used his conference speech to reiterate the tacit dimension of knowledge (Polanyi 1962) and the social issues associated with Knowledge Management in an attempt to influence such perspectives.

During the conference the researcher came to realise that discussing Knowledge Management in terms of "improvement to work practice" rather than the "creation of knowledge" appeared to gain him credibility. This use of the term improvement is considered in detail in the conclusions to the thesis.

8.3 Initial analysis

The AFFEKT framework was used to structure the initial analysis. The appreciation was undertaken in two strands. The first was to gain an appreciation of the problèmatique in terms of purposeful human activity. For this SSM was used in two streams, the "stream of cultural analysis" and the "logic-based stream of analysis" (Checkland and Holwell 1998), the desire to improve was also explored and defined during this analysis.

The second strand involved exploring in detail the three core elements of the analysis described by the AFFEKT framework: to gain an appreciation of the problèmatique in terms of substitute technologies and the technological capabilities of the proposed Knowledge Management system (this is not outlined here as the AKM system was used); in order to devise a theoretical framework for the intervention the researcher gained an appreciation of the theoretical influences on the project (both from the relevant literature and from previous initiatives and change programmes implemented within the organisation); and finally to gain an appreciation of the broader organisational context within which the intervention would take place.

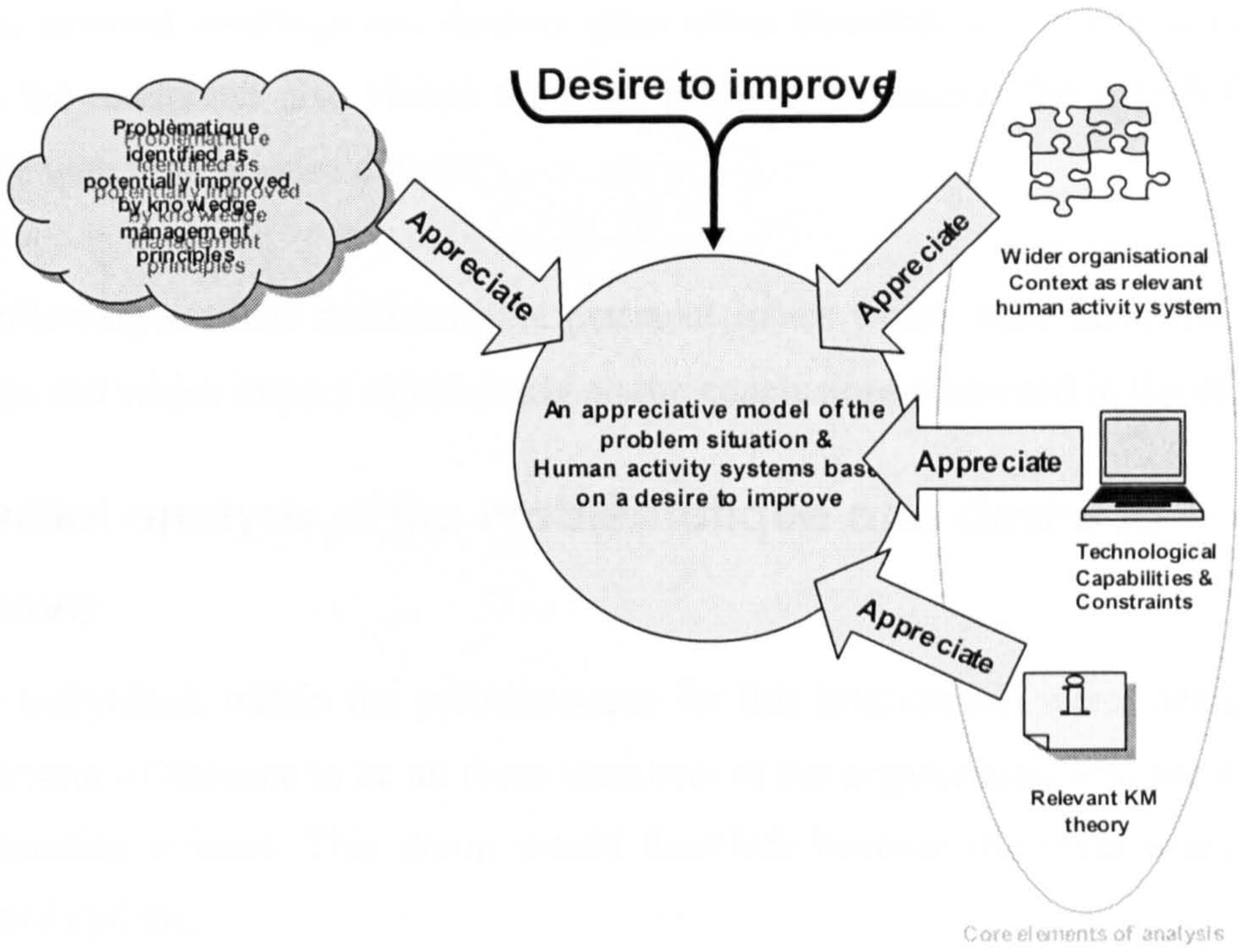

Figure 26: The focus of the initial analysis.

In addition to the research undertaken during the Cardiff conference, the initial analysis was undertaken through interviews with all members of the UKP science team and with other key stakeholders in the UK, and during invited visits to offices in Slovenia, South Korea, Hungary and France. Rich Pictures were drawn up based on the interview transcripts, notes and through listening to the tapes. The researcher posted an e-mail to all the science officers asking them to complete an online Likert scale questionnaire exploring support for a Knowledge Management system for Science and the perceptions of such technology. The aim of the questionnaire (which the researcher had described at Cardiff) was firstly to introduce the researcher to the whole group, secondly to demonstrate that all users were being consulted, thirdly to demonstrate that the researcher was being proactive and listening, and finally to ascertain how likely it was that the SCI:net service would be used and how likely it was to be accepted. The results of this questionnaire were very positive towards the service however only one quarter of Science officers completed the form. (See appendix 2)

The overseas visits involved interviews with all the staff involved in science, an interview with the Country Director (the results of which fed into the CD:net analysis) as well as interviews with other senior staff. In addition a number of social

events, external meetings and dinners were often attended. For example in South Korea the researcher also visited the FCO Embassy to discuss the British Council Science with their science attaché.

The following sections document the pertinent issues which were identified in this analysis and which impact significantly on the conclusions presented in the thesis.

8.4 Initial analysis of the Problèmatique and desire to improve

Those individuals within the problèmatique for this intervention were identified by the Director of Science to be all those members of the organisation who are engaged in promoting science. This group would therefore become the main users of the proposed system.

The British Council's promotion of Science, Engineering and Technology (SET) formed part of the UK Government's programme for the international promotion of science, as co-ordinated by the Chief Scientific Advisor's (CSA) Committee on International Science and Technology, (on which the British Council was represented).

This committee expected the British Council to deliver against the following goals:

- *"To establish the awareness of modern Britain as a world leader in science and technology, as an important means of advancing our general political influence on the world stage.*
- *To promote international research collaboration to the benefit of the UK science base" (Anderson 2001).*

The British Council attempted to deliver against these aims through two interdependent programmes of activity, the first was well established but the second had been introduced relatively recently:

- ***"Excellence in international science:** covers the promotion of partnerships and professional and academic standards, and support for young scientists. The products and services used in this area target scientific communities, engineers and research managers around the world."* Its aim was to

"promote UK excellence in international science through engagement and influence with scientific communities around the world. The instruments for this are face-to-face meetings and networking" (Anderson 2001).

- *"**Understanding science in society:** covers science communications and innovation, science policy and reform, and sustainability. Products and services are targeted at the public and policy makers."* Its aim was to *"facilitate an understanding of science in society... The instruments [for achieving this] include exhibitions, public debates, lectures, seminars and events"*. This was expanded to focus particularly on young people (Anderson 2001).

Across the overseas operations of the British Council around 283 staff had a remit for science (all these people are referred to as science officers when undertaking this role) however few of them were full time, with the majority spending less that 25% of their time on science. Indeed much of this figure was made up by small offices undertaking a single science project for a few days a year. In total the Science staff input overseas was around 40 full-time equivalents. The focus of this cycle of research activity was on the 36 or so science officers who regularly spent a significant amount of their time on science matters.

The UKP science team that supported this overseas science activity was based in Manchester and consisted of three full time and three part time members of staff led by the Director of Science. They also supported HQ departments on science issues; represented and liaised with the UK science community; developed science policy and provided the management of projects.

From the perspective of one of the consultants who make up the UKP science team, the team acted as *"a hub for science"* with each member *"lending a hand to different activities"*, and *"bouncing ideas"* among themselves. They worked as a team to support their overseas colleagues in the delivery of science work and alerted them to new opportunities. According to one consultant, this group provided a knowledge-management related service to overseas science officers by responding to their questions, by challenging the representatives to reflect upon their work, and by contacting each other for help.

The work of the science team was divided into to two areas: policy activity and operational activity. As one of the consultants described this work "*The policy side... is helping [the director of science] and the rest of the team in developing our science policies and overall corporate science policy and [to develop] policies in a region*". The operational activity was described as *"the advisory role in terms of what our officers are doing overseas – a simple way of describing our job is to help our colleagues overseas to deliver their science programme"*. Another consultant in the team also described their role in these terms: *"My role there is as a facilitator to facilitate dialogue between the UK institution and our overseas officer to encourage work to collaborate"*.

The work of this team was to support the group of overseas science officers and provide a strategic direction for their work. As one of the consultants described it: *"It's alerting [overseas science officers] to opportunities that exist in the UK as sources of funding, potential partners and also picking up on ideas that happen in the UK and making them relevant to what's happening overseas"*.

Actors involved in this cycle

- **Director of Science:** The Director of Science holds a Ph.D. in science and is the most senior science representative within the organisation. He manages a team of 6 science consultants within the Manchester headquarters and is responsible for developing the overall strategy for science within the Council. He championed the action research and proved very supportive of both the research and the intervention.
- **Science Consultants (3):** Reporting to the Director of Science, the science consultants work from the Manchester Headquarters.

1. **Science Consultant 1:** This consultant has worked within the organisation for a significant period of time. He holds a science Ph.D. and his personal network is extensive. He is highly sceptical of changes and of the benefits of IT. He was the most sceptical about the SCI:net intervention.
2. **Science Consultant 2:** This science consultant worked part time. She was very interested in technology and managed a high profile web-site project developed

by the team to promote science to young people. She was very technologically minded and also had an awareness of Knowledge Management principles based on her MBA.

3. **Science Consultant 3:** This consultant was very open to new ideas and highly reflective on the science promotion work. He was highly supportive of the research activity and the intervention.

- **Science Administrator:** This person was the most concerned about the intervention as she felt any system which required administration would increase her workload. She did however appreciate that the Director viewed the project as crucial. Once she saw that the system might save her time in administration she became neutral verging on enthusiastic.
- **Additional Science staff in the UK:** These staff work with the ISM department and are responsible for information on science and its distribution within the British Council.
- **Overseas Science Officers:** These staff are managed by their local Country Directors and vary depending on the commitment of the particular overseas office to science. In order to make sense of these actors the researcher described archetypal science officers as part of the initial analysis. These are described in section 8.6.1.5 .

The next section outlines the problèmatique for this research as defined in consultation with the Director of Science to be all those overseas staff actively engaged in science representation and with the UKP science team.

8.4.1 Identifying the problèmatique

One of the aims of this initial research was to identify which members of the organisation would become members of SCI:net. According to the Director of Science such a group's membership should include those people working on science promotion. For the researcher SCI:net's membership would be defined through the initial analysis within the problèmatique. Unlike CD:net in which membership was defined by job titles, for SCI:net the Director of Science mandated to the researcher that membership would be decided by the UKP Science Team and based on an individuals involvement in Science activity. In addition to all science officers a select

number of other staff who were particularly interested in Science would be members of SCI:net (for example ex-science officers who recently moved to other posts).

Throughout this research project the organisation did not posses a single definitive global address book. Collating a list of all employees with a particular job title took up a significant amount of time (for example the researcher had to compare three lists of names and e-mails just to get a single list of Country Directors and e-mail addresses for CD:net!) Capturing the names and e-mails of employees who were involved in science proved even more problematic, even if their names were already known. In general the science team therefore had a difficult job of managing a list of such contacts and tended to find the list out of date.

The problems involved in identifying a community of science officers were made more difficult by the smaller offices overseas and by the reductions in science budgets. *"The boundaries are now getting increasingly messy as the office has slimmed its science staff and is beginning to mix science up with governance – so for example at the moment in China we are doing a lot of work helping the Chinese with the planning and development of science parks ...headed up by someone in the education team because the key science parks in China are university related."* (Science Consultant 1).

"We never truly know what people overseas are doing"..."We never really have a true picture of who is doing science work within the British Council" (Science Consultant 1). These statements provided a fascinating reflection on the CKO's desire to develop a "community of Country Directors", and the Director of Science's desire to develop a network. At the periphery of these groups, members could be leaving and joining constantly, and thus to consider them as private or closed would be difficult. For example what if a Country Director became a Policy Director (a regular occurrence given the rotations)? Yet the organisations own view of itself was as if it was in stasis. This issue is returned to in the conclusions to the thesis.

8.4.2 The work of an overseas science representative

The following section provides a brief outline of the work of overseas science officers, and considers the most significant pressures that they face in their work. An

analysis of their work was undertaken using SSM, and this analysis is discussed in greater detail later in the chapter.

The science promotion activity undertaken overseas was dictated by the Country Director through the yearly planning process in which the budget and time to be spent on science was decided. This represented one of the key problems faced by the UKP science team as they had little direct financial control over overseas science promotion. Furthermore Country Directors could classify events on the margins of science representation as science related activity for budgetary reasons. For example, they could reclassify existing Education-programme events as joint Science Events because they involved speakers from the science faculties of UK universities.

The majority of the overseas science budget was spent on "Joint Research Projects" (JRPs) which funded science exchanges under the *excellence in UK science* programme. These had been run for a long time and science officers were familiar and confident in organising them. They essentially required the application of existing knowledge rather than innovation of new ideas. In contrast the newer *understanding science in society* programme was seen by science officers as more difficult to administer as it did not rely on existing known practices. Rather science officers were called upon to constantly innovate new activities. Instead of administering an application for funding the officers needed to organise high profile events, promotions and marketing effort for a *"non-traditional audience"*, something that they were not traditionally good at doing.

Ideas for such activities usually came from the UKP science team in Manchester, either as a suggestion or as a request to participate in a larger event (as some of the events were trans-national). They might also liaise with bodies such as the Royal Society (e.g. to arrange the international tour of the Royal Institution's Christmas Lecture). Running such events required significant skills and many science officers found it challenging. For example, finding good UK speakers, an audience, local speakers (the British Council always tries to include a local dimension to its events) required knowledge and information. In many cases however Science Officers rely on their own guess work and serendipitous opportunities. For example a Science Officer in France described how upon seeing an advertisement for a lecture by a

leading UK academic which was taking place in Paris she decided to contact the academic directly and ask if he would be prepared to speak at the British Council during his visit. From this initial conversation an entire event was designed. Additionally in South Korea a Science Officer outlined how her knowledge of the local scientists and universities meant that she would know their particular interests and be able to respond with relevant activities.

8.4.3 Pressures on science promotion: The desire to improve

The pressure to change the work of Science Officers that had prompted the Director of Science to contact the Knowledge Manager originated both from internal changes within the British Council and from external pressure from central government. The UKP science team had suffered for a number of years from a large scale erosion of its operational budgets and staff numbers in the UK, and had seen less budget being spent on science by Country Directors overseas. This erosion was perceived by the Office of Science and Technology (OST) to be due to the British Council generally not perceiving science as part of UK culture, and hence as part of its core remit (Internal memo). This assertion appeared true, evidenced by the general lack of interest of Country Directors and Policy Directors in Science Promotion.

A few months prior to this research taking place and following this criticism from both the OST and the FCO, the British Council's Chairperson made a commitment that SET would become a greater priority for the organisation. The Council's Board thus required that adequate resources for SET should be ring-fenced within the organisation and within the overseas budgets. As the budget constraints on science were relaxed so the science officers and science team were suddenly under huge pressure to innovate new activity and improve the existing activity in order to impress upon the FCO and OST the benefit of their work.

Alongside these pressures, the British Council's 2005 strategy review was underway, requiring a shift in emphasis from "excellence in science" programmes towards more programmes of "understanding science in society" targeted at the wider public and so called *"successor generations"* (young adults) (Anderson 2000). Strategy 2005 outlined this as "*Under the strategy, the Council will give increased emphasis to targeting the successor generation, especially those who are expected to be in*

positions of influence in the future, such as young professionals and postgraduate students. The authority generation will not be neglected. However, many of the new programmes and services will be aimed at reaching a larger number of young people... The changes will include...the re-direction of science work to focus on the promotion of UK science, support for the mobility of young scientists and thematic projects on scientific issues of public interest."(British-Council 2000). This *"transition in science"* was unpopular with a number of the science officers who had traditionally only dealt directly with scientists in organising face-to-face exchanges and visits. In particular it was felt that those scientists who relied on the JRPs for funding their travel to the UK would be displeased. Others however were more supportive, believing that the JRPs were expensive, tied up resources, and as one representative put it; *"why should the British Council continue to fund old researchers – if they are any good the Research Councils should fund [them]"*. Most science officers appeared to feel that a suitable balance was needed, but that the "understanding science in society" activity would require a shift in their work practices. The overseas perspective towards this transition is shown in the rich picture segment given below (Figure 27).

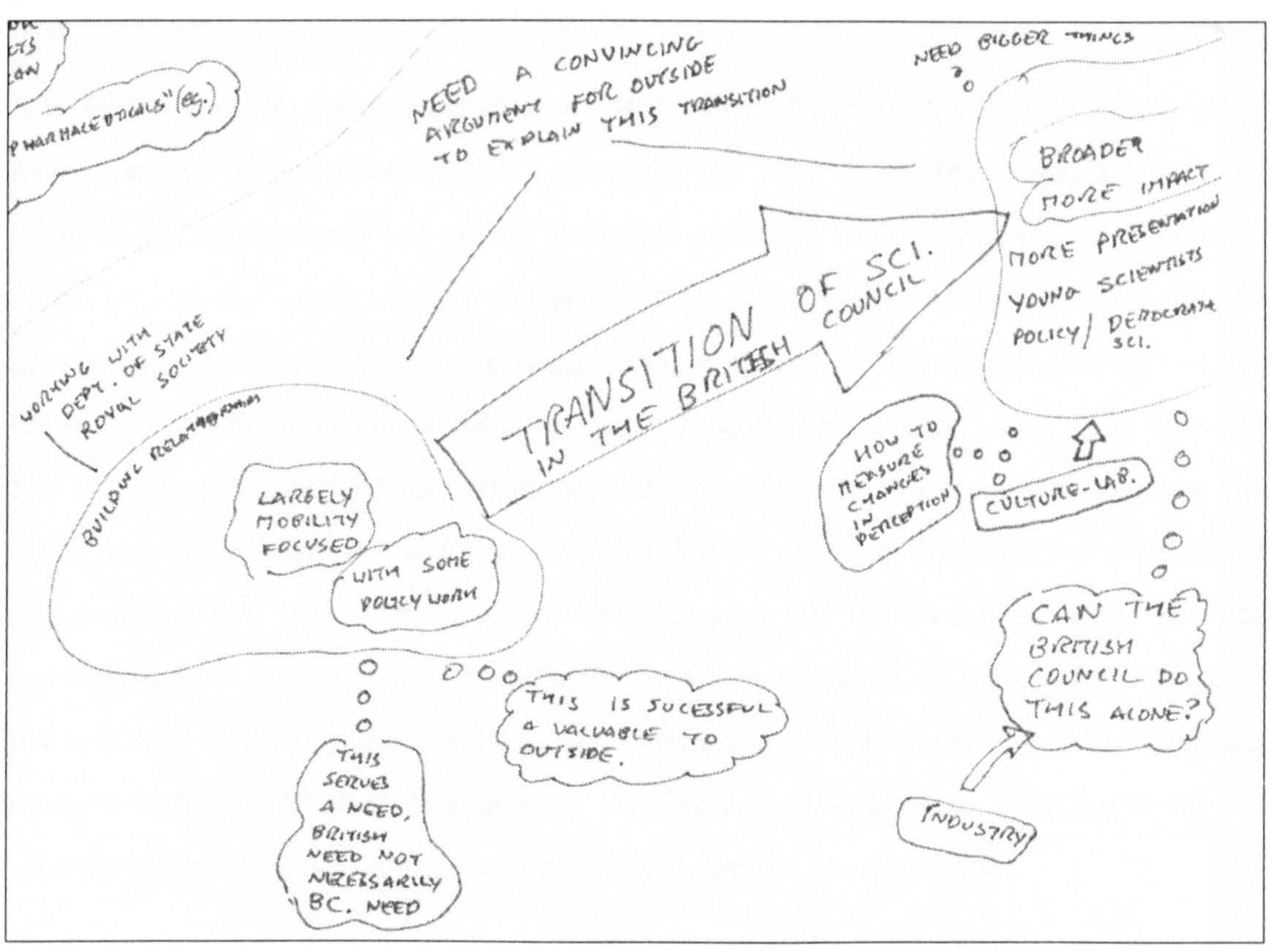

Figure 27: Rich picture segment outlining the shift from mobility focused activity to broader impact activity.

Attempts to innovate new practices however were seen to be hampered by the after-effects of the previous budget constraints. During this time there had been a shift away from recruiting science specialists in the UK to recruiting generalists in the overseas countries because UK appointed science specialists commanded far higher wages. As such there was, in the words of one interviewee "*less London-appointed "Brits" doing science work!"* A science specialist was defined as somebody with a degree in a science or engineering discipline.

Such a shift was seen as problematic however as generalists were more likely to require support as outlined by a UKP consultant; "*there has been a trend to move over to localising posts [appointing people overseas directly rather than in the UK], and I think this will increase the need for them and us to communicate more with each other."* Another consultant said *"I think inevitably they will be relying more on our professional experience to help them out delivering their science programme...[as a result] I can see that communication and networks of information and sharing are going to become even more important for us on the science side."*

It would be against these pressures to change working practices that the Knowledge Management intervention would ultimately be judged by the organisation. The Director of Science outlined during an initial interview that the existing emphasis on *"hub and spoke"* communications (led by the Manchester consultants) should be developed into a network, as the small number of consultants in Manchester would be unable to effectively undertake the major innovation required alone. The Director felt that the UK consultants maintained *"heaps of linear relationships"* (hence the "hub and spoke" simile) and that they wanted to develop these into a network of relationships that freed the consultants to focus on innovation and strategy. He was concerned that the science consultants in the UK acted in *"responsive mode"* towards the overseas science officers by responding to their questions but not helping them to collectively learn or innovate. The Director was keen to alter this model of communication so that science was proactively represented overseas.

Parallels can be drawn between this desire to improve and the institutional aspects of Knowledge Management, particularly the development of "new organisational

forms" (Organisation Science, Special issue 1999) such as the proposed n-form organisation (Hedlund 1994). Hedlund argues that such organisations enable the network to collectively combine their knowledge, through temporary constellations of people, and through individuals at all levels undertaking lateral communication with the management role (assumed by the UKP science team) being catalytic and promoting rather than dictatorial (Hedlund 1994). There appeared to be compounding pressures however in that the lowering of skills of the overseas science officers increased reliance on the UKP science team to innovate, yet the UKP science team were overloaded. Therefore Knowledge Management was seen by the Director as a way to enable the overseas science officers to collectively learn from each other and innovate without the science team acting as information brokers.

The overall aims of SCI:net could therefore be expressed as a Root Definition from the perspective of the Director of Science.

SCI:net is a Science officers owned system which aims to transform the British Council's science representation from being centralised (hub and spoke) to being distributed as a network, by means of applying Knowledge Management principles and introducing technology (Figure 28) in order to increase innovation through collective knowledge creation.

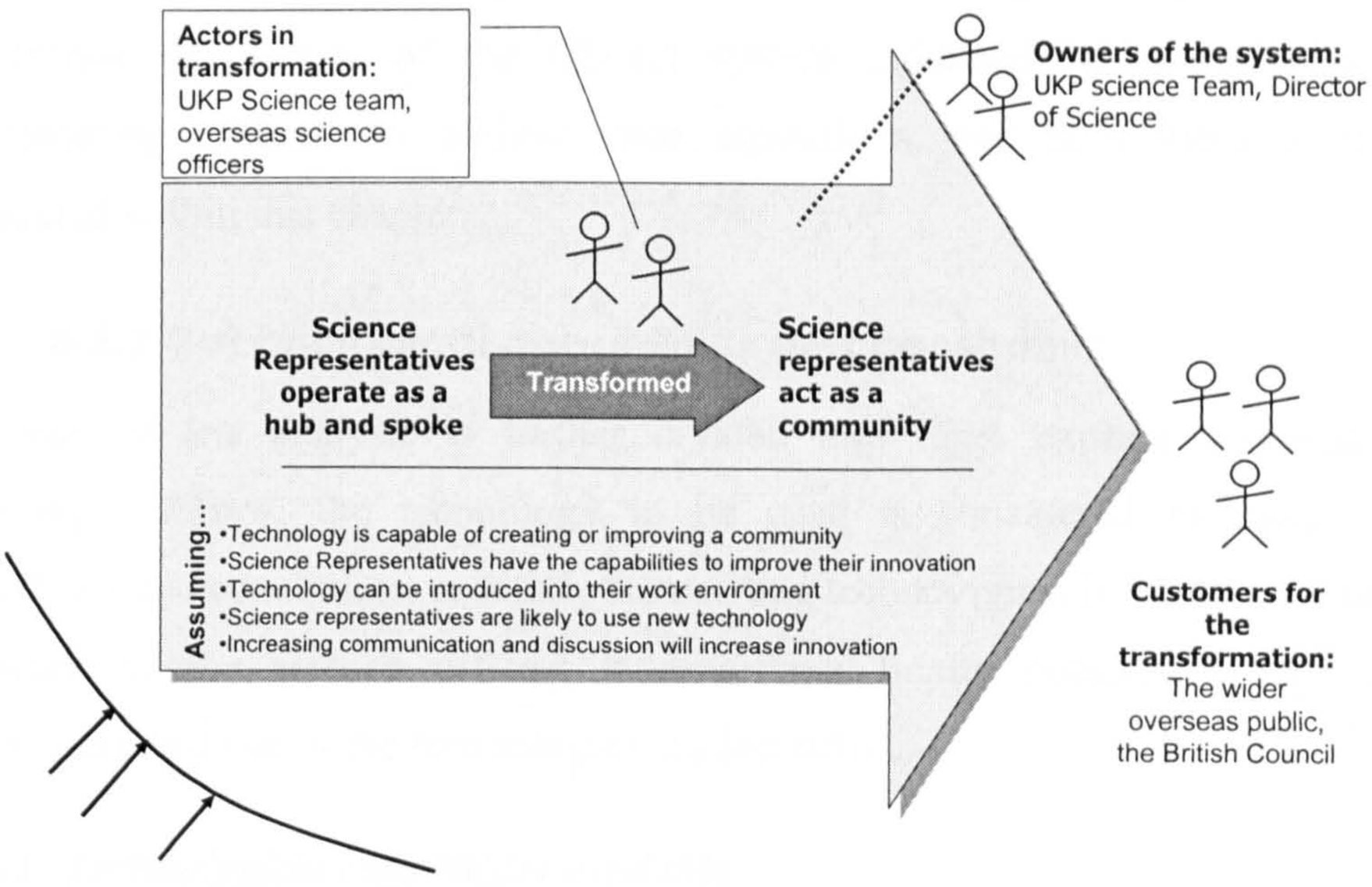

Figure 28: CATWOE of desire to improve for SCI:net expressed in diagrammatic form.

The Root Definition describes the aim of the Knowledge Management initiative not in terms of the development of a Knowledge Management system, but to enable science officers to innovate practice by developing them into more of a community. Its success would thus be subjectively assessed by the Director of Science on how it improved the existing practices of the science officers. This use of the term improvement will considered further within the thesis conclusions.

8.5 Appreciation of the core elements of analysis in AFFEKT

In addition to the overall analysis of the problèmatique, AFFEKT emphasises the necessity of exploring three other core elements of the analysis, the wider organisational context, the technological capabilities and constraints, and relevant theory.

8.5.1 The wider organisational context

Issues associated with the organisational context were studied throughout the action research. The issues of particular relevance are discussed within the other analyses described in this chapter. In particular the knowledge sharing programme captured the overall aspirations of the organisation towards Knowledge Management. By way of contrast the failure of the CD:net system indicated wider concerns with implementing systems to achieve such aspirations, and both these issues are considered within this chapter.

8.5.2 Technological capabilities and constraints

This part of the analysis is further divided into three explicit concerns with technology. Firstly, the technology to be used is considered in terms of its capabilities and constraints; secondly the existing technological infrastructure used in the work of the science officers is described; finally potential issues in the introduction and use of the technologies are identified.

8.5.2.1 Technological capabilities available

Unlike the CD:net research cycle in which the researcher had a significant degree of control over the underlying technology, this cycle employed the AKM product from KM systems plc and the researcher was thus only able to configure the system.

During the initial months of the SCI:net cycle the new version of the AKM product (Version 2) was launched and it was hence used for the implementation of SCI:net. The new version included the alterations and improvements suggested by the researcher as part of the previous cycle of research. The user interface had thus been improved and appeared closer to employing the *"language of users"* (Nielsen 1994) rather than Web-systems developers (a criticism of AKM made in section 7.5). The system was also easier to re-configure for different purposes given its modular design. Since the researcher had already undertaken an extensive assessment of the product and had advised on the design of the second version of the product this analysis was then used to inform the design of the SCI:net service.

It has been suggested by Fitzgerald that although the integration and tailoring of externally produced software packages is prevalent, few methodologies cater for this situation (Fitzgerald 2000). As outlined in the literature review a large number of packaged software systems have been developed for Knowledge Management of which AKM is an example. As Fitzgerald further highlights; *"Neither the top-down [software development lifecycle] approach which implies the elicitation and freezing of requirements in advance, nor the bottom-up prototyping and iterative development approach which views requirements as emerging as the development process takes place, are sufficient in isolation. Rather a mix of strategies may be more appropriate. Thus...some systems functions may be developed in a top-down fashion using the traditional lifecycle, perhaps with an exaggerated absence of user involvement... and the remaining system functions may be developed in a bottom-up fashion using prototyping approaches."*(Fitzgerald 2000).

This cycle's use of the AFFEKT framework in order to configure and use the capabilities afforded by AKM (rather than specifically designing a technology as in CD:net) explored the framework's appropriateness for the configuration and introduction of the highly modular AKM product. *"The packaging market is becoming increasingly sophisticated, and more and more packages which are highly tailorable are becoming available. Yet the configuration of such packages is non-trivial"*(Avison and Fitzgerald 1999).

Once a package has been chosen there is a lack of control over the new capabilities which become available (for example KM systems plc would not alter their development agenda on the basis of one user) especially in coping with new and emerging requirements (Avison and Fitzgerald 1999). Due to a lack of skills, finance, time or methods, organisations such as the British Council are often forced to select the "best fitting" packaged solution and use it with little modification, changing practice as necessary to fit in with the packaged solution (Markus 1999). The researcher's advice given during the previous action research cycle, that the AKM product be developed as a set of consistent modules was intended to mitigate this effect. Yet tailoring of the AKM product constrains the researcher to only alter those aspects of the package which are designed to be tailored, in contrast to CD:net where the research was able to alter almost all aspects of the system (although this often took significant time). Since this study suggests the need for Knowledge Management Systems to be rapidly reconfigured, and the technology's capabilities of being added and removed so the use of a packaged system in some ways constrains the systems ability to support Knowledge Management. It is intended that the AFFEKT framework's approach to configuration as a rhythmic interaction with users can address this constraint, and that such rhythmic development provides an appropriate mix, as called for by Fitzgerald (2000), between a concern for structuring requirements through user involvement, and appreciating technological capabilities and constraints in design.

In this way the AFFEKT framework highlights, and aims to influence, both the agency of the technology on the social setting in which it is employed, and further the agency of the social setting on the technology.

8.5.2.2 Appreciating the existing ICT infrastructure in terms of substitutes

CD:net highlighted how perceptions towards technology were derived from the appreciation users had of an alternative substitute technology, their social context and their perception of the new system. Within the SCI:net research cycle the Director of Science highlighted the problems with the existing communication systems in discussing the need to shift from the "hub and spoke" mentality propagated by centralised communications. Existing technology was thus reflected upon in relation to its impact on "information overload" and "initiativitus" among the

users (Venters and Wood 2000). The following sections explore the substitute technologies used by science officers and the UKP science team.

8.5.2.3 The Intranet and the Internet

Like all the other departments and sections of the British Council, the UKP Science team had a site on the organisation's Intranet for distributing information to overseas science officers. This site was developed and updated by the Intranet Department based on requests from the Science Administrator who was generally too busy to develop it herself. This led to a significant delay in publishing material so that the site was not used for regular news. The website also formed part of a wider Intranet site and could therefore be viewed by all members of staff. Since it was also part of the Intranet it was structured around a standard schema which was based on the corporate hierarchy, and meant that the UKP science team remained at the centre with the overseas offices subsumed.

As the Science Administrator admitted about the site: *"It's a mess, a complete mess and we are not finding the time to deal with that. We really should"*. The researcher was thus keen that SCI:net should not be simply seen as an extension or development of this particular site rather that it should reflect the purposeful activity of Science, focusing on the overseas science officers rather than reinforcing the "hub and spoke" mentality of the existing organisation. Furthermore since the UKP team were finding it difficult to administer a small site by themselves, any assumptions that they could maintain a larger Knowledge Management system appeared questionable.

While the Intranet site was not regularly used either by the overseas science officers or the UKP team, many people amongst these groups suggested that the main source of information they used in their work came from the Internet and that the technology involved was changing their work practices; "*A change has occurred in the way that we work, particularly through the use of the Internet*" (Science Officer).

One science officer suggested *"I use the web, [it's] typically, my first response if I get an enquiry from somebody, the first thing I do is... I go straight into [Alta-vista] and... I use this to do a quick search and see what information is on there and then tailor something from that – so the web is probably now the most important source."*

As the British Council tends to run science programmes within technologically advanced, or advancing, countries the staff there generally have fast connections to the Internet. *"Overseas colleagues often have every information tool we have"* (Science Consultant 2). This was particularly evident in South Korea where staff talked about having ADSL connections to the Internet at home, at a time in the UK where such broadband connections were still rare.

This access to the Internet has altered the balance of work within the organisation. *"I have found it very valuable - the Internet, and what I thought was quite interesting was that a lot of what I've seen with regard to this stuff has been... how those people overseas can get access to the same information as this team here."*(Science Consultant 3). Although this enabled overseas science officers to access high quality science information, which was something aspired to by the UK team, inconsistencies then arose in the science team's perception of such emancipation. One consultant stated there were *"too many lastminute.com approaches"* in which overseas staff relied on good communications to undertake risky projects. His use of the phrase *"lastminute.com"* referred to their late and poorly organised approaches which he felt were highly risky and problematic. It was also suggested that overseas staff would use information from less credible sources simply because it was available on the Internet and appeared to be useful. Also, this move away from a reliance on the UKP science team for information was felt to mean that overseas science staff would not get any additional feedback on their ideas. So whilst the science team members appeared to desire a system to reduce the necessity for overseas science officers to contact them by providing them with support and information, they also appeared to be worried about the Internet since it appeared to provide some, or all, of these requirements.

Members of UKP were concerned about the inability of overseas representatives to find "good" information on the Internet, yet they themselves were almost entirely reliant on the Internet for their information (e.g. the researcher regularly observed them use Internet Explorer while on the telephone to overseas science officers, for example to find the contact details of academics, or to search for materials). A member of UKP also admitted that "*we are so few in numbers that our depth of*

knowledge on particular subjects is sometimes incredibly thin...often restricted to people we know and have worked with before" this could then prove to be problematic as *"we don't get time to travel around the UK to meet contacts...we more and more rely on databases and e-mails!"*. Given all of this interrelated tension with both the overseas and UKP teams reliant on the Internet, it appeared odd that the UKP science team had not considered educating overseas staff in using the Internet better in order to capitalising on their own knowledge, but rather were observed to continue to consider their role to be mediators and experts. This contrasted with the view of members of staff overseas; for example one science officer overseas said *"I'm not good at using computers or the searching for more detailed information using the Internet. So I think I need some training. If I [am] more skilful in using the computers, then it will be easier and [I will] get more useful information"*. Further the responses adopted included approaches to reducing the requirement for knowledge from overseas rather than increasing their capabilities to learn; *"we[the UKP science team] try to address this [the issue of lack of their own subject knowledge] by pre-packaged sectors of activity...exhibitions and seminars"*. In addition the team did not address their own admitted knowledge needs as one consultant outlined *"We don't have any systematic way of recording or classifying our knowledge"*.

As with CD:net the UKP consultants suggested that *"people overseas are bombarded with far too much information"*, perhaps implying that the Internet would confuse them further? Yet their approach remained one of reducing this volume of information (by editing and mediating between the sources) rather than supporting the overseas officers to handle such an overload. Although training was suggested as being necessary for all staff, this still focused on training in science promotion rather than training in dealing with changes in science promotion and using information and knowledge in such innovation.

To the researcher this appeared to suggest an inability by the UKP science team to reconceptualise their problems in terms of developing a community. Rather they reinforced existing approaches which continued to focus on the "hub and spoke" model. It also appeared to reiterate the espoused theory vs. theory in use concepts outlined with CD:net. The UKP science team were espousing a theory about the need

to support overseas Science staff in learning and increasing their knowledge; however their theory-in-use continued to be founded on the belief that overseas staff did not have the capabilities to improve their work and thus needed their support and control.

8.5.2.4 Email List

SCI:net was named after an e-mail list that the UKP science team had created in order to contact overseas staff. The vast majority of the messages posted had come from the UKP science team, and these were usually externally sourced press releases or information concerning government science policy or UK science research. Only occasionally did overseas science officers reply to a message, and these replies tended to come from experienced overseas science officers rather than newly appointed generalists. During the time when the mailing list was reviewed (around two years in total) the researcher cannot recall a message from an overseas science officer asking for specific help or innovation. This therefore reinforced the "hub and spoke" mentality previously described.

Some receivers of these messages considered them to be simply "objects" that they could distribute directly to promote UK science. For example, in Hungary one officer argued that the e-mails were useful for sending straight to outside contacts, and that SCI:net should provide articles marked as "suitable/unsuitable" for sending directly to outside contacts. This appeared interesting as it suggested that the messages which were aimed to improve the way science was promoted were being used as the product of that promotion. The CKO's statement that the British Council should became a "Knowledge Organisation" (see section 5.7.3) appeared to be realised in this case since the organisation's internal information was being employed as a product of the organisation.

Interestingly whilst the UK centric approach might have inhibited overseas science officers from participating directly, one consultant felt that the act of posting messages using the list reinforced his relationship with what he referred to as the community of science officers. He mentioned that *"you can afford to just whack it out because it doesn't take much time, and in fact, you can have a bit of fun with it. I suppose, you can be a bit more amusing with it and do it a bit less formally and*

chatty and stuff. I think that helps to build a sort of sense of a science community". Whilst such a "chatty" approach might also benefit the science officers it does appear to benefit the consultant in his perception of his place in the "community" as "reinforcer" or "builder".

SCI:net was therefore named after this e-mail list, although this appeared to be both beneficial and problematic. The name was initially allocated by the Director of Science as he was keen to build on the list's success. Yet since the existing e-mail service focused on simply imparting information the researcher felt that overseas science staff might then feel that the service was for the same purpose. Furthermore it also suggested that "ownership" of SCI:net remained with the UKP team, rather then being shared among all members. The inter-perception of SCI:net thus extended back through the interpretation of the e-mail list from which it was named. For example overseas science officers might perceive the initial messages on the SCI:net Knowledge Management system were an extension or continuation of the dialogue on the mailing list.

8.5.2.5 E-mail and telephone

The main person-to-person contact between the UKP science team, and the overseas science officers had been via the telephone and e-mail. The telephone had been useful to *"bounce ideas around and to chat"* however it could be difficult, as one science consultant interviewed had suggested; "*I mean phone contact tends to be, I wouldn't say restrictive, but almost restricted to Europe mainly because of time factors and anybody in the Far East [was unlikely to call] because we have a seven or eight hour time shift; it's quite difficult to overlap by phone."* As such E-mail was increasingly used, and formed the most frequent contact mechanism.

There were a wide variety of reasons for overseas science officers contacting the UK science team. These contacts tended to represent the various activities undertaken and the most frequent contacts concerned requests for advice, and requests for speakers, either within the UK science community, or within the British Council. The UK science team, as a "Hub", regularly carbon-copied (cc-ed) e-mails to each other, and science officers overseas regularly carbon-copied the team in correspondence such that they were kept very informed of the ongoing development of the overseas

network. They often used the information from these copied messages to inform others: *"I'll tend to be copied in on e-mails. Then when good news stories come out of that, then it's ideal to be able to disseminate that round to other people and say, something great has happened here."*

8.5.2.6 Other problems with technology

In using e-mail and Internet technologies within their work science officers faced many problems. A number of these problems also influenced the work of Country Directors and have been described previously. Science officers complained of information overload and a lack of time; *"It's absolutely the case that people are just too busy...finding the time to do something that is non-essential is extremely difficult. The pressure is there all the time with urgent, priority stuff. So doing anything which... collates historical information and knowledge and data is difficult to encourage people to do."* In contrast however one consultant argued that the staff should make time; *"people say that they are too busy and what have you, but I'm a member of various e-mail discussions....Wouldn't it be valuable if the science person in Hungary had some science visit and they are doing a "back in the office report" anyway [a standard report for Country Directors on a visit] wouldn't it be valuable on SCI:net...cut and pasting doesn't take that long".*

This was an interesting point because it raised the issues of community and identity. *"We are used to reporting to our Director about something and...for the team or whatever bit of the Council we are working in. I think we are less good at, or we just don't think about, sharing it across the region or network...and often the reason given is time".*

8.5.3 Conclusions to the analysis of the technological infrastructure

Technology shapes and is shaped by the social environment; the existing technology used by science officers appeared to strongly reinforce the centrality of the UKP science team within organisation. Whilst the overseas science officers had access to sophisticated technologies that may have had the potential to free them from their reliance on the UKP science team, the technologies were not being used in this way. The UKP science team appeared to continue to reinforce their centrality as the "hub"

of information, and their use of the internet provided a good illustration of this. For example one interview stated *"when I haven't got visitors. I actually have lunchtime I sit down and I look at the BBC web site and the Telegraph web site and I do that virtually every day to keep in touch with what's happening in the UK in terms of news"*. Furthermore this person admitted that *"my default web page is not the Council web page – it's Alta-vista because I like Alta-vista. I go straight into that and I think I'm reasonably efficient at doing sort of searches and focusing on things so if I get a request, the first thing I do is use the web to do a quick search and see what information is on there and then tailor something from that – so the web is probably now the most important source."* Clearly if SCI:net were to achieve its intended use it would need to be as useful as such substitute sources.

The researcher was thus faced with a difficult choice; should the Knowledge Management technology specifically disallow such centrality, or be neutral to its influence? As the "hub and spoke" model appeared to be the dominant mode of communication, and as the science officers clearly reinforced its dominance, the challenge of SCI:net would risk significant failure. The science officers might simply ignore the technology given its lack of representation of their dominant mode.

The researcher thus sought to develop SCI:net in such a way that the UKP science team maintained some dominance, but that they themselves appreciated such dominance and sought to reduce it and further to ensure that overseas science officers were strongly represented. SCI:net was thus a learning initiative for both overseas science officers and the UKP science team.

8.6 "Political systems" analysis and "Social systems" analysis

8.6.1.1 Differing opinions regarding the skills of overseas science officers

Amongst the UKP science team perceptions towards SCI:net varied greatly. The Director was very keen, as was one consultant, although another was quite ambivalent verging on supportive, whilst both the final consultant and the administrator were reluctant to commit themselves feeling that it would increase their workload. This argument had direct parallels with the lack of commitment shown by

many of the Country Directors towards CD:net. Furthermore, the opinions of some members of UKP science team towards the overseas science officers were, in the view of the researcher, at times unnecessarily patronising. One person said of the overseas staff that *"5% of people are cutting-edge, 95% of people are really basic"* and that SCI:net (and the researcher's analysis) was thus focusing on that 5%. Further this same person then said that *"these people [the 95%] just want suggestions of material"*. Given that the whole basis of science representation was under consideration for change the notion of *"suggestions of material"* continued to concentrate innovation and knowledge within the UKP science team, which although perhaps the case at that time, could not represent a future in which the demand for knowledge was set to increase. These statements were also at odds with the result of the questionnaire sent to science officers at the start of the research cycle in which all 19 respondents (significantly more than "5%" of the total) were quite positive about SCI:net (on average answering "quite likely" to the question "I would find SCI:net easy to use." with no negative or even neutral responses).

It is also interesting to contrast the negative responses of the UKP science team with the opinions of some of the experienced UK appointed science officers working overseas. A Deputy Director in South Korea who was very committed to science had agreed to dedicate 5% of his time to support the network *"to beef up the support structure...to provide expert input into projects"*. In Russia, Italy and Australia the senior science officers had committed to participating in writing stories for the service, yet it still proved difficult to get some members of the UKP science team to engage.

Given such differences in response the researcher felt that a significant amount of effort should be focused on working with the overseas science officers' network so that they could demonstrate their abilities to the UKP science team. Further the researcher decided to work among the team during the development in order to persuade those negative science officers of the potential value of the service. This is discussed in further detail below.

8.6.1.2 Perceptions of technology

Since the science officers were focused on events and activities concerned with science they tended to be relatively technologically aware and interested in its impact. The researcher was thus less worried about the rejection of SCI:net on the basis of its difficult user interface that with the CD:net system. *"I think you know by definition, you've got people who have an interest in science and an interest in technology like me... Well I have to drag myself back because I really want to play with the G-Wizz toys."* In comparison with the problems encountered with CD:net, the science group appeared less likely to be stopped by significant breakdown in their use of the system *"I think you'll get a much more receptive audience there than you might do amongst other members of staff."*

8.6.1.3 Cultural influences

These people involved in science activity within the Council were by no means a homogenous group. Skills, cultural differences and language were of greater concern than had been observed for the CD:net group in which all the staff were UK appointed. Whilst Country Directors were predominantly British (certainly very fluent in English and very "westernised") and highly educated, this was not always the case with the science representatives. Whilst a reasonable level of English was required, other issues often appeared to inhibit the organisational conversation. For example one Korean remarked that *"many Koreans prefer the person to person introduction, so it is very important for us to do that with contacts"* which implied that asking questions through a system such as SCI:net might prove problematic. Furthermore *"some people also aren't inclined to communicate. They just don't think about it. ...so you'll probably get some countries who are more active, but I suppose in other countries they don't reciprocate it."* The impact of national culture on Knowledge Management is an important yet underdeveloped issue with few examples of research (e.g. (Brown and Duguid 2000; Merkens, Geppert et al. 2001; Yoo and Torrey 2002)). This is interesting, given the emphasis placed by many Knowledge Management authors on the internal culture of organisations (Boland and Tenkasi 1995; Bonaventura 1997; Davenport, DeLong et al. 1998; Banks 1999; Gold, Malhotra et al. 2001). Although this is an area for future study, it is not explored further in this research as it was not possible to catalogue or explore the cultural backgrounds of the users of SCI:net due to the organisation's concerns over

cultural diversity and equality. SCI:net thus did not explicitly consider the issue, other than to briefly reflect upon the impact of different cultural groups on knowledge creation, reflection and privacy.

8.6.1.4 Problems with encouraging reflection and innovation

During the early stages of the research members of the UKP science team had broadly identified their role as one of supporting and attempting to engender double loop learning among the overseas science officers (Argyris and Schön 1996). For example, one of the team gave the example of a Brazilian science officer developing a large event in Curitiba, Brazil. The UKP consultant involved was concerned that the project was unfocused and too large. In discussing how he handled this, the consultant said *"I would...contact the [person responsible] saying – "Have you thought this through? We think [XYZ] are issues that you haven't quite worked out."* The consultant's aim, he said, was to get the overseas office to reflect upon their planning in greater detail. Interestingly though the person in Brazil went very quiet following these comments. The consultant said "...*I think they sort of gave up on us and viewed us as being obstructionist, obstructing their plans whereas we were actually trying to say "no – we're happy you're doing it but perhaps you have put on too big an event? – are you aiming at scientists or are you aiming at whoever?... I suspect they felt we were being awkward, whereas we were just trying to make certain that they didn't end up with egg on their faces because it is easy to do... It's very difficult striking a balance between helping colleagues improve the quality and deliver a quality event or product and being regarded as slow or obstructionist or bureaucratic."* This examples suggests that overseas science officers would occasionally ignore situations in which they felt under criticism (and were empowered with the ability to ignore such situations), and further that encouraging them to reflect upon their work could prove difficult. Privacy and safe enclaves issues explored in the CD:net action research (Hayes and Walsham 2000) would suggest that the openness of SCI:net may alter such dialogue.

8.6.1.5 Assumptions of Community

The experiences gained in developing CD:net, together with the literature on Knowledge Management suggested that simply assuming a community of science officers existed could prove problematic (Walsham 2001). Whilst the Director of

Science was keen to develop a sense of community amongst science officers, the researcher's experience with CD:net led him to be concerned whether such a sense community really existed or could be created. As Williams suggests, (Williams 1976), the word community can be a deceptive and *"warmly persuasive word"*. Focusing on communities, and in particular "community of practice", may lead one to be closed to alternative social arrangements: *"While the idea of community may comfortingly suggest that organisations are significantly culturally homogenous, practice uncomfortingly suggests they are to a significant degree divided, driven by practice even as that practice provides participants with their particular kind of organisational identity"* (Brown and Duguid 2001).

The negative effects of assumptions about community had been evident during the CD:net cycle of action research, and thus every effort was made to explore the social nature of science representation in order to discover whether a sense of community really existed. One person commented that they *"had relatively little contact with other British Council science operations overseas"*. This view was supported by the comments of the UKP science team who argued that overseas offices didn't work together very well. Furthermore during visits it became apparent that generally only sporadic contact was undertaken, and yet there was a great desire to improve this among all parties. There were also pockets of close contact between certain science officers, and the annual conferences were very sociable occasions during which friendships and working relationships formed. Following the conference such friendships were often maintained between two or three delegates. For example during the Cardiff conference two science officers from South East Asia were introduced and spent a significant time talking and socialising as they shared a common language. Following the conference this friendship led them to arrange a number of joint events. Indeed the researcher developed close ties with a number of science officers during the Cardiff conference; these officers later supported the action research activity. For example science officers in South Korea and Hungary invited the researcher to visit their country, and the Russian and Australian science officers wrote articles for SCI:net.

Whether or not the sense of a "science community" existed at that time amongst the science officers there was certainly a desire to develop a greater sense of community.

In addition to the Director of Science's commitment, and the time commitments of the officer in Korea, many others commented that a community of science officers was desirable. One officer commented that SCI:net should *"give identity and credibility to the group"* and that it should *"provide a community of practice of people with expertise"*.

The ability to develop a community through use of the AKM technology was however unproven and likely to be difficult (as suggested by both literature (Roszak 1994; Hayes 2001; Newell, Robertson et al. 2002) and the CD:net research cycle). It was thus suggested that whether of not a sense of community developed SCI:net should still be capable of supporting the purposeful activity of individuals without necessarily requiring their active participation. This would be particularly important given the number of science officers who only worked on science very occasionally. The researcher thus suggested that the SCI:net service should provide information and resources which would help science officers who did not visit the service regularly and who were not part of a "community of practice". Such information needed to be regularly produced and the site administered. Such administration would also be necessary to ensure that discussions were relevant and that messages were removed or archived once conversation ceased.

Given the reticence of the UKP science team to manage their website, and that they were the only group capable of dedicating sufficient resource or time to administer the service it was suggested that a dedicated coordinator should be appointed to commission and develop the service, and to approach individuals for information.

The experience of using the consultant during the development of CD:net suggested that the role of the administrator of SCI:net be considered carefully. At the launch of SCI:net and during the following months of action research the researcher and the Director of Science worked closely together to develop the service since both were committed to the underlying Knowledge Management aims of SCI:net. Furthermore the Director's involvement would promote SCI:net's significance to science officers. The Director was well liked by the science officers and had no direct line management or power over them. Once the research period was over it was decided that somebody else would be recruited to manage and develop the system further. It

was intended that this work would be their main responsibility and that they would be trained in AFFEKT by the researcher.

Whilst the researcher intended to provide information to support the work of the science officers in order that they could use the service, the overall aim of the proposed service would continue to be to encourage science officers to develop a sense of community by promoting what Lave and Wenger describe as a trajectory of membership from *"legitimate peripheral participation to core membership"* and participation in management (Lave and Wenger 1991; Wenger and Snyder 2000; Wenger, McDermott et al. 2002). This is a trajectory in which the form of membership changes as learning takes place and as this change leads the member to shift from being a peripheral member to being a core member. Peripherality and Legitimacy, they argue, are two forms of change required to make such a transition. Perhiperality is form of membership which provides exposure to the practices of the "community of practice" but with lessened risk, special assistance and lessened cost of error. In changing from a peripheral membership they would also be a need for legitimacy; for the peripheral member to be treated as a potential member particularly when the individual is unable to act competently in the eyes of the community. Within SCI:net these needs were taken into account through the provision of stories which outlined how well-known Science officers had suffered problems and overcome them. These stories were provided with space to discuss problems and experiences and ask questions. Additionally a mentoring service was provided to link peripheral members of the Science officers to more established members. This was promoted and supported by the UKP science team. Finally the information placed on SCI:net focused on generating opening frank discussion and reflection on the difficulty of practice rather than disseminating best practice.

However if science officers were simply a collection of separate individuals with no interest in conversing then the aim of developing collective support could prove impossible to achieve. Such a sense of community however need not necessarily involve all the science officers but rather separate groups with a collective desire to share and develop knowledge; for example a community of new science officers learning the job, or of South American science officers developing culturally relevant programmes. As an overseas representative had previously stated *"the group of*

people overseas are not a homogenous group" and one of the UKP science consultants had emphasised that there was a wide variety of skills amongst the science officers.

"*So-called communities are composed of individuals, each with their own different tacit knowledge. A common purpose, such as selling drugs, and common vocabularies, such as specialist jargon, do not imply a shared world-view"* (Walsham 2001). Following on from this criticism the researcher aimed to identify relationships and similar purposeful activity among science officers and explore how the wider organisation influenced these. For example the formal organisational strategy influenced relationships since particular countries would have different science strategy depending on the wider global strategy of the organisation. For example Western Europe, or the European Union accession countries, shared general policy and undertook similar science programmes. The researcher was also interested in understanding the skills and experiences of the different science officers in order to explore shared purposeful activity among them. This was particularly marked among less experienced science officers who appeared less aware of the similarities in their work and the work of others.

Drawing on research within Knowledge Management which suggests the benefits of archetypes within stories (Snowden 2000; Snowden 2001), archetypal actors were identified among the science officers from the initial research. The following table shows the labels given to these archetypes together with a paragraph describing each one written in the first person.

Notice that the UKP science group are considered individually due to their small size and significantly different roles. The archetypes were then used in conversations between the Director of Science and the researcher in order to design the SCI:net service. This table is taken directly from one of the SCI:net design documents (Venters 2001) as presented to the director of science:

1) **"Part-timers"** I am a locally appointed member of staff allocated to science only part time, I have difficulty devising innovative activity. I do not have specialist knowledge of science and look to the UKP science team to provide the procedures and practices that I can follow to achieve my aims. I am keen

to learn, but unable to travel. Science is not core to the activities of the Council in this country.

2) **"Londoner"** I was appointed from HQ and have a strong grasp of science in the UK. I am keen to expand the wide programme already being run. While not overtly resistant to programmes devised in Manchester, I feel confident and able to adapt and design for the local environment of my country. I am capable of researching the information I need and relaxed in contacting HQ for help.
3) **"Team-player"** I work within a team to implement science. My London appointed line manager has a large amount of experience in science and is always at hand to help with ideas, but it is my responsibility to put these into practice.
4) **"Local-Scientist"** I was locally appointed because of my extensive knowledge of the country's science base. I am well educated in science, but don't know much about UK science. I have extensive knowledge of running programmes and administering JRPs, as I have been doing this for a long time. If I left it would be hard to continue as I know the contacts personally. I am worried about changing things as they have always worked well.
5) **"Information-Specialist"** I work in the information centre in my country. I have no responsibility to run or organise science events, but am often faced by questions and issues regarding science. I want to answer these in a quick manner.
6) **"Arts Country-Director"** I am a Country Director and thus want to be kept abreast with UK science. My background is non-science related, and I am reluctant to run a large science programme. I am however being forced to change this view and am looking for quick and cheap ways to promote science.
7) **"Moved-On"** I am a senior member of staff who previously worked as a science representative but have since moved into a generalist position. I like to keep up to date with the Science programmes but am not involved in service delivery of science at the moment. I have lots of useful experience which I am willing to share, however this is becoming out of date as time goes by.
8) **"UKP"** The Manchester Science Team do not represent an archetype as such, but rather a separate yet defined group of people within the Science Community. This group of highly specialist consultants provide a special case. Their objective is, in essence, to enable in-country science activity, and to represent the science agenda within the British Council. This group is of special importance within the science community, although their drivers and understanding may be different from others. If a Knowledge Management system is fully adopted to change the work practices of science within the British Council, it is most likely to affect the operation of this group. This group may both desire change and be fearful of its implications.

The researcher and the Director of Science both agreed that these archetypes aided the development of SCI:net in various ways. Such archetypes were also useful in undertaking SSM analysis by enabling the research to reflect upon their Weltanschauung. The UKP science team and the Director of Science felt that they

enabled the team to discuss overseas officers more easily and consider each potential innovation to the proposed system by discussing it in terms of each of these archetypes.

Notice that in addition to the science officers, other actors who are interested in science were also included. This was because the Director of Science realised that these parties were often accessing science information, and receiving e-mail messages through their country's science officers. It was thus decided that although SCI:net should include areas for these individuals, they should not have full access to the service. For example there was a section included entitled "Drawing up a science strategy" which was open to Country Directors and aimed to help them develop a science strategy. It's inclusion within SCI:net would enable science officers to discuss and promote science activity to each Country Director and suggest that they use the service. The collective innovation of new practices could thus be promoted to Country Directors within that area of the site.

8.7 Identifying systems of purposeful activity

Having explored the problèmatique and the core areas of analysis as suggested by AFFEKT the researcher then used the Rich Pictures drawn to suggest models of purposeful activity. SSM was employed in order to identify holons- root definitions of systems relevant to the broad problèmatique (Checkland 1997). These holons aimed to provide an insightful analysis of the problem, and thus lead to potential improvement. Each of the root definitions then captured a particular view of the human activity system/s of science representation, and incorporated a particular Weltanschauung. The aim of each Root Definition was to answer Peter Checkland's question "*Given the picture of the problem situation and the perceptions of 'the problem' by people in it, does the suggested root definition seem to have a chance of being useful?*" (Checkland 1981)

Developing Knowledge Management support for such purposeful activity systems required a consideration of the different Weltanschauung of those involved. The initial analysis had already highlighted the diversity of views amongst the science officers. The archetypes thus proved useful in characterising potential actors within such purposeful activity.

Through this review of the problèmatique the researcher identified the following holons which appeared to represent the key purposeful activities of overseas science officers. This particularly focused on those holons which involved the UKP science team since, pragmatically, the SCI:net system needed to address the requirements of this team since without their support it would be unlikely to succeed:

- Mentoring
- Work Programme Development
- Proposing and Developing events/activities
- Organising events/activities
- Identifying Speakers
- Monitoring the impact of science activities
- Spreading good news
- Induction of new staff
- Ranking projects
- Allocating funding to projects
- Searching for science related information

Examples of these Root Definitions and the relevant Conceptual Models are shown in appendix 3.

In order to describe each of these holons, a primary Root Definition and appropriate CATWOE were produced and a conceptual model devised. A *"root definition may be looked at as a description of a set of purposeful human activities conceived as a transformation process"* (Checkland 1981). In producing these holons it was apparent that in many cases the "transformation" evident in the systemic description was often related to knowledge and learning. The Conceptual Models for such Root Definitions describe the activity system needed to achieve such a transformation; *"The conceptual model is an account of the activities which the system must do in order to be the system named in the [root] definition"* (Checkland 1981). The aim of SCI:net however was not simply to support and improve the existing practices of science officers, but rather to enable them to innovate new practices.

Whilst the Conceptual Models represent epistemological systems relevant to understanding the existing practices of science officers (or at least that subset of

science officers described by their archetype), the SCI:net system did not necessarily aim to improve the actual practiced they describe, for example, allocating funding to projects. Rather the intention was that SCI:net would afford science officers with support to reflect upon and innovate improvement in their own practices of funding allocation. This meant that the SCI:net system would not be designed on the basis of how funding allocation might be improved (for example by providing a schema for allocating funding effectively), but rather with the aim of providing the science officers with the capability to arrive at such an improvement (and hopefully many other improvements) as a community. This is in contrast to the usual use of SSM in which *"every application of the methodology can be seen as a specific illustration of a general model of circumstances in which a problem is perceived or improvement is thought desirable, and action is taken (by means of the methodology) to do something about it"* (Checkland 1981). The action taken to do something in relation to a problem, is actually action to enable the actors to perceive the problem and do something about it (as an ongoing action). This suggests a fundamentally different approach to the comparison stage of SSM in which the users undertake a second order comparison. Reflecting on this, then the aim of the SCI:net system is to provide information and models such that users might themselves undertake an SSM-type comparison in order to undertake action to improve their purposeful human activity, yet somehow not exposing them to the full complexity of SSM.

In order to achieve this the researcher explored whether by drawing upon Knowledge Management theory (in particular the ideas of sensemaking and reflection in action) and reflecting upon the models of purposeful activity, the SCI:net system might afford benefit to innovation around such purposeful activity. This was a design activity which relied upon the skill, experience and innovation of the researcher, as no heuristics existed as to how the technological capabilities of the AKM system might afford such benefit.

8.8 Tailoring the AKM product and commissioning information to construct SCI:net to promote reflection and improvement

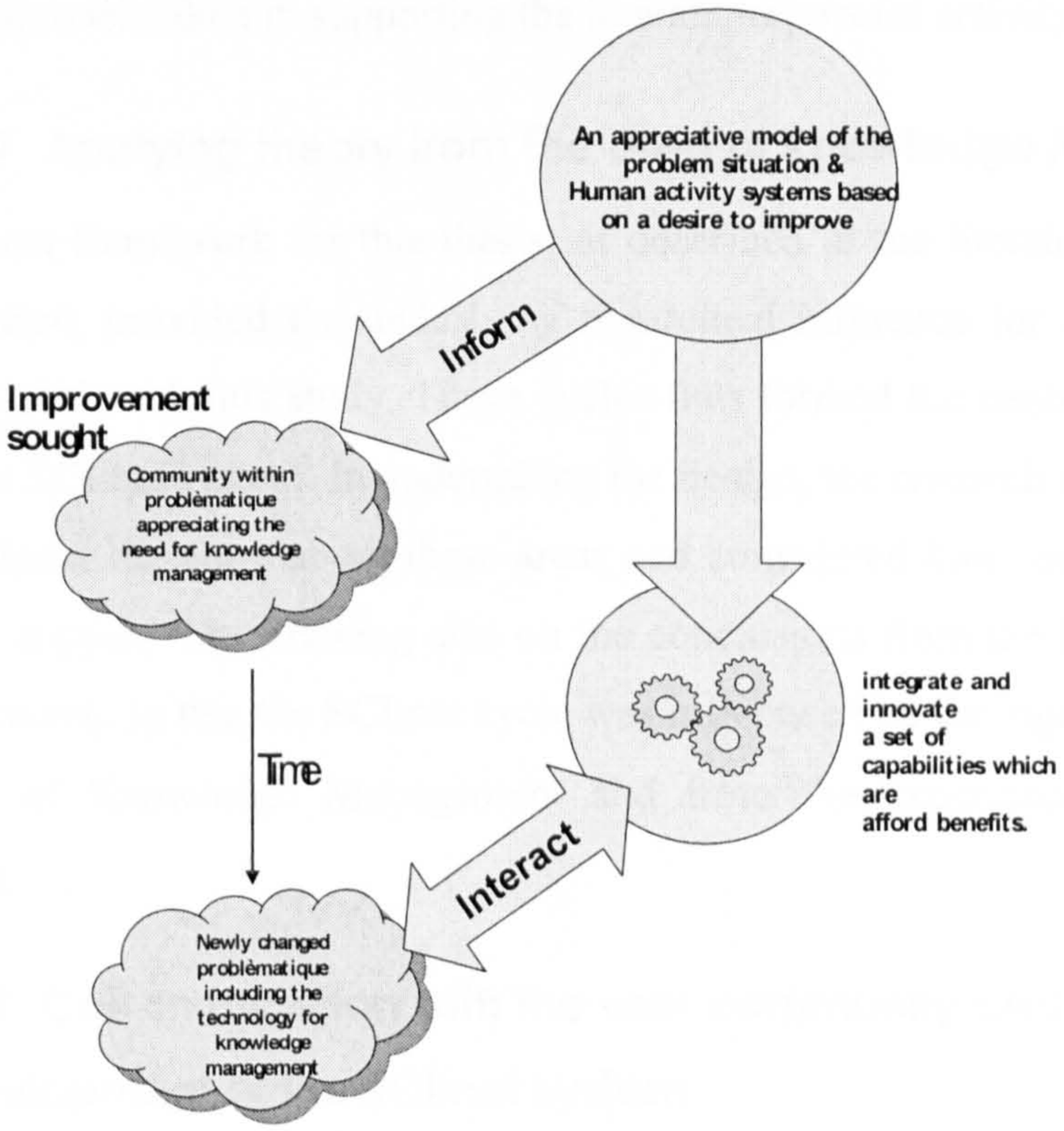

Figure 29: The Inform and Introduce phases of AFFEKT.

Having drawn up Conceptual Models and gained an appreciation of the core elements of the analysis, SSM identifies the need to compare these models with the real-world. This "comparison stage" is ideally undertaken with concerned participants within the problem situation such that a debate about possible improvements may take place. *"The comparison is the point at which intuitive perceptions of the problem are brought together with the systems constructs which the systems thinker asserts provide an epistemologically deeper and more general account of the reality beneath surface appearances"* (Checkland 1981). This comparison was undertaken in two parts. Firstly, the proposed models were compared with the researcher's understanding of the problem situation, with the researcher acting as proxy for the overseas science officers.

In this way the comparison and implementation stages of SSM were merged as the researcher worked alongside the UKP team, discussing the Conceptual Models and

Knowledge Management theory in considering how to implement the service. This integration may have prevented the researcher from returning to the earlier stages of SSM for further iteration, thus potentially reducing the value of the Conceptual Models. However it did ensure that Knowledge Management theory was included within the approach taken in supporting the human purposeful activity.

8.8.1 Applying theory from the area of Knowledge Management

The theoretical framework for this thesis, as described in the literature reviews and the introduction, provided the underlying theoretical influence for all the research cycles associated with this study. These cycles thus formed the central theme in the design of the SCI:net system. In undertaking the design, the research activity referred to the significant literature about these areas and considered how the capabilities of AKM might support this, drawing also on the conclusions from the first and second cycles of research. In this the SCI:net cycle was influenced by the significant theories in the area of Knowledge Management and from the experience from similar interventions.

8.8.2 Communication with the user community and the development of the SCI:net system

Having gained an appreciation of the problèmatique the AFFEKT framework identifies that time should be taken to explicitly interact with science officers to discuss the intension to develop the service. For the SCI:net development this activity was undertaken in three stages; firstly a week was spent collaboratively developing the SCI:net system together with the UKP science team. Secondly shortly after this week and prior to the Guildford science update conference SCI:net was launched. Thirdly, this conference was used to interact with, and introduce SCI:net to, the overseas science officers and to discuss how it should be developed further. The technology had been introduced prior to the consultation at Guildford at the request of the Director of Science who was keen that the service should be available for distributing the reports of the conference and undertaking discussions immediately following the conference. This was not ideal however because the introduction of the technology before the conference could have influenced perceptions and led to technological determinism, with the discussion at the conference influenced by the initial perceptions of the first people to view the

system. The conference hence pushed the beginning of the second iteration of AFFEKT to immediately after SCI:net's introduction at Guilford

Prior to the launch of the initial SCI:net implementation a number of e-mails had been sent to all science officers describing its potential benefit for their work. These e-mails were signed by both the researcher and the Director of Science in order to highlight the latter's support for the development.

As the UKP science team remained central to the success of the Knowledge Management system, significant time was spent discussing the potential system with each member of the team. These discussions focused on how the team might use the AKM service to support their ongoing conversations with the overseas science officers (e.g. how to best organise the Science Update Conference). Based on these discussions the researcher was able to reconfigure the AKM system's design to better suit the needs of the users (for example adding a discussion board to discuss the conference venue). Since this was straightforward to do, it could be done rapidly between the discussions.

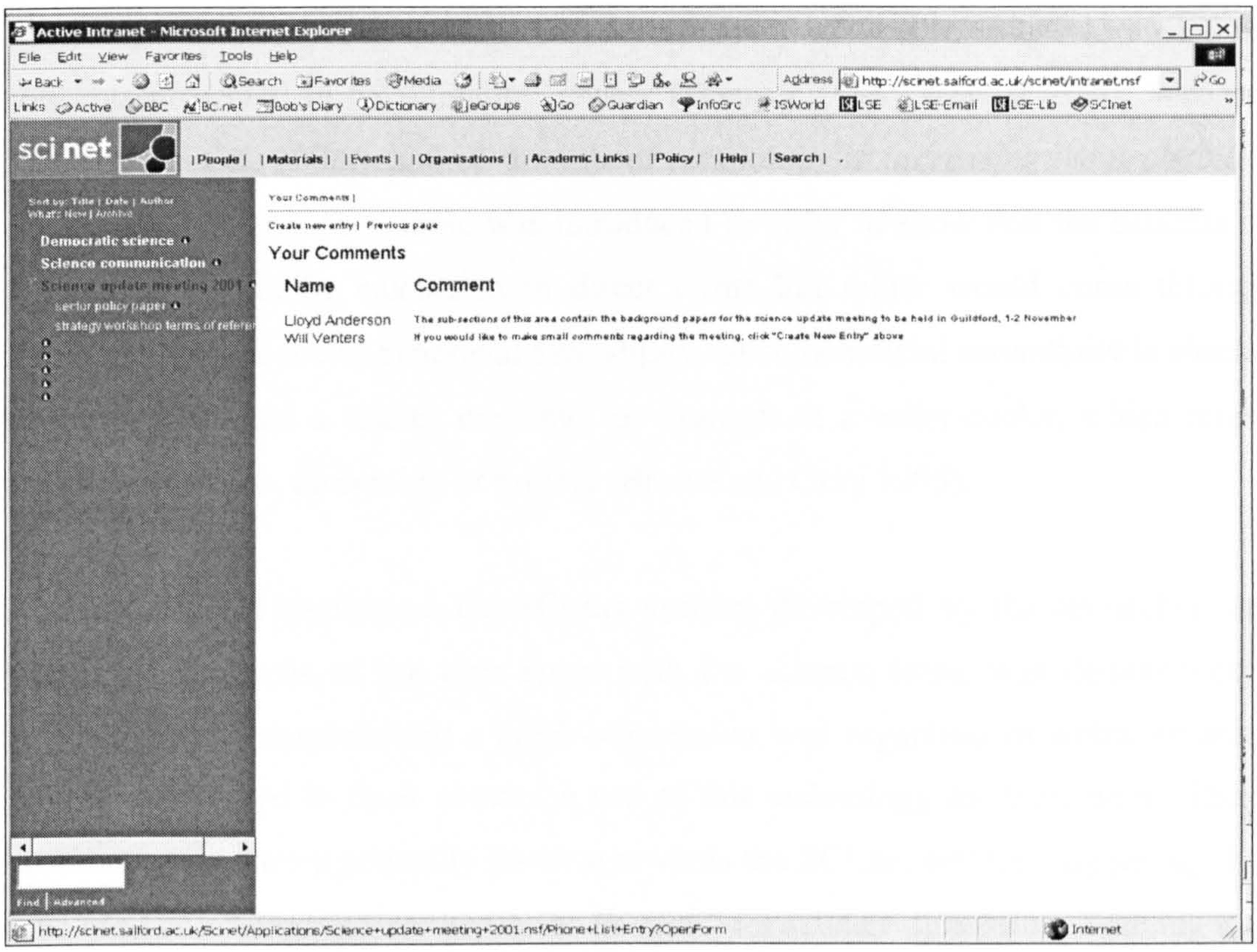

Figure 30: SCI:net Pilot Service using AKM technology following the week working with the UKP science team. This example shows a discussion board created to discuss the forthcoming Science-Update conference.

One of the significant problems identified with the CD:net service was that the system did not become "present to hand" to the Country Directors. Hence there was seen to be a need to regularly remind the users of the system's existence and of how to use it in their work. This would also be particularly necessary for the science team, since their regular use of the system was likely to encourage others to participate. To this end a set of cards were printed which described how to use SCI:net and these were pinned next to their computers. They found these cards useful for both reminding them how to use the system and for marketing the system to them.

8.8.2.1 The Guildford Science Update Conference

Although the pilot system had been launched sometime before the Guildford conference, the conference itself provided the first significant opportunity for many of the attendees to explore the proposed pilot system and to have it introduced to them. A half day was given over to discussing its implications and the implications of networking on science representation. As at the previous conference the researcher spoke although this time he focused on the issue of achieving improvement through

knowledge creation and sharing, the development of "community" (drawing on concepts presented in the literature review (Wenger 1998; Wenger 2000; Wenger, McDermott et al. 2002)), and on the role of technology in *increasing the probability of serendipity.* This final topic was introduced in order to show that the benefits of SCI:net could not be calculated in direct terms but rather would come through increasing the chance of beneficial serendipity. Such beneficial serendipity is similar to the benefit from a chance meeting, for example at a water-cooler, which might lead of a new idea, discussion or project (Brown and Gray 1995).

At the Guildford conference the SCI:net system, developed by the researcher and altered on the basis of the time spent with the science team, was demonstrated. Following this demonstration a break-out session was organised in which separate groups were asked to think about the use of this technology for their work. These breakout groups were generally positive towards the SCI:net service, suggesting that it be used as a *"single points and main channel"* for science discussion. Training was mentioned with science representatives mentioning that an induction programme would be useful, an interesting point considering the reluctance of some members of the UKP science team in training overseas science officers to use the internet.

In addition a qualitative questionnaire was given to each attendee that they were asked to return before the end of the conference. (See appendix 2). Nearly all of these were returned and were positive about the systems benefit, including those from people who did not actively participate in discussion.

In this way the Guildford conference completed the first cycle of the AFFEKT cycle and also began the analysis for the second cycle of development. This second cycle would be undertaken quite quickly and would focus on rapidly increasing the use of the SCI:net system, providing more stories and information on the system and promoting discussion on SCI:net. These further developments led from the needs identified through the SSM analysis.

8.9 Configuring the system for use and populating it: the second cycle of AFFEKT

At this point the SCI:net system was available for use by the overseas science officers. A significant proportion of these officers had been introduced to the system during the Guildford conference and had had the opportunity to comment on the system and how it should be further developed. The researcher thus undertook to quickly evolve the system in order that it should provide benefit for the innovation associated with the purposeful activity described by the holons.

8.9.1 Populating the infrastructure with content

Prior to the Guildford Science Update meeting the service had been very sparsely populated with material being drawn from the existing website and the mailing list. This material had been chosen to demonstrate the aims of the service and to support the identified purposeful activity; however it was far from a complete service with many of the areas of activity not represented.

Following the Guildford conference the service was quickly populated in order to support a range of identified purposeful activity. Suggestions for required materials were taken from the qualitative questionnaire distributed at the conference, from suggestions in the breakout sessions and from the earlier analysis. It was noted however that the aim was not to simply provide another information source, but rather to support innovation around the defined purposeful action. Each piece of information placed on the service was thus justified based on its contribution to this aim.

The information with which the service would be populated had to at least reflect the perceived need for the service (since as demonstrated by CD:net, the posting of messages could still shift the perception of the service). The researcher was therefore keen to ensure that the messages posted on the site would reflect users' perceptions of the system. Furthermore the researcher did not want to simply post information which would be available elsewhere; rather if knowledge were to be created then the system should provide information which is thought provoking and new.

SCI:net's structure (e.g. the names of the folders and the sub-folders) was derived from reflecting upon the description of the archetypal science officers, the holons and the conceptual models. Taken together these suggested areas of the sites that would be beneficial for particular archetype science officers. Folder names were then chosen to focus on purposeful activity of such archetypes rather than reflecting the generally sanctioned titles of information. For example one folder was entitled "Drawing up a science strategy" and contained information and a discussion aimed at supporting archetypal "Arts Country Directors" who needed to produce a science strategy section within their country plans. This folder avoided specialist terms and focused on detailed advice rather than discussion. In contrast a folder entitled "Planning and running science activities" was aimed to encourage "Londoner" and "Local-Scientist" science officers to support their less knowledgeable colleagues. This section of the site contained lots of discussions, checklists and stories about running events written by well known overseas science officers.

8.9.2 Technical configuration

In order to populate the system further the researcher considered each of the holons described and reflected upon how such modelled systems might potentially be improved by the AKM technology. For example, considering one aspect of the work of science officers as being *"a system to mentor overseas science officers with less experience of science representation by appropriate means in order to improve their ability to perform their work"* led to a set of conceptual models being produced for this activity. From this the researcher was able to considered how the capabilities of the AKM system could support such an activity within the Conceptual Models, and further how they could enable the science officers to improve such a purposeful activity.

As an example, a root definition was produced which described the work of the UKP science team as "a system to mentor overseas science officers". By drawing upon the literature on Knowledge Management, together with adopting a social constructivist stance towards Knowledge Management the researcher suggested that the AKM product should be configured to provide the following activities which would improve such a modelled mentoring system:

- That the value of "mentoring" be promoted among all science officers through the authoring of a policy document on the subject. This document could then be distributed through SCI:net.
- To provide an on-line form to register the desire to have a mentor including a description of background and experience.
- To provide an on-line form to register as a possible tutor.
- That each country with a science representative provide a page containing details of staff and their backgrounds to aid coordination of a mentoring programme.
- To provide a structured support document to help people mentor less experienced staff.
- To assess the effectiveness of the mentoring programme through on-line questionnaires together with discussions for the mentor and mentee.
- To provide a discussion facility to debate the benefits and development of such an activity in relation to other activities.

Similar tables were produced for each of the holons identified. These tables were then "merged" to form a specification for the SCI:net system so that it provided benefit for each of the holons. The system for monitoring and controlling the holon described by the Conceptual Models proved useful in identifying approaches to both improvement and knowledge sharing. The AKM product was configured to represent these requirements.

8.9.2.1 Stories and argumentation

Having developed a structure and approach for SCI:net, the researcher was keen to populate it with materials relevant to the purposeful activities identified amongst the science officers. Stories had been identified within the literature as valuable in sharing knowledge and developing a sense of community. Stories *"preserve the knowledge acquired for the benefit of community. Stories are more than a celebration of practice; they are an essential part of the practice to be celebrated"* (Orr 1996). They *"help us discover something new about the world. They allow us to pass that discovery on to others"* (Brown and Duguid 2000). Based on the Conceptual Models developed from the initial research, the researcher proposed a number of areas around which stories might be beneficial in sharing meaning among

the science officers (e.g. stories about running events). The researcher then contacted the UKP science team in Manchester in order to identify those science officers whose opinions on the topic were considered by the UKP team to be useful. These science officers were then contacted by telephone and persuaded to either write a story, or to be interviewed by the researcher who would then "ghost write" their story (that is writing the story in the first person as though autobiographical to the science officer. These stories were posted on the SCI:net service, and, in order to enable other science officers to discuss the meaning and lessons of the stories, a discussion area was provided.

The stories on SCI:net practically demonstrated the work being undertaken across the science group and also introduced the members to each other. This had been requested during the interviews in that people said; *"I would like to know what all the overseas countries are doing in their country and how those events and exhibitions worked."*

It was further hoped that these stories would be beneficial in altering the ongoing activities of the science officers by demonstrating how others undertook their own work. *"Examples of good and bad behaviour... create memorable stories that can lead to behaviour modification"* (Denning 2000). Since *"conflict is essential for creativity and innovative problem solving"* (Rothman and Friedman 2001) the science officers were also encouraged to critique and argue around the contentious points raised. This led science officers to share their experiences.

Although this approach was well received the researcher also agreed with a comment previously made by a Policy Director that: *"The reality of doing a project on the ground is so exciting that it is quite hard to translate onto paper...when these stories, these good-news stories come back from these countries and are re-printed they make really tedious, boring reading, and yet the reality of them was very interesting and exciting on the ground. That is one of the difficulties the council has, of conveying the excitement of doing these things..."* The science officers who wrote the stories often felt is was difficult to effectively express their work in a short story; furthermore the researcher found writing such stories difficult.

8.9.3 Technical constraints as defence from engagement

During this period of development it became apparent that whilst being openly supportive of the SCI:net initiative, some members of the science team were still concerned about its potential impact on their work. These concerns were not directly expressed, but rather members of the science team projected them as concerns over the ability of the overseas staff to actually use the system. These included their expressing doubts in the ability of science officers to use the service, concerns regarding data-protection (even though the researcher had already liaised with the Council's Director of IT security), issues over password management, and issues over document management. These concerns however had not been raised in the extensive research undertaken overseas where science officers had appeared quite prepared to use difficult systems as long as they supported their work.

While these concerns appeared to have some validity the researcher sensed that the UKP consultants' reasons for raising them lay in their fear that their workload would increase once the system was installed. They appeared to be indirectly using the perceived technical constraints of the AKM system as a defence against this change. Interestingly, another member of the UKP science team had once described how a contact's database application had also been ignored by the UKP team: *"We have a database called ICON. I use it very effectively, and I like it, but only because I am sufficiently adept at manipulating things...For most people it's actually very un-user friendly...no one else in the team likes it... and it's becoming redundant".* This system had been ignored by a few members of the UKP science team who were unprepared to share contacts in this way and who continue to use their personal card indexes. Yet in other areas of the organisation the ICON system had been successful. It appeared that some members of the UKP science team were unprepared to explore difficult technology even if it is very effective in improving their work.

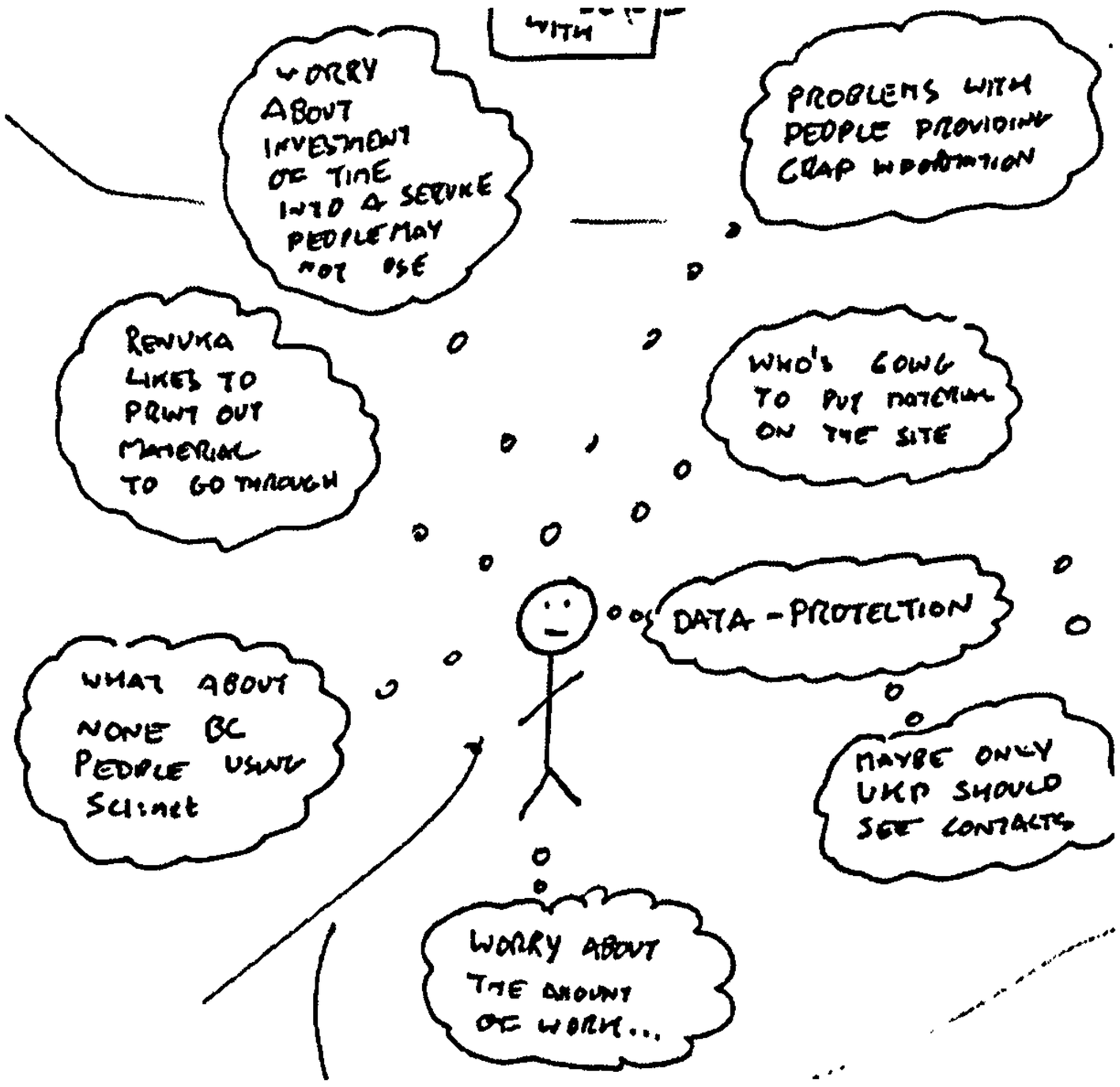

Figure 31: Rich Picture Segment showing constraints as defence from engagement.

Given that the researcher had observed the UKP science officers being constantly interrupted by telephone calls and e-mails asking simplistic questions, he began to consider that improved knowledge sharing would mean they did not have to answer such questions, and that they were reticent because they enjoyed this particular aspect of their work, or felt that their continued employment hinged on dealing with such calls. As Dave Snowden asserts, not everybody within an organisation wants to learn and develop their skills (Snowden 2000).

The concerns raised by members of the team defence against the SCI:net system appeared to become more significant when one of the consultants pointed out that were the service to be a success then it could fundamentally change the nature of their work. *"SCI:net could change the whole way the science team operates..[it] would make us like ISM"*. In this way the consultant was suggesting that the Information Services Department employed information specialists whilst UKP employed subject specialists but that each was undertaking similar roles, supporting the information and knowledge needs of the overseas offices. Such a comparison would suggest that the need for highly specialised science representatives might be replaced by teams of generalists with access to good information sources. Such a

position may have been challenging for the established UKP science team, and further would require an increase in the skills of the overseas science officers.

The science team's role traditionally involved brokering and managing the social interaction and supporting the purposeful activity of the science officers (i.e. acting as the "hub"). The Director however was keen to develop the Knowledge Management system as a network, so reducing the reliance on his time. This aim was particularly relevant given that the third stage of the British Council's knowledge sharing strategy set the objective of transforming the organisation into being a Knowledge Management organisation. It suggested that this transformation might face stiffer resistance than envisaged.

8.9.4 Conclusions for Practice: the continued use of SCI:net

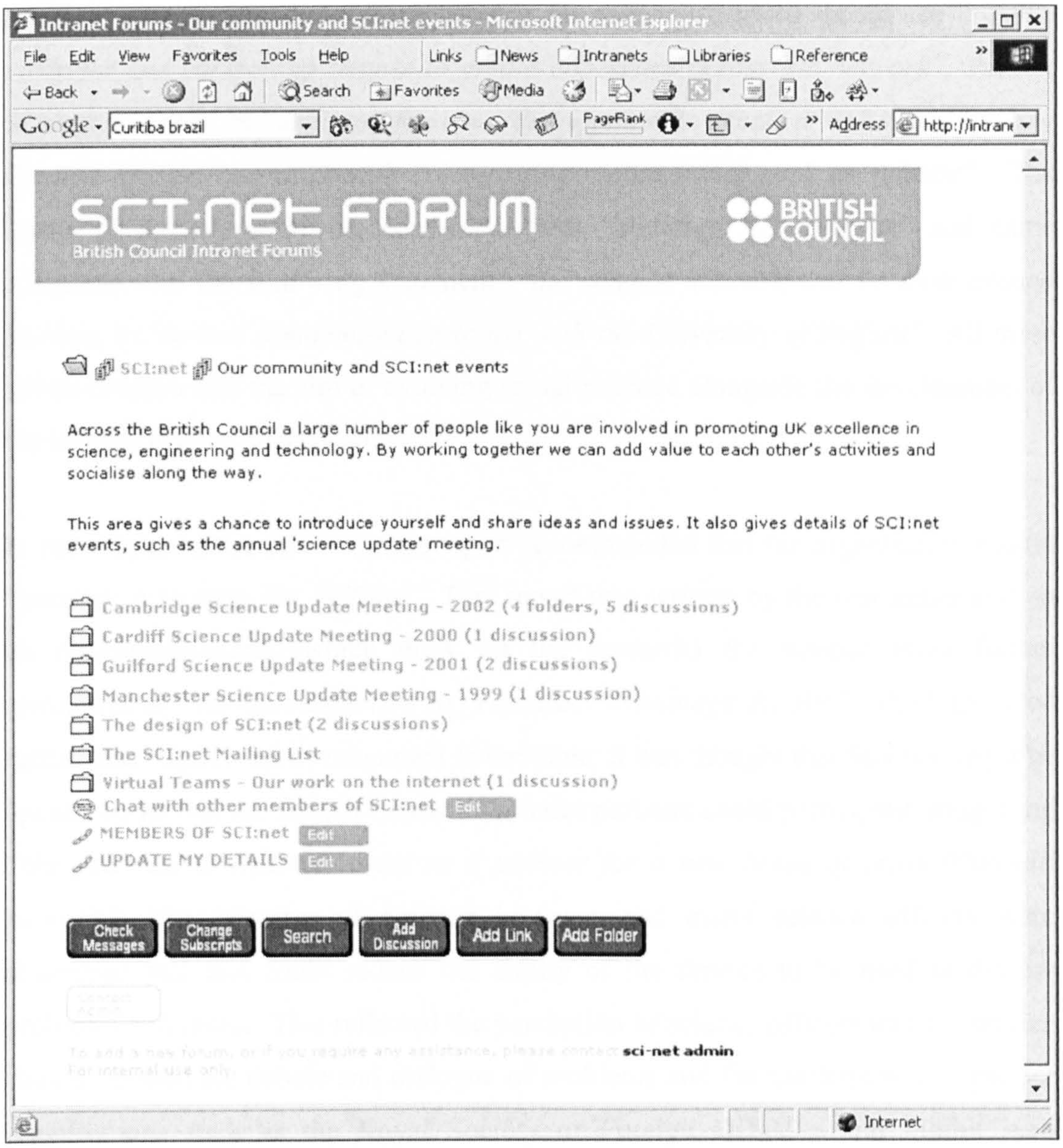

Figure 32: Final SCI:net System at launch.

During the second Science Update conference in Guildford the participants were questioned as to the direction that should be taken with SCI:net with one person commenting that it was a "*useful thing to have, and one of [British Council science's] USPs [Unique Selling Points]*". All the following quotes are derived from the report written by a consultancy company to provide a coherent summary of the agreements that arose from the conference.

The formal response to this activity recommended that SCI:net should become central to the work of science representation, with the science team committing to

"developing SCI:net into a world-class, international, science promotion network" and that, in line with the approach taken in the research the tool should use *"simple, powerful and compelling themes to create coherence across the network"*. Further SCI:net was seen as *"using professional development to create a new vision for how Council officers can work with cross-cutting global issues such as science"*. The theme of the report of the conference was *"Building the network"* and came complete with the following statement: "*the science network will be built around SCI:net, an on-line community developed with the University of Salford"*. All these points confirm that the aim of evolving social practice alongside the development of the technology had succeeded.

In order to continue this work the report recommended that the organisation should *"produce a strategy for SCI:net"*. This report was written by the researcher and on its recommendations (which drew on the research) the science team further committed to "*dedicate sufficient HQ resources to manage the site"*, which included further funding for the development to continue. It was thought that SCI:net might be opened up so that the British Council's science partners could participate, suggesting *"the potential of SCI:net to act as a pioneer for a new breed of cross-Whitehall network"*. The Director of Science however and many science officers were concerned that this could reduce the ability of the service to be used to discuss problems and issues. This reflected the perception of science officers that the service should be used for debate and dialogue of problems and the participation of partner organisations such as the Royal Society or Foreign Office would inhibit such dialogue.

The need for training that had been raised in interviews and was seen as key to the development of SCI:net was also picked up in the report: *"There is a clear need for professional development for those working to promote British science overseas. It is also important that skills are shared around the network, rather than it functioning as a hub and spoke operation. Finally, it is essential that British Council staff are rewarded for their work within the network."* SCI:net was seen as a mechanism for achieving this through *"auditing [the] skills held in different countries and using SCI:net to encourage co-operation between countries."*

While clearly this represents a formal view of the outputs from the conference it also captures the perceptions of those attending the conference. It was written by two independent consultants who had attended the conference and also interviewed the participants in order to arrive at these views.

8.9.5 SCI:net development handover

Following the second cycle of the AFFEKT development, in which the SCI:net service had been tailored in order to reflect the comments from the science officers at the Guilford conference and to include a large amount of content to support purposeful activity, the research activity came to an end.

In order to ensure that SCI:net continued to develop the Director of Science appointed a member of staff to take responsibility for the system's ongoing evolutionary development. The researcher was asked to explain the design rationale, to suggest how further development could be undertaken and to recommend readings such that this employee might better understand the design process (e.g. (Checkland and Scholes 1990; Norman 1990)). Much of this time was spent in explaining the AFFEKT framework and its rationale. The appointed staff member later e-mailed the following message: *"the meeting was really useful and I have read through your research paper, which is helpful, and I did buy the book you recommended as well."* This member of staff has since continued to develop the system in consultation with both the UKP science team and the overseas science officers.

8.10 Review of the learning from the developing thesis

This final section provides a review of the learning which has been developed up to this point in the thesis. It captures the conclusions from the CD:net and AKM cycles together with the learning associated with the implementation of SCI:net (as in previous chapters the conclusions from the previous cycles are shown in grey). These results are then used in the concluding chapter in order to develop the practical contributions of the thesis, and to undertake second order reflection.

	Learning from the complete study
The design and introduction of Knowledge	Designers should appreciate technological constraints, substitute technologies, and organisational change initiatives during development as these are likely to impact on the

Management systems	systems perceived purpose and use. Such analysis may reveal conflicts between different groups (e.g. the hub and spoke) which should be considered in the design of the Knowledge Management system. This analysis should include consideration of information which the system could contain. SSM might aid this by focusing on purposeful activity through various weltanschauung. However SSM focuses on direct improvement whereas Knowledge Management aims to improve the capability to improve. As such it is suggested that the technology enables users to gain a soft systemic understanding of their purposeful activity such that they might undertake improvement. Argumentation is a crucial aspect of knowledge creation and should be promoted within the system.
	Users may support the system and suggest necessary features, however these should be considered in relation to their human purposeful activity as users are presenting their espoused theories towards technology rather than their theories in use. The identification of "membership" might prove problematic and thus it should be possible to legitimately participate on the periphery (Lave and Wenger 1991).
	The way a system is developed and introduced will impact upon users perceptions. A champion must consider this by exploring the perceptions of users. Such a champion may also mediate extreme changes in the perception of the product through their privileged position. Identifying archetypes from the analysis material will enable the champion to describe and consider the perceptions and expectations of users. Engaging individuals to write stories around the identified purposeful human activity proved beneficial in supporting innovation.
	Users need to be actively engaged in the development process in order to evolve the tool in use, however such engagement may be difficult if the system does not already afford benefit. The intervention will be affected by user's perceptions towards previous change initiatives within the organisation. It is suggested that a rhythmic set of participant research activities be undertaken both to align the champion with the users and to bring the system present-to-hand for users. Such rhythm would also ensure the system remained relevant. However it is also useful to punctuate such rhythm with high profile consultation and marketing of the intervention. A conference with users may provide such an occasion.
The design of Knowledge Management technology	It is suggested that the underlying Knowledge Management technology in the further cycles of research be capable of being rapidly reconfigured. This may be better undertaken if the Knowledge Management technology is in modular component form. The technology should also not impose a

	specific purpose or metaphor through its HCI design. As users perceptions of the tool are significant and built up quickly they should be introduced to the technology in a controlled manner with legitimacy for exploring the system from its champion.

These findings represent the practical learning from the three cycles of action research. The next chapter uses these lessons to develop a set of coherent contributions from the study. In order to achieve this, the chapter reflects holistically on the action research and draws upon themes from the broader debates with social studies. Finally these wider issues are used to develop a set of conclusions regarding the role of AFFEKT within Information Systems.

CHAPTER 9 CONCLUSIONS

"The outcome of any serious research can only be to make two questions grow where only one grew before." (Thorstein Veblen 1857 - 1929)

9.1 Introduction

This chapter captures the lessons learned from all the cycles of action research (i) in order to contribute insight into the area of concern, (ii) to develop broader themes from the action research and (iii) to describe the overall contribution of the study. The aim is to evaluate the study by reflecting on the research question and to consider the success of the action research process and the study's contribution.

The chapter is structured using the methodological framework as presented in Chapter 4 ; that is reflecting on problèmatique, method and researcher. The key themes drawn from the theoretical framework are described through the three cycles of action research in order to provide a coherent set of conclusions to the study as a whole.

Section 9.2 reflects on the problèmatique and draws on the three action research cycles that were undertaken. This section revisits the action research in order to explore a number of broader themes, within the British Council in particular and society in general, in order to better understand the nature of the action research interventions. The tentative contributions from this analysis are shown in bold text. These broader themes extend the themes of the action research and are then used to explore the contribution of AFFEKT to the field of Information Systems. The section concludes by presenting a concise summary of the significant contributions of the study in terms of research and practice.

Section 9.3 reflects on the research method used and critically assesses both the validity of the study undertaken, and the contributions presented in this chapter. This section considers whether the use of alternative methodological approaches could have benefited the research.

Section 9.4 reflects on the researcher himself, proving a summary of the experience gained in undertaking the action research.

Section 9.5 outlines recommendations for future research work.

Presenting generalisations from action research is always problematic (Dash 1999) and indeed some commentators argue that the quality criterion employed within conventional research are inappropriate for action research and that other criteria, such as the improvement of practice and learning or professional development, may be more relevant (Revans 1988; Dash 1999). However this view avoids the academic responsibility for contribution, since as a piece of research this thesis must contribute to the academy of Information Systems, even if such a contribution is applicable only to a particular organisation at a particular time (Susman and Edvered 1978). What contribution this study makes to the field of Information Systems is located within the particular context of the British Council as presented through the plausible coherent story of the three cycles of action research (Checkland 1981; Wood-Harper 1989).

The contribution of the thesis concerns the field of Knowledge Management, as discovered through the series of interventions undertaken by the researcher that operationalised the theories of Knowledge Management. In addition to this the study also explored the aspects that led to the interventions taking place, both in terms of the organisational pressures and the technological constraints imposed. The contribution of the thesis to Information Systems practice lies in the development of the AFFEKT framework as a mechanism for developing Knowledge Management systems.

9.2 Reflections on the problèmatique

A central organising theme to emerge from the action research is that of "improvement". This term is used in order to reconceptualise Knowledge Management in terms of a *desire to improve* so moving beyond the various difficulties involved in conceptualising messy problems and issues about knowledge. The term was also used with the Knowledge Team, the UKP Science Team and during the Cardiff and Guildford conferences in order to focus attention away from the traditional problematic conceptions of Knowledge Management, which were based on narrow definitions of knowledge or simple comparisons with information, and data (Davenport and DeLong. 1996; TFPL 1999). The term also mediated between the highly functionalist perspective towards Knowledge Management adopted by the CD:net consultant and the wider view of the researcher. In this way the term acted as a boundary object (Star and Griesemer 1989) mediating between the tensions towards Knowledge Management present in the various participants in the development of both CD:net and SCI:net. As such the concept allowed the development of a collectively understood purpose for the interventions so avoiding the early determinism of what such "improvement" might be and what it might mean.

This notion of improvement in purposeful activity proved to be useful within this study in articulating the desires of the various stakeholders from their Weltanschauungen even through they remained unable to identify specific rationalistic problems of "poorly managed knowledge" within the British Council, such that clear Knowledge Management led solutions could then be created. This use of the term fitted with the use of SSM and helped the stakeholders to appreciate the contested nature of Knowledge Management. This highlighted the fact that Knowledge Management had not been adopted within the British Council simply as a fad (Davenport and Grover 2001), but rather showed that the problems identified by the stakeholders, and to which Knowledge Management theory resonated, were messy and thus difficult to effectively describe (Ackoff 1974). The initiators of both CD:net and SCI:net perceived Knowledge Management as an approach that was capable of improving such wicked problems (Rittel 1971). For example, the desire to improve held by the Director of Science broadly concerned the need to answer Lord

Sainsbury's (OST) concerns that science representation was being poorly executed (Anderson 2000). Alternatively for CD:net the desire to improve came from pressure on the Country Directors to collectively learn and innovate in response to changes in the way the British Council was expected to operate. Such problems present no obvious "solution" or rational decision making process for it is not possible to isolate a single problem to which a solution may be sought. SSM proved therefore beneficial in achieving a consensus among such messy desires to improve, so enabling Knowledge Management interventions to take place with the aim of bringing about such improvement. **In this way it is argued that it is only possible to consider Knowledge Management led improvement, rather than Knowledge Management related solutions.** The well documented difficulty of evaluating knowledge management initiatives (Roos and Roos 1997; Miles, Miles et al. 1998; Stewart 1998) is therefore reiterated, since any realised improvement can only be located within the context of such messy problems.

9.2.1 The desire for "Community"

In order to bring about an "improvement" within the problèmatique the concerns expressed resonated with those theories within Knowledge Management that espoused the creation of "communities of practice". The central underlying logic that emerged from the two cycles of action research that were undertaken within the British Council could be characterised as a belief that within Knowledge Management "communities of practice" (Brown and Duguid 1991; Wenger 1998) were seen as something desirable in improving the organisation, and that it was therefore worthwhile to attempt to bring them about. Such a view was strongly supported by the recent literature on Knowledge Management: "*Companies have found that the most used, and useful, knowledge bases were integrated into the work of one or more communities...[they are] the ideal social structure for "stewarding" knowledge*" (Wenger, McDermott et al. 2002). Since "communities of practice" are linked to learning and learning is an emergent process, so it is argued that "communities of practice" are themselves emergent and evolutionary. "*They come together, they develop, they evolve, they disperse, according to the timing, the logic, the rhythms, and the social energy of their learning*" (Wenger 1998). Wenger goes further in suggesting that there are events and perturbations which can either stabilise or destabilise a "community of practice", but that the community cannot achieve

complete stability since change is an on-going part of that practice. He argues further that such stability (or modification) cannot be forced since *"it is a mistake to assume that practice is inherently a conservative force, and it is a mistake to assume that practice is erratic or can be modified by decree"* (Wenger 1998). Wenger suggests that any organisation provides two sources of structure: the structure which is designed and institutionalised (e.g. as defined jobs or authority structures), and the structure which emerges from practice. Indeed Wenger suggests that institutionalised factors can act as Boundary Objects (Star and Griesemer 1989) which mediate between "communities of practice". For example Wenger (1998) states that "*the design of an organisation is not so much an overarching structure as it is a boundary object. It connects communities of practice into an organisation by crossing boundaries. It does not sit on top; it moves between. It does not unify by transcending; it connects and disconnects. It does not reign; it travels, to be shaped and appropriated in the context of practice"* (Wenger 1998).

Within the British Council the Knowledge Team were authorised to further provide technology, events and communication within those groups identified as "requiring Knowledge Management". They did not however have the authority to dictate involvement; indeed knowledge is associated with cognition and thus individuals have a choice, so it may not be possible to acquire such authority (while people may comply with Knowledge Management this compliance does not necessarily mean their knowledge is being shared (Snowden 2000)). The researcher thus attempted to encourage, rather than mandate, the development of a community from the groups of individuals based on the assumption that existing institutional structures prevented direct communication between these individuals. It was hoped that a lack of communications technology was inhibiting the evolution of "communities of practice" and that its introduction might (as suggested in some of the literature) enable the emergence of such communities (Von-Krogh, Ichijo et al. 2000; Wenger and Snyder 2000; Wenger 2001; Wenger, McDermott et al. 2002; Pan and Leidner 2003). However it was acknowledged that other institutional factors might also be inhibiting the evolution of such a "community of practice" and would influence any such intervention. It was clear however that both the Country Directors and the Science Officers had not been provided with a technology to communicate effectively in this way before these projects were initiated.

The members of these groups within the British Council did not however appear to exhibit the natural characteristics of a "community of practice". Wenger suggests that these natural characteristics include mutual engagement in similar practices, joint enterprises and a shared repertoire of knowledge (Wenger 1998; Wenger 2000). On this basis, if the groups of Science Officers and Country Directors had been able to exhibit such characteristics prior to the Knowledge Management interventions then the likelihood of successfully encouraging the formation of a "community of practice" would have increased.

Reflecting upon the CD:net cycle it would appear that the lack of engagement with CD:net by the Country Directors was perhaps not surprising given that they did not previously exhibit many of the characteristics of a "community of practice": Their purposeful activity was focused on the operation of their country and was not collectively undertaken with other Country Directors. They did not appear to have a shared repertoire of skills since they often took different approaches to their work. Finally they did not collectively develop or use artefacts associated with being a Country Director.

By way of contrast the Science Officers possessed a number of the features Wenger associates with a "community of practice". They identified themselves in some ways as a group of Science Officers. Many attended the Science Update conference, and received informational artefacts from the UKP science team (for example the Science News journal). They even occasionally undertook joint enterprise such as globally run conferences. On this basis it is perhaps unsurprising that SCI:net was more successful than CD:net.

However one is still led to ask how it is that these individuals, undertaking broadly similar activities and generally very supportive of the Knowledge Management initiative, did not possess a far greater propensity to become a "community of practice"? Given that the British Council aimed to develop them into such a community, how might the various inhibiting social and institutional factors have been identified and then altered as part of the interventions? The interventions were undertaken in a controlled, thoughtful manner by a researcher who was fully aware

of the lessons from the literature on Knowledge Management. The development of the interventions was not limited by budget or by technology but only by the institutional factors which influenced and inhibited the development of "communities of practice".

In contrast to the generative structures that Wenger identifies as enabling the emergence of a "community of practice", the following section attempts to identify those "de-generative" structures which conditioned and thus limited the emergence of "communities of practice" within the British Council (Mutch 2003). In this way the concept of "communities of practice", that was used as an aspiration within the development of both CD:net and SCI:net, is used here in order to look at the broader context of the Knowledge Management interventions (something suggested as necessary by (Neef 1999)).

In the interventions it appeared that the Knowledge Team, the Science Officers and the Country Directors were all strongly influenced by the latent features of the organisation, in particular its "Hub and Spoke" nature; the very features that such "communities of practice" aimed to reduce.

The "Hub and Spoke" structure of the organization was central to this broader context; indeed *"the critical feature of the Council is that it is a head-quarters administering a network of offices overseas."* (Lee 1995). The *"hub and spoke"* structure within the organisation was highly evident throughout the long history of the UK's influence overseas. It stretches back into both British colonial history and the overall running of the Foreign and Commonwealth Office, as evidenced within the action research by people using phrases such as *"going native"*, *"London-appointed Brits"* and *"the UK's Mission"*!

Given the British Council's long history and its success whilst structured in such a way one is led to ask why knowledge sharing and the creation of such "communities of practice" was important to the senior management group within the British Council? Why did they (and the CKO) desire to broadly change the organisation's structure from such a "hub and spoke" form? Why and how was this desire to improve translated into a desire to develop a "community of practice" by the CKO?

Answers to these questions perhaps lie within the changing nature of both the social world and the world of cultural diplomacy.

The British Council's history has been strongly influenced by its historical role of providing propaganda and of imposing influence (Donaldson 1984). Its role during the Second World War was to battle in neutral countries against the influence of Fascism (Donaldson 1984; Cull 2003). Furthermore *"during the Cold War the British Council maintained its propaganda value and developed an important double function. It provided a point of contact with western ideas in the non-aligned world and, when thaws permitted, the Eastern Bloc."* (Cull 2003).

The modern world however has shifted in such a way that the west now influences culture in foreign countries through trans-global corporations, the media, language and the Internet more than through institutions such as the British Council (Giddens 1999). The BBC world service which was once the main western broadcaster in many parts of the world (partly funded by the FCO as part of its cultural relations operation), now competes with a huge variety of other western broadcast companies that are also broadcasting globally. Suddenly, the kind of information and cultural influence previously put forward by the British Council and the World Service are available in many different ways within an increasingly globalised world (Giddens 1999). When Manchester United Football Club encounters throngs of supporters in China and opens shops in Singapore one is left questioning the future role of the British Council. The SMG within the British Council however strongly argues that it is these very influences that mean that the world needs the British Council, since they argue that globalisation and cultural imperialism requires a body that balances the opinions of people across the world towards the UK (Taylor 2003). So providing a counter view to the western cultural-imperialism represented by McDonalds, Hollywood and Manchester United. It was this change that was the basis for Strategy 2005 and influences the Knowledge Sharing Strategy (Taylor 2003).

Strategy 2005 argued that modern cultural diplomacy must concern the development of mutual understanding (British-Council 2000; Taylor 2003). This was reiterated by the British Council in arguing that "*mutuality is central to the work of the British Council, our belief in internationalism stems from an appreciation of the*

interdependence of today's world" (British-Council 2002). Indeed the British Council now argues that its *modus operandi* is one of dialogue based on mutuality and shared benefit (Green 2002). According to a recent speech by the Director General of the British Council, *"a sense of community, and the mutual respect this brings, grows out of shared experience and memories. By creating opportunities for shared experience between peoples of different cultures, the foundations are laid for bridging cultural gaps and expanding cross-cultural understanding"* (Green 2002). This focus on mutuality was reinforced in the years during and after the action research, in particular by the events of the 11th September 2001, which occurred in the final months of the SCI:net action research. The reaction to these events even included the suggestion of a mutual sense of community among western cultural relations organisations; *"The events of 11 September shocked us all. But as I have argued, the case for international educational and cultural exchange is even more relevant. And the next step will be to think beyond military coalitions to a coalition of cultural relations agencies. We will – and must – strive even harder for honest, open and mutual dialogue"* (Green 2002).

Both the knowledge sharing strategy and Strategy 2005 represented an attempt to refocus the structure of the organisation away from its historical roots and to face such challenges. Whilst the strategy and the knowledge sharing programme were not seen as necessarily complementary (note the suggestion by one Country Director that the CKO intended CD:net as a mechanism to challenge the Strategy), both aimed to change the organisation in order to face these new pressures (see section 5.7). This was perhaps the broader desire-to-improve within which the knowledge sharing strategy was located. For the British Council it was insufficient that the proponents of Knowledge Management argued that knowledge creation could only occur within a community when such a community did not exist within this form of "hub and spoke" organisation. The organisation needed a way of changing the existing practices and felt that "communities of practice" represented the route to achieve this. The Knowledge Team thus needed to try to encourage the development of "communities of practice". Yet the latent organisational structure, and the interpretive frameworks of the staff (Polanyi 1962) presented a significant constraint on attempts to develop "communities of practice" within the organisation.

The Knowledge Sharing Strategy, and in particular CD:net and SCI:net tried to develop "communities of practice" within the organisation in order to support a shift in cultural relations activity. Throughout the research many individuals were strongly vocal in supporting such a change, and yet they did not easily form the kinds of communities that they desired to participate in. In a sense therefore the Knowledge Sharing programme was attempting to encourage the antithesis of the historic *"hub and spoke* bureaucracy evident in the organisation.

Rather than simply providing Knowledge Management technology as a communications infrastructure which passively supports the existing status quo within the British Council, SCI:net and CD:net were in the position of challenging the existing status quo. The next section thus explores the nature of such a challenge.

9.2.1.1 The impact on "individuals"

The concept of individualisation is a key theme within social theory, sociology and globalisation at this time; as is the issue of how to manage and develop technology for such individualisation, in contrast to attempts to develop communities.

Hallier and James (Hallier and James 1997) have described the general decline in loyalty felt towards organisations, and the way that individual perception of risk can also lead individuals to subvert organisational strategy (Miles, Miles et al. 1998). This was paralleled in the British Council by the backlash by some Country Directors against the Strategy 2005, together with the concern over changes in science promotion held by some Science Officers.

It is interesting to note that at a time when the organisation was placing pressure on Country Directors and Science Officers to improve their work, and had increased their personal insecurity through a series of redundancies and office closures as part of Strategy 2005 (policies which were likely to reduce loyalty and increase individualisation (Beck 1992)), the organisation also invested in Knowledge Management with the aspiration of increasing a culture of knowledge sharing, peer support and openness.

The regular rotation of senior staff across the globe, the ongoing change in working practices, the significant reduction in staff numbers in the UK, and the threat of such a reduction overseas leads to individualisation in which the individual takes control of their own career and work (Beck and Beck-Gernsheim 2002). The role of the employees within the British Council had, at the time of this research, lost the assurances and the protective functions previously evident within the organisation (Scott and Walsham 1999). Country Directors and Science Officers may have been in confusion as to whether they should adopt an "*I am I*" attitude (Beck 1992) or to support the development of a "community of practice" within the institution. These two stances appear to be mutually exclusive, and thus a route needs to be sought such that organisations of individualised employees can still work in a mutually supportive way (Du Gay 2000).

The *"Excessive Individualism"* (Beck 1992) evident within the British Council during this research is also a theme in modern life. As Beck and Beck-Gernsheim argue *"we live in a world in which the social order of the national state, class, ethnicity and traditional family is in decline. The ethics of individual self-fulfilment and achievement is the most powerful current in modern society"* (Beck and Beck-Gernsheim 2002). They further argue that attempts at creating a social cohesion must start from recognition of individualism, diversity and scepticism. Knowledge Management however attempts to recreate the lost sense of community, and *"Communities of practice"* is an appealing notion (Williams 1976) even though the employees of the British Council lived multiple disconnected lives in which they were not always members of such social groupings. The British Council is an organisation of the global age in which life is nomadic (Beck and Beck-Gernsheim 2002), spent in cars, on aeroplanes, on the telephone and the internet, and involved with activities in many countries. Even the influence of national cultures was problematic; one consultant working within the organisation described Country Directors as being "cultureless", suggesting that they wore the clothes that were in fashion on the day they left the UK and then they assimilated aspects of the culture in each of their postings. Even the researcher was led to enter such a nomadic existence. In contrast to this the organisation also imposes a form of life influenced by the new-colonial "hub-and-spoke" structures represented by the headquarters, Whitehall and ambassadors. The Knowledge Sharing programme attempted to sit as a mediator

between the existing bureaucracy and the changing reality of life within the organisation. It is no wonder that the Country Directors intended to use CD:net to discuss both political issues and their personal tax arrangements, and that the Science officers were keen to develop local networks that were disconnected from Headquarters (as occurred in South East Asia) when boundaries between work and home, and locality were blurred for these groups.

9.2.1.2 Beyond the individual

It is possible to draw on such a theme and go beyond the idea of a single employee and consider it in relation to the structure of the organisation as a whole. The British Council was facing pressure to change its approach to cultural relations from both "outside" and from "within". Just as the "customers" of the British Council could use the Internet to communicate directly with educational institutions in the UK, so the overseas staff could also circumvent Headquarters for such information. The complaints of the UK based Policy Directors and Science Consultants that they were no longer consulted over activity planning is perhaps evidence of this circumvention. Whilst a role still remained for overseas offices of the British Council as promotional centres, the suggestion by one Science Consultant that headquarters had become a "knowledge management system" in itself perhaps hinted at an underlying truth. The headquarters of the organisation was centred on the belief that the overseas offices required support and information to be collated and sent to them, yet internet technology appeared to reduce such a need. One can speculate that a future British Council will operate as a truly networked (Hedlund 1994) organisation, without a focal point centred in the UK (apart from administration and policy). This view challenged further the attempt by both the researcher and the Knowledge Team to provide technology which aimed to develop a sense of community for this group since such a technology might challenge their very existence. Could the UKP Science Team therefore foresee the possibility that the SCI:net system would further sideline them within science promotion?

One might surmise that the "hub-and-spoke" structure, although universally criticised within the organisation for its bureaucracy and for its lack of knowledge sharing also provided a stabilising influence across the British Council. Certainly across the global organisation most members of staff were well aware of the politics

and activity going on in *"London"* (as Headquarters was generally called) and still held it in warm regard. People may have criticised its approaches and yet they seldom spoke against the people or the overall structure. Furthermore the researcher did not meet a single member of staff who was not fully committed to the cause and beliefs of the organisation, even though many did not agree with its actions. Such commitment therefore might well have enabled overseas staff to communicate through a shared culture and body of knowledge associated with London (Yoo and Torrey 2002).

One can therefore speculate that new models of cooperation, such as that of the individualisation and cooperation evident in the open-source software movement (Ciborra and Andreu 2001) or in action research (Venzin, von Krogh et al. 1998) could have presented alternative models of Knowledge Management within the British Council. It would be an interesting future research topic to reflect on the AFFEKT framework in relation to the development of the open-source movement and new organisational forms (Romanelli 1991; Ciborra 2002).

9.2.2 Drawing the societal, individual and organisational issues into a change programme

The use of technology, in the form of the Internet, television and telecommunications is central to many of the pressures and changes that are external to the British Council. Within the British Council itself technology has also played a significant role in a number of organisational changes. The "open government" strategy intended to make Whitehall more accountable for its actions through the Internet, has influenced the British Council's record keeping practices (Foreign-and-Commonwealth-Office. 2001). Both the Global Technology Initiative (GTI) and the Intranet have changed the organisation's communications mechanisms leading to increased use of e-mail among all members of staff and increased reliance on the Intranet (For example the weekly office bulletin which was once faxed to staff, then e-mailed to Country Directors is now only posted on the Intranet). Furthermore in response to these pressures the British Council chose technology to be the driver of change through Knowledge Management and through the focus on technology within Strategy 2005.

Historically technology has been seen to shift the social structures within the British Council in similar ways to the changes envisaged by the Knowledge Sharing strategy. For example the fax machine was described by a member of staff in South Korea in the following way. "*When I first entered this office I couldn't dream of intranet or the internet or e-mail. At the time fax was marvellous, we were quite satisfied with just using the fax machine.*" This person then described how the fax machine suddenly meant that they could send questions and post memos to London expecting an immediate response. This facility enabled them to participate in a dialogue about planning rather than simply awaiting "orders" sent slowly via the diplomatic bag. In contrast to this view a policy director based in London complained that the fax machine had made his job far worse because he had less time to think and was at the "beck and call" of the overseas offices. He even described how since the introduction of the fax machine he was in less control of his time and needed to respond to overseas offices more. Similarly, the introduction of kiosk technology in many overseas offices and the development of local websites meant that the organisation's headquarters were forced to consult overseas offices about changes to the corporate website.

These influences of technology were significant in creating change within the existing structures of the British Council, and thus were the catalyst for the organisation's move towards a less centralised form (the fax machine for example changed the relationship between Policy Directors and overseas offices). This change was evident in the downsizing that took place within the organisation (Lee 1999); ongoing initiatives such as Strategy 2005; the Knowledge Sharing Programme; and the memorandum of understanding with the BBC and the World Bank. All these initiatives focused on ICT technology as an agent of change within the organisation. This therefore suggests that the Knowledge Management aims of CD:net and SCI:net were secondary to the attempted change in the organisational structure and the removal of rigidity in communications through "frame-breaking" actions defined as a *"radical move away from embedded organisational cultural webs"* (Child and Heavens 2001). While the Knowledge Manager and CKO might have perceived the knowledge sharing strategy to concern improving the knowledge of overseas staff such an intervention could not be separated from its impact (or perceived impact) on

the existing "hub and spoke" structure. Thus Knowledge Management effort might be argued to be a "frame-breaking" action.

Change within the British Council appeared to be emergent and the product of the employees' perception of the organisation, the artefacts they engaged with, and the other members of the organisation. This study introduced the notion of inter-perception in order to reflect on such relationships.

9.2.3 Inter-perception and Knowledge Management systems

Drawing upon the lessons of the empirical study it is argued that each individual user's underlying epistemological approach influences the way in which an intervention is perceived and adopted. This study shows that the engendering of a community is significantly influenced by the perception that each individual holds towards themselves, the organisation as a whole, the technology and others made present through the technology.

The social constructivist perspective adopted towards Knowledge Management argues that a Knowledge Management system should enable an individual to simultaneously externalise their practiced experience in order to make sense of it, and to internalise the information from others externalisation activity (Berger and Luckman 1966; Schultze and Leidner 2002; Venters, Cushman et al. 2002). "*Where researchers have considered Knowledge Management systems in detail there have been calls for research into the design of integrated systems for knowledge that are of value within chaotic changing environments through the evocation of action and reflection*" (Nonaka, Reinmoller et al. 2001). Knowledge should be continually re-represented and challenged as objects that contain, express and inscribe accumulations of meaning and experience (Berger and Luckman 1966). This is an ongoing process with users continually internalising their understanding of the role of the Knowledge Management system. The information presented by Knowledge Management systems and the underlying Knowledge Management technology are both inscribed with a socially constructed meaning. The organisation, through its employees becomes constructed within such technologies It was on this basis that the researcher introduced the concept of inter-perception to explicitly describe the

social construction of meaning of the system in addition to the social construction of meaning of others "through" the system's information content.

Members of the British Council were observed to be regularly sharing their knowledge, constructing meaning from their experiences, and applying knowing to such experiences; (indeed it may be argued that this is a constant ongoing activity for *"to live is to know"* (Maturana and Varela 1987)). They were already interacting with an always present whole (Heidegger 1962), and did not first analyse their world and then formulate objective intentions to direct their activity (Introna 1997). They approached such involvement through the application of tacit knowledge as the central tenet of skill and within this tacit knowledge was their own interpretive framework (Polanyi 1962) *"We assimilate most of our presuppostions by 'learning to speak of things in a certain language'... we have no clear knowledge of what our presuppositions are and when we try to formulate them they appear quite unconvincing...When we accept a certain set of presuppositions and use them as our interpretive framework, we may be said to 'dwell in them as we do our body'"*(Polanyi 1962). The interpretive framework of Country Directors was influenced by the act of being a Country Director, something which historically involved secrecy, bureaucratic communication between Policy Directors as "hubs" and themselves as "spokes", and a general governmental approach to work which had developed over time to include individualisation and a lack of trust.

Likewise the act of being a Science Officer also involved "hub and spoke" communications and was influenced by the change programme to refocus science promotion on a wider public. Another significant factor was the predominant positivistic attitude of western scientists' epistemology as shown by the Director of Science's regularly used statistics or empirical material in communications, when Science Officers asked what statistics were available on issues at the conference, and when consultants talked about "hypotheses" (Davenport and Prusak 1998; Butler 2002). Such interpretive frameworks also influenced how the new technologies such as CD:net and SCI:net were appropriated into their repertoire of tools.

This study thus confirms the view of Butler (2002) whose study suggested that practitioners generally adopt a functionalist perspective towards knowledge and thus

attempt to use technology in a functionalist way. This study therefore reinforces the need to reconsider the role of technology in Knowledge Management so that it focuses on changing interpretive frameworks, and then through this change to develop "communities of practice" within the organisation. **Inter-perception is proposed as a concept which will aid the potential Knowledge Management system's developer in exploring such interpretive frameworks.**

9.2.4 The potential to change the interpretive framework

The research suggests the need for a new approach to the design and development of Knowledge Management Systems. In particular it suggests that Knowledge Management Systems should not be considered separately from the users' perception of them, and from the broader organisational context in which they are to be used. Yet, technology vendors of Knowledge Management Systems (such as KM systems plc) continue to focus on rationalistic modes of Knowledge Management in which knowledge is decontextualised and delivered via technology (Butler 2000; Hahn and Subramani 2000; Wickramasinghe 2002), either through the codification of such knowledge, or alternatively through communication as a conduit for knowledge transfer from individual to individual (Hansen, Nohria et al. 1999; Varey, Wood-Harper et al. 2002). This study argues however that the success of such products is not necessarily related to their technological capabilities, but rather to the way in which such capabilities afford benefit and can be effectively integrated into work practices.

The adopted stance of this study towards Knowledge Management highlights knowledge as being the emergent product of purposeful action. On this basis Knowledge Management interventions are concerned with encouraging such emergence (as also supported by (Nonaka and Takeuchi 1995; Kidd 1998; Matusik and Hill 1998; Von-Krogh, Ichijo et al. 2000; Alvesson and Kärreman 2001)). The role of technology within Knowledge Management is therefore to create the conditions under which such emergence takes place.

In a recent paper Lynne Markus *et al* (Markus 2002) describe a design theory which aids in the development of systems that support emergent knowledge processes (EKPs). Markus describes such emergent knowledge processes as *"organisational*

activity patterns that exhibit three characteristics in combination: "deliberations" with no best structure or sequence; highly unpredictable potential users and work contexts; and requirements which... include general and specific [information] and tacit knowledge". These EKPs align well with the purposeful activity of both the Country Directors and the Science Officers within the British Council. Markus *et al* further argue that such activities are emergent, that technology designers are ill equipped to develop technology in support of such activity (Markus 2002) and that *"consequently a new IS design theory is needed"*.

The authors then propose such a design theory, which was developed out of a project to support the process of organisational design within manufacturing organisations that included HP, GM, Digital Equipment Corporation and Texas Instruments. This design theory in many ways mirrors the findings of this study. This study's call for modularity in Knowledge Management systems is supported by their argument that Knowledge Management systems require *"componentized structure"*. It also suggests the need to consider all elements of an individual's purposeful action, and it supports the need for the consideration of users' perceptions of the technology (although they focus on motivation, training and knowledge rather than on the wider issue of inter-perception).

Markus *et al* however continue to consider the development of Knowledge Management systems as being concerned with how to "map" technology to the emergent knowledge processes of individuals. The focus of their design process is on the technological "support" for such emergence; *"EKP design theory represents a total solution to the design problem by correlating users requirements with systems design and development principles"* (Markus 2002). Markus el al thus conclude by arguing that "*through its emphasis on integrated support, our EKP design theory helps resolve the considerable...disagreement in the knowledge management field"* (Markus 2002), see also (Fahey and Prusak. 1998). In this way technology is seen as adopting a passive role both within the ongoing evolving knowledge practices and within the subsequent design process.

Such a design process aligns closely with Markus's subsequent assertion that there are only two kinds of IT projects: technical projects and "TechniChange" projects

(Markus 2003). Technical projects essentially concern the automation of the mechanistic aspects of an organisation's infrastructure (e.g. the replacement of printed phonebooks with online phonebooks) and are judged in terms of budget, time and against a formal specification. Such technical projects fit with Zuboff's notion of *"automate"* (Zuboff 1988).

TechniChange projects, on the other hand (which, this study argues, the EKP design process aims to support) view *"IT as a means of organisational ends"* (Markus 2003), and so use IT to drive business change. This, Markus argues, requires a different approach from the tried-and tested technical approaches that support technical project management (Markus 2003). Markus cites examples of business change such as to *"save procurement costs through reduced admin expenses and better contracts with vendors"*, *"enhance customer intimacy"* or to *"improve new product development"*. Success in these projects will be judged in terms of the ability to change not only the technology but also the business. It will be measured in terms of goals, processes and work-flow, attitudes and culture. Within such projects the technology must be designed in such a way that it will be adopted by the users and integrated within organisational routines. The IT systems associated with such "TechniChange" projects will change business through, in Zuboff's terms *"informating"* the practices of users such that they are integrated into the routines (Zuboff 1988).

By way of contrast with "TechniChange" projects, and hence with the EKP design process, this study demonstrates that there is a third type of technology project which is fundamentally different from "TechniChange" projects. Such projects, of which CD:net and SCI:net are examples, aim not simply to change the organisation and the technology (as the EKP design process intended), but rather to engender a continuous emergent change in both, by "managing" both the technological change and the cultural change within an organisation. The management of both technological and cultural change in this way is an emergent process in which neither is random, but at the same time neither is controlled. The aim of such projects is not simply the development of an efficient ready-to-hand system that supports existing or new purposeful activity, but rather the engendering of discomfort and unease around such

purposeful activity so that it is reflected upon and continues to change. To expand the taxonomy of Zuboff the term *"phenomenate"* is proposed.

The aim of systems development therefore becomes to continually change existing practices, rather than aiming to achieve a point of stasis. This process cannot thus be thought of simply as "design" since that implies a phase of "implementation and use"; rather a co-development process should be continually used in a cycle of learning and improvement in which both designer and users are participant. Purposeful activity continually evolves, institutional factors continually evolve, and the "community of practice" continually changes. Such change is not simply a feature of the environmental context of the system to be either attenuated or designed out of existence but rather to be amplified, celebrated and supported. On this basis it is suggested that existing Information Systems Development Methodologies and software engineering techniques such as incremental and iterative software development (Boehm 1988; Pressman 2000), or Joint Application Development (Wood and Silver 1995; Avgerou and Cornford 1998) in which the primary focus remains the development of a best-fit technology are less appropriate for the production of Knowledge Management systems.

The AFFEKT framework together with the concept of inter-perception support the co-emergent process of changing both the technology and the organisation. This is achieved by providing a better prediction about the interrelationships between the changes in the organisation and the changes in the technology within the organisation, and by providing a route through which to influence these emergent aspects.

The AFFEKT framework draws together key issues within Knowledge Management by aiming to enable a researcher to engender the emergence of a useful technology and human purposeful activity - *"we need to shift from experts who analyse and interpret, to facilitators who through active discourses, enable the emergence of new understanding and perspectives"* (Snowden 2000). **In this way the AFFEKT framework contributes to the field of Information Systems by presenting a framework which focuses on the emergent character of the organisation (as represented by the users' purposeful activity) and of the technology.** The

framework thus responds to the calls for emergence within organizations to be taken into account within information systems development; "*if emergence rather than stability is taken as the dominant character of organizations, at least in some periods, there is a need to radically rethink the way in which IS are developed*" (Truex, Baskerville et al. 1999). AFFEKT is therefore concerned with the emergent character of both the problèmatique and the Knowledge Management system.

The central concern within the adopted social constructivist perspective towards knowledge is that the creation of knowledge is a dialectic process in which society and the individual are mutually constructed by each: *"society is a human product. Society is an objective reality. Man is a social product"* (Berger and Luckman 1966). In this study, AFFEKT aims to influence the social dialectic for a particular problèmatique through the design and introduction of technology as well as through dialogue with users. AFFEKT aims to develop Knowledge Management systems that evolve to influence the socially created world, and will further be influenced by this socially created world (Orlikowski 1992). The framework thus focuses on stories, debate and affordance as being central to such an influence.

Resistance to any Knowledge Management system is perhaps inevitable since these systems aim to support and promote a continual change in purposeful activity. Such change its likely to be both uncomfortable and challenging to users and the wider organisation since it "phenomenates" existing purposeful activity (as undertaken for example within the British Council through the promotion of argumentation and stories on SCI:net). If the Knowledge Management system is successful it should not be comfortable to use and since it is uncomfortable may be avoided and thus ascribed as a failure (Schultze and Boland 2000). However such resistance might not necessarily materialise as a failure of the system so much as an inability of users to effectively adapt their perception to the new system and new practices because of their previously embedded interpretive framework – their theory-in-use (Argyris 1991; Argyris 1995; Argyris and Schön 1996). To identify CD:net as being either a failure or a success is impossible since CD:net's very lack of use might have significantly altered the underlying interpretive frameworks of the Country Directors (their underlying theories-in-use being challenged by their observed failure to use the

system which they supported). AFFEKT aims to influence such inter-perception of users, of and through, the system.

Even though CD:net failed to be used in the long term it may still have achieved the goal of leading Country Directors to question their purposeful actions and thus alter the underlying latent features of the organisation. For example, CD:net brought the problems of Country Directors into the focal awareness of the Policy Directorate and led some Country Directors to reflect on their own communications. For example Policy Directors may have realised that Country Directors desired to talk about the strategy without their knowledge. Indeed the very fact that CD:net was brought to the awareness of Policy Directors was posited as a significant reason for the ultimate interaction failure of the system since it led Country Directors to see the system as dangerous or subversive.

The idea of technologies which "phenomenate", that is that they engender the creation of phenomena which challenge purposeful action, fundamentally challenges the perceived neutrality of technology. Within the British Council technology became influential on the existing organisational hierarchy, since CD:net was perceived as being subversive; furthermore SCI:net was used by the Director of Science to demonstrate progress in the transition of Science Representation to the FCO and thus reinforced the existing structures. Subsequent to this study the British Council's intranet was used to poll members of the organisation in which the poll questioned whether or not Science should receive the same budget as Arts. A message was later posted on SCI:net which had been "*intercepted*" from the Arts group and which urged Arts officers to vote *"if you want to make sure the arts wing of the BC is represented..."*. In response to this a member of SCI:net posted a message saying; *"I am sure you will be disgusted by such blatant vote rigging, and so might feel a similar urge to vote in favour of science."* To propose Knowledge Management systems as neutral artefacts therefore is to misrepresent their nature. AFFEKT, through its focus on such organisational concerns accounts for such actions.

This study therefore suggests that the British Council's organisational framework inhibited criticism and so led to political factions and rivalry. Where presented with

challenges to the status quo (as demonstrated by CD:net, or by the attempt at democratic discussion on the Intranet) the existing structure ensured that voices were not heard.

9.2.5 Drawing these themes into practical action – the AFFEKT framework in action

The AFFEKT framework represents a methodological response that aims to continually evolve both an organisation and its technology. The framework is cyclical and aids an action researcher in appreciating a problèmatique from the perspective of various Weltanschauungen, the broader organisational context, and the influential theories driving the intervention. In addition the researcher systematically appreciates the technological capabilities within the problèmatique as well as those available for the intervention. The researcher is thus led to bricolage a potential system and then to discuss this with those involved such that understanding and perceptions are broadly aligned. The researcher then introduces the given technology alongside the ongoing discussion with the users and continues the cycle again. The approach is evolutionary, flexible and relatively unstructured. It aims to be contingent rather than prescriptive *"because the skills of different analysts and the situations in which they are constrained has to be taken into account in any project"* (Avison and Fitzgerald 1995).

The AFFEKT framework is cyclical because the concept of inter-perception suggests the need to evolve Knowledge Management systems through their co-development alongside the changes in users' perceptions (and potential changes in the organisation's communications infrastructure). In particular this study suggests that the users' application of the systems will be emergent since they afford benefit to their purposeful activity and are adopted within their work practices so becoming "ready to hand". This suggests that Knowledge Management systems should be developed through an evolutionary process in which both human experience and technology are altered such that improvement may emerge.

Emergence is *"the principle that whole entities exhibit properties which are meaningful only when attributed to the whole, not to its parts... Every model of a human activity system exhibits properties as a whole entity which derive from its*

component activities and their structure, but cannot be reduced to them." (Checkland 1981). Holistically, any Knowledge Management system only becomes valuable in relation to the whole system. SCI:net, for example, would only be useful within the wider activity of science representation.

In keeping with second-order cybernetic principles, the engendering of such emergence must be located within the broader social system (Ashby 1956; Checkland 1981). AFFEKT thus aims not to catalogue a description of the context from which to design a Knowledge Management system, but rather to engender a system that evolves through the active participation of the users. Such an approach to intervention appears consistent with the concept of viability (Beer 1984), and with the consideration of autopoiesis (Maturana and Varela 1980) in systems theory. In general, inanimate objects and systems cannot reproduce or be self-creating. There is thus a need for Knowledge Management systems to "include" the researcher in order to continually respond to changes in their internal environment. This role also involves influencing the users of the system such that their impact on the system supports the considered beneficial route for improvement (hence AFFEKT's focus on "informing" users as a crucial part of the process).

This view supports the call for emergent practices within Knowledge Management (Merali and Snowden 2000; Snowden 2000; Nonaka and Nishiguchi 2001) by introducing the AFFEKT framework as a systemic approach to engender such emergence; "*we are seeing a new pattern of Knowledge Management practice emerging, in which the organisation is treated as a complex ecology. The role of manager is as gardener or game warden, not mechanic or big game hunter; the consultant becomes a mentor or enabler of descriptive self-awareness rather than purveyor of prescriptions to manage the symptoms of corporate failure.*" (Snowden 2000). A recent literature review of Knowledge Management technology concluded that *"the ability to continually change and obtain new understanding is the power of KM technologies and will be the application of future work"* (Liao 2003). It is this ability to continually change which the AFFEKT framework addresses through its cycle of appreciation and interaction.

The emergence of equipment within work however is not separate from existing practices, rather the emergence of applications or the use of Knowledge Management systems are such that they are "ready to hand" for particular practices. In the words of Heidegger the system is *"something-in-order-to"* (Heidegger 1962) and part of the field of alternative equipment (Ciborra 1996). As the purposeful activity changes therefore so the Knowledge Management system must evolve to remain "ready to hand" (Introna 1997; Ciborra 2002). **This study emphasises a focus on such "readiness-to-hand" in order that systems are integrated into the ongoing practices and tools of individuals and thus support the creation of knowledge as an emergent property of action and reflection.**

Although Schön emphasises the need for reflection and thus learning at the point of action (Schön 1982) the majority of tools require a separation from action through the use of complex feature-rich knowledge management systems which leads users to reflect on the tool rather than on their actions. However the rise of Google as a very easy to use search engine, Blogging as an immediate and simple web publishing system, and SMS as a quick and easy message sending service hint at shifts towards a technology which is ready to hand. Whilst both CD:net and SCI:net were constrained to remain separate from other tools used (in particular Microsoft's Outlook, which is used as the British Council's E-mail system) the researcher's aspiration was that they would still appear familiar and "ready to hand". The Knowledge Management systems were thus developed with a similar language and metaphor to other Intranet sites. They did not contain personalisation, for reasons previously explained, nor complex features. **This study asserts that systems that are designed solely through consideration of the users' breakdown and complex involvement with the equipment are not appropriate for Knowledge Management.** Such a view is in stark contrast with software vendors who continue to promote complex integrated Knowledge Management systems, personalisation systems and portal technologies.

The design of technology through AFFEKT

The AFFEKT framework provides an empirically grounded theoretical framework to aid a developer in co-evolving and introducing technologies for Knowledge

Management. This section explores the approach that was adopted within the AFFEKT framework towards the design of such technologies.

Winograd and Flores have explored such an emergent process of design: *"The most important designing is* ontological. *It constitutes an intervention in the background of our heritage, growing out of our already existent ways of being in the world, and deeply affecting the kinds of beings that we are. In creating new artefacts, equipment, buildings and organisational structures, it attempts to specify in advance how and where breakdowns will show up in our everyday practices and in the tools we use, opening up new spaces in which we can work and play. Ontologically oriented design is therefore necessarily both reflective and political, looking backwards to the tradition that has formed us but also forwards to as-yet-uncreated transformations of our lives together. Through the emergence of new tools, we come to a changing awareness of human nature and human action, which in turn leads to new technological development. The designing process is part of this 'dance' in which our structure of possibilities is generated."* (Winograd and Flores 1986).

The metaphor of "dance" formed one of the starting points for this study in that the researcher was interested in the interaction between an individual's purposeful activity and technology: the sense of the "dance" between technological capabilities and human activities underpins the interventions described within the action research; Through a consideration of this "dance" the researcher has been able to avoid deterministic approaches to the design of technology, instead approaching design as the interrelationship between, and the evolution of, both human purposeful activity and technological capability. The AFFEKT framework is thus founded on this sense of "dance".

In drawing upon the varied and complex nature of the interventions described within this study, a theme emerges relating to how such a "dance" occurs in practice. This theme draws together the findings from CD:net, the deployment issues involved in using AKM and the literature on design. The theme concerns the way that individuals collectively make sense of each other *through* technology. This theme of *inter-perception* is consistent with the *"dance"* described by Winograd and Flores

and with the social constructionist literature on Knowledge Management technology previously identified as central to this thesis.

In undertaking such emergent design this thesis began from the premise of an existing technological infrastructure which was to be configured or "designed" in order to *phenomenate.* Within this action research project the technology consisted of the underlying programming code for CD:net and the AKM software package. The study thus strongly argues for such systems to be selected and configured on the basis of the capabilities they afford through the concept of affordance.

Such an approach moves us beyond the information systems development methods that emphasise the identification of "requirements" and that essentially map such requirements onto technical design (Avgerou and Cornford 1998; Pressman 2000). Instead we argue that technology should be designed through a process of negotiation between the various capabilities and constraints that are imposed on the intervention. Current approaches to systems design reify the existing purposeful activity of individuals ("what they do at the moment") at the expense of those technical capabilities that might afford benefit if available to the users. AFFEKT, by highlighting the necessity to consider the technological capabilities available, places these technological capabilities at the same (or perhaps a higher) "level" in the analysis and development as the existing purposeful activity. **The overall aim of AFFEKT is to change existing practice so to focus simply on existing practice would be self-defeating.**

This study argues that a consideration of the technological capabilities and constraints possessed by available technologies (e.g. packaged software solutions), and represented by programming design is important. This study shows that such constraints are not simply part of a functional specification but can also be an opportunity for appreciating the context and for undertaking innovative action. The architect Frank Lloyd Wright's "Fallingwater" house was designed for a site located in a valley full of boulders, trees and a river, each of which in some way constrained the design (Larkin and Pfeiffer 1997). Yet within his design these supposed constraints also informed and inspired the architect to design a new form of building that could fit within such constraints. The constraints thus enabled innovative action,

for example in the house the river flows under the building and the boulders form part of the construction and add to the design (Larkin and Pfeiffer 1997). These constraints became significant features of the house and yet a "functional specification" would most likely lead to actions which instead aimed to develop of "solutions" to such constraints (e.g. moving the river and boulders or placing the house on stilts above these problems). **Therefore rather than reducing the impact of the constraints this study argues that they should be considered in depth within the overall systems development so that they may inform the design of the system**. For example, during the development of CD:net, although the Intranet standards constrained CD:net's design they also informed the research as to the structures that the users might initially understand, and the features that they might initially use .

Latent organisational structures, interpretive frameworks, technological constraints and substitute technologies and power structures within an organisation all act to limit the effectiveness of Knowledge Management systems. The development of a "community of practice" proved to be problematic and as such both the CD:net and the SCI:net systems did not immediately become ready-to-hand for their users. CD:net failed to engender the development of a community of Country Directors, and although SCI:net was more successful it was still not hugely successful in that it continued to rely on the UKP science team to act in some ways as a central hub for the communications. One is therefore led to ask why we expect Information Systems to achieve such things so easily. Knowledge Management has been dismissed as a failure because of its inability to engender learning and to share knowledge effectively. Yet definitions of knowledge remain elusive and understanding the process of learning and knowledge creation are highly problematic.

An aspiration of Knowledge Management activity should be the development of Knowledge Management systems that are ready-to-hand and which engender the emergence of "communities of practice". Perhaps we should be satisfied however with approaches that simply improve practices and lead people to innovate. When people purchase artefacts such as a house they expect to have to change things, to decorate, to refit the kitchen, to fit an outside tap etc. When we buy a car we

understand the constraints it imposes; we might be annoyed that it does not have a place to store our sunglasses but we do not consider it a failure. Perhaps we should consider Knowledge Management systems in such a light? The implications of such acceptance would perhaps lead to individuals considering how they might change their practices to reflect constraints in the Knowledge Management system.

9.2.6 Final comments on AFFEKT and on the problèmatique

AFFEKT is the product of experience; it represents the way things were done within the action research and stands in harsh contrast to the "productization" of Knowledge Management into technical systems or consultancy practices that is so evident in the practice of Knowledge Management (Merali and Snowden 2000).

A methodological framework such as AFFEKT takes a significant length of time to develop through practice and fieldwork (Wood-Harper 1989). AFFEKT however is in no way complete. It has been explored through only one full cycle of action research. This thesis therefore takes the first tentative step on the journey towards a systemic framework for developing information systems that support knowledge work. As Checkland asserts "*if, over a period of time and a number of experiences, problems are solved, in the sense that things 'improve' as measured by some agreed criteria, or that concerned people in the situation make themselves feel that insight has been gained or useful changes made, the confidence in the methodology may grow, and we may gradually come to feel that it has been tested and found useful.*"(Checkland 1981). For the SCI:net cycle improvement was achieved since the system was considered to be a success. Further research is now necessary in order to evaluate whether further success is possible.

The AFFEKT framework does not provide a description of how the capabilities of a particular modular Knowledge Management system should be effectively configured. At present the framework simply provides support for making sense of the complexity of the development process, and support in structuring reflection in order to appreciate the problèmatique. It is left to the skill of the developer to translate these reflections of the problèmatique into a developed system. Further research is therefore necessary to extend the framework in order to provide greater support for a Knowledge Management systems' developer.

9.2.7 Contribution to Information Systems

The contribution of this study may be evaluated in the light of the research objectives. The study set out to explore how knowledge management concepts are applied through the introduction of technology and further how this leads to organisational improvement.

The study provided a detailed review of Knowledge Management concepts, and of how these concepts are applied to technology. These concepts were then applied within three action research cycles. Within these cycles individual's interaction with the technology was explored, with the concept of *inter-perception* introduced to better make sense of this. As an outcome of this action research a framework (AFFEKT) was devised that draws on the contribution to the initial research question to present a framework to aid others in introducing Knowledge Management systems.

This AFFEKT framework highlights the disparity between information systems development methodologies which focus on the development of solutions to expressed problems, and Knowledge Management systems for which such expressed problems are not available. AFFEKT thus presents a methodological framework which supports the development of a particular form of information system which traditional methodologies have by and large ignored – technology which does not aspire to have a pre-defined purpose, but rather which aims to support users in exploring the technology's purpose.

This study also contributes to the field of information systems by providing a plausible coherent story of two significant Knowledge Management interventions within a complex organisation. Such research has been called for by (Butler 2002).

9.2.8 Contribution to Practice

9.2.8.1 Direct contribution to the British Council and KM systems plc.

As an action research study a significant contribution to practice occurs within the participant organisation. The study provided organisational improvement to the British Council's knowledge sharing programme in a number of ways:

- The SCI:net project provided a successful pilot Knowledge Management systems for the Science Officer community. Based on the success of this pilot the researcher was invited to return as consultant and implement the recommendations further. The Science team have placed SCI:net's future development as central within their work programme and have been contacted by the FCO science department to discuss further the use of SCI:net within Whitehall. As a sign of their commitment to using and developing the service the Director of Science has appointed a member of staff to maintain SCI:net in the future. The researcher was asked to spend a day training this employee in the technology of SCI:net and the principles underlying the AFFEKT framework.
- The conclusions reached during the AKM cycle of research were fed into the research and development strategy of Knowledge Management Systems plc and led to some significant changes in Version 2 of the AKM product. In particular the AKM product began to be marketed as a modular product. It is the researcher's feeling that this was a direct contribution from this study.

9.2.9 Contribution of the thesis to future practice

The three cycles of action research and the AFFEKT framework offer a series of lessons which will aid future developers of Knowledge Management systems to better develop such systems. The table at the end of the SCI:net chapter outlines suggested actions to improve the way Knowledge Management systems are introduced. The study also contributes to the practice of software engineering and information systems development by identifying a new form of Information Systems development project for which existing approaches are inappropriate.

9.3 Reflections on research method

The aim of any research method within the process of action research is to undertake both action and research. In this way any conclusions and evaluation of the method's validity and usefulness should be made in terms of both its use for research and action.

9.3.1 Evaluation of the research

Myers (Myers 1997) suggests that the evaluation of interpretive research be undertaken in terms of theory and in terms of data. Myers goes further to suggest a set of questions which should be considered in such an evaluation. Drawing on these questions this section reflects upon the study in terms of theory and data, asking Myers questions. The first three questions concern theory:

1. **To evaluate the research in terms of its contribution to the field and as to whether the researcher has developed or applied new concepts or theories.** The research's contribution has been presented above in section 9.2.7 and in section 7.7.1 . A significant need has been identified for empirical research in the area of Knowledge Management (Markus and Lee 1999; Butler 2002). This thesis has described a major real-world intervention in terms of an action research study, and through this action research has critically assessed and evaluated existing approaches to Knowledge Management. The thesis has developed a theoretically and empirically grounded framework (AFFEKT) which should enable others to better understand the complexities of such interventions. The conclusions above are then drawn from a reflection upon all elements of the empirical analysis.
2. **Does the researcher offer rich insights into the human, social and organisational aspects of information technology and their application?** The action research highlights in detail the complexity involved in introducing technology into a truly global organisation. The rich technical and social aspects of this intervention are described and SSM is used to explore a variety of different viewpoints. These viewpoints, identified in both the interviews and through the researcher's own experiences, highlight the complexities of introducing Knowledge Management systems. In particular the researcher has described the messiness and difficulties of undertaking action research thus presenting a rich insight into the process of research. Unusually the description includes both the user's interaction with, together with their perception of, a system, and outlines the researcher's experience in developing the same system.
3. **Does the research contradict conventional understanding and hence provide a richer understanding?** This research aimed to explore in detail

the way that technology was introduced and used as part of a Knowledge Management initiative. The research can be seen as challenging accepted functionalist approaches to the use of technology for Knowledge Management by showing that technology can form a significant part of a Knowledge Management initiative only if consideration is given to the social process of developing and introducing the technology. In line with the literature which calls for more evolutionary and subjective approaches this study explores the use of such approaches, and also operationalises them in order to develop systems and reflect upon the problems experienced. The research thus presents a richer description of how Knowledge Management technology comes to be used within an organisational context than is provided by traditional functionalist views. In this way the study crosses the divide outlined in the introduction between the calls from academics for more evolutionary approaches which highlight the intersubjectivity of knowledge, and the practical concerns of introducing Knowledge Management systems. The research highlights throughout the benefits and problems on both sides and posits AFFEKT as a pragmatic framework for future activity.

The following 4 questions were suggested by Myers (Myers 1997) for evaluating the use of data within an interpretive study:

1. **That a sufficient quantity of data must have been collected for significant insights to emerge.** Myer's use of the term "quantity of data" is a concern for the evaluation of interpretive research, since within such research the term "quantity" is perhaps problematic. A single interview, or even a moment in time, may be sufficient to provide significant insight into the problem situation. The immersive nature of the action research provided a significant interaction with the organisation over a period of years and over fifty interviews were undertaken during this period. The majority of the insight gained, however, emerged from the reflection upon actively participating within an organisational context (around ten diaries were filled with notes). It was not the quantity of data that appeared relevant however, but rather the insight that the data and the experiences provided. The researcher continued to engage with the organisation within each action research cycle until a decision was made that sufficient insight had been gained in order to undertake action and identify the conclusions. As Pettigrew (Pettigrew 1985)

acknowledges, it can be difficult to make such a decision that enough understanding has been gained. Perhaps the researcher should have continued interviewing until no further useful insight could have been gained (Howcroft 1998). When interviewing globally however this would prove to be impossibly expensive. Social phenomena are however *"not homogenous through time"* and thus ending the action research remains an arbitrary act (Checkland and Holwell 1998). Given that the research activity was linked to action taken within the organisation, the research continued until the researcher felt satisfied enough to act or until organisational pressures precluded further research (for example the deadline imposed for the launch of CD:net). Furthermore the time to undertake such interviews was necessarily limited by the timetable set for the ongoing knowledge sharing programme of the British Council. One can argue this point from the standpoint of action research for such an experience provides a description of the general problems faced by an analyst in attempting to implement a Knowledge Management system. The problems of gaining empirical data (as experienced with CD:net) form part of the action research experience, for it demonstrates the real difficulties in implementing systems. It is the judgement of the researcher that the methodology and the area of concern have been sufficiently explored in order to yield significant learning within the area of action research.

2. **That multiple viewpoints and alternative perspectives should be considered.** The central research method employed within this research is that of SSM, in which *"every statement about a human activity system must be a statement about the system plus a particular [Weltanschauungen] associated with it."*(Checkland 1981). The researcher explored the idea of Weltanschauungen throughout the research attempting, as far as possible, to interview subjects through a consideration of their viewpoints. During the SCI:net cycle the researcher worked with the UK science team to identify archetypes among the community and to either interview representatives of these archetypes or, where this was not possible, to reflect upon their potential views. Any attempt to identify a "representative sample" will necessarily be normative, implying well understood divisions within the group under investigation; something which was problematic, for example,

within the first cycle of action research. Furthermore the global nature of the organisation precluded certain groups from direct study, either through the cost of travel, time or availability. Reflection on the Weltanschauungen of those other participants in the research was therefore a key method of ensuring that alternative perspectives were considered.

3. **That sufficient information about the research method and research process should be presented.** Considerable attention has been paid to describing the research method, and this has been undertaken theoretically in Chapter 4 and practically throughout the three chapters on CD:net, AKM and SCI:net. Indeed the researcher devised a framework to structure the reflection about the study which included a reflection upon the researcher's part in the study and upon the impact of the research method. Throughout the research the researcher was led to continuously reflect upon the method and its appropriateness, and to present this reflection within the written study. The AFFEKT framework thus emerged from the researcher's reflection upon the method and processes of the action research interventions and this framework aimed to improve the practice of the action research. Since it has been suggested that *"each action research project, to some extent at least, is unique, and it is difficult to draft general laws about how to carry out such projects."*(Avison, Baskerville et al. 2001). It is unlikely that a comparison can be made between methods among action research projects. Yet the AFFEKT framework (along with the narrative of the action research) does encapsulate the skilled action of the interventions in a communicable form. Reflection upon research method may be difficult, particularly since the inexperienced researcher faces the double challenge of undertaking both research and practice, something many researchers are reluctant to undertake (Baskerville and Wood-Harper 1996; Lau 1997). Yet this is also the benefit of such a study as it is highly appropriate for information systems development (Avison, Wood-Harper et al. 1998), providing an insight into the world of practice as well as drawing lessons from that experience.
4. **The contribution of the research in terms of academia and practice.** The contribution of this research to Information Systems, to practice and to the researcher are described in section 9.2.7 . In addition the practical contribution of the study resides in the action research cycles which describe

the reflection on the practice of implementing Knowledge Management systems and are thus likely to be useful to others attempting similar interventions (Schein 1987).

It is on this basis that the research asserts the value of the contribution of this thesis.

9.3.1.1 Critical consideration of the use of methodology

Much of the use of SSM within the action research was conventional in nature. SSM was employed as problem contextualisation tool and as research enquiry method within the CD:net cycle. The second cycle employed mode 2 SSM (Checkland and Scholes 1990) in reflection upon the lived experience (Scott 2000), while the final cycle employed SSM within the AFFEKT framework approach.

This study was undertaken by a new researcher, trained in the ostensibly positivist epistemology of science through his previous B.Sc. in computer science, grappling with an interpretivist epistemology. The researcher thus entered into the spirit of interpretivist research, adopting an appropriate stance towards Knowledge Management and towards research enquiry. However reflecting upon the choice of method it becomes apparent that this adopted paradigm may have also been problematic. It would appear in hindsight that alternative perspectives, in particular critical realism, if adopted may have provided an alternative, and potentially richer insight. Such insight would not have been similar to, or "better" than, the adopted interpretive approach as each gives rise to a particular way of seeing the world (McGuire 1973) since *"both the product of research...and the process of research...is socially constructed"* (Lee 1999).

Pluralist philosophies such as critical realism argue against the isolation into paradigms of research (as presented by this thesis's methodology's reliance on SSM and interpretive methods), rather they welcome a diversity of paradigms and methods, either for their own sake, as appropriate for particular research questions, or as necessary for research which is trans-paradigmatic (combining a number of epistemologically distinct research methods) (Mingers 2002).

The pluralist philosophy of critical realism appears to be particularly relevant to the problems encountered within this action research. *"Research underpinned by*

pragmatism tends to be case study oriented and aimed at improving practice as in action research or even consultancy" (Mingers 2002). Furthermore the study's approach included the use of diverse approaches with the researcher wrestling to impose these within the overall interpretive approach rather than celebrating them as a core part of method. For example the questionnaires employed in SCI:net were only used as straw-polls because of their positivistic underpinnings.

In contrast to critical realism the adoption of a social constructivist perspective towards Knowledge Management and the hint of agency of technology evident in the cycle of action research also suggests that actor network theory (ANT) (Callon 1986; Latour 1987), while less applicable to the action research elements than SSM, may have enabled greater understanding of the agency of technology and knowledge within the social networks (Law 1992). Furthermore the concept of inter-perception has close parallels with the agency of technology within ANT, and the inseparability and irreducibility of technical, structural and personal dimension (Introna 1997).

In particular the concept of inter-perception of technology may have been better described through the concept of heterogeneous networks. While such an ANT perspective would have proved problematic in this study's pursuit of improvement, for it does not provide significant tools for information systems development, it may have aided in the exploration of inter-perception. The conclusions to the thesis also highlighted the relevance of power to the study in terms of both Inter-perception, and individualisation suggesting further study from a critical perspective may be beneficial.

9.4 Reflections on Researcher

One of the most significant concerns in action research is the lack of a critical voice, and the tendency to act like a consultant reporting what the organisation wants to hear (Gummesson 1988; Avison, Lau et al. 1999). Schein expresses this concern as being too much *"of the organisation"*. The researcher in this study was both *"of the organisation, but not of the organisation"* (Schein 1987). He was treated in many ways like a member of the British Council and afforded the benefits of that status (business cards, desk, car-park pass, 24hr access to the offices, travel budget etc), and yet he was also not of the organisation returning regularly to the University;

focusing on academic literature in the field of Knowledge Management rather than being drawn to management literature; questioning and reflecting upon his research methodology. The researcher was also not paid like a consultant or member of the organisation, receiving a relatively modest sponsorship rather than consultant's wages. The ways in which the researcher was "of the organisation" were ultimately not as important as the ways the research was not "of the organisation" for it was this detachedness which was central to the contribution of the action research both to the organisation and to the academy.

One of the main contributions made by the Ph.D. study was to develop the research skills of the researcher. When the research began the researcher was a naïve computer scientist secure in a world of technological solutions and unaware of his own epistemology. The process of undertaking this research changed him into a questioning insecure sceptic, ever challenging the socially constructed nature of the world and never secure in the nature of solutions. The thesis was on one level an exploration of confusion to structure (in the nature of the research), and from structure to confusion in the mind of the researcher. In this way the researcher was greatly changed by the personal learning evident in action research (Revans 1988).

One of the most significant challenges was to construct a coherent plausible thesis out of the incoherent messy and rich life-experience of the action research. The thesis is long, rambling and in places the argument is poorly expressed, for that is the nature of a researcher struggling to draw coherence from something which, while planned, was buffeted and altered in its undertaking. While the thesis must be expressed in the linear fashion of text, sensemaking is retrospective and not limited to linearity (Weick 1995), and hence the action researcher is forced to retrospectively make sense of their experience in order to construct a plausible coherent story (Checkland 1981). In this way the researcher cannot claim positivistic truth, but only plausibility. Writing an action research Ph.D. is perhaps simply another cycle of the ongoing research activity.

9.4.1 Suggested future research

This thesis considers how Knowledge Management technology is deployed and used; in this it proposes the AFFEKT framework to aid such technology's development

and use. The British Council is a unique global organisational context, and hence this research's findings refer to a unique setting and context. Since the AFFEKT framework emerged from intervention in this unique organisation it would be interesting to research its use within other organisational forms.

One of the key developments in information systems has been the rejection of objectivist approaches and the development of more phenomenological approaches. However interest in Knowledge Management has floundered through its acceptance of ostensibly objectivist notions of knowledge and information. This Ph.D. does not explicitly develop the Knowledge Management agenda, but rather challenges its very basis, exploring why organisations constantly return to simplistic definitions based on knowledge and information when attempting to support and improve highly rich and complex activities such as innovation and learning. In response the conclusions to this thesis present a new form of information systems development which better represents the needs of this form of social constructivist Knowledge Management project.

Building upon the findings of this study, it is suggested that future research consider that a cause of such simplification is the inability of organisations to appreciate and describe the "sense of concern" which led them to explore Knowledge Management as a route to improvement (this thesis began such exploration through its use of the word improvement as a boundary object in such regard). By resorting to objectivistic enquiry techniques such as taxonomies or knowledge modelling in describing their Knowledge Management issues, organisations are clearly led towards simplistic technological solutions to such poorly understood concerns. To counteract this problem it is suggest that further research explore the concept of appreciation (Vickers 1970) and inter-perception, utilising alternative approaches to the AFFEKT framework as a means by which this *area of concern* may be systemically explored. The researcher believes that future research into engaging the employees of an organisation in a journey of appreciating the complexity and interrelated nature of their individual "problems" may lead to wider improvement through technological means. (The researcher is beginning such exploration through their involvement in

Phronesis[19] at Salford University). Such research would essentially remove the researcher from the role of director/developer within AFFEKT to a role of facilitator with users acting as action researchers or action learners (Revans 1988).

This suggests future research in developing systemic and pedagogical approaches, embedded within technological artefacts, which may aid individuals to undertake this journey to appreciate their problèmatique, area of concern and route to improvement. The formalisation and documentation of such reflection-on-action (Schön 1982) is similar in process to the forms of action research or action learning undertaken within this thesis.

It is suggested that further research consider if, through technology, it is possible to engender professionals to "research" their personal problèmatique using systemic methods, essentially engendering all users to participate in a personal AFFEKT cycle of reflection. Could such professionals then collectively act upon the findings for organisational improvement through Knowledge Management? In this way groups and communities could collectively undertake a form of action research to improve their knowledge practices, similar to the self development of "community of practice" (Wenger, McDermott et al. 2002).

Such research would contribute further to debates on research methods, potentially exploring the encapsulation of various aspects of an interpretivist methodology within an end user technological solution. This future research would also contribute to Knowledge Management and organisational learning, questioning the role of technology in objectivist views of knowledge sharing, and suggesting a route through technology towards understanding.

9.5 Final Conclusions

This thesis began with the desire of an organisation to improve. It ends also with a desire to improve – the desire of a researcher to explore further the way technology is introduced and used within organisations.

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[19] Phronesis: The centre for appreciative systems. http://www.phronesisresearch.org/

It appears that if organisations are to truly achieve the benefits promised by Knowledge Management there is a need to re-evaluate approaches towards design of the technical artefacts which mediate the social world of organisations. This study presents one approach to such design in the form of the AFFEKT framework in which technology is continually co-evolved in use. This framework is an attempt to integrate the inchoate elements discovered in the action research of this thesis into a coherent form which may be resonant with others experiences.

APPENDIX 1: EXAMPLE RICH PICTURES

This section includes a selection of the Rich Pictures drawn for the thesis. These rich pictures formed a significant part of the analysis. Around thirty rich pictures were produced in total. Each was drawn in hand on an A3 sheet of paper.

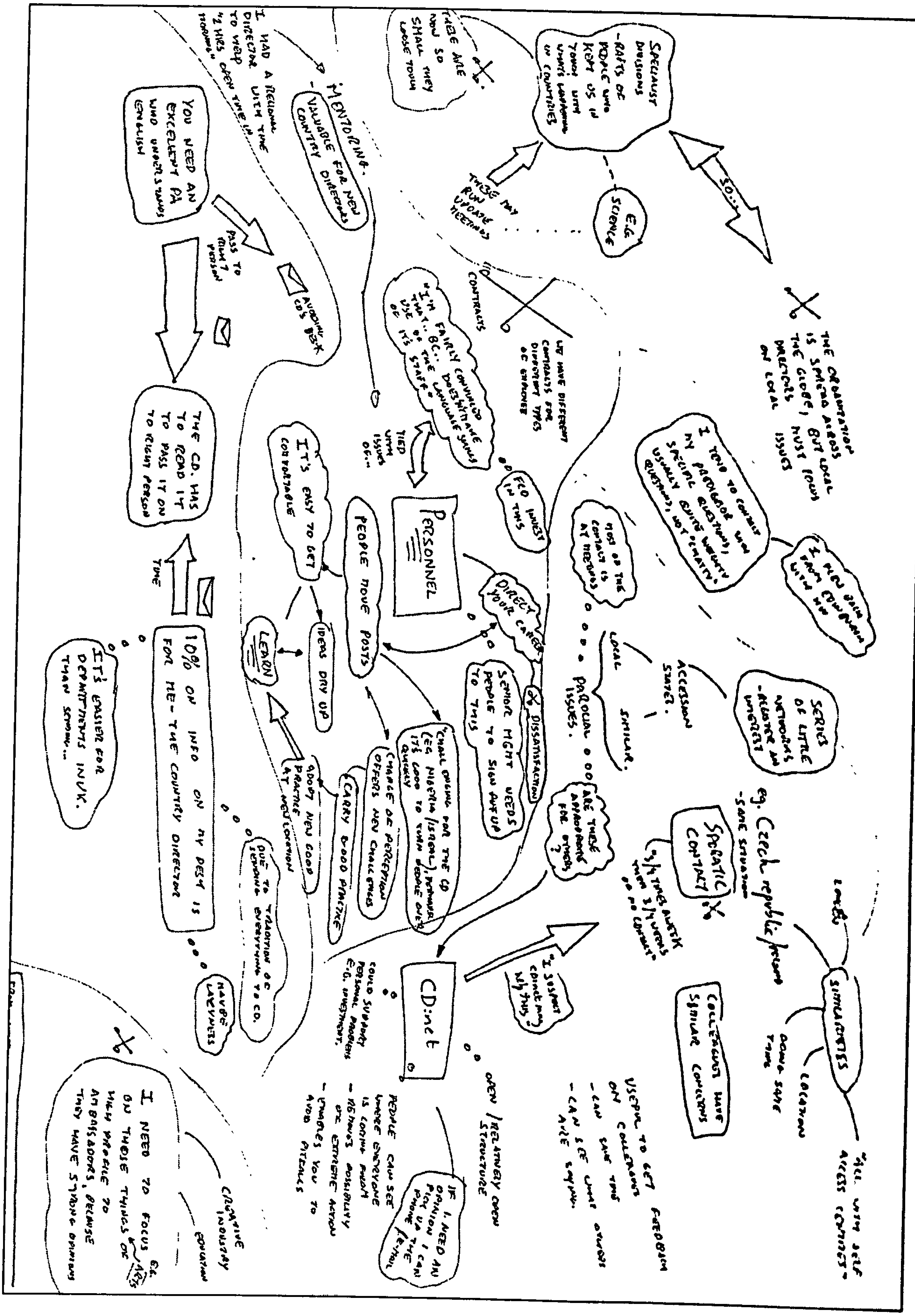


Figure 33: Rich picture of Country Director's experiences

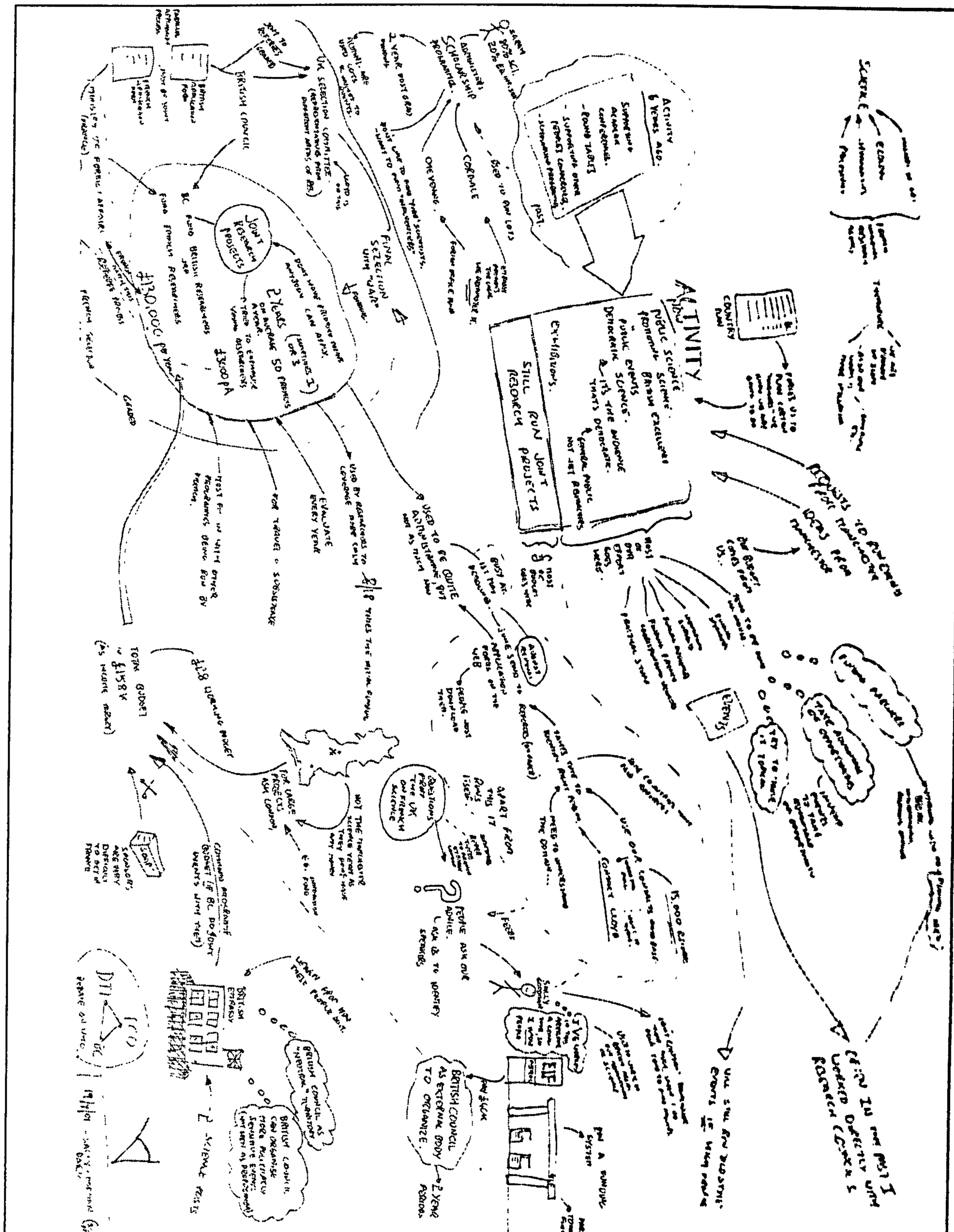


Figure 34: Rich picture of overseas Science Officers' activity

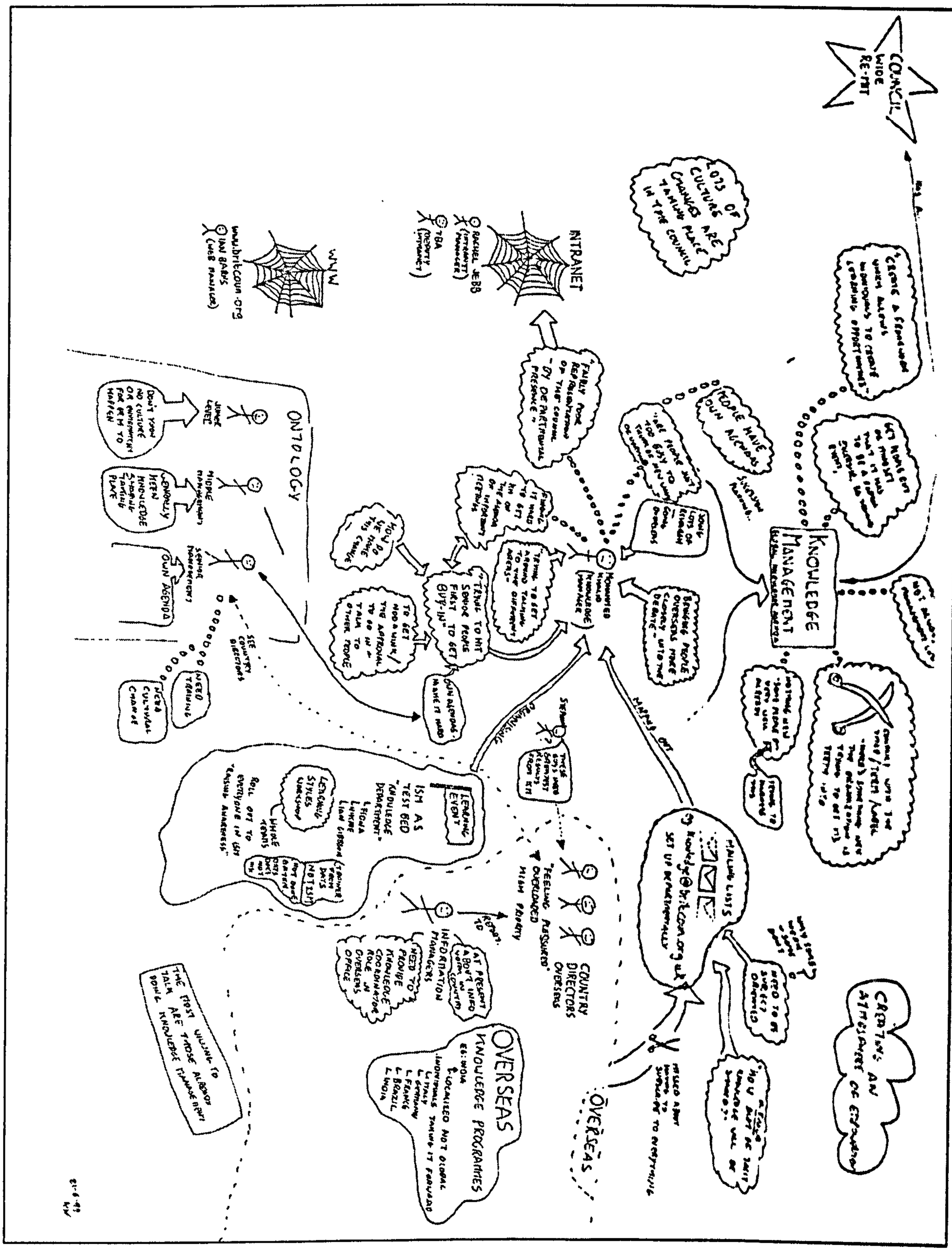


Figure 35: Rich Picture of Knowledge Manager's activity

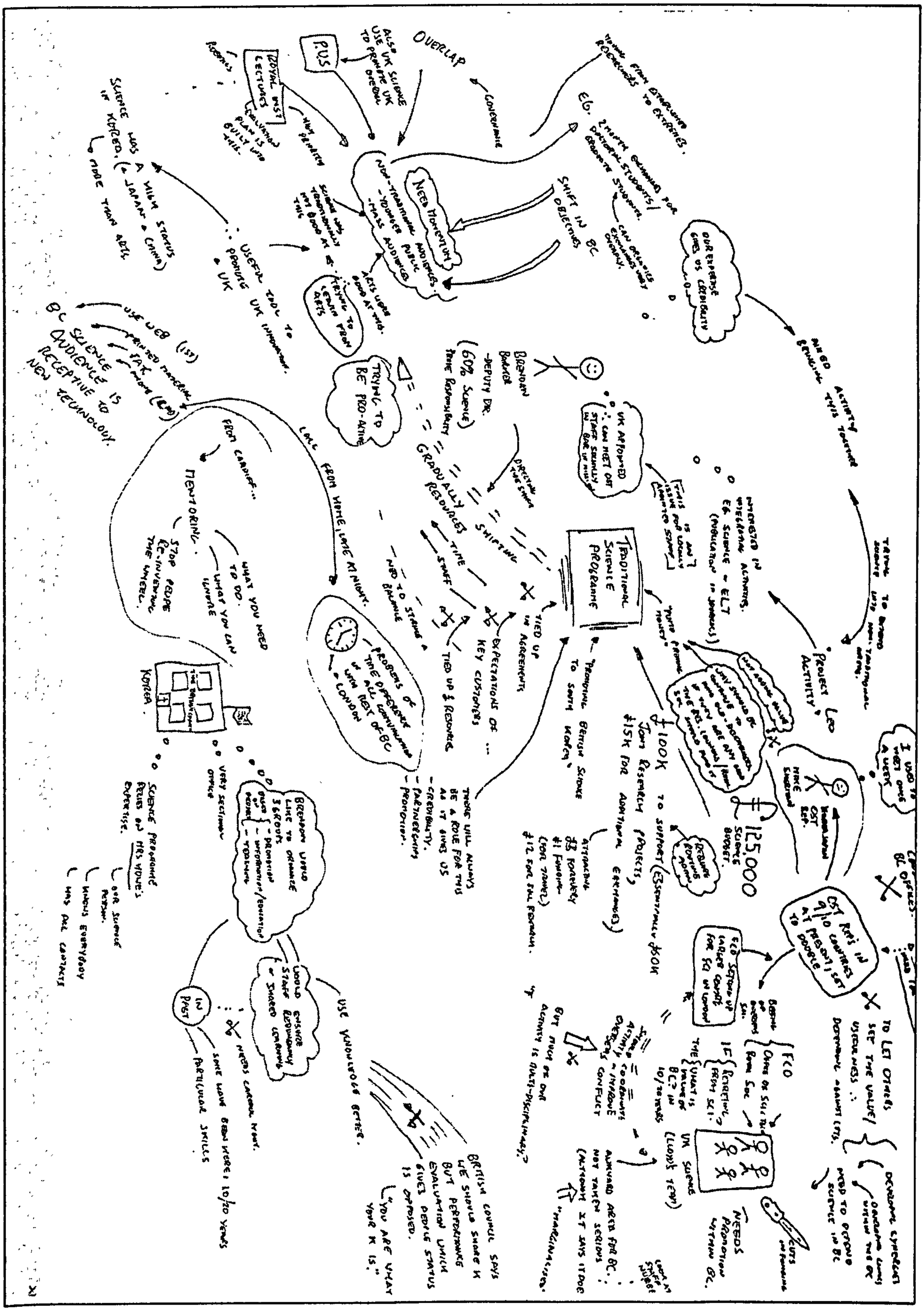


Figure 36: Rich Picture of Science Officers activity

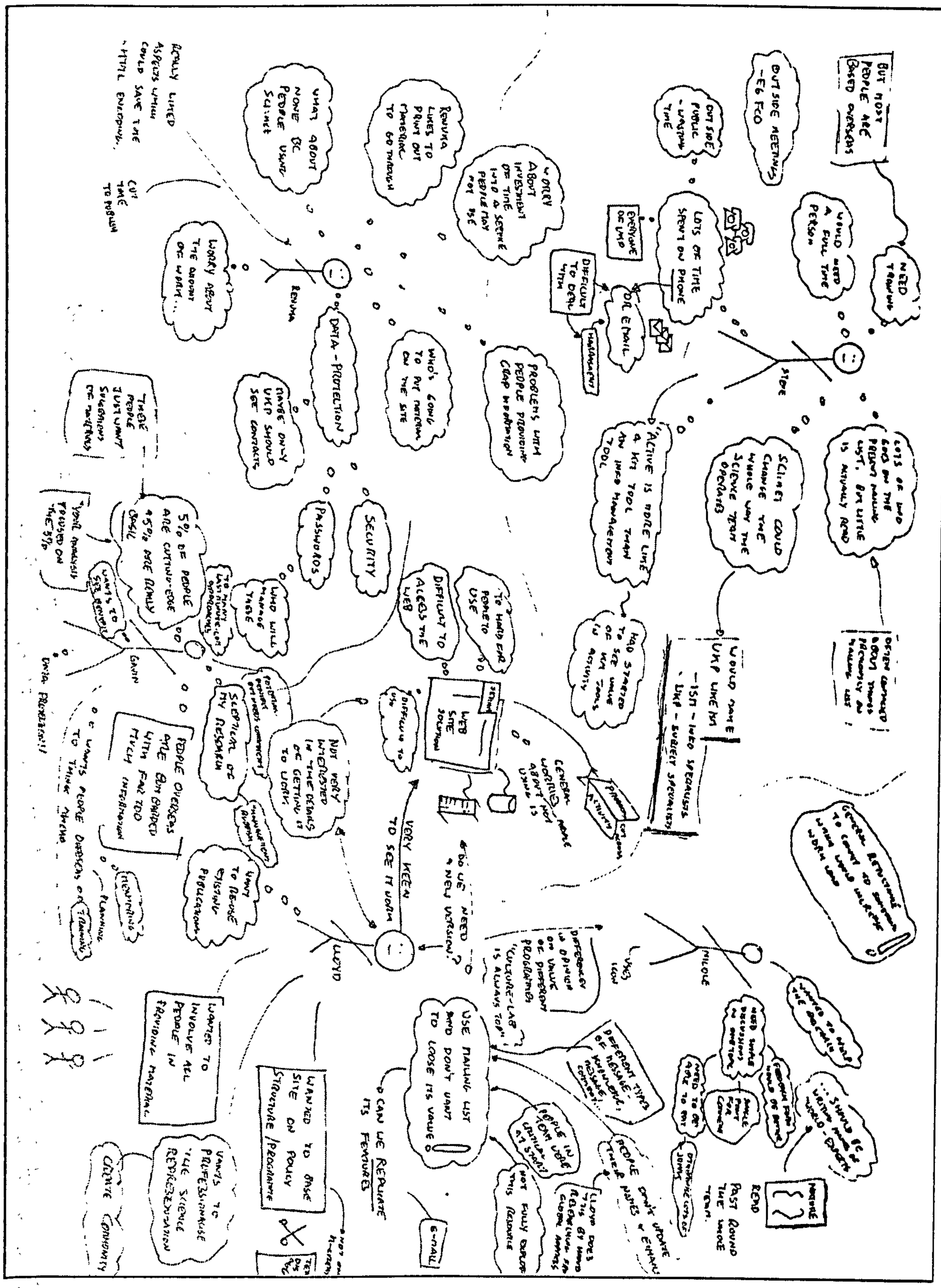


Figure 37: Rich Picture of UKP Science team's use of technology

APPENDIX 2: SCI:NET QUESTIONNAIRE RESULTS

During the SCI:net research cycles two questionnaires were issued with the aim of gaining some understanding of the support for the systems. These questionnaires were not intended to strongly inform the researcher but rather to gain a "straw poll" of some Science officers' opinions within the interpretive study. Their use is discussed in greater detail within the relevant chapters. The survey instrument used was drawn from Satzinger (Satzinger and Lorne) and explored the perceptions of users towards groupware tools. The questionnaire was asked immediately following the Cardiff Science update conference and a year later at the Guildford Science update conference. At the Guildford conference additional qualitative questions were added which explored the Science Officers perceptions of the launched SCI:net service.

The survey asked for responses on the following scale:

LIKELY Extremely Quite Slightly Neither Slightly Quite Extremely **UNLIKELY**

The following questions were asked (Satzinger and Lorne 1995):

Q1	Overall, this type of computer support would be useful to my workgroup.
Q2	Overall, this type of computer support would make my workgroup more efficient
Q3	Overall, this type of computer support would make my workgroup more effective.
Q4	Overall, my workgroup would welcome this type of computer support.
Q5	Using computer support would make my group work easier.
Q6	Using computer support would improve my job performance.
Q7	Using computer support would enable me to accomplish my group work more quickly.
Q8	Learning to use SCI:net would be easy for me.
Q9	I would find it easy to get SCI:net to do what I want it to do.
Q10	My interaction with SCI:net would be clear and understandable.
Q11	I would find SCI:net to be flexible to interact with.

Q12	It would be easy for me to become skillful at using SCI:net.
Q13	I would find SCI:net easy to use.

Post Cardiff the questionnaire was distributed using the Science e-mail list and completed on-line. Of the forty or so members of the mailing list nine completed the form. The Guildford questionnaire was distributed at the Guildford conference and nineteen responses were received. The results are shown in Figure 38.

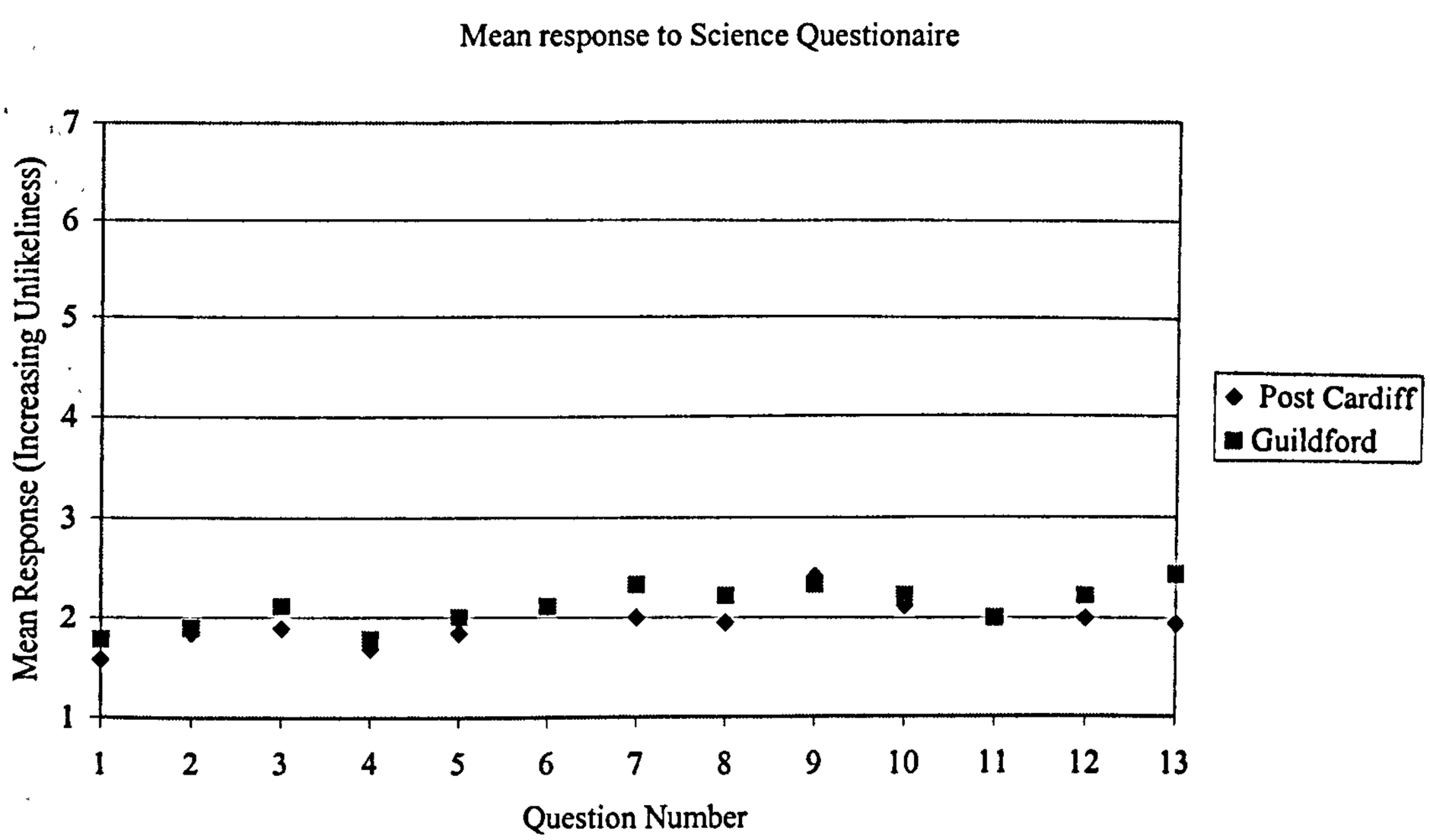


Figure 38: Responses to Science Questionnaire

These results cannot be interpreted as a description of the views of the Science Officers, however it is interesting to note that there appears to be no noticeable change between the conferences and that the staff who returned the survey made a positive response.

APPENDIX 3: TABLE OF RESEARCH ACTIVITY

This appendix provides an indicative outline of the key documents, interviews, meetings and activities undertaken by the researcher. The table is a post hoc selection of key events which provides a flavour of the research activity.

Type of Encounter	Job Title / Role / Team in attendance	Date	Location	Description
ISM Away Day	Key members of ISM	27/10/1998	Manchester	First encounter with the British Council and ISM
Paper distributed	Authored by deputy head and head of ISM	1/1999		This paper introduced KM issues to the organisation prior to the meeting on the 28/1/1999.
Strategy Meeting	Meeting chaired by CKO. Attended by many key members of the organisation and some external experts.	28/1/1999	London	First Meeting to consider role of Knowledge Management in the British Council. This meeting introduced Knowledge Management to the British Council.
Planning Meeting for Research.	Knowledge Manager	4/2/1999	Manchester	Agreement over researchers place within the Knowledge Management Team
Induction Programme- Training Course	New Staff	4/1999	Manchester	Training programme for new employees
Induction programme for ISM	New Staff	5/1999	Manchester	Training specific to working in the ISM department
First meeting of the Knowledge Board of the BC	CKO, Knowledge Manager, World-Bank Representative, ISM Director, ISM Dept Director.	~6/1999	London	Preparing the Knowledge Sharing Strategy for the BC prior to its presentation to the SMG
Workshop	Knowledge Manager, Information Managers from across the globe.	28-29/9/ 1999	Madrid, Spain	Workshop to consider Knowledge Management for the British Council overseas.

Interview	Country Director - Spain	29/9/1999	Madrid, Spain	
Interview	Director of Education	29/9/1999	Madrid, Spain	
Consultation through Web	CKO	7/10/1999		The CKO launched a on-line consultation regarding CD:net
SMG Board Meeting	CKO, SMG (Research not in attendance)	22/10/1999	London	CKO presents the Knowledge Sharing Strategy to the SMG and gains agreement.
Intranet Workshop	Intranet Managers from across the organisation	8/12/1999	Manchester	3 day long workshop to consider the role of the Intranet in the organisation.
Intranet Board Meeting	Key staff in the organisation.	14/12/1999	London	The Researcher sat on the Intranet Board, responsible for Intranet Strategy.
Agreement	Knowledge Manager	26/1/00	Manchester	Agreement reached as to researcher's leading of CD:net and SCI:net
Agreement	CKO	21/2/2000	London	Agreement from CKO as to role of researcher in CD:net and SCI:net
Interview	GTI Director, Future Country Director	21/2/2000	London	
Interview	IT Infrastructure Manager	21/2/2000	London	
Short Interview	Country Director – Sierra Leone	2/2000	Manchester	
First Meeting with AKM	AKM User Group	17/3/2000	Harrogate	During drinks at the end of this meeting the research introduced his research to the CEO of KM Systems.
First Meeting of CD:net Project Team	Consultant, Knowledge Manager, Researcher	12/7/2000	London	
Meeting	Consultant	21/7/2000	London	
Interviews	Various members of Policy Directorate	7/2000	London	At this time a large number of interviews were undertaken with members of the Policy Directorate and other key staff
Meeting	Consultant ,Knowledge Manager	3/8/2000	London	Agree on plan of action and roles and responsibilities for CD:net
Interview	Consultant	~8/8/2000	London	Interview on role of Country Director with the Consultant
Interview/Meeting	Consultant	17/8/2000	London	Discussion and interview focused on the CD:net tool
Meeting	Director of Science	8/8/2000	Manchester	This meeting included a presentation of the

				development version of CD:net
Meeting	Knowledge Management	29/8/2000	Manchester	Discussion of the problems of contacting Country Directors.
Launch of CD:net	Knowledge Manager	1/9/2000		Launch of the CD:net service
Meeting	Consultant	11/9/2000	London	Agreement on approach for CD:net promotion.
Interview	Director of Singapore	12/9/2000	Manchester	
Meeting	CIO, CEO, Sales team of KM Systems.	21/9/2000	Harrogate	Start of the AKM cycle with agreement for research activity
Meeting	Consultant	23/9/2000	London	Discussion on slow death of CD:net
Interview	Director of Slovenia	26-27/9/ 2000	Slovenia	Interview with country director. Initial research for SCI:net
Meeting	Director of Science	1/10/2000	Manchester	Initial meeting to discuss SCI:net prior to Conference.
Conference	40 Science Officers	4-9/10/2000	Cardiff	SCI:net conference, including meetings with a number of science officers and presentation.
Meeting	Knowledge Manager	17/10/2000	Manchester	Job Description for SCI:net agreed
Meeting	HCI person from AKM.	18/10/2000	Manchester	Discussion on workplace portals for AKM cycle
Workshop on AKM	Prof, GEMISIS PhD Researchers	21/10/2000	Manchester, GEMISIS	First workshop on AKM.
Meeting	Knowledge Manager	5/12/2000	Manchester	Discussion on restarting CD:net.
Agreement to Use AKM software for SCI:net	KM plc	6/12/2000	Harrogate	
Meeting	Consultant, Knowledge Manager	11/12/2000	London	Decisions to hand over CD:net to consultant.
Executive Workshop	Dave Snowden of IBM	12/12/2000	Oxford	Very senior BC staff present at this workshop
Workshop on AKM	Prof, Consultant, Researcher	19/12/2000	GEMISIS	This day workshop focused on analysis of the AKM product
Interview	Director of Science	21/12/2000	Manchester	
Interview	English Language School Manager	6/1/2001	Budapest, Hungary	Significant insight into the use of Science Materials
Interview and Lunch	Country Director	8/1/2001	Budapest, Hungary	
Interviews	6 interviews with staff in the Budapest Office	9/1/2001	Budapest, Hungary	

Interview	Science Assistant	10/1/2001	Budapest, Hungary	First direct interview with a science officer working overseas.
Preparation of AKM document		16/1/2001	GEMISIS	Presentation of the draft AFFEKT framework. Decision to use AFFEKT for SCI:net
Interview	Science Consultant	~20/1/2001	Manchester	First Interview
Questionnaire	Director of Science, all science officers	23/1/2001		Distribution of initial questionnaire for SCI:net
Interview	Science Consultant	24/1/2001	Manchester	First Interview
Breakfast Meeting & Seminar	Prof. Etienne Wenger	25/1/2001	Salford University	Further elaboration of Communities of Practice focus of the work.
Interview	Science Consultant	28/1/2001	Manchester	
AKM User Group Meeting	AKM Users	1/2/2001	Harrogate	AFFEKT takes further shape and begins being used to construct SCI:net
Interview	Science Administrator	2/2/2001	Manchester	
Interview	Science Officer	19/2/2001	Paris, France	
Interview	Science Officer 2	19/2/2001	Paris, France	
Interview	Science Assistant	19/2/2001	Paris, France	
Interview	Country Director	19/2/2001	Paris, France	
Interview, Dinners, Work-shadowing, British Council Events	Science Officer /Deputy Director	23/3/2001	Seoul, South Korea	Spent one week with this science officer, and interviewed all his staff; key figures in the office and attended various functions.
Interview	FCO Science Attaché	~25/3/2001	Embassy, Seoul, South Korea.	External view of the BC science officers from overseas.
Interview	Country Director	25/3/2001	Seoul, South Korea	Significant interview reflecting on CD:net
Meeting	Director of Science	25/4/2001	Manchester	Agreement for use of AKM in SCI:net
Meeting	Knowledge Manager	2/5/2001	Manchester	Discussion on progress of SCI:net and agreement for support.
Contract Agreement	AKM and BC	14/6/2001		Contract signed for use of AKM systems for SCI:net (the system was already in

				development at this point.)
Doctorial Consortium		7/2001	Slovenia	This crystallised some of the significant development of AFFEKT within SCI:net.
Interview	Director of Science	3/7/2001	Manchester	
Week with Science Team developing SCI:net	Science Team	16-20/7/2001	Manchester	
Discussion	Science Team	30/7/2001	Manchester	Presentation of completed development and discussion of changes.
Launch of SCI:net		8/2001		Second cycle of AFFEKT begins.
Questionnaire	(sent by Director of Science).	12/9/2001		Second questionnaire for SCI:net distributed and invitation to use the service sent out.
Meeting	Director of Science	9/10/2001	London	Preparation for conference
Conference (Science Update)	Science Team & around 30 Science Officers	1-2/11/2001	Guildford, UK	This included a half-day workshop focusing on AFFEKT
Meeting & Lunch	Director of Science	19/12/2001	London	Agreement on action to change SCI:net following conference.
Final cycle of AFFEKT	Further development and launch of SCI:net.	23/1/2002	London	The SCI:net system is further developed.
Solicit Material via telephone.	Science Officers in Russia, Italy, Australia, UK...	23/1/2002	London	The service was populated.
Meeting	Director of Science	7/2/2002	London	Handover of altered SCI:net with provision of support
Workshop with staff appointed to manage SCI:net	New Staff Member	15/8/2002	London	Workshop to acquaint new staff member with the AFFEKT development approach for SCI:net

APPENDIX 4: EXAMPLE ROOT DEFINITIONS AND CONCEPTUAL MODELS FROM SCI:NET

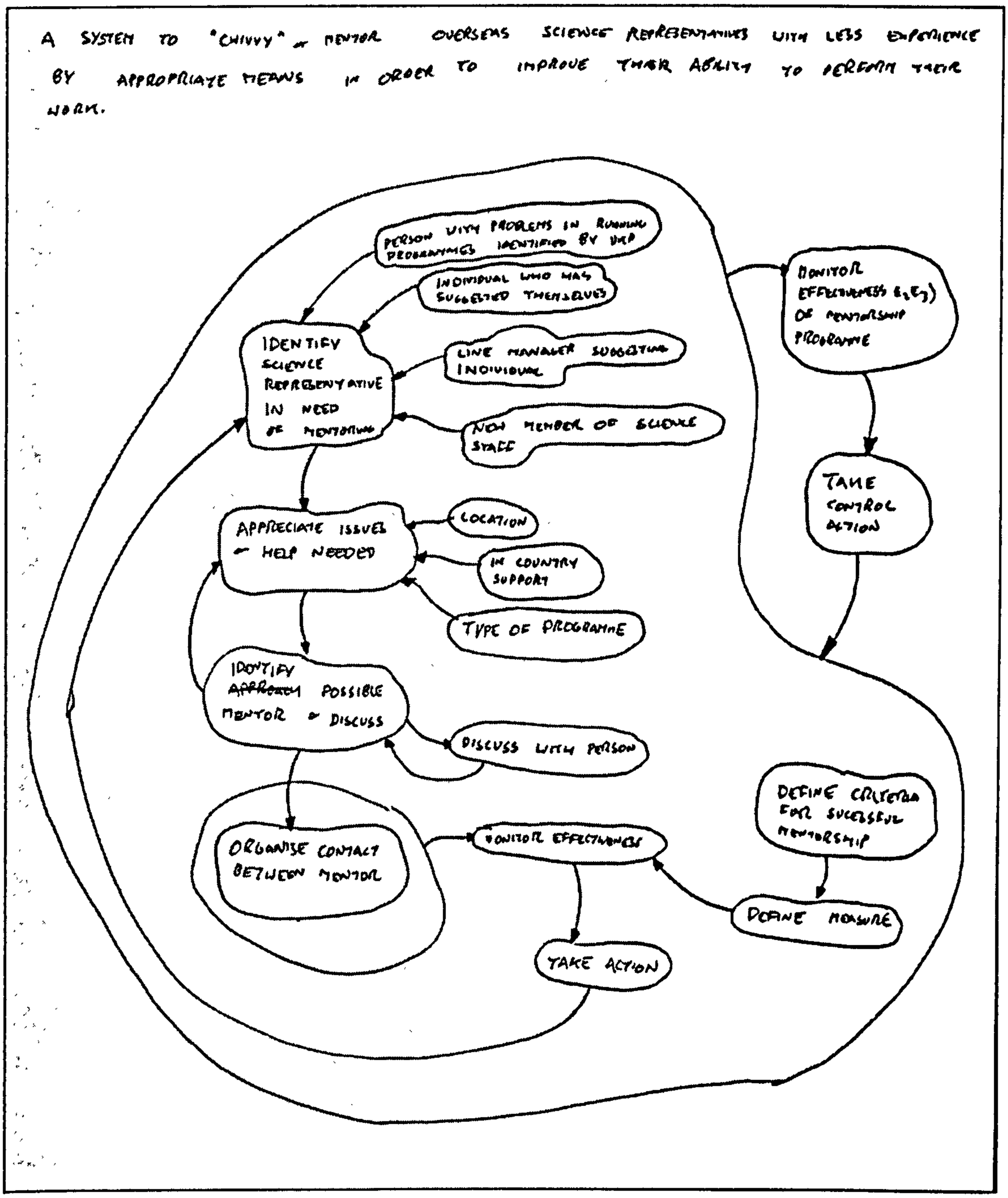
4.1: Introduction

This appendix provides a selection of root definitions and conceptual models produced during the SCI:net cycle of action research. During the complete study around 20 such models were produced.

4.2: Mentoring

The aim of this "system" is to mentor overseas science officers who have less experience by assigning a relevant science representative who has significant experience to them, and introducing these two. Once introduced the progress of the mentor and trainee should be monitored and effective action taken if problems occur.

It is envisaged that very senior and experienced science officers undertake the administration of such an activity. This could include "Londoners" and "moved on" staff.



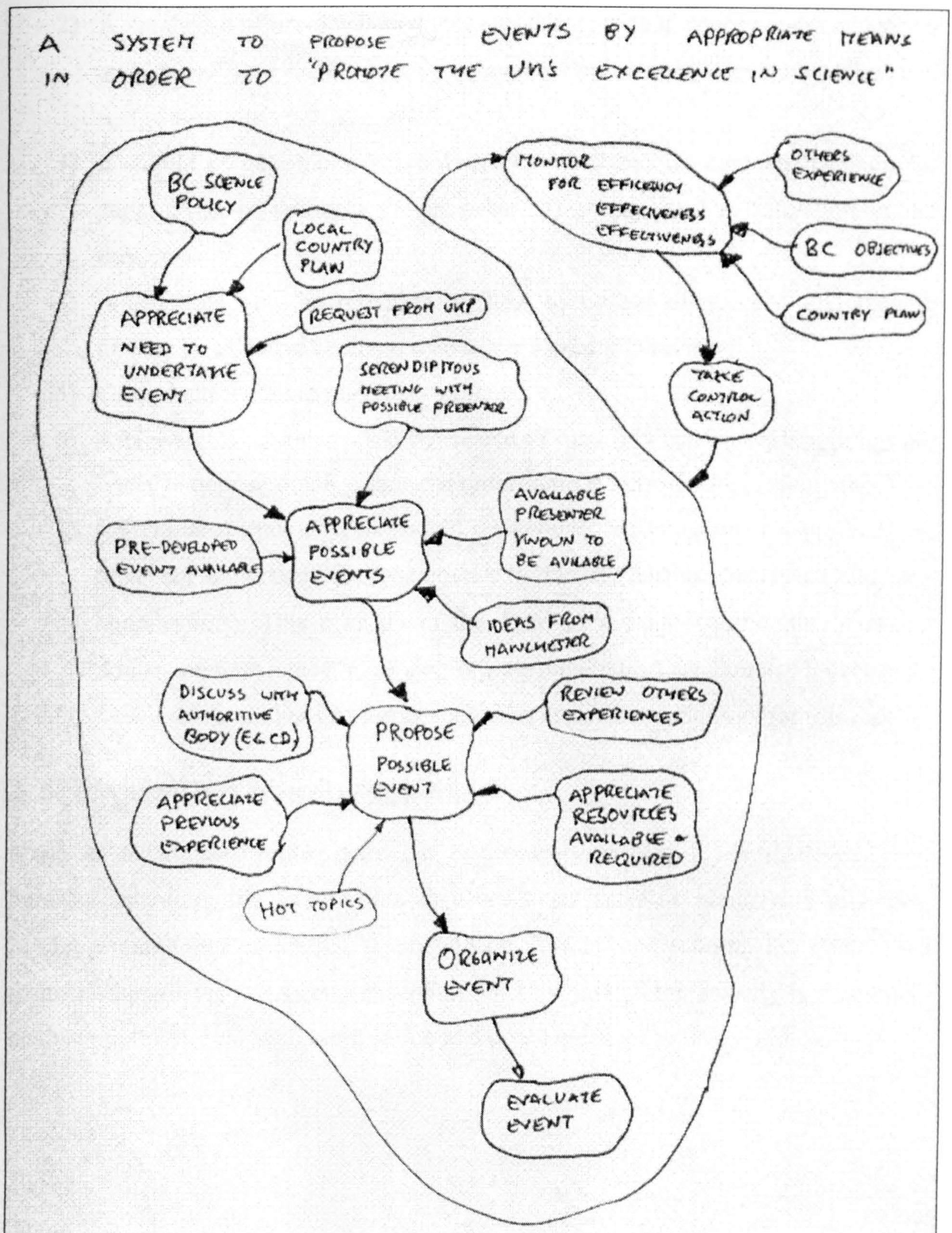
Recommendations from this conceptual model to be applied to the design of SCI:net.

1) Promotion of the concept of "Mentoring", for example a policy document on mentoring to be disseminated via SCI:net, "Science Update" meeting and e-mail.
2) An electronic form on SCI:net to register Science Officers to be mentor or trainee, including details of experience and background.

3) New staff should be asked to complete a larger form which includes the registration for a mentor, along with details to register for SCI:net.
4) It is suggested that for this to be achieved each country actively involved in science promotion should have a page containing details of staff (with backgrounds) and the programme they are operating. This would allow the coordinator to assign appropriate mentors more easily.
5) The coordinator should be assisted with a diary to follow up the mentoring relationship for monitoring how people are getting on. (Microsoft Outlook could be used in this task).
6) In order to assess the effectiveness of the mentoring programme, it is suggested that SCI:net could include an electronic questionnaire for mentor and mentee. The coordinator would simply need to send an e-mail to ask the pair to complete the form. (This could be done automatically using an electronic workflow or diary application.)

4.3: Proposing and designing events/activities

One of main activities that takes a large amount of science officers' time is the designing and proposal of planned activities. Such activities may be sparked because of a possibility of booking resources, a serendipitous meeting with a good speaker, a previous commitment, joint work with embassy mission etc. However in designing the event a number of complex activities have been identified (see figure below). In order to support this through Knowledge Management practice the problem has been further sub-divided into lower levels of complexity: organising the event, identifying speakers, monitoring impact. Each of these is considered below.



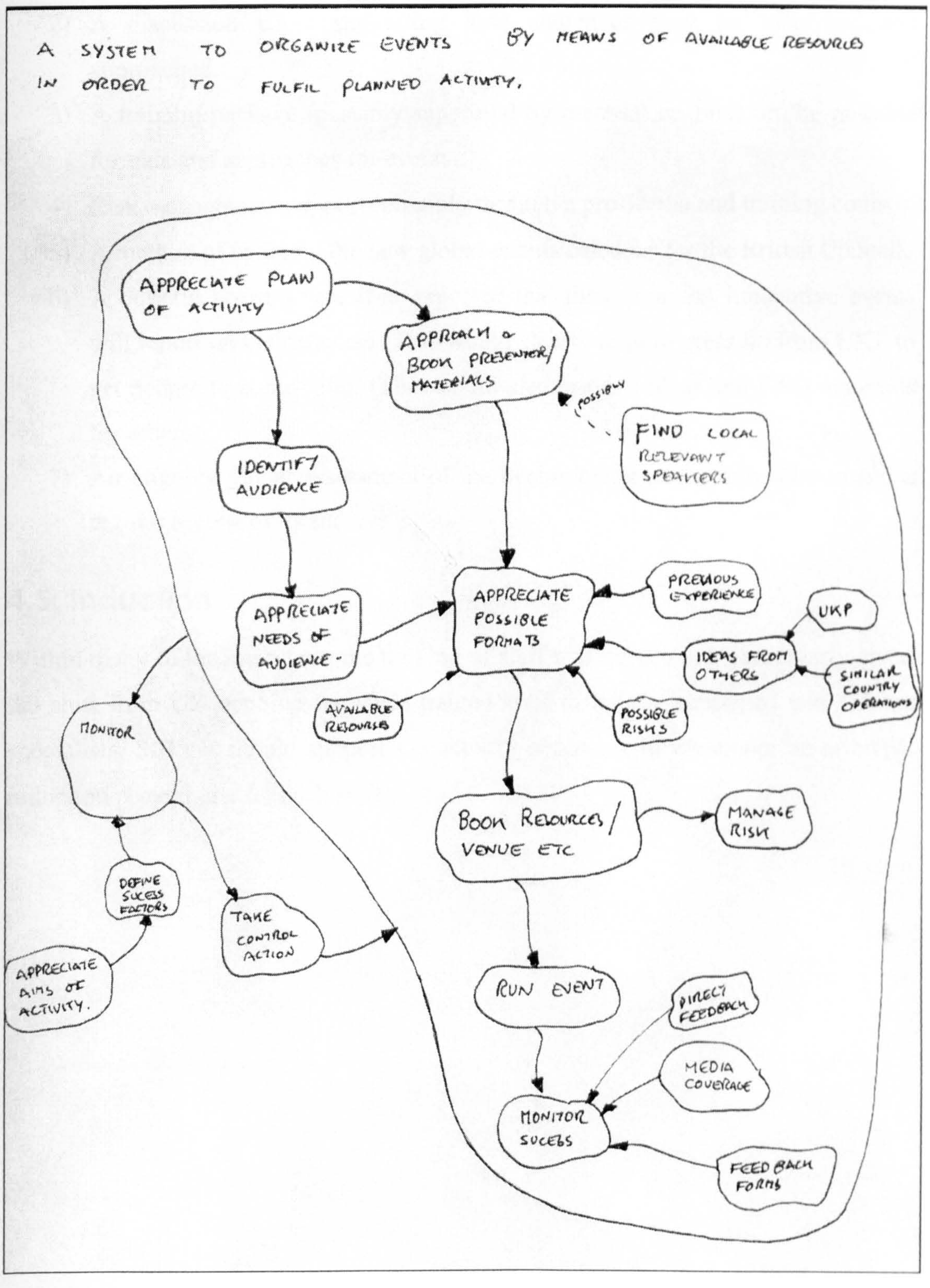
Recommendations for SCI:net design

1) British Council science policy documents should be available to consider the events impact on the objectives.

2) A catalogue of pre-developed successful events (e.g. innovations) should be available. These should include documents on how these events worked and tips to consider.
3) It should be possible to liaise with a coordinator of a contacts database for suggestions of speakers for an event. This may lead to alteration in the design.
4) Information may be provided on how to budget effectively, and how to present an effective business case to the Country Director.
5) Cross-sectorial ideas may be catalogued.
6) A Hot-topics calendar could be created to suggest when interesting things are likely to happen in UK science in order to tie events in with current affairs.
7) Individual science officers should review events run against the proposal for the event and present their experience to relevant parties (particularly for very large events). This may be in the form of lessons-learnt / good-news, a discussion with a mentor, or simply a personal report for Country Director.
8) That a score-card or pro-forma should be available on SCI:net for this task.

4.4: Organising events/activities

Once an event has been proposed, it is necessary to plan the intricate detail of actually operating the event. This involves tasks such as identifying audience, booking materials / presenters, organising the format, and running the event. (See figure). Knowledge Management support for this part of the activity is suggested, such support focuses much more on the practical aspects of running such activity.



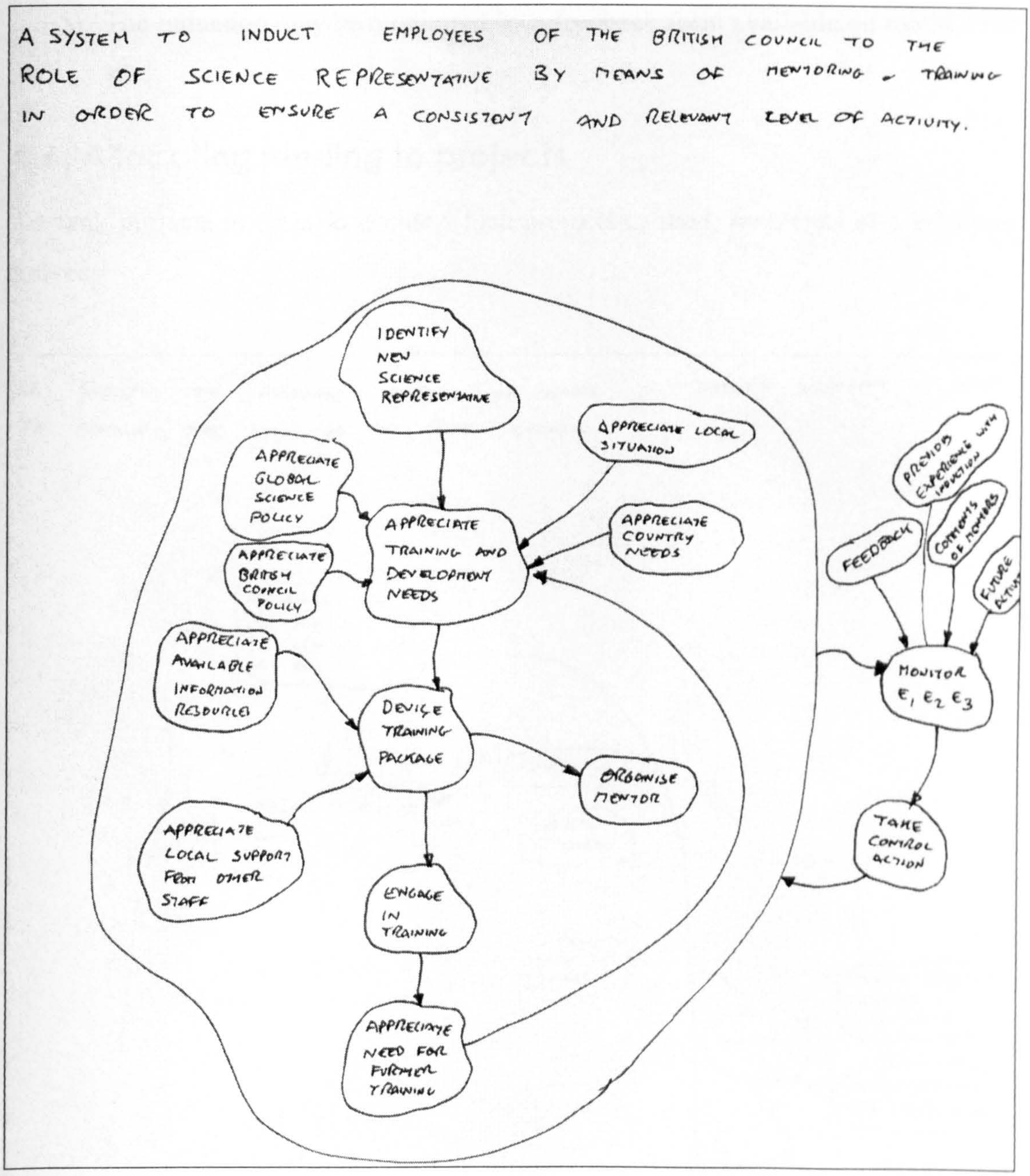
Recommendations for SCI:net design

1) A "frequently asked questions" page which may be searched to find specific recommendations.

2) A discussion paper suggesting how audiences may be identified and approached.
3) A training package (possibly supported by material on-line) on the possible formats and approaches for events.
4) Risk management support (possibly through a pro-forma and training course).
5) A method of updating the new global-events calendar for the British Council.
6) A bulletin board where it is expected that those running innovative events will report on their success (This would clearly require pressure from UKP to get people to contribute). (This would also provide ideas and FAQ materials for others).
7) An ongoing global assessment of the events being run within science and a regular review of its success.

4.5: Induction

Within many of the interviews the training of staff was mentioned, particularly given the shift from UK appointed science trained staff to locally appointed non-science specialists. SCI:net should support the activity necessary to undertake an effective induction programme for such staff.



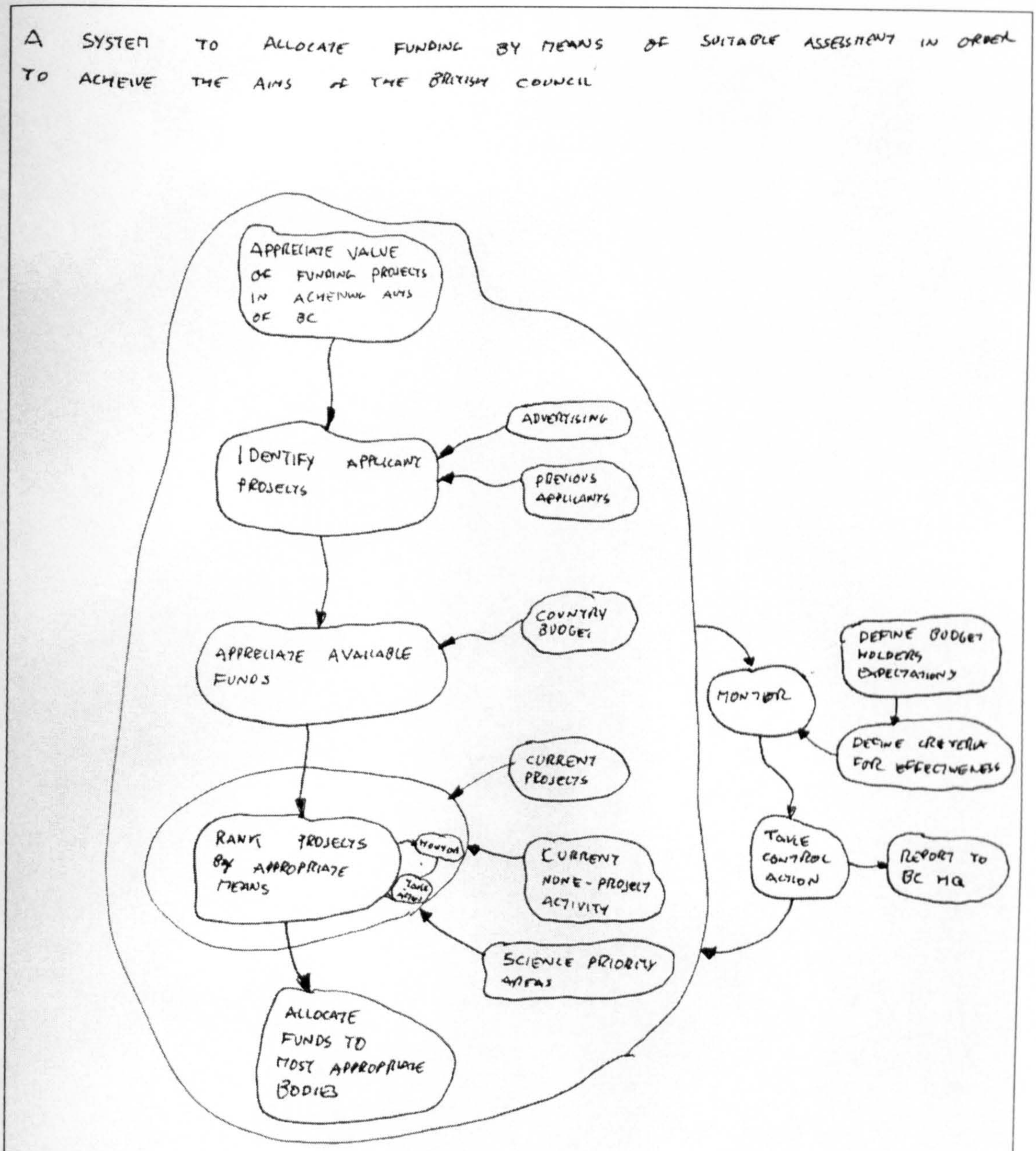
Recommendations for SCI:net design

1) SCI:net should include a "news" section in which it is announced when new representatives are recruited.
2) Contact should be made with a new science representative and their line manager to discuss the local situation and, job needs and outline British Council policy.
3) A training package should be created which points to specific areas of the SCI:net service which the new representatives should read and review.
4) The new science representative should be introduced to the mentorship system (again supported by SCI:net).

5) The induction may be monitored by a feedback form available on the SCI:net site.

4.6: Allocating funding to projects

To rank projects in order to decide which projects to fund, by means of a selection process.



Recommendations for SCI:net design

1) Discussion and training section on identifying possible projects.

2) Accountancy and budget advice, including tips on budget planning for country plans.
3) Discussion and possible pro-forma documents on allocating funds and best-practice for this task.
4) Discussion and training section on expectations of budget holders and planning and control of the allocation process.

APPENDIX 5: GLOSSARY

Acronym	Description
ADSL	Asymmetric Digital Subscriber Line – A broadband internet connection through a telephone line.
ANT	Actor Network Theory
BPR	Business Process Reengineering
CATWOE	Mnemonic of the crucial characteristics which should be included in a well-formed definition (Checkland 1981).
CD	Country Director
DATS	Development and Training Services
FAQ	Frequently Asked Questions
FCO	Foreign and Commonwealth Office of the UK government
GFS	Grant Funded Services
GIA	Grant In Aid
HCI	Human Computer Interaction
ICL	An IT services company (Now part of Fujitsu Group)
ICT	Information and Communications Technology
IS	Information systems
ISDM	Information Systems Development Methodologies
JRP	Joint Research Projects
OST	Office of Science and Technology in the UK government
PDA	Personal Digital Assistant
SET	Science, Engineering and Technology
SMG	Senior Management Group (of the British Council)
SMS	Short Message Service

SSM	Soft Systems Methodology
UKP	UK partnerships: A department in within the GFS division of the British Council responsible for managing partnerships between sectors in the UK and overseas such as science or education. The UKP Science Team are located within this department

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