Managing knowledge in the UK health sector: state of the art and future perspectives

Draft final report of the Phase II scoping project:
Knowledge management systems for lean healthcare

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1. INTRODUCTION

1.1. Knowledge management in healthcare

In January 2006 a Lancet article by Michael McCarthy asked "Can car manufacturing techniques reform health care?".1 This article reported how various US hospitals are making efficiency gains by adopting lean manufacturing techniques pioneered by companies such as Toyota and Boeing. Given the universal pressures on healthcare resources worldwide, and in particular those within the NHS, there is a clear need to examine whether 'lean' and other approaches to knowledge management (KM) could bring benefits to health services. Given the history of KM initiatives in the manufacturing sector, this is a surprisingly under-researched area in the NHS. We therefore undertook a scoping study to identify and understand the state of the art regarding KM in healthcare, with particular reference to the NHS context. This study had several components and this report pulls these together in individual chapters.

1.2. Research team

This project was undertaken by a multi-disciplinary team led by Dr Davide Nicolini of Warwick Business School (WBS). The co-authors are Dr John Powell of Warwick Medical School (WMS), Dr Laura Martinez-Solano of WIMRC, and Paul Conville of WBS. The views expressed in this publication are those of the authors and not necessarily those of the University of Warwick.

1.3. Funding

This Scoping Project was funded by the Warwick Innovative Manufacturing Research Centre (WIMRC) as part of their Phase 2 scoping initiative. The WIMRC is funded by the Engineering and Physical Science Research Council (EPSRC) with supplementary support from collaborating industrial partners.

1.4. Citation

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2. RESEARCH DESIGN AND METHODOLOGY

2.1. Introduction

This project aimed to investigate the current Knowledge Management (KM) concepts, policies and practices within the UK healthcare sector to identify priorities for future research and development (R&D) activity.

The objectives of the study were:

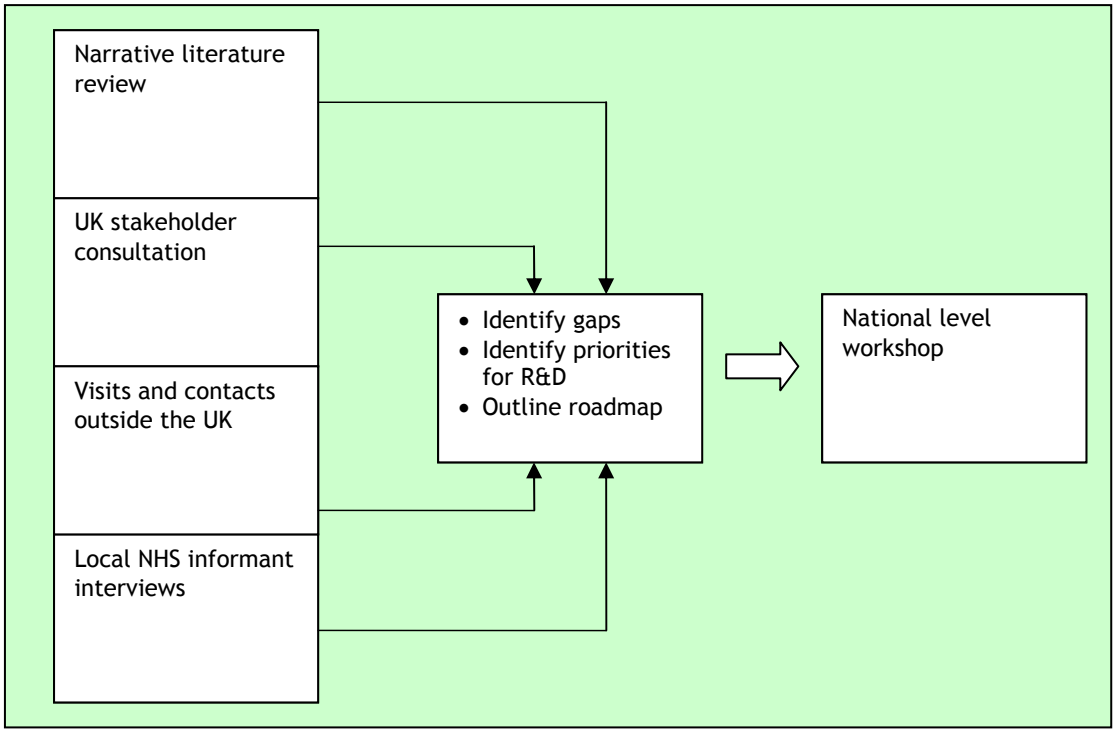
- To investigate the state of the art of KM in the healthcare sector (national and international);
- To identify which new tools and processes need to be developed for satisfying the specific KM needs of NHS heath care organisations;
- To generate a R&D agenda;
- To establish strong partnerships with healthcare organisations interested in collaborating with the WIMRC, NHS R&D organisations, and international centres of excellence.

The scoping study was conducted by an interdisciplinary team from the University of Warwick including researchers from the areas of management studies, engineering, and medicine. The methods used a combination of literature review; expert opinion obtained through stakeholder interviews in the UK and overseas; interviews with local NHS informants; and a facilitated workshop. The project ran from April to September 2006. MREC clearance (exemption from requiring full MREC application) was obtained in May 2006.

The research team was supported by an Interdisciplinary Advisory Panel including Professor Jacky Swan, Director of the IKON Research Unit at the WBS; Professor Matthew Cooke, Professor of Emergency Medicine, Health Systems Improvement expert; Clive Reynolds, Director of Programmes, Warwick Manufacturing Group; Dr. Rosanna Breen, Learning Specialist, NHS Institute of Improvement and Innovation.

The project was articulated in the five main tasks summarised in Figure 1 and briefly discussed below.

Figure 1: Scoping study design and activities



2.2. Literature review

As this was a scoping study, a narrative overview of the health and business/management literature on knowledge management in healthcare published since 2000 was undertaken. The review was performed in three stages. Stage 1 involved the collation and identification of relevant literature. A search of the literature was performed using electronic bibliographic databases covering health and social sciences. In stage 2, members of the research team created a thematic coding scheme based on preliminary readings and discussion. Emerging themes were discussed and agreed. Abstracts were then categorised and coded in Nvivo7. Through this process it was possible to produce a qualitative synthesis of a large body of research and to characterise the current discourse of KM and related major initiatives in this area.

2.3. National stakeholder consultation

The stakeholder consultation was based on face-to-face and telephone interviews with about fifteen senior NHS executives, academics, and industry leaders. The interviews were conducted between May and August 2006. The interviewees were identified using a snowball technique (we started with the highest possible level and proceeded following the suggestions obtained during each interview). The interviews were analysed inductively in search of emergent themes and broad areas of consensus.

2.4. Visits and contacts outside the UK

Project members carried out telephone consultations with international centres of excellence (in Australia, Finland, and Canada) and visited four KM

centres of excellences in Canada (SEARCH Canada; Health Care Management Research Centre, University of Alberta; Knowledge Translation Group at Edmonton General Hospital; Centre for Global eHealth Innovation, Toronto University Health Network) in July 2006. A further and round of visits and consultation was carried out in the first week of August in the USA. Contacts included the Boston based Institute for Healthcare Improvement, two well know consultants in the area of KM and IT for healthcare, members of a large Pharma company, and academics. The consultations and visits were particularly useful for comparing the KM strategy currently adopted by the NHS with those of other countries with slightly different healthcare systems and for identifying some broad common general trends.

2.5. Local NHS informant interviews: "a view from the ground"

In order to identify the views of a range of West Midlands NHS stakeholders the team designed and conducted a semi-structured telephone survey with key informants in primary care trusts (PCTs) and acute care trusts. Directors of Public Health, Medical Directors, and Directors with responsibility for Human Resources/Training and Education in all the acute and primary trusts in the (old) West Midlands Strategic Health Authority (SHA) area were sampled, along with those from some acute trusts in Birmingham and the Black Country. Fifteen agreed to participate in the survey. All the interviews were audio-taped and summarised. The analysis was conducted independently by two of the team researchers who operated inductively in search of common themes emerging from the interviews.

2.6. Final workshop

The interim results of the project were presented and discussed at a national workshop organised in collaboration with the NHS Institute for Innovation and Improvement. The seminar, entitled "Managing Knowledge in the UK Health Sector. State of the Art and Future Perspectives" took place on the 3rd October 2006 at the NHS Institute building in Coventry. The aims of the workshop were as follows:

- To discuss the approaches and practices for managing knowledge in the UK healthcare sector
- To compare the state of the art of Knowledge Management in the NHS with that of the private sector
- To identify the most promising directions for R&D initiatives on how to support the KM needs of the health care sector

About 20 people attended in person, while at least as many followed the event from remote locations by web cast.

3. LITERATURE REVIEW

3.1. Introduction

3.1.1. Overview

This literature review summarises a wide range of articles related to Knowledge Management in the Healthcare Sector. It is not a "systematic review" in the usual sense of the term, but a qualitative synthesis of a large body of research as part of a broader project designed to investigate current Knowledge Management concepts, policies and practices within the UK healthcare sector. Literature from 2000 to the present was searched in health and business/management databases using key concepts relating to knowledge management and healthcare. This document will be of utility to both academics and health practitioners to understand how knowledge management is conceived and applied in the healthcare sector or, who wish to explore in more detail specific Knowledge Management practices in the healthcare sector.

3.1.2. Background

Over the past ten years Knowledge Management, as a concept and a set of practices, has penetrated increasingly into the fabric of organisational and managerial processes in the UK private sector. More recently the public sector has begun to embrace the theories and practices in this area. Healthcare is a knowledge intensive business and Knowledge Management initiatives hold the promise of improved efficiency in this sector. However, as far as we are aware, there has been no detailed assessment of current Knowledge Management initiatives in UK healthcare.

3.1.3. Definitions and review boundaries

As is evidenced by the search terms utilised below, the field (or discourse) of Knowledge Management is bounded by a range of inter-related terms which are often used interchangeably and over which there is still some debate. According to Abidi (2001) Knowledge Management (KM) in healthcare can be regarded as the confluence of formal methodologies and techniques to facilitate the creation, identification, acquisition, development, preservation, dissemination and finally the utilisation of the various facets of a healthcare enterprise's knowledge assets. For the purposes of this study Knowledge Management is defined as:

"The systematic process of identifying, capturing, and transferring information and knowledge people can use to create, compete, and improve" [American Productivity and Quality Center].

This excludes from the analysis an unknown quantity of processes and tools which may in some inadvertent or unintended way support the flow knowledge. Importantly however, where, in the literature, reference is made to the knowledge enabling role of such processes they will be included in the review.

3.2. Methods

3.2.1. Overview of process

The literature review was performed in three stages. Stage 1 involved the collation and identification of relevant literature. A search of the literature was performed using electronic bibliographic databases covering health and social sciences. The search terms used are shown in Table 1.

Table 1: Search terms

Healthcare
Hospital
Medic$
#1 or #2 or #3 ("healthcare" or "hospital" or "medic*")
Knowledge capture
Knowledge creation
Knowledge diffusion
Knowledge dissemination
Knowledge exchange
Knowledge identification
Knowledge management
Knowledge retention
Knowledge translation
Knowledge transfer
Knowledge utilisation
Knowledge acquisition
Organisational learning
Tacit knowledge
Explicit knowledge
#5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 ("Knowledge capture" or "Knowledge creation" or "Knowledge diffusion" or "Knowledge dissemination" or "Knowledge exchange" or "Knowledge identification" or "Knowledge management" or "Knowledge retention" or "Knowledge translation" or "Knowledge transfer" or "Knowledge utilisation" or "Knowledge acquisition" or "Organisational learning" or "tacit knowledge" or "explicit knowledge").
#4 and #20
limit #21 to search in abstracts
limit to #22 to English language

The databases searched included CINAHL (allied health), Medline (medicine), Embase (medicine), Business Source Premier (social science/business and management), Science Direct (social science/business and management). The searches were conducted in June 2006. Titles and abstracts of relevant literature were reviewed for relevance by one of four researchers and relevant articles were input into Nvivo7, a software package (www.qsrinternational.com).

In stage 2, two members of the research team created a thematic coding scheme based on preliminary readings and discussion. All collaborators then met to discuss and agree the coding of themes. The abstracts were then

categorised and coded in Nvivo7. Three over arching-categories were identified: "the nature of knowing in the healthcare sector"; "specific Knowledge Management tools and initiatives"; and "the barriers and enablers of KM in the healthcare sector".

In stage 3, the literature in each of the thematic areas was analysed. Through this process a further eight sub-categories were identified (See Table 2).

Table 2: Categories and sub categories of literature

• The nature of knowing in the healthcare sector • The fragmented and distributed nature of medical knowledge • The proliferation of medical knowledge, information and data • The preference for local knowledge in the making of clinical decisions • Knowledge Management tools & initiatives in the healthcare sector • Information Technology based tools • Social learning initiatives • Education and Training initiatives • The barriers and enablers of Knowledge Management in the healthcare sector • Tools specific barriers • Organisational / External factors

3.3. Findings and discussion

3.3.1. General characteristics of the literature

Three features of the literature are striking and worthy of special mention. The most immediate characteristic is the dividing disciplinary lines. Three distinct disciplines emerged as the key contributors to the literature:

- Information Sciences
- Business & Management
- Medical and Allied Health Sciences

There was, however, some degree of blurring and overlap with regards disciplinary boundaries. This was often the case for papers written by multidisciplinary teams or where the disciplines themselves suggested a degree of institutional overlap as in the case of Medical Informatics (1 & 3) and Health Care Administration (2 & 3). It is worth noting that this first characteristic may be a partial reflection of selection bias in that the databases searched were oriented towards these three disciplines.

The prevalence and significance of contributions from the Medical Sciences is an important characteristic of the literature and one that sets it aside from much of the private sector literature where the main contributions have been confined to I.T. and Business and Management (Hazlett, 2005). This suggests that there is considerable interest in Knowledge Management from within the Medical Sciences and, consequently, the healthcare sector.

The second feature concerned the large proportion of the literature published in second tier medical journals. Therefore, despite the

aforementioned interest, Knowledge Management remains at the periphery of academic work in the Medical Sciences. This was particularly the case for accounts of specific Knowledge Management tools where contributions tended to be from practitioners keen to publish their own accounts and experiences.

The final general characteristic of the literature was the prevalence of 'grey literature' such as unpublished reports, policy documents, statements, strategies and frameworks released by the Department of Health and primarily for use within the UK NHS. These tended to be largely supportive of, and optimistic about, the potential of Knowledge Management in the Health Care Sector and occasionally referred to specific Knowledge Management initiatives underway.

A decision was made by the research team to include both the grey literature and those papers for which only the abstracts were available.

3.3.2. The nature of knowing in the healthcare sector

While the Knowledge Management discourse has existed for many years in the private sector (Swan and Scarborough, 2003) it is relatively new to the healthcare sector. One of the more prevalent features of the literature on Knowledge Management in the healthcare sector was the discussion around the distinctive nature of knowing in healthcare. The first reoccurring issue here concerned the highly fragmented and distributed nature of medical knowledge in healthcare organisations and the sector generally. A second major and recurring theme, particularly within the Informatics oriented papers, was the reference to the proliferation of medical knowledge within an ever expanding healthcare sector. The third theme concerning the nature of knowing in the healthcare sector was around the importance of local knowledge in the making of medical decisions. Clearly, many of the decisions made in this sector relate to peoples' health and well being and the cost of poor decisions can be immediately life threatening. In situations characterised by such high stakes, the literature reported a preference among medical practitioners for knowledge of a local nature. These themes and their sub- themes are reviewed in more detail below.

<u>The fragmented and distributed nature of medical knowledge</u>

Although the fragmented or 'distributed' nature of organisational knowledge is not unique to healthcare organisations or the healthcare sector (Troikas, 1996) the literature is replete with references to the highly fragmented state of medical knowledge and, crucially, the need for collaboration across organisational and professional knowledge boundaries (e.g. Meijboom, 2004). As Tagliaventi and Mattarelli, (2006) suggest, healthcare settings are professionalised institutions in which different groups with specific rules, job representations, behaviours, and values converge. Similarly, David (2006) asserts that health-care delivery is fundamentally a collaborative process having both explicit and tacit knowledge aspects, where health-care providers work together to achieve outcomes in terms of access, quality, and cost that they would find difficult if not impractical to accomplish on their own (David, 2006; pg 144). Likewise, Aldred, (2002) asserts that

managing knowledge in the NHS is like trying to knit with thousands of strands of knotted wool: data is held in a number of locations, managed by a variety of people and agencies, and stored in every imaginable format.

The fragmentation of medical knowledge is also revealed in the presence of strong professional boundaries. Ferlie et al, (2005) argue that social boundaries and cognitive or epistemological boundaries between and within the professions retard the spread of innovations. Currie and Suhomlinova, (2006) examined the impact of both organisational and professional boundaries on knowledge sharing within the context of the UK NHS, using a case study of an academic health centre that encompassed a university medical school and a host of NHS organisations, including commissioners and providers of health care. Their findings revealed that knowledge sharing was very difficult to realise in practice because of professional boundaries. Further, Guven-Uslu, (2006) highlights the divide between clinicians and managers in clinical networks stating that 'Each group coalesces around divergent orientations towards health care delivery, with executive managers privileging cost and clinicians privileging patient care' (pg 99).

One of the repercussions reported in the literature of these professional boundaries and the fragmented nature of medical knowledge is the gap between academic research evidence and everyday practice in healthcare settings. Indeed this is such an important issue that a lively subfield known as Knowledge Translation has emerged in response. According to Ho et al, (2004) Knowledge Translation (KT) is defined as "the exchange, synthesis and ethically-sound application of researcher findings within a complex system of relationships among researchers and knowledge users." (pg 91) In short, Knowledge Translation articulates how new scientific insights can be implemented efficiently into clinical practice to reap maximal health benefits.

The implications of this fragmentation are also discussed by Edwards, Hall and Shaw (2005). They present the cases of a hospital and an ambulance service. Both organisations appear to be approaching Knowledge Management in a fragmented way. According to Edwards et al (2005) despite trying to think more widely towards a 'whole' sector Knowledge Management approach they are unable to see the whole knowledge process because of the distinctly different way their organisations and their work practices are structured.

An additional difficulty arising from the distributed nature of knowing in the healthcare sector was discussed by Pope, Robert and Bate, (2006). They studied the early implementation of Treatment Centres (TCs) in the NHS - designed to dramatically reduce waiting lists for elective care. In particular they were interested in exploring how meanings about TCs were created and evolved, and how these meanings impacted upon their subsequent development. Their conclusions were that the meanings of TCs were 'lost in translation' between various layers of interlacing networks within and outside the NHS.

The proliferation of medical knowledge, information and data.

Ironically, the much documented difficulty of getting new knowledge into practice may stem from an over abundance of medical knowledge. Many papers referred to the increasingly saturated state of the healthcare sector, and individual practitioners in particular, in new information.

For example, Cain et al (2005) claim that the digital age is revolutionising research, education, and patient care in the modern academic medical centre as it brings complex molecular, genomic, and proteomic maps, interactive learning objects, and complete patient record sets to the fingertips of users. Similarly, Davenport and Glaser, (2002) vividly portray the situation with the real life example of Dr. Bob Goldszer who, according to the authors, must stay on top of approximately 10,000 different diseases and syndromes, 3,000 medications, 1,100 laboratory tests, and many of the 400,000 articles added each year to the biomedical literature.

The result, as Heathfield and Louw (1999) argue, is that medicine has reached a crisis point. Doctors can no longer memorise or effectively apply the vast amounts of scientific knowledge that are relevant to their clinical practice. Gray and de Lusignan (1999) echo the same concern by stating that modern healthcare professionals have to resolve an 'information paradox'; they are overwhelmed with information but cannot find particular information when and where they need it.

So prevalent is the challenge of 'information overload' in the everyday work of healthcare practitioners that some of the literature has moved past mere descriptions of the problem towards lengthy accounts of origins and solutions (Hall and Walton, 2004). Indeed, the emergence of Medical Informatics could be seen as directly linked to the current crisis of information overload. As is discussed below, one of the most prevalent tools for Knowledge Management in healthcare is Data Mining, an advanced Information Technology for searching and analysing massive amounts of data.

The preference for local knowledge in the making of clinical decisions

A third theme that emerged from the literature concerned the various different sources and types of knowledge that formed the basis of medical decisions. A pattern emerged which suggested a preference for local knowledge and tacit knowledge. One of the key works in this category is Clarke and Wilcockson, (2002). Entering the debate around Evidence Based Medicine and the implementation of research based knowledge they made an important distinction between knowledge for practice (or distal knowledge) and knowledge from practice (proximal knowledge). Distal knowledge was derived from outside a specific care environment and was thus seen as relatively prescriptive and not owned by practitioners themselves. Proximal knowledge was derived from within a specific practice care environment and, therefore, was dependent on the contextual issues within that environment such as staffing levels and the nature of the service. Crucially, for Clarke and Wilcockson, this meant knowledge from practice (proximal knowledge) did not meet many of the criteria used to

judge the quality of knowledge such as its ability to be generalisable in traditional ways. To be relevant to other care environments proximal knowledge must be decontextualised, core elements identified, transferred to another care environment, and recontextualised in the new care setting. As a result, they feared, proximal knowledge would be excluded from the systems supporting Evidence Based Practice. It is worth quoting Clarke and Wilcockson's (2002) conclusion at length:

> *"Whilst a great deal is expected of evidence-based practice, it is no panacea. Evidence and distal knowledge may be a tool (Trinder, 2000) but it is the proximal knowledge that allows practitioners in health and social care to know whether it is the right tool for the job, whether it is the right knowledge for the needs of their service users. As a result, there is relative stability of distal knowledge but instability in decision-making based on the rapidly fluctuating proximal knowledge. Consequently, clinical decision-making is located, or 'situated', in the context of proximal knowledge, changing as that contextual knowledge fluctuates in time and between place and person."* [Clarke and Wilcockson, 2002 pg 398].

The importance of local context was also a major finding of Gabbay and le May (2004). Their research investigated how general practitioners and nurses derive their individual and collective decisions. Conducting an ethnographic study over two years in general practices in the south and north of England Gabbay and Le May found that clinicians rarely accessed and used explicit evidence from research or other sources directly, but relied instead on what the authors termed "mindlines" (collectively reinforced, internalised, tacit guidelines). Although informed to an extent by reading, these mindlines were mainly constructed on the bases of the clinician's own and their colleagues' experience, their interactions with each other and with opinion leaders, patients, and pharmaceutical representatives, and other sources of largely tacit knowledge.

The concept of proximity was taken up again by Tagliaventi and Mattarelli, (2006). They investigated the processes of knowledge sharing between individuals in different professional groups and discovered that 'operational proximity' (the degree to which professionals were collocated) was a major determining factor in the flow of knowledge with those working side-by-side exhibiting the strongest tendency to share knowledge. Again the theme of local context was evident in Dawes and Sampson (2003). They discuss the information needs and information seeking behaviour of clinicians and found that after desk text sources, the second most frequent source of was simply asking a colleague. Significantly, they found only one instance where electronic databases were the primary resource.

Closely related to these discussions was the role of tacit knowledge in relation to medical decisions. Alaszewski, (2005) suggests that concerns with ensuring safety and minimising harm are driving 'modernisation' of health care systems and that these changes are having an important impact on decision making, for example moving from decisions grounded in tacit

knowledge to those based on knowledge encoded in clinical guidelines or computer-based decision support systems. Alaszewski (2005) concludes that current changes are unlikely to have the desired impact as they tend to disregard the reality of professional decision-making, especially the ways in which professionals need tacit knowledge when using decision-support systems.

3.3.3. Knowledge management tools & initiatives in healthcare

A substantial proportion of the literature discussed specific tools or initiatives for managing knowledge in the healthcare sector. While some contributions were theoretical the majority were based on existing practices. Both are included in this review. In general the tools and initiatives described in the literature could be categorised as belonging to one of three types. The first grouping of tools and initiatives are described as Informatics/I.T. based. The second group is referred to as socially based. In this group the focus was directed toward informal communications, practice and collaborations. The third grouping relates to Human Resources driven initiatives focusing in particular on issues such as Continuing Professional Development and education.

As with the disciplinary origins of the literature there was overlap and blurring between these categories. For example Brice and Gray (2003), discuss how a Community of Practice (social) operated within the electronic Library (I.T.). Conversely, Fahey et al, (2003) report on how an I.T. tool is used to support clinical networks and how networks were used to support CPD/education.

Information Technology

Electronic Libraries

Building on the continued growth of Evidence Based Medicine electronic libraries were seen as an important way of supporting the clinical decision making process. As Turner et al, 2002 exclaims, 'the National Library for Health aims to act as a one-stop shop to support evidence-based decision-making'. In terms of their function eLibraries were seen primarily as a tool for supporting the retrieval of useful knowledge, especially for use in the making of clinical decisions. Gray and de Lusignan, (1999) suggest that the NHS National Library for Health solves the healthcare sector's information paradox (the difficulty in finding relevant information when and where it is needed despite an abundance of information).

Plaice and Kitch, (2003) review the steps libraries in the south-west of England have taken to make knowledge management a reality. They find that the central role of the library and information service has been reinforced and embedded and librarians have been recognised for their real worth to their organisations. Kronenfeld and Doyle, (2003) place the development of electronic libraries and the role of hospital librarianship in an historical context. Turner, (2004) again reviews the NLH and considers some of the issues involved in developing, delivering, and managing the service since its initial launch in November 2000. Turner claims that partnerships have been developed with other knowledge services, in

particular with NHS librarians, to encourage the integration of local and national knowledge resources. Wales, (2005) describes the central role of the NHS Scotland e-library as a system-wide technology infrastructure facilitating management of both explicit and tacit knowledge.

Outside the UK, Williams et al, (2004) describe the Eskind Biomedical Library (EBL) and how it has created a Digital Library that uses a holistic approach for integration of information and skills to best represent both explicit and tacit knowledge. They find that EBL's Digital Library exemplifies a clear attempt to organise institutional knowledge in the field of librarianship, in an effort to positively impact clinical, research, and educational processes in the medical centre.

D'Alessandro et al, (2005) suggest that in order to meet the information needs of isolated primary care providers and their patients in the US Navy, a digital health sciences library, the Virtual Naval Hospital, was created through a unique partnership between academia and government. Similar to the NLH, this was dedicated to delivering the right information at the right time to the right person so the right decision can be made, they argue that the Virtual Naval Hospital functions as a knowledge-management system for the US Navy Bureau of Medicine and Surgery. Mphidi and Snyman, (2004) report on the extent to which three South African academic libraries utilise the intranet as a knowledge management tool. They find that there is a strong awareness of the importance of knowledge management and the value of the intranet as a knowledge management tool, however, the potential of the intranet as a knowledge management tool is not utilised fully.

Data mining

Building on the emergence of data mining and knowledge discovery in databases (KDD) as field of study within the Information Sciences, several researchers have discussed the potential value of these tools to the Healthcare sector. Starting from a popular observation that the sector is overloaded with information Berger and Berger, (2004) advocate the use of Data Mining techniques among nurse researcher. They argue that the shift toward evidence-based practice and outcomes research presents significant opportunities and challenges to extract meaningful information from massive amounts of clinical data to transform it into the best available knowledge to guide nursing practice. Nurse researchers, they suggest are in an ideal position, as ‘domain experts’, to transform the information that is available in existing data repositories into useful and understandable knowledge to guide nursing practice.

Abidi, (2001) advocate the use of Data Mining techniques for the operational management of Healthcare enterprises. Their paper is based on the argument that despite generating massive amounts of ‘knowledge-rich’ healthcare data, modern healthcare systems do not use this data to improve the management and delivery of healthcare services. They provide details on an ‘info-structure’ that uses Data Mining to acquire, share and operationalise healthcare knowledge.

Similarly, Wickramasinghe, Geisler, and Schaffer, (2006) highlight the growing discrepancy between the revolutionary changes in medicine and the minimal changes in healthcare processes which leads to inefficient and ineffective healthcare delivery. They argue that healthcare organisations must use data mining techniques to maximise the data and information generated by them and which flow through ICTs if they are to improve access to and quality of their services. In a later paper Wickramasinghe and Schaffer, (2006) provide a case study on an orthopaedic operating room were Data Mining and other Information Technologies were used in effecting more efficient and effective healthcare processes.

Web Based Systems

A number of web based IT tools were discussed in the literature. At a general level Aidemark, (2005) discussed the potential of the intranet for social and cognitive knowledge processes in a healthcare organisation. Falkman et al, (2005) outline the authors experience in developing 'SOMWeb', a virtual meeting place to support collaborative working and community building among clinicians. This virtual meeting place, they claim, supports the development of a digital knowledge base which provides the foundation for a more evidence-based medicine.

Continuing the focus on collaborative working in virtual settings David (2006) investigates three telemedicine technologies; teleconsultations, distance learning (this could also be considered an HR driven KM initiative), and teleradiology for their impact on the transfer, discovery and creation of knowledge. Teleradiology involves digitised radiographic images being sent to a radiologist who reads the images and provides a diagnosis by e-mail or telephone, depending on the urgency of the situation. Distance learning in health care includes activities such as continuing medical education (CME) credits, graduate and undergraduate courses, and public health seminars. Depending on the subject matter, the class type, and the audience, education can involve knowledge transfer or knowledge discovery. Teleconsultations generally involve one health-care provider (usually a primary care provider) seeking advice from another (usually a specialist or sub-specialist) who has specialised expertise regarding the health problem at hand. Such consultations may be knowledge transferring, discovering, or creating, depending on the situation.

Similarly, Winkelman & Choo, (2003) discuss the role of virtual communities to support and learn from patients. They argue that health-care organisations can promote knowledge creation and utilisation by chronic patients through the introduction of a virtual, private, disease-specific patient community. This virtual socialisation, they argue, could alter the role of chronic disease patients from external consumers of health-care services to a 'community of practice' of internal customers wherein knowledge could be gained from the experiences of those living with chronic disease.

Developing the theme of community based IT systems Koumpouros et al, (2006) discuss the development of an internet-based 'Health Community Knowledge Management System' in the field of Cardiology. The objectives of this system was the creation of an ontology for the modelling of the knowledge base around cardiology, while facilitating every day working needs of the various intended end users.

Social Learning Initiatives

A prevalent theme in the literature was the acknowledgement that the major knowledge challenges facing the healthcare sector cannot be resolved by the use of IT based KM tools alone. This is a theme that mirrors the development of KM discourse in non health care fields. By a sizeable margin the literature focused on two social KM mechanisms: Communities of Practice and network modes of organising as an alternative to IT based KM tools. It was common for both Communities of Practice and networks of practice, as terms, to be discussed somewhat interchangeably and so for the purpose of this paper they will be reviewed together.

Communities of Practice and Clinical Networks

Gabbay and le May's (2004) important article does much to highlight the important role of informal networks and communities in conveying evidence to clinicians. Focusing on the two multi-agency Communities of Practice they analysed how they processed and applied knowledge in formulating clinical views. Their major finding was that clinicians derive their healthcare decisions primarily from collectively constructed "mindlines" through a range of informal interactions in fluid "communities of practice".

Donaldson et al, (2005) provide an alternative reading of CoPs. In their study of the UK charity Macmillan Cancer Relief the authors relate how the organisation is learning from its work with groups and communities as well as patients and carers in order to benefit people living with cancer. In essence, it is suggested, the charity has created and supported a number of groups and communities that "float" around its organisational structure and extend its reach far beyond its formal boundaries. Because these groups are not part of the formal structure, they cannot be "managed" like normal organisational teams. Nonetheless, the conversations and stories shared in them generate new ways of thinking and practising, and may also result in tangible "products" such as documents, standards or major programmes.

On a similar note Winkelman and Choo, (2003) discuss CoPs designed for patients with long term chronic disease. They suggest that HC Organisations can learn a great deal from supporting a forum that allows the exchange of experience and knowledge among such patients.

According to Conner, (2001) networks based on informal relationships are not new in the NHS, but rather it is the formalisation of these networks and the recognition of their potential that is new. They provide the example of the Northern and Yorkshire Learning Alliance (NYLA) which was established as part of the Northern and Yorkshire health community's efforts to radically improve care. They describe how the NYLA operates as a network with a

small team of change experts working to develop change management and service improvement capacity across 10,000 square miles.

Edwards, (2002) puts forward the view that formal NHS networks have started to emerge as a way of sustaining vulnerable services and maintaining access where the requirements of training or sub-specialisation would otherwise mean complete closure of local services. Networks offer a way of making the best use of scarce specialist expertise, standardising care, improving access, and reducing any "distance-decay" effects that can result from the concentration of specialist services in large centres. They can create systems that ensure patients receive a standard investigation and are referred on rather than being held in a local service that may not have the full range of expertise. As a result, networks should be able to exploit any relationships between quality and volume and enable a faster spread of innovation (Edwards, 2002).

For Addicot et al, (2006) one supposed advantage of the network form of organising is the greater capacity for the transfer of evidence-based or 'best' practices across the network and accelerated organisational learning. They cite this as the major reason behind the emergence of networks as the preferred mode of organising in the UK Healthcare secotr. In their study of managed NHS cancer networks in London they found that while networks did assist structural reconfiguration, their knowledge management role remained marginal. In their analysis they make a distinction between managed and organic professional networks. They argue that in politically-sensitive sectors such as cancer, there have been central targets (for example reducing waiting times) which networks have been expected to deliver, monitored through performance management. Crucially, they found that this type of network crowded out the alternative knowledge-sharing objectives.

Brice and Gray,(2003) present an interesting discussion of the role Managed Clinical Networks play within the National Library for Health. As Brice and Gray (2003) suggest, managed clinical networks were introduced to streamline and standardise care across boundaries and to diffuse evidence and 'best practice' across the whole health economy. Tagliaventi and Mattarelli, (2006) also examined the involvement of individuals in 'networks of practice' and found evidence of substantial knowledge flows. Additionally, Edwards' (2002) has shown that UK based cancer networks have started to report significant benefits as a result of being able to focus on the needs of their patients without the distraction of managing the less patient focused parts of the system such as non-clinical support services.

Education and Training Initiatives

The final theme around KM tools related to the use of educational initiatives such as Continuing Professional Development. Much of these contributions focused on the way in which educational initiatives could be used to support the process of 'knowledge translation'. A clear example of this is Greenhalgh and Russell's, (2006) article focusing on a part-time online

Master of Science course whose learners are mostly senior health care professionals engaged in knowledge translation.

Lockyer et al, (2004) also discuss the role and place of reflection in the process of knowledge translation. For Lockyer et al, (2004) reflection is the mechanism by which we contemplate and try to understand relatively complex and sometimes troubling ideas for which there is no obvious solution. Reflection allows for the transformation of ideas and experiences into new knowledge and action. Their paper argues that educational programs can encourage reflection through the judicious use of case-based discussion, formal and informal needs assessments, and commitment to change exercises. In the workplace, critical incident techniques and debriefing of cases provide opportunities for thoughtful inquiry.

Pope et al, (2003) studied the acquisition of knowledge in the anaesthetic practice of an English hospital. Among their key findings was the important role clinical apprenticeship performed in the in passing on tacit knowledge.

Kenner and Fernandes, (2001) approach the issue of knowledge management as an advanced topic in nursing education. They lament that for most graduating nurses, knowledge management as a concept or set of practices is foreign. The two authors advocate the introduction of KM into the curriculum claiming that Knowledge management is an approach that prepares the advanced practice nurse for the ever-changing health care environment. It is a tool, they argue, that will help a nurse to work more smartly, efficiently, and cost-effectively. Likewise, Martins et al, (2005) also suggests that education in knowledge management would provide a positive contribution to professional development, though as they point out, it is scarcely appreciated at present.

A final and somewhat alternative contribution is offered by Ralph and Ortega, (2006) who detail a range of HR based practices aimed at retaining and attracting knowledge workers at the Huntington Memorial Hospital in Pasadena, California. More specifically the HR practices were designed as part of a scheme intended to retain loyal personnel and establish organisation knowledge and contribute to the quality of the patient experience. To this end the hospital has introduced a concierge service, staff referral incentives, wellness initiatives, and a child care centre.

3.3.4. The barriers and enablers of knowledge management (tools & initiatives) in the healthcare sector.

Many of the papers included a discussion of the barriers and enablers of KM in the healthcare organisations. These are discussed respectively in the following section.

<u>The Barriers of Knowledge Management</u>

From their investigation into the value of an NHS cancer network in London Addicott et al, (2006) found that over management of cancer networks was a major barrier. Clinical and managerial networks were also considered by Guven-Uslu, (2006) who argued that despite government encouragement for

clinicians and managers to work together in networks to improve performance this type of networking was difficult to realise in practice. The major barrier identified in the study was clinical-managerial conflict. As Guven-Uslu (2006) explains: 'Each group coalesces around divergent orientations towards health care delivery, with executive managers privileging cost and clinicians privileging patient care' (2006: pg 99). Additionally, the study found that top-down 'managerialist' approaches to the implementation of benchmarking initiatives within networks set clinicians against managers.

Lorence and Churchill (2005), examined the uptake of computerised patient record systems as a means of clinical knowledge management. Overall, they found a non-uniform diffusion of computerised health information technology, due in part to cultural factors, mistrust of computerised data, and lack of technology training and knowledge.

The issues of mistrust in computerised data was also raised by Bower et al (2001) who studied the use of ICTs, in particular teleconferencing, as a way of building cross-professional and cross-disciplinary boundaries. They found that the uptake and application of such ICTs was fundamentally affected by a range of social and operational issues, such as fears over a new formalisation and trackability of previously informal conversations; a rebalancing of power relationships (between professionals using the ICTs as well as between doctor and patient); pressures on social/ cultural and procedural alignment between participants; and personal attitudes to the technologies, i.e. a general disliking of ICT.

Interestingly, there was also evidence in Bower et al (2001) that ICTs were severely compromised by an inability to deal with tacit nature of communications and knowledge. This issue was touched upon previously by, among others, Bower et al (2000). They found that professionals in the health care sector often resisted ICT innovations which they perceived as having the potential to disrupt crucial processes, especially when these processes involved a substantial tacit knowledge component.

Focusing on the problems encountered in bringing about effective 'team-working' in operating theatres Finn and Waring (2006) found that 'architectural knowledge' (knowledge that connects and integrates the specialised component knowledge of team members) was fundamental to effective team practice and the delivery of safe, efficient patient care. Importantly, however their research found that the creation of 'architectural knowledge' was inhibited by the organisational context. More specifically, they found that the need for flexibility (in terms of changing personnel during surgery in the operating theatre militated against the creation of architectural knowledge which required a degree of continuity.

Similar cultural factors are picked up by Dean (2002) who explored barriers to learning from errors. Dean (2002) found that barriers to learning from prescribing errors include the non-discovery of many prescribing errors, lack of feedback to the prescriber when errors are discovered by other

healthcare professionals, and a culture that does not encourage reflection on errors together with why they occurred and how they can be prevented. Dean (2002) concludes by calling for changes in both systems and culture so as to provide an environment in which lessons can be learnt from errors and put into practice

Currie and Suhomlinova, (2006), examine the impact of both organisational and professional boundaries on knowledge sharing within the context of the UK NHS, using a case study of an academic health centre that encompasses a university medical school and a host of NHS organisations, including commissioners and providers of health care. They find that specific governmental regulations actually strengthen the boundaries within the field and run against the logic of cooperation essential for knowledge sharing. In particular, government-set performance indicators cause the activity of health care organisations and those in higher education to diverge so that research and practice are uncoupled.

The Enablers of Knowledge Management

Based on their study of practice sharing in a network of practice Tagliaventi and Mattarelli (2006) found that when professional groups shared common values, such as the centrality of the patient, exchange of knowledge was greater. Also, and as discussed earlier, they found that knowledge related interactions were greater among professionals that were in close operational proximity. Similarly, Russell et al (2004), explored the process of knowledge exchange in an informal email network for evidence based health care. The informal email network helped to bridge the gap between research and practice by serving as a rich source of information, providing access to members' experiences, suggestions, and ideas, facilitating cross boundary collaboration, and enabling participation in networking at a variety of levels. Ad hoc groupings and communities of practice emerged spontaneously as members discovered common areas of interest. Critical success factors include a broad based membership from both the research and service communities; a loose and fluid network structure; tight targeting of messages based on members' interests; the presence of a strong network identity and culture of reciprocity; and the opportunity for new members to learn through passive participation.

Bowen and Martens (2005), focused on knowledge translation within a community of practice. They took as their point of departure an apparent gap in the literature around personal factors in knowledge translation. On this line of investigation they found that the 'quality of relationships' and 'trust' connected many different components of knowledge translation, and were essential for collaborative research.

Koumpouros et al, (2006) research the critical success factors for establishing a multidisciplinary health community knowledge management system using internet-based ICT. Some of the major success factors they found included: knowledge critical mass, political commitment and endorsement, well-structured ontology, multilinguality of the content and

timeless processes and patient-and problem-oriented knowledge management system.

Similarly, Edmondson (2003) investigated the behaviours promoting learning in interdisciplinary action teams, particularly in the operating room. Edmondson sets the thesis up by arguing that members of these teams must coordinate action in uncertain, fast-paced situations, and the extent to which they are comfortable speaking up with observations, questions, and concerns may critically influence team outcomes. Against such a context she found that the most effective leaders helped teams learn by communicating a motivating rationale for change and by minimising concerns about power and status differences to promote speaking up in the service of learning.

Table 3: Major Barriers and Enablers of KM success in Healthcare organisations

BARRIERS	ENABLERS
Over management	Shared common values
Clinical managerial conflict	Minimising concerns about power and status differences
Gap between Science and Research	Interdisciplinarity (broad based membership)
Lack of trust	Close proximity (operational)
Poor quality relationship	Salient topics
Insufficient technology skills	Political Commitment & Endorsement
Inability to deal with tacit knowledge	Loose structure

3.4. Summary

The key findings of the literature review on Knowledge Management in the healthcare sector were organised into three key thematic categories. The categories closely resembled the standard structure of the literature in that most articles started with a discussion of the research questions, or the framing of the problem. This invariably involved the author relating the potential of the concept 'Knowledge Management' to the Healthcare sector. It was from this that the first thematic category, the nature of knowing in the healthcare sector, was derived. Within this theme there were three key findings.

The first concerned the highly fragmented or divisionalised state of knowledge in the healthcare sector. The argument was that the healthcare sector encapsulates an enormous array of distinct knowledge domains that are often formally organised into distinct units. As a result significant professional, disciplinary and organisational boundaries come into play and across which successful KM must attempt to operate.

The second key finding with the first theme concerned the apparent proliferation of medical knowledge. This was highlighted as a driver for the Knowledge Management as increasingly individuals and organisation within the healthcare sector struggled to keep up-to-date with the constant influx of new knowledge and information.

The third key finding relating to the nature of knowing in the Healthcare sector relates to the apparent preference for local knowledge in the making of clinical decisions. This was discussed as presenting a major challenge to those Knowledge Management practices that parcel explicit knowledge and deliver it to the point of practice via electronic systems. Clinicians confronted by a situation in which knowledge was required tended to seek the advice of trusted colleagues before turning to the type of tools just mentioned.

For the majority of papers, once the problem (or the potential) of Knowledge Management in the Healthcare sector had been discussed there followed a discussion of how Knowledge Management tools and practices could be put to use. From the large number of practices suggested we deduced three broad categories.

The first and most prevalent category was around IT based approaches. These ranged from e-libraries which attempted to deliver the right information to clinicians through to decision support systems which tried to ensure the right information was delivered at the right time and place (these technologies could be a highly portable handheld type device).

The second broad area of Knowledge Management practice was around the use of clinical networks and communities of practice. These were seen as a forum wherein professionals could meet to discuss challenging areas of practice so as to ensure best practice. These were both intra and inter-organisational.

The third area was based on the use of various education and learning initiatives. These ranged for the formal such as Continuing Professional Development to the more informal such as reflection on personal practices or the clinical apprenticeship model.

It was common for all these tools and practices to involve a discussion of the barriers and enabler or success. This formed the third major theme of the literature review and produced a number of key findings. By its very name Knowledge Management suggests the necessity of management. However, one of the recurring barriers suggested in the literature was the over management of knowledge management. Other major barriers concerned the poor quality of relationships a general lack of trust, and inadequate IT skills. An important barrier identified was around the prohibitive affect of professional boundaries and the confounding of these by certain government regulations. In addition to the logic opposite of the barriers the enabling factors included most importantly close operational proximity and shared values and goals. This again highlights the importance of professional boundaries. Those professional working in closely related fields and those working in close physical proximity tended to display the strongest knowledge sharing attributes.

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4. STAKEHOLDER CONSULTATION

4.1. Summary of methods

In order to investigate the state of the art of knowledge management (KM) and areas for future research in the healthcare sector, the team conducted a series of interviews with national stakeholders in the UK who are experts in healthcare knowledge management and/or who lead key organisations doing knowledge work within or for the NHS. Fifteen face-to-face and telephone interviews were conducted between May-August 2006. The interviewees were identified by the advisory group and by using a snowball sampling technique (following suggestions obtained during each interview). The interviews aimed at:

- Exploring the perceived level of awareness for knowledge related issues in the healthcare sector and the evolution of policies in this areas over the years
- Identifying the major strategic priorities that need to be addressed in order to address the knowledge needs of the UK healthcare sector
- Naming the most successful initiatives in this area
- Identifying the most promising areas for future academic research

Interviews were audio-taped and transcribed, or in a few cases contemporaneous note-taking was used instead. The content of interviews was coded using Nvivo. Data were analysed inductively in search of emergent themes and broad areas of consensus. The results of the analysis are reported in the sections below. The text indented and in italic is extracted verbatim from the interviews and reported here for illustration purposes.

It should be emphasised that this exercise was constructed as a consultation and not a fully fledged survey. Given the nature and size of the sample, the following section should not be construed as a representative account of the state of the art of KM in the UK sector but as a summary of the general trends and major challenges in this area.

4.2. Findings

4.2.1. Conceptions and meanings of KM in the UK healthcare sector

Different conceptions of what KM (and managing knowledge) means

The first finding of our research is that even at a strategic level there is considerable variation in the way KM is understood. This is hardly surprising given the sheer number of definitions available both at an academic and practitioner level. That said, most of our informants tended to distinguish between three types of knowledge:

- Clinical knowledge (i.e. knowledge from clinical evidence)
- Service Knowledge, (i.e. knowledge from experience on how to run the service)

- Patient-centred knowledge, (i.e. the history of transactions between patients and the different parts of the service)

While in our sample there was a wide consensus about the importance of the Clinical and Service knowledge, this was not the case for the Patient-centred knowledge. This indicates that patients are still often considered as external to the healthcare system and not as integral part of it. As we shall see, the latter realisation is one of the major challenges for the future of KM in healthcare.

The distinction between types of knowledge underscored the assumption that each requires a different management strategy. Accordingly, several of our informants implied that approaches which showed a certain level of effectiveness in one area, for example the use of formalised evidence and guidelines in clinical practice, might not work well for what concerns managerial issues. As a consequence, they purported an approach to managing knowledge based on multiple approaches and channels.

Positional and professional biases

Another major source of differentiation between ways of understanding KM stem from the hierarchical position and occupational location of the interviewees. Possibly because of their "high" institutional position, most of our informants tended to adopt a narrow managerial view as opposed to a more broad definition of what counts as "knowledge" in the expression "knowledge management". This contrasted with the academic interviewees, who adopted a broader view. Accordingly, many of the interviewees in strategic and managerial positions tended to include in their explicit or implicit definitions of knowledge and KM only the aspects of "knowing" which are amenable to "management" to the exclusion of other forms of "knowing" which go on as part of the daily work practices. For instance, most of them would be uncertain whether "corridor work", a demonstrable activity of knowledge sharing, should be taken into consideration in the reflection on KM. This was not the case for academics, who pointed out that when not properly taken into consideration, such bias may obscure a whole set of phenomena that are of paramount importance for the effective running of any organisation.

The interviews also suggested that the meaning of KM varies by occupational role. As one informant put it:

> *"…the librarians are kind of over there talking about knowledge management and improving access to knowledge via the library's information systems. Then all the technical people are somewhere else in the organisation talking about the IT and palm top services that you can use to look up best practice, clinical guidelines and stuff like that, and that's all done over there and then all the HR people who are interested in learning rates and how people change their practice and learn from mistakes are all over there, communications is somewhere else and all of those things --but in my experience in going to NHS organisations, they're not joined up in that way".*

This scoping research does not provide enough data to ascertain whether this is a result of the lack of a unitary KM strategy or one of its causes (or both).

The controversial status of the term

While the interpretation of the term varies, there is a general consensus that the term "KM" itself is controversial. All informants reported that:

- the term and terminology of both knowledge management and organisational learning do not have a general currency in the NHS;
- in many ways, the term produces the wrong association among NHS members. For some, the term "management" is associated with a very focussed sphere of interest (that of the NHS managers) while others may think of document management ;
- people refer to the same issues using different and alternative ways of expressing or, more often, lack a vocabulary for addressing such issues.

Informants gave several explanations about this state of affairs, ranging from the tendency of the NHS to fall within the "not invented here trap", to the fact that an appreciation and adoption of the term implies already a level of sophistication and awareness that is generally absent in the NHS. As one of the interviewees put it:

> *"if you start asking questions about knowledge management, you'll get a silence at the end of the phone, because they won't be quite sure…when you use the term in a colloquial or conversational sense, most people think you're talking about document management or records management or information management. I think there's a hierarchy of sophistication, a developmental hierarchy".*

Regardless of the reason behind it, the lack of a shared theoretical discourse and a common language around the issues of managing the knowing processes in the NHS makes it:

- difficult to recognise good practices as examples of KM;
- difficult for those who pursue the same goals to recognise the existing common interests and join forces;
- difficult to establish a conversation with other sectors – for example the private sector, where there is a wealth of experience in this area;
- difficult to establish a conversation among those who carry out activities in this area in view of evaluating and improving the existing practices.

The relationship of KM and Information technology

Most of our informants commented in one way or another on the relationship between KM and information technology (IT). This is because there is a general perception of contiguity between knowledge and information and there is thus a more or less implicit assumption that IT (and especially internet technologies) could be part of the solution on how to improve the way in which the NHS manages what it knows:

> *"People would tend to associate it immediately and first with the information that's needed in order to make good quality decisions about what to do for people who are using the NHS".*

From a managerial perspective, the desire (or aspiration), is for a tool which would reduce the daily information and evidence overload:

> *"what informed boards need ... try and put boards in a position from the ocean of information that it could receive to actually just knowing them and what it is they actually need to have in order to make the critical decisions that a board's responsible for, whether it's running a primary care or a hospital".*

Accordingly, the majority of informants tended to associate KM with tools and services capable of delivering the right information in the right form at the right place. Most of the informants, however, refrained from taking a wholly technological-oriented approach, and emphasised that technological solutions should be complementary to the existing processes. Even the most ardent supporters of systems such as Decision Support Systems (DSS) seem to have metabolised the decade long lesson that DSS cannot replace professional discretion, that IT is at the service of Knowledge processes, and not vice versa. In fact, several interviewees commented on the fact that some of the well known difficulties and resistance that IT has traditionally encountered in the NHS could be overcome, at least in part, if technical solutions could be reframed in Knowledge terms.

There was a widespread awareness of a constant risk that KM issues are reduced to their technological aspect. One interviewee used the example of a book compared with a computer:

> *"when the medium is books, you never get that; you don't get people around a table arguing about the font of a textbook or which type of printer they used; but as we move the knowledge management from paper to computers, people lose the point and start arguing about the technological side instead of the content and there's a real bias in the system there".*

4.2.2. The situation on the ground

A lot of KM under different names

Although the present research was not intended as a complete survey of existing KM practices, a task that would go well beyond its scope, a clear finding of this project is of a wealth of initiatives and programmes that in

different ways explicitly tackle the issue of improving the effective management of knowing in the NHS.

First, we found KM institutionalised in some very prominent national initiatives, such as the National Institute for Health and Clinical Excellence (NICE), the National Library for Health (NLH), and the NHS Institute for Innovation and Improvement. The term "institutionalised" signifies that these organisations pursue KM as part of their core mission. Because part of their activity is maintaining and raising the attention on this issue, the presence of these organisations both signify and sustain the increasing awareness for the issue of managing knowledge in the NHS.

Second, we found evidence of a the growing attention to KM issues in the presence of a variety of private firms and entrepreneurial endeavours which address these topics, such as the Map of Medicine, Bazian, and the many companies which operate in the area of advanced e-learning, etc. These private ventures, which integrate the traditional activity promoted by professional and clinical associations, show that the issue of managing knowledge has reached a level of interest and investment which supports the emergence of for-profit organisations.

Third, our research revealed that a significant amount of KM in the NHS goes on under different names and hence is sometimes not counted as such. Examples of KM initiatives which were clearly identified by our informants as good practices of KM were the National Patient Safety Agency (NPSA), Clinical Networks, and NHS Direct. Such organisations are stealth "KM" initiatives which are seldom considered as such. From the perspective of the present research they are particularly important in that they demonstrate the level of attention that the issue has gained in the service.

Finally, we also found that the NHS is using or experimenting with some of the more modern techniques of KM (from virtual communities to knowledge portals, from social marketing to blogs, from theatre to interactive videos), although not all of these are recognised as KM tools. For example, many of the "networks" which populate the NHS are akin to the "communities of practice" which have been promoted in several companies in the private sector. However, as one of our informants put it:

> *"I do not use the term communities of practice, and clinicians prefer the term clinical network that has the same meaning but does not make reference to community".*

As discussed above, the linguistic difference here becomes a barrier that prevents the transfer of experience between the two environments exposing the NHS to the risk of having to rediscover the wheel all over again – a situation that according to one informant is unfortunately quite common.

A vision but not yet a strategy

While our scoping study identified a variety of places institutionally involved in the systematic process of identifying, capturing, and transferring

information and knowledge, it also emerged that the activities of all these institutions, organisations, and programmes, are only loosely coupled.

In particular, it is not possible to identify a place where all these activities were coordinated or monitored, nor even a repertoire or list of the KM activities conducted in the NHS. There was also difficulty in identifying at different levels the locus of responsibility of these activities.

At national level, for example, several informants identified Sir Muir Gray as a "quasi" NHS Chief Knowledge Officer [CKO]":

> *"I think of Muir Gray as unofficial de facto Chief Knowledge Officer for the NHS"*

The problem with a CKO being unofficial is, of course, that this situation somewhat defeats the original purpose of having CKOs at all. In the private sector this position was mainly introduced as a way of signalling the centrality of knowledge and learning in the organisational processes. Establishing a CKO was thus both a symbolic and a strategic move intended to support and sustain the necessary awareness for the active management of knowing and learning processes. The presence of an "unofficial" CKO therefore might signal that the issue has not (yet?) obtained the necessary legitimacy and that the concern for knowing and learning issues is still somewhat peripheral in the strategic agenda of the NHS.

The situation at national level was mirrored at regional and local level. We could only identify a few local CKOs and discovered that only a few SHAs or Trusts have KM strategies or comparable policies.

These findings could be summarised in the observation that while the importance of knowledge issues in the NHS has produced a *vision*, this has not been translated (yet) into a clear, recognisable, and unitary *strategy*.

On the one hand we found clear evidence that an increasing number of people share the conviction that knowledge must become one of the central design and management principles of the NHS. This vision acknowledges that the NHS is a knowledge intensive organisation which needs to be designed (or re-designed) around the principle of an effective flow of knowing and learning processes. We also found a general agreement on the idea that the knowledge backbone of the NHS consists of three fundamental processes: capturing and filtering scientific evidence and experiential wisdom to create "*the best single version of the truth that we know at the moment for what concerns clinical, service, and personal knowledge*"; efficiently distributing such knowledge – which includes interfacing with the different stakeholders in ways that are compatible with their way of working or living (in the case of patients); and effectively mobilising such knowledge, that is, finding effective ways of putting it to work. On the other hand, we found that the implementation of such a vision is still very much piecemeal and bottom up. Not only there is dispersion and disconnection among initiatives, but the

NHS lacks a shared common theoretical discourse that would allow these different activities to be conceived as part of a common framework.

In sum, our data indicate that the concern for KM issues in the NHS is in a dynamic and transitional state. Our data do not allow us to state whether the issue is actually gaining importance, or, alternatively, that the issue has difficulty in finding a stable place among the strategic priorities of the organisation. They do suggest quite clearly, however, that some more work and coalition building will be necessary for making KM a central concern in the healthcare sector.

A "de facto" preference for social networking

This scoping work clearly indicates that the NHS has developed a *de facto* preference for social networking as a way of identifying, capturing, and transferring improvement information and knowledge. As one interviewee put it:

> *"The NHS is cut through and through and through with networks, subterranean networks, fellowships, clubs, groups; sometimes they're Royal Colleges, sometimes they're professional associations, sometimes they're just loose affiliations of people with similar interests and it's as complex as the outside world is".*

Examples would include major networking initiatives such as the Managed Clinical Networks but also other, more grass root forms of networking such as the collaboratives which emerged under the auspices of the Care Services Improvement Partnership (now made visible through the NHS network portal), the Doctors.net.uk portal, the CHAIN initiative, and many others.

The main exception to the predominance of social networking is the use of guidance and guidelines from organisations such as NICE. One could argue that initiatives such as the "Map of medicine" are at least in part aimed at injecting a network dimension – for example by incorporating local know how into a national guideline.

Three major explanations were given by our respondents for explaining the networking phenomenon. Some of our interviewees noted that direct communication, either in person or mediated by textual artefacts (letters and written documents, emails or texts) is the elective form of communication in the healthcare work environment:

> *"The most powerful things are still e-mail and the…you know erm…I'm not aware of any really technology-based knowledge management that's really being used well, if you see what I mean...".*

Others added that this preference goes hand in hand with the historical paucity of the NHS technological base. Finally, one observer noted that direct relationships and personal networking is a particularly efficient strategy in an environment like the NHS where boundaries shift all the time and mobility is very high. In this sense, members of the NHS tend to turn to

networking as a very reliable and sustainable form of association which can be easily maintained in spite of changes of affiliation, job title, and location.

An interesting aspect highlighted by some of our interviewees is the emergence of an "on the ground" distinction between mandated and non-mandated (i.e. spontaneously formed) networks. On the basis of still anecdotal evidence (to be corroborated by further research), some of our respondents suggested that because of their nature, the major mandated networks were not always capable of overcoming the organisational and professional barriers which they were supposed to. As a consequence, the process of harnessing and sharing knowledge is slowed down – when not inhibited outright - by political and professional barriers:

> *"The problem is that they've become over-formalised and with a habitual tendency to beauracratise organic initiatives"*

> *"Mandated networks, because of central government intervention and control, will tend to be subject to audit—they tend to be subject to audit. And they'll orientate themselves towards that, which will then mean that the knowledge sharing could be driven out. So almost the formal attempt to manage knowledge is causing problems with the management of knowledge. It's actually having a destructive effect"*

The perception of our informants, which needs to be further corroborated by future research, is that the emergence of a number of non-mandated (and often non visible) networks constitutes in many ways the response of a workforce who has appreciated the power of networking approach but who has also experienced some of its limitations: in the words of our informants:

> *"My experience has been that on the whole, people go into healthcare because they are concerned to make a better world. They tend to be altruistically driven; they're certainly not driven by money, because for the most part, the salaries are not as remunerative as they might be elsewhere. The corollary of that is they are willing to share; they're excited, they are proud and willing to be open about good practices...[however] As soon as the health service says all right we'll have a clinical network, we'll establish it, we'll support it, we'll fund it, we'll measure it, it starts to lose that kind of vibrancy".*

In this sense, our informants conveyed the sense that it is within these smaller and less organised networks that some of the best knowledge sharing actually takes place:

> *"These non-mandated networks may exhibit characteristics of a community to a much greater extent than mandated networks"*

Our informants added, however that, non mandated networks have their own set of problems, starting with the issue of how to justify the resources

and time that they absorb and continuing with the difficulties that these "grass root" formations face in producing long lasting change.

> *"The problem for the non-mandated network in knowledge sharing is because it's not mandated, typically, we don't converge with policy, for example, the priorities of the commissioner... Therefore, they can find things difficult to get going. They can share knowledge, but it may become a talking shop rather than something that has an influence upon decisions made at a strategic level".*

The incremental and mostly bottom up adoption of networks and communities as the main way of sharing and circulating knowledge and experience is thus posing the very strategic issue of how to govern the process of knowledge networking in the NHS, with the necessity of balancing management against autonomy. The issue for future research is to identify by what means and using which tools, the NHS can adopt a "cultivation" approach to the management of this wealth of relationships and activities**.**

An "in practice" orientation towards knowledge dissemination

According to our findings, the preference for networking activities goes hand in hand with another specific orientation (or practical bias) which may also be the result of the bottom up emergence of KM activities in the NHS. Most of the KM discourse and initiatives on the ground were mainly, or especially, focussed on the capture and dissemination of clinical and service knowledge and capability. In this sense, the emphasis of most initiatives was preventing the "*constant reinvention of the wheel*", as one of our informants put it, on the basis of the idea that "*if only we knew what we knew the NHS could be much better than it is*". As one informant put it:

> *"Most of the meetings you go to around service delivery in the NHS, what people are saying is actually we don't have a problem with new ideas in the NHS, it's just actually spreading that knowledge and getting it taken up. Somewhere in NHS there is some way of solving everything perfectly--well, perhaps not perfectly, but the problem is nobody knows where that is... it's just more luck than design how people find out about those new innovations".*

It must be added that while the prevailing interest and concern seems to be still for the sharing and dissemination of existing experience and evidence, there is a perception, shared by a minority of our respondents, that the next challenge is not in improving the methods and techniques for *sharing* the existing knowledge, as much as improving the ways in which the healthcare sector *mobilises and puts to work* what it knows. Accordingly, some of the most advanced initiatives of KM deal not only with how to get the right information to the right people, but also how to influence individual and organisational behaviour. In this sense, the interest is for harnessing expertise and techniques from fields such as marketing and social movements which have accumulated a vast experience on how to effectively promote social and individual change.

A prevailing attention for clinical knowledge

Another aspect emerging from our data, is that there seems to be much more attention for the capture, dissemination, and circulation of clinical knowledge than for other types of knowledge. As one of our informants put it:

> *"On the managerial side, there was virtually no body of existing knowledge to which people can refer; so when we say should we run our outpatient clinic this way, it would be extremely unusual for anyone to say ah, yes, let's just remember what Leicester did and what they learned. Whereas, with healthcare professionals, there's a lot of literature that informs decisions".*

Once again, it is important to report that some informants identified the inherent limitation of this widespread attitude. They emphasised that this prevailing attitude is more a reflection of the power relations in the field than the effective needs of the NHS.

For example, some informants made a strong case that restricting the discussion of KM to the, otherwise legitimate, knowledge needs of clinicians or healthcare professionals means ignoring the single major recent change in healthcare: the rise of the competent patient (as an individual or as a member of a pressure group). They argued that doing KM in the healthcare means also addressing the issue of how patients and users of the services can be rendered sufficiently "knowledgeable" so that they can become active subjects in the process. In many ways discussion of KM without the issue of how to involve patients in the process of knowledge production, sharing and utilisation is somewhat outdated, as is a focus on producing tools and techniques intended to exclusively satisfy the needs of professionals.

How the situation on the ground compares with other OECD countries

Although the differences between the UK and other OECD countries is discussed elsewhere in this project report, it is worth reporting that several informants, who were operating at an international level suggested that the situation in the UK is in many ways more advanced than in other comparable contexts.

> *"I see more attention and focus on knowledge management in the UK than I see in most of the countries, if not all of the countries"*

These observers attributed this situation to a combination of factors, which include the presence of visionary figures, political pressure, and the particular structure of the NHS which makes the launch of large scale initiatives at least feasible.

4.2.3. Challenges and barriers ahead

Main challenges

In order to identify the most promising ways forward, we asked our interviewees to pinpoint what they considered to be the major challenges ahead for the management of knowing and learning processes in the NHS.

Most interviewees named the following five priorities:

- raising the awareness and the political priority of knowledge issues;
- harnessing the power of information;
- improving the management of networks;
- integrating patients into the KM discourse;
- shifting the attention from knowledge categorisation to mobilisation.

Raising the awareness

A first challenge identified explicitly or implicitly by the majority of informants regards the necessity of raising the awareness and the political priority of KM issues in the NHS. There is a need to develop a common language and set of shared principles that can support the emergence of a clearer strategic direction for the different KM related initiatives. The challenge is to find commonalities between the different and often diverging disciplinary views and agreeing which kind of KM strategy is more suitable for the NHS (for example, does the NHS needs a CKO? How should the diverse KM oriented initiatives in the NHS be governed?) One of the perceived benefits of a more structured strategic reflection on the knowledge needs in the NHS could be overcoming the traditional "non invented here" syndrome which prevents the healthcare sector learning from (and also from "teaching to") other sectors.

Harnessing the power of Information

A second major challenge has to do with improving the exploitation of existing information. Many informants suggested that the challenge ahead is not about circulating more information but rather less, and more targeted and relevant information. At the same time, the challenge is to find the appropriate form and delivery channel of such information. While emerging technologies are likely to play a central role in this process, the general perception of our informants is that future tools will have to be designed around the effective needs of the users in the NHS.

It is worth adding, however, that some of our informants highlighted the intrinsic risk of organising the field of clinical and service knowledge in terms of a rigid distinction between producers and consumers. This model embodies a notion of knowing (and clinical work) which is not generalisable. The challenge is thus in preventing initiatives which harness information production from leading to procedural rigidity which might cause delay, or subtle forms of deskilling with the consequent reduced capability of front line healthcare practitioners.

Dealing with networks

While most of our informants welcomed the wave of networking initiatives aimed at circulating and disseminating clinical and service knowledge, they

also identified as future challenges the development of sustainable models of networking, the identification of suitable technologies, and the emergence of appropriate forms of network governance. As noted by some of the interviewees, the emerging differences and tension between mandated and non-mandated networks raises the issue of which form of governance methods are suitable for sustaining and nurturing these phenomena which, as shown in other industries, need to strike a delicate balance between management and autonomy.

Bringing the patient in

One of the main challenges identified in this work is the need to conceive the patient as a part of the healthcare knowledge context and not solely as one of its users. Accordingly, the challenge is finding more sophisticated and sustainable ways of entrusting patients with the necessary knowledge both for using the existing services efficiently and for contributing competently to the healthcare processes in which they are involved. For example, some of our informants anticipated that the most interesting new developments in the use of ICT in healthcare are likely to be related to the issue of patient involvement. As demonstrated by path breaking initiatives in places as diverse as the Far East, the US, and Cuba, the challenge is how to intersect clinical, service and personal knowledge in order to manage health instead of disease, either by promoting healthier life styles, or through earlier identifying, preventing the deterioration of existing conditions, or through improving concordance with medication.

From categorisation to mobilisation

Finally several informants identified as a main challenge:

> "*Getting health professionals to look at their current practice against our recommendations and to change their practice when it's appropriate to do so*".

Accordingly, they view as a challenge shifting the attention from the current emphasis on knowledge sharing and circulation to what has been defined as "knowledge mobilisation", that is, a view which emphasises that knowledge has greater value when shared and implemented. The challenge is thus moving from a concern with simply "knowing more" to "smartly doing differently". The challenge, however, is of a tall order:

> *"Most places, if they found a new and good idea somewhere, they spend another year blowing it over, changing it and probably ending back where they started before they implement it locally. There's something about the culture of adopting new innovations, etc. You can share them; it's a little between just knowing about it and actually adopting it, isn't it? If people really stopped and thought, I think that's probably the biggest hurdle; even when people know about it, they either ignore it because they say it doesn't apply here or they don't ignore it, but they take so long to actually adopt it"*

The critical phrase in this quote is "culture of innovation", a terms which suggests the necessity to turn the existing forums for exchanging and circulating knowledge into places where innovation is promoted and takes place.

Barriers

While identifying the major challenges ahead, the interviewees also identified some potential barriers. Two in particular were prominent.

The first is the perceived risk that the complex issues of how to manage knowledge in the healthcare sector succumb to the traditional tendency of "*reducing everything to the lowest common denominator*". The risk is that the overall aspirational vision is reduced to a short set of applications and targets. As a consequence, the risk is that of reducing "*e-learning to e-training and knowledge management to a target number of web portals*" as described by one interviewee.

> Second, a major potential stumbling block was identified in the state of IT technologies in the NHS. While in general all informants were cautious about glamorising new technologies and heralding them as the main solutions to the existing and future KM challenges, they also readily recognised that the absence of a solid IT infrastructure constitutes a real barrier to any sustainable initiative of KM. The NHS Connecting for Health programme was of course acknowledged, but the fact that (for example) many nurses still have insufficient access to a PC is generally perceived as a major stumbling block for the improvement on how knowledge is managed in the NHS.

4.3. Ways forward and opportunities for future research

There are a number of areas in which academic research could make a difference:

- *Evaluate successful KM approaches and share learning with other industries.* Several of our informants stated that very little formal and in depth evaluation was carried out into knowledge initiatives. Accordingly, there is a need to understand which approaches had worked well and which had not. At the same time, academic research can foster the dialogue between the NHS and other sectors, supporting the translation of KM expertise from service-related and knowledge-intensive industries to the healthcare sector.

- *How does knowledge influence decision making?* One of the recurring observations put forward by our interviewees was that we understand very little about how information and evidence are actually used in practice on the front line and in boardrooms, which are "*the two main places where NHS resources are actually committed and used*". Accordingly, a relevant topic for future research is to understand how knowledge arrives in, and is used in NHS boardrooms, how it informs managerial decisions, and how it manifests in the language of the managers.

- *Learning from accidents and mistakes.* While we have witnessed a significant increase in the attention on patient safety over the past few years, we know little about whether the NHS learns from its own mistakes, why sometimes this is not the case, and what can be done about it. Accordingly, there is a pressing need for exploring the processes of organisational learning (or not-learning) from accidents, as a precursor to improving patient safety initiatives.

- *How to foster and support networked learning*. In spite of the widespread use of networks as a way of circulating and sharing learning, very little is still known about the processes and facilitators of effective "networked learning". By studying the results and experiences of the existing learning networks within the NHS important lessons could be learned.

- *Improving the New Service Introduction capability of the health care sector*. Several of our experts commented on the necessity to focus on the issue of knowledge mobilisation and improve the innovative capacity of the NHS organisations. Academic research could provide a vital contribution by supporting the translation of the existing wisdom on New Service Introduction from other knowledge intensive sectors and by developing models, toolkits, and road maps that assist NHS practitioners and organisations in their efforts to implement innovative practices and processes.

- *How to package evidence*. In spite of the many initiatives around, our interviewees suggested that still more work is necessary in order to find out effective ways of packaging and circulating existing information. In this sense, they suggested that two promising areas for future R&D are (a) the development of tools and technologies aimed at reaching and involving patients; and (b) experimenting with new media and interactive methodologies as ways of influencing NHS practitioners and patients. Among the ideas that emerged during the interviews were the use of theatre, digital television, direct marketing techniques, and new social technologies on the internet (blogs, video clips) as ways of reaching out and influencing a broader public.

5. VISITS AND CONTACTS OUTSIDE THE UK

5.1. Introduction

One of the main objectives of the present study was offering a scoping view of the key Knowledge Management (KM) processes and technologies employed in the healthcare sector of advanced industrial economies outside the UK. The research team therefore established contacts with a number of Centres of Excellence in several OECD countries. After some consideration and in view of the time and budget constraints of the project, the team decided to focus on four national contexts which could constitute useful comparisons with the UK situation, namely Canada, USA, Australia, and Finland. During the month of May members of the team conducted a number of exploratory phone interviews with leading institutions in these countries. Following the results of these contacts, two members of the team undertook two short visits to Canada (June) and the USA (July) in order to obtain further details on the most interesting experiences emerging from the first round of consultation.

The following part of the report summarises the results of the visits and contacts. Some of the background detail on each location has been taken from other sources in order to provide context. The final section encapsulates the major findings emerging from this part of the project.

5.2. Canada

5.2.1. Knowledge Transfer and Knowledge Management in the Canadian Health Care System

Since the late 1990s, the Canadian Government has strategically endorsed "Knowledge Translation" as a primary way of improving the health of the population, providing more effective health services, and strengthening the health care system. Knowledge Translation (KT) is defined as:

> *"The exchange, synthesis and ethically-sound application of knowledge - within a complex system of interactions among researchers and users - to accelerate the capture of the benefits of research for Canadians through improved health, more effective services and products, and a strengthened health care system"* [CIHR, 2004][2]

The development and implementation of the national KT strategy is delegated to the Canadian Institutes of Health Research (CIHR) established in 2000.The CIHR integrates research through 13 "virtual" institutes, i.e., networks of researchers brought together to focus on strategic health problems. Each Institute, which is dedicated to a specific area of focus, is led by a Scientific Director who reports to the CIHR Governing Council.

[2] CIHR (2004), *Knowledge Translation Strategy 2004-2009. Innovation in Action*. Ottawa, Canadian Institutes of Health Research, ISBN: 0-662-38785-6. Available on line at http://www.cihr-irsc.gc.ca/e/26574.html accessed August 2006.

While in many ways the CIHR fulfils a role similar to those of the UK Research Council (identify strategic research priorities, oversee the distribution of funds, and evaluate outcome and results) the adoption of KT as the cornerstone of its future strategy is extremely relevant for the present research. In its "Knowledge Translation strategy 2004-2009" (CIHR, 2004) the CIHR placed KT at the core of its future mission, effectively setting the issue of the efficient and effective use of knowledge at centre stage.

CIHR sees KT as "a dialogic and interactive process" which is "radically different from the traditional view of 'knowledge transfer' as a uni-directional flow of knowledge from researchers to users" (CIHR, 2004). Building on previous research, the CIHR recognises that dissemination approaches have not proven to be effective and that the mere reception of knowledge by the potential user does not imply its 'use'" (Landry, Lamari and Amara, 2001 quoted in CIHR, 2004).The vision for knowledge translation at CIHR is thus:

> *"To develop a systematic, integrated approach to accelerate optimal use of the best available research evidence in the interest of the health of Canadians".*

Accordingly, its current strategy rotates around four major priorities: supporting KT research, i.e. research on KT concepts and processes; contributing to building KT Networks, i.e. networks of researchers and research users; strengthening and expanding KT at CIHR, i.e. improve capability to support KT research and, with partners, KT itself; and supporting and recognising KT excellence, i.e. build and celebrate a culture of KT (CIHR, 2004).

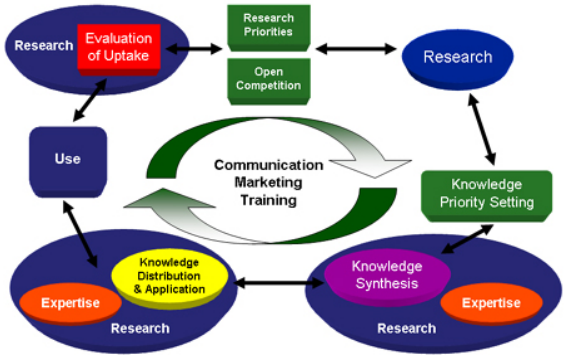


Figure 2: CIHR model of knowledge production and circulation

From the perspective of this research, the CIHR and its KT blueprint signal a strategic concern for the management of knowledge in the Canadian healthcare system. At the same time, the CIHR approach to KT (summarised in figure 1 below) frames the issue mainly in terms of capacity building and exploration rather than benchmarking and exploitation of existing knowledge. Finally, it gives priority to social networking as the main technology for achieving these goals, eliminating in this way other possible approaches.

In this sense, the Canadian case constitutes a relevant comparator and a learning opportunity for the UK health care sector.

Rationale for the visits

Based on the above considerations, the research team decided to contact and visits two Canadian provinces in order to deepen the understanding of some of the ways in which the KT strategy was implemented on the ground. Because of the limited scope of the research and time available, we decide to focus our attention on the provinces of Alberta, which is considered a beacon in the implementation of the KT strategy, and Ontario - namely the Centre for Global eHealth Innovation of the Toronto University Health Network, one of the most prominent Canadian research centres in the area of healthcare innovation through ICTs. The visits took place in June 2006 and were conducted by Davide Nicolini and Laura Martinez Solano.

5.2.2. Knowledge translation in Alberta

Alberta is one of the central provinces of Canada with a population of about 3 million and an area that is several times the size of England. The provincial healthcare system is administered by Alberta Health and Wellness, which oversees the work of nine Health Regions. The nature of the territory is in itself a major challenge and a reason for the highly devolved nature of the system. For part of the year, some of the territories are not reachable via land, and can only be accessed by air.

In order to deepen our understanding of the state of the art of KT in Alberta we visited three different organisations: SEARCH, a not-for-profit capacity-building organisation, the Health Organisation Studies unit the University of Alberta Business School, and the Knowledge Utilisation Studies Programme (KUSP) at the Faculty the Nursing.

During the visit at SEARCH, the two researchers encountered the CEO and some of the senior managers and faculty of the programme during a 2.5 hours group interview.

A similar setting (a group interview with the whole team) was used with the Health Organisation Studies unit the University of Alberta Business School, and at KUSP in the Faculty the Nursing.

SEARCH

SEARCH (Swift Efficient Application of Research in Community Health) Canada is an Alberta-based public service organisation operating since 1996. Originally funded by a the local Heritage Foundation, since 2005 it operates independently governed and funded by member organisation, which include heritage but also the nine health regions, the University, and the Provincial healthcare authority.

The main aim of SEARCH is developing "capacities for, and communities of, practice-based learning and innovation, in practice and research sectors across the province" (Casebeer et al., 2006[3]). It does so by supporting a

[3] Casebeer, A., S. Hayward, R. Hayward, and S. Matthias(2003), "SEARCH A learning and communication network" In C. M. Scott and W. E. Thurston, eds. *Collaboration in context*, Calgary, AB: University of Calgary, pp. 183-94.

network of health professionals and researchers dedicated to the creation of new knowledge and its translation into better quality health care decisions. SEARCH's approach is built around three overlapping areas of focus: building capacity for choosing evidence, creating evidence, and using evidence in the context of healthcare activities. This is obtained through a participative approach to capacity building "which recognises both service and academic organisations as part of the health system". (Casebeer et al., 2006, p.3).

The organisation, which is kept intentionally very small in order to retain maximum agility (it only employs a dozen permanent support staff, while most of the activities are carried out by contracted faculty or consultants) delivers three types of services: a 24 -month practice-based learning programme (SEARCH Classic), an ad hoc "just in time" project support service (SEARCH Custom), and an organisational development consultancy (SEARCH consulting).

The core activity of SEARCH revolves around a 24 months cohort-based learning programme first started in 1996. The programme, which is based on the principles of problem-based learning and action learning, aims at long-term, sustainable capacity building of individuals and their organisations. It consists in a combination of residential sessions, practice-based research projects and it is supported by a sophisticated proprietary web-based learning supports system (the "Desktop").

Participants, who join on a voluntary basis, are established health professionals from many health care areas, including nursing, social work, health promotion, mental health, family medicine, and health administration. They are selected by Alberta's health authorities and range from front line clinicians to senior managers. Individuals cannot apply to the programme and posts are only allocated to organisation. The programme is neither academically accredited (you do not get any qualification at the end) or mandated (it is not part of compulsory training activities). At the same time, however, the regions derive an immediate benefit from getting involved in the programme in that SEARCH is formally recognised by the Canadian Council for the Health Services Accreditation as part of their conditional or unlimited accreditation for one, two or three years.

The learning activity is centred on practice-based research individual and team projects. Participants continue in their employment and their salaries remain guaranteed by their sponsoring organisations. Approximately half of their time is allocated to learning and research-related activities. The client of the project is always the healthcare organisation to which the participant belongs or another healthcare organisation in the same province. The Projects are negotiated directly with the management of the heath care organisations involved in the process, so that the project has both high visibility and strong support from the outset. In order to emphasise the fact that SEARCH project are opportunities for developing the organisational capacity and not ways of training individuals, SEARCH tends not to deal with the HR department and deals directly with the operation management of the healthcare organisation.

Most of the projects are facilitated by academics who are seconded for part of the time to the SEARCH programme. Arrangements are made between SEARCH and their departments or faculty. In this way, the programme establishes a working partnership between service providers and organisation, ensuring a direct contact between the university and college environments. The training side of the programme consists mostly in developing skill in using information tools and technologies, research methods and practice, participating in collaborative networks, and personal development as a change agent.

The topics covered in the project span from evaluations of community health programs, change management capacity assessments, analysis of the impact of the on-call burden on rural physicians and the value of telepsychiatry. For example, one of the recent most successful projects regarded the impact of income on obesity. A group of participants explored what are the factors related to obesity and what role does income play and that is a critical review of the literature. Another participant explored how the balanced scorecard is used in teaching hospitals. Finally, another group is doing a project on hope and its impact on care providers (hope as in "optimism").

One of the crucial characteristics of the "SEARCH classic" 24 months programme is that the participants have ongoing access to a network of faculty and past participants through a web-based communications system designed to facilitate knowledge sharing. During the programme specific activities are put in place for supporting the development of the cohort cohesion fostering its develop into a community of practice. At the same time, participants are offered access to previous participants and faculty, so that past members become part of a large and growing network. In this way, the result of the programme extends well beyond the 24 -month programme. SEARCH program processes and outcomes are evaluated during, after each instructional module, and at 12, 18, and 24 month intervals using surveys and focus groups. According to the interviewees, to date, more than 125 health practitioners and 60 faculty members have participated in SEARCH's program. Seventy per cent of participants continue to be active in research after four years.

To support to the community of inquiry stemming from the 24 months programme SEARCH uses a variety of strategies and initiatives.

First, all participants continue to have access the databases, the Desktop to stay connected, and are introduced to the participants in the next cohorts ("once a searcher always a searcher"). Second, they are involved, either as client or as advisers, in the second programme run by SEARCH, i.e., SEARCH Custom.

SEARCH Custom is a just in time support service to individual and organisation carrying out improvement programmes. Upon request from member organisations, and often thanks to the intermediation of previous

participants to the 24 months programme, SERCH provides content and process support to ongoing innovation projects. A typical arrangement is constitute by "research development advisors" who make a link from the college or university in the local area to the local region. Advisers spend a set period of (part) time in the host organisation providing the requested support. Where applicable, advisers can be selected between previous members of the SEARCH programme. In this way, SEARCH Custom achieves a variety of goals, from growing research support network and communities of interests, to establishing direct link between academy and service organisation, to the development of new academic capabilities through the creation of a number of "scholar practitioners"

Second, the networking and community dimension of the SEARCH programme is ensured by the "Desktop" application developed in collaboration with Vividesktop Global Ltd. (http://www.vividesktop.com).

The "Desktop" application grew organically over the years based on the needs of the participants to the SEARCH process. The application is called "the Desktop" in that its interface replicates a typical stylised office of an Alberta's GP with its common use objects and furniture (see figure 3).

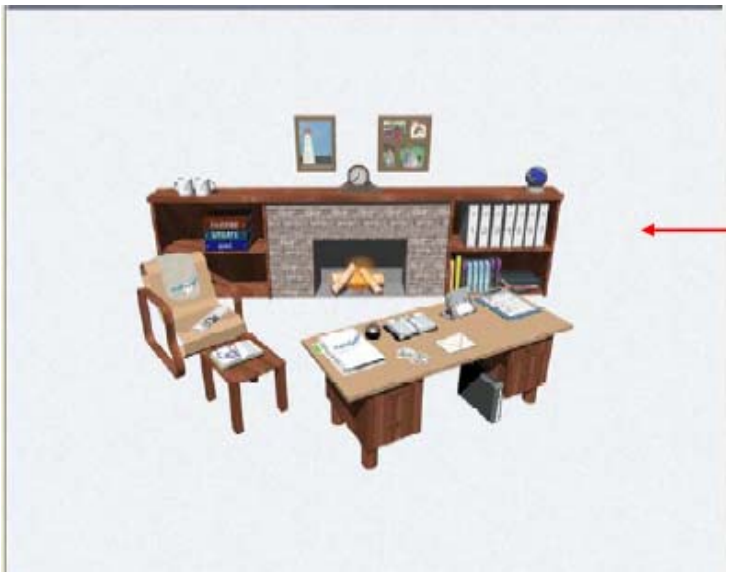


Figure 3: Interface of the Desktop application

The application provides a variety of functions aimed at supporting learning, sustaining community, and assisting the research process. The functionalities include:

- Searching the database of previous participants, faculty, materials, projects, and skills.
- Accessing a variety of training materials and learning tools (on-line courses; interactive exercises, etc.)
- Supporting the training activities by allowing streaming videos, synchronised presentation slides with audio, etc;
- Accessing scientific libraries and databases, guidelines, protocols from a variety of public and private sources;
- Supporting collaborative working and online project collaboration through messaging , shared workspaces, shared diaries, shared project directories, online discussion and videoconference;

According to the members of SEARCH, the critical aspect of "the Desktop" (in more than one ways a typical KM tool) is being perceived as a support SEARCH activity. As one of the interviewees put it:

> *"The initial assumption is that it had value because it was a repository of information and that that was enough. I in my mind, it parallels many of the corporate, the private sector world, made around knowledge management, of which, the healthcare world is falling into that trap ten years later. So just providing access to these massive repositories will somehow influence behaviour change. Not to say that these depositories don't have value, but they are not unto themselves sufficient".*

Because it is used regularly as part of the activity during and after the initial 24 months programme, desktops become seamlessly one of the basic infrastructures which support the networking and collaborative activity.

> *"The Desktop is a tool that has been in continual evolution and development, but it is an interesting example in my mind of a knowledge management tool that has been able to evolve in ways that are more compatible with our understandings of what in fact knowledge management—if that term really is the appropriate one—makes most sense".*

Accordingly, the "Desktop" is now used not only as a support for the Classic and Custom programmes but also in a variety of other contexts. An interesting recent evolution is the "Personal Evidence Project", a just-in-time way for an individual to capture his thinking around a particular problem he/she is facing. The "Desktop" provides a structured note -taking function as the person investigates the problem, which might mean a quick exploration of the literature or some engagement with other experts to find out what their perspectives are. Through the desktop practitioners are able to pull all this information together in a summary format that is an ongoing record of their thinking. Given that in Canada, as elsewhere, practitioners are increasingly required to become lifelong learners, this is potentially an interesting a way for physicians to track their ongoing requirements for continuing competence with their professional organisations.

<u>The Health Organisation Studies Unit, University of Alberta Business School</u>
The Project: Organisational Learning in Primary Healthcare Innovation
This is a research, not a teaching, group formed mostly by social science researchers and only two business studies related researchers, in collaboration with people in healthcare. Associate Professor Trish Reay explained that they just finished a 5-year research project titled 'Organisational Change in Healthcare', which included topics such as: Nurse practitioners, Continuing Care and Restructuring. Dr. Reay indicated that their current 3-year research project is entitled: 'Organisational Learning in Primary Healthcare Innovation' http://www.bus.ualberta.ca/hos/research/research_olphci.htm, is highly related to the past one, analyzing new ways of improving primary healthcare (first

contact with patients). She explicated that they are expecting to interview the same 10 people in each of the 6 selected regions in Canada every year. The project will also show whether the Best Practices are shared at regional or national levels.
Professor Karen Golden-Biddle explained that:

> "*… We analyze the relation between Knowledge Translation and Change… How the practitioners introduce new ways of working. We are talking about knowledge exchange and sharing, what actually happens… In this research we want to do high quality research, but also to involve the main decision makers of the organisations. It is a two-way exchange. There is a reflection between scholars and people in organisations…*"

Associate Professor Carole A. Estabrooks clarified that the Healthcare area is often highly pragmatic and methodologically driven. And their training is heavily professionalised and does not go too deeply into analyzing social theories. Therefore, she considers that the healthcare department will greatly benefit from establishing relations with experts from social science disciplines. Her unit at least is currently trying to find the proper collaborative relations to work with social science groups.

Knowledge Management terminology has a negative connotation
According to these social-science and nursing researchers, Knowledge Management is a fashionable term which is not well accepted in their working areas. In fact, it has a negative connotation.

> "*…Knowledge Management …is kind of a nasty term... The term has a negative connotation… pretty much for everyone… for healthcare people and [social science] researchers… Knowledge Management is a term that belongs to the area of terminology that changes every decade or half-decade…*"

They elaborated on why the term may not be well accepted in Canada, explaining that there has been a strong social belief called 'Medic Care in the Canadian Healthcare System', which is based on equality Healthcare in Canada is public and accessible. They also indicated that, most recently, healthcare, like other sectors, has been pressurised to adapt industrialising ideas. They mentioned that there is less trust in researchers' work, of which benefits now have to be quantified.

> *"…know that no one have ever bankrupted themselves by caring for someone who is sick. That is a core value and ethic. It [Healthcare] is public and accessible… [Now there is] pressure on public accountability…and less emphasis on the researchers' capability… much more towards a model of behavior about production… [we are told that] we should be practicing what we know… concerning efficiency...[Financial institutions] need to find a way to see that their investment has some output…"*

However, they observed that the term is increasingly used in relation to areas of economics, industry or business management, where 'Knowledge Management' helps to attain objectives such as the elimination of the duplication of tasks and the improvement of productivity, whereas healthcare practitioners are more concerned about personalised care, but not effectiveness or efficiency. Practitioners may link the term Knowledge Management with an excessively manipulative and intrusive technique on the part of managers.

> *"…Have you seen this cartoon? Where the guys are trying to quit and the manager is telling them, 'no! [you can not do it], now we have to suck everything that you learnt… At one point our 'practitioner' tried to catalogue what everybody knew and tried to map it. Then he tried to identify where we had a gap in expertise in certain areas… Managing numbers, names,… my hours, my sicknesses…and now they even want to manage my knowledge! It is the final straw…"*

Evidence Best Practices rather than Knowledge Management
Nevertheless, they recognise that although people in their areas (social science, nursing) may not like to use the term Knowledge Management, their research interests indeed cover certain aspects related to this term such as Evidence Best Practices.

> *"…Do you consider that you are doing Knowledge Management? 'Well yes…well not that I would not call it that… If we think in terms of knowing in the doing of change, or of knowing in the doing of clinical work…yes… Then Knowledge Management is heard more frequently. Normally it is called Evidence Best Practices… Then, Evidence Best Practices [research in Canada] is more progressive than that in the USA…"*

Some main Knowledge Management initiatives in Canada
They recommended talking with the relevant authorities on Healthcare to learn about the different existing mechanisms used to manage knowledge in the Canadian Healthcare sector at the regional and national levels, because their expertise is not on healthcare macroeconomics in Canada. However, they still gave their opinion from their research perspective. They commented that they are not aware of a national strategy for Healthcare in Canada. In fact they consider that the implementation of Healthcare processes in Canada is very fragmented, since Healthcare is federally legislated and provincially controlled. They added that the national government is restricted on what it can do in Healthcare because it does not have rights under their original founding. Even though the social science researchers believed that research funding is the government's tool to influence what things should be happening in Healthcare. The Professor in Nursing Studies disagreed with this comment. They agreed that it may be a part of it. However, they were aware of several initiatives to manage knowledge at national and federal levels.

- There is a national initiative for adopting Electronic Patient Records.

- There is a Tele Romanow Commission: The Commission on the Future of Health Care in Canada will make recommendations about sustaining a publicly-funded health system that balances investments in prevention and health maintenance with those directed towards care and treatment. In accepting to head the commission, Roy Romanow says, "The task before us is to draw upon the ingenuity of all Canadians to ensure… that our health system meets the challenges of the 21st century."
- -Medicine service which is nationally coordinated.
- Capital Health. http://www.capitalhealth.ca/default.htm

They also recommended reading Dr. Michael Rachlis who wrote 'Second opinion: What's wrong with Canada's health-care system and how to fix it'.

Centralised vs. Decentralised national healthcare systems – Difficulty in Sharing Best Practises

They believe that although the Canadian Healthcare system is quite decentralised, it has the supporting mechanisms to ensure that knowledge circulation is done properly. They questioned whether it is necessary to have a centralised system (such as the UK effort) to support knowledge share (i.e. best practices share) among the national healthcare. They were not completely sure about whether best practices in one location could actually be transferred and fruitfully implemented in other places. Their own experiences have shown them that it is hardly possible.

> *"…Knowledge sharing is very fundamental to this Primary healthcare project that we are doing right now… In Alberta they invested money in very specific innovation sites, but they expect that these sites will be sharing with each other… there are conferences every few months. But the underlying base is that it is very hard to share what you learn in one place and have it used in others. Everyone thinks that they have to do it themselves before they learn from someone else…"*

> *"…In Ontario,… the ministry… has given a small quantity of money to a nursery group to develop and implement practices' guidelines… You cannot imagine how genuinely concerned the people who have to implement them are… about these practices. In Canada…even in Evidence Best Practices, there are conversations concerning what are 'evidences'? Do we accept them?..."*

<u>The Knowledge Utilisation Studies Program at the Faculty of Nursing</u>

The "Knowledge Utilisation Studies Program" (KUSP) is a research centre of the Faculty of Nursing of the University of Alberta. It was established at the end of the 1990s to develop knowledge and research utilisation theory that can be used to increase the use of research by nurses and other allied health professionals to improve patient and client health outcomes.

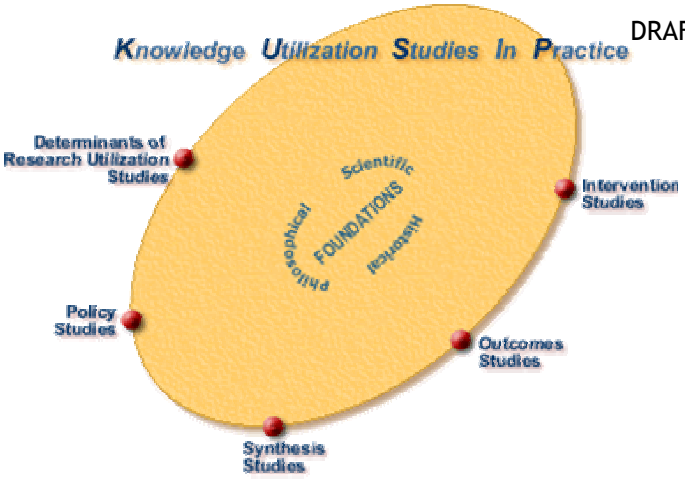


Figure 4

The programme operates mainly through research and postgraduate academic training. The two institutional objectives of KUSP are improving the ability to model research utilisation processes and accelerating current work by nurses and other investigators in this field in Canada and elsewhere, promoting and encouraging new work.

KUSP research and education activities focus on three questions:

- What factors influence the use of research by nurses and others working in complex health care organisations?
- What strategies are most likely to increase the use of research and other relevant knowledge in health care settings?
- What measurable outcomes can we expect to see as a result of more and better knowledge use?

These questions are addressed using the approach summarised in Figure 4.

The unit is one among about five operating in Canada. It is directed by a faculty sponsored directly by the CIHR, which, as part of its present strategy, established about 10 KT chairs around the country in order to develop long-term institutionalised centres of interest on the topic.

While Alberta's Centre is mainly focused on the organisational conditions of KT, other centres are more individually focused, either exploring the factors affecting the take up of medical evidence (Toronto, Mc Master) or focussing on consumer evidence-based decision making, that is, how do we help consumers making the best evidence-based choice when they have health problem (Ottawa).

The KUSP approach to KT

KUSP take a broader a more "catholic" approach to KT than in the CIHR definition reported above.

In the CIHR definition, the primary purpose of KT is to address the gap between what is known from research and knowledge synthesis and implementation of this knowledge by key stakeholders. Implicit in what is meant by knowledge is primarily scientific research, as made clear by the CIHR clarification that the interactions are between researchers and users and researchers tend to only produce research or science. Although there is a recognition that the relationship is in fact dynamic and reciprocal, the CIHR approach (which reflects the prevailing view in North America) tends

to consider knowledge mainly that deriving from clinical trials and controlled experiments.

For KUSP, this approach misses some important aspects of the nursing (and other healthcare professions) work, which, in their words:

> *"Isn't the kind of sexy work of giving the pharmaceutical agents that bring cholesterol down or cure cancer, it's caring work, in a large part… you generally go to the hospital to get nursing care when you can't manage it at home, because you're sick and unable to do it yourself"*

In this sense, KUSP is especially interested in exploring the issue of knowledge in work, that is

> *"the relationship between work and knowledge -- what knowledge is required to work and how much of that knowledge is research and how much of it is other forms of knowledge and how are those different forms--how do they travel, how are they stored and retrieved"*

According to KUSP members, this allows a broader and more realistic understanding of knowledge dynamics and its management, one that is, for example, sensitive to aspects such as the professional origin of knowledge and its users, the different status ("they call it "class status") of different types of knowledge and the fact that very often the skills at which nurses excel are culturally devalued in the existing medical work:

> *"We see nurses producing knowledge on the fly and it's completely invisible. It's not recorded, it's not talked about, it's not studied, it's not valued; there's a lot of interesting power and gender and class issues that go on and a lot of the work that nurses would produce in organisations can be considered feminine or domestic, so it's really not very valued, regardless of the work forces and its gender composition; it's not highly valued work"*

Research priorities and promising directions for future work

The above broad understanding of the notion of knowledge production and transfer means that the unit's interest in KT goes well beyond what they describe the prevailing narrow interest to focus KT research on "the study of guidelines implementation". This because the prevailing way of understanding and studying KT end up perpetuating the hierarchy within healthcare professions, one in which the humanistic and relational component is devalued because it cannot be quantified or captured by protocols and experiments.

The characterising trait of this unit is promoting an understanding of knowledge as an organic and messy process, one in which the tacit elements are constitutive and critical. This, in turn, is clearly reflected in the group's research priorities. According Carole Easterbrook, the leading members of KUSP, future research on KT should address four specific issues: context, motivation, succession, and support.

Researching the contextual conditions which facilitate KT

Although the group recognises that framing the issue in this way is somewhat "positivistic" in style, KUSP members believe that there is an urgent need to deepen the understanding of which contextual conditions ("factor") facilitate KT and, in turn, what is the relationship between this and organisational outcome. They see an important future work in operationalising context, both in term of the types of activities (for example, they found that distinguishing between acute and long term focus makes a significant difference) and of organisational characteristics (leadership, evaluation, forms of feed back and, in general, culture). There is already some work in this area, although much more is needed. Researchers, for example, have established that controlling environment is not conducive to KT and that this type of environment is quite predictive of lower lever of research application. A similar relationship has been established with rewarding and non-rewarding environments. The overarching idea is that one of indicator of "better hospital" is the level and efficiency of KT, and that the two together could be predictors of quality of service. One of the major challenges of this line of research is developing metric for measuring KT. The group has conducted some work in this area, but reckons that more is needed.

Motivation to use evidence in action

A second important area for future research is exploring what drives professionals to decide to adopt a certain course of action, such as using a particular treatment. The idea is moving beyond the individual knowledge deficit that informs much of the evidence based movement. The latter model suggests that if we tell clinicians things that they "do not know" they would use this knowledge. Because we know that this is not the case, the EBM movement has suggested that it is necessary to teach practitioners on how to read and use research. Once also this has shown ineffective, the proposal has been to teach practitioners how to criticise knowledge. According to KUSP, the "more of the same" approach is fruitless, and that research will have to look elsewhere, taking an epistemic leap and looking, instead, at more systemic aspects and changes. There is also a need to continue to explore the relationship between work and knowledge:

> *"I think we don't understand the relationship between work and knowledge--what knowledge is required to work and how much of that knowledge is research and how much of it is other forms of knowledge and how are those different forms--how do they travel, how are they stored and retrieved. It's a huge issue for us, the storage and retrieval piece; so those are two areas that I see are really important."*

Succession

A third aspect that the group considers of great importance is exploring ways of preserving the wealth of expertise of the nurse who are going to retire in the near future. At lest in Canada, there is an issue of a large amount and wealth of know how which risks at getting lost because a whole cohort of the senior nurses will soon go in pension. As on of the interviewees

put it "We should have an archival nursing project real fast before everybody retires and dies in the senior generation".

End-user centred knowledge intermediation technologies
Finally, some member of the group emphasise that although KUSP as a whole is necessarily skewed towards the "tacit" side, there is ample evidence that codified K is important, is used, and should be therefore made easily accessible. They argue that there is hence space for developing a variety of technologies, which, however, have to be built around the "knowledge in working".

They call these technologies "K intermediation technologies".
Examples of intermediation technologies include reminders, awareness technologies (intelligent drug formularies or labels which warn of potential contraindication and/or drug-drug interaction), and on tools which can support/enhance the existing nursing praxis which is oral and informal in character. The idea is that oral and face-to-face forms of K transmission at least to some extent can be supported electronically. For example, shift report, one of the critical activities in nursing, is increasingly done by tape, so that you do not have to overlap shift.

<u>The Centre for Global eHealth Innovation, Toronto General Research Institute of the UHN, Toronto General Hospital, Canada</u>
Interview with Dr. Alexandro Jadad, Director of the Centre for Global EHealth Innovation, University Health Network, Toronto General Hospital

Dr. Jahad has been writing about the role of virtual communities in managing knowledge in the Healthcare sector during the last 20 years. He commented that knowledge transfer in Healthcare is considered the new alchemy of the 21st century. He said that there is a necessity to learn more effective and entertaining knowledge transfer processes for Healthcare, because current techniques are very boring and archaic. He considered that the Knowledge Management Healthcare sector is still living in the 19th century. He explained that Knowledge Transfer processes have always been the same, but that people are now expecting different results. Therefore, he considered that the progress that has been done in this area has an unlimited value so far.

He indicated that there are some world leaders doing research on several aspects of Knowledge Management in the Healthcare sector that are currently located in different counties of Canada, such as the following:
Alberta

> *"…Alberta is the richest county in Canada,… but they do not have great experience of Knowledge Management in the Healthcare sector… However, most recently, they have been hiring spectacular researchers from other places…"*

Such as:

- Associate Professor Sharon E. Straus, Departments of Medicine / Community Health Sciences, University of Calgary. Associate Professor Straus's project is EPOcare, which analyses how to improve service effectiveness providing clinicians and patients access to high-quality evidence for clinical decision-making using mobile computers and other techniques. http://www.cebm.utoronto.ca/projects/epocare/index.htm
- Dr. George Browman BSc (McGill), MD (McGill) MSc, (McMaster) FRCP(C), Department of Oncology, University of Calgary. Dr. Browman's current interests include clinical practice guideline development and implementation, evidence-based decision making, health information sciences, and evaluation of clinical interventions in cancer. http://www.fhs.mcmaster.ca/ceb/faculty_member_browman.htm Professor Jadad commented that: "…He is a world leader on knowledge gestation along the whole spectrum… from basic science to healthcare politics…"
- Dr. KenDall Ho, MD, FRCPC (British Columbia), Vancouver General Hospital Department of Emergency Medicine. Dr. Ho is a practicing emergency physician at the Vancouver General Hospital Department of Emergency Medicine. He is the Associate Dean and Director of the Division of Continuing Medical Education, UBC Faculty of Medicine. He also serves on the Backbone of Research, Education and Innnovation (BCNET) Applications Advisory Committee. http://www.cpdkt.ubc.ca/About_Us/The_UBC_CME_Team/Kendall_Ho__MD_FRCPC.htm Professor Jadad commented that: "…he probably is the leader in Canada in Knowledge Transformation and Knowledge Management…"
- Dr. Jeremy Grimshaw, MBChB, PhD, FRCGP, Faculty of Medicine, University of Ottawa. Dr. Grimshaw is the Director of the Clinical Epidemiology Programme at the Ottawa Health Research Institute and Director of the Center for Best Practice, Institute of Population Health, University of Ottawa. He holds a Tier 1 Canadian Research Chair in Health Knowledge Transfer and Uptake and is a Full Professor in the Department of Medicine, University of Ottawa. http://www.medicine.uottawa.ca/epid/eng/grimshawbio.html Professor Jadad commented that: "…he is working on how to simulate the future Healthcare sector…"
- Associate Professor David Moher, University of Ottawa Evidence-based Practice Center (UO-EPC). Dr. David Moher is Founder and Director of the Chalmers Research Group (CRG), and is Director of Clinical Research at the Children's Hospital of Eastern Ontario Research Institute (CHEO RI). He is also an Associate Professor in the Departments of Pediatrics, and Epidemiology & Community Medicine of the Faculty of Medicine at the University of Ottawa. Dr. Moher directs the University of Ottawa's Evidence-based Practice Center (UO-EPC) and is the Lead Convener of the Cochrane Collaboration's Reporting Bias Methods Group (RBMG). Dr. Moher is an editorial board member of several leading journals. He is an advisor for the evidence-based medicine portfolio of the British Medical Publishing Group. http://www.chalmersresearch.com/p_moher_adm.htm

- Dr. R. Brian Haynes MD (Alberta), MSc (McMaster), PhD (McMaster), FRCPC, MACP, FACMI, Michael Gent Professor and Chair of the Department of Clinical Epidemiology and Biostatistics, Chair of the Health Information Research Unit, University of McMaster. Dr. Haynes' current research interests are primarily in knowledge translation research and medical informatics, focused on ways to improve medical care through improving the dissemination and application of validated medical care knowledge. Of particular interest are studies of the nature of information problems that afflict practitioners, patients, the public and policy makers, and trials of potential solutions from information technology (online databases, expert systems, and computer-aided quality improvement). http://www.fhs.mcmaster.ca/ceb/faculty_member_haynes.htm Professor Jadad commented that: "…he is managing the largest projects in Knowledge Management research in the world…"
- Dr. Brian D. Hodges, MEd, MD, FRCPC, Affiliate Scientist of the Division of Behavioral Sciences & Health, Toronto General Research Institute (TGRI). Dr. Hodges is currently an Associate Professor and serves as a consultant to the Medical Council of Canada, the Royal College of Physicians and Surgeons of Canada, the American Board of Psychiatry and Neurology and the Institute for International Medical Education. http://www.uhnresearch.ca/researchers/profile.php?lookup=2484
- St. Michael Hospital Micro-hospital - Professor Jadad commented that: "…They have invested $15 million in a Knowledge Management project"
- Centre for Global EHealth Innovation - http://www.ehealthinnovation.org/ajadad Professor Jadad commented that: "We have put $10 million into infrastructure for simulation systems…We have a platform through which to involve the public in knowledge gestation and to support virtual communities… In the Centre, we have simulation rooms… We are working with 61 companies. I want to remark on my interest in collaborating with Warwick Manufacturing Centre… No one has the required resources to make the currently required change in Knowledge Management of the Healthcare sector. Therefore, we need to join efforts…"

Interview with Gunther Eysenbach

Dr. Gunther Eysenbach is Associate Professor at the Department of Health Policy, Management and Evaluation, University of Toronto. He also holds a position as Senior Scientist at the Centre for Global eHealth Innovation, Toronto General Research Institute of the UHN, Toronto General Hospital, Canada. Gunther has a background in public health, which orients very much his interests towards studying and promoting open access of patients and professionals to medical knowledge. He has researched for years different aspects of consumer health informatics in view of making K ready available at the point of use. Gunther Eysenbach is the founding editor & Editor-in-Chief of the Journal of Medical Internet Research (http://www.jmir.org/) which he started a few years ago thanks to a grant and which he still edits.

JMIR is a peer reviewed, open access internet journal where it is the researchers, and not the readers, who pay. Researchers fork out a relatively small fee to have their piece reviewed and possibly published on line. The money comes usually from their grants under the heading "dissemination" and covers the costs of publication and reviewing. Readers on the contrary have free access to the content. The journal, which has attracted quite a bit of attention and some controversy, aims at rendering the result of research widely available without having to wait for the traditional "trickle down" process. Because the results can be easily tagged, the circulation within the scientific community is highly enhanced. At the same time, patients and other consumers have easy access to results for which otherwise they would have to pay – a condition which could constitute a barrier to accessing the information.

While the model proved to be very innovative and attractive (in fact, there are similar initiatives also in the field of biology and physics), there are some open questions regarding its long term economic viability, given that the customer base is necessarily limited and if prices for the reviews are raised too much researcher will simply revert back to traditional journals.
According to Dr. Eysenbach, consumer health informatics is one of the most interesting areas for future research in the area of "managing medical knowledge". He sees as two main issues for the years to come how to improve the quality of information and access.

He adds, however, to be quite suspicious of the very idea of knowledge management, which he believes, makes us believe that the process could be handled as a planned activity. On the contrary, he suggests that it is more useful to conceive the process of as being governed by producer/consumers types of relationships. From this perspective, he suggests the necessity to distinguish (segment) types of customers, starting with differentiating between patients and clinicians. He reasons that although they are both consumers of K, these two large market niches pose different challenges.
Improving quality of information and access for patients.

According to Gunther Eysenbach, the digital revolution and internet have radically transformed the identity and role of "patients". Patients have become active consumers and users of medical knowledge, and as such they should now be considered as integral part of the ecology of medical knowledge and of KT processes:

> *"Patients have become active catalysts of KT. When patients come to a clinic with a website printout which they handle in to the doctor, they are changing profoundly the very nature of the medical relation. The doctor might not like it, but in a growing number of instances this is one of the way in which doctor learn and become aware of the latest results of research and medical trials".*

Emerging evidence from research shows that the new role of patients have a very significant impact on the practices of their doctors, to the point that

up to 6-7% of doctors admit that they have got new relevant information from their patients.

The new identity and role of patients raise thus a number of new and exciting challenges both in terms of research and intervention.

For what concerns the quality of information available to patients, the most pressing challenges are: how do you measure the quality of information? How do you guide consumers? How do you really empower consumers to distinguish between good and bad information?

The latter is a very difficult issue that hasn't been cracked yet. The initial approach, based on the idea of "certifying" medical knowledge, proved unsuccessful, in spite of being which pursued by a number of agencies including the OECD.

The problem here is that there are plenty of ratings on the outcomes of research. However, the ratings are provided by commercial companies who are obviously reluctant to give it away for free. How to generate reliable open source ratings that can orient the public is thus a critical piece for future research.

A second relevant issue concerns access to information for patients. The main issues in this case are: how do you enable access? How do you overcome access barriers? How do you overcome the barriers deriving not only from lack of internet access, but also from lack of computer and especially health literacy?

Dr. Eysenbach states in this area he does not think highly of tools and believes much more in the process of teaching. The model he envisages is "internet schools for patients":

> *"We realised that there are a lot of benefits for patients from having knowledge of their condition…the problem is that they often lack the skills to find out the relevant information or to recognise which is the good one".*

Accordingly, he has been involved in initiatives from boosting the capacity of patients to become competent heath information seekers and consumers, testing the efficacy of simple training courses and documents on in validation techniques and checking and comparing sites.

Improving quality of information and access for health practitioners:
A second facet of the same issue is how to improve access and quality of information for practitioners. In this case, the main barrier is not lack of skills as much as data overload and time. Issues in this area include: how do you represent guidelines in a form that is useful for physicians.

The problem, of course, is that guidelines are long and verbose documents that few have time to read:

> *"We have a lot of guidelines that are ignored by doctors who are overwhelmed…the aim is rendering these guidelines machine readable so that they can be integrated into the electronic patient record. The model is making protocols more timely and more based on a push model"*

Dr. Eysenbach stated that there are a number of teams around the world that are working on this topic. The goal is representing guidelines in XML or another meta language so that they can be accessed in a variety of ways. He is currently conducting a naturalistic usability study on how to increase the usefulness of on screen guidelines in which the researchers observe how doctors interact with guidelines.

In sum, Dr. Eysenbach idea is that we are witnessing a major transformation that is making patients increasingly active and health information increasingly accessible. This is true of both scientific and personal health data: not only the internet has radically changed access to scientific medical knowledge, but an increasing number of hospitals are making their electronic patient records available to the public. If this on the one hand poses the problem of providing the patients the right skills for understanding and validating information, it also radically changes the way in which new IT systems are designed. The future will in fact require a shift from IT systems designed to respond to the needs of professionals to a new generation of tools developed with the patients in mind.

5.3. USA

5.3.1. Knowledge Transfer and Knowledge Management in the US Health Care System

One of the major characteristics of the US healthcare system is its sheer fragmentation. The presence of a multitude of players in a highly competitive environment means that any attempt at sharing knowledge has first to deal with the boundaries generated by the market. At the same time, however, the highly competitive situation constitutes a strong incentive for many of the HMOs to establish improvement and learning mechanisms. Failure at achieving good value for money or demonstrable quality (which, in turns, quickly turns into reduction of revenues from loss of contracts) is two strong motivators at addressing K issues.

This has led many HMOs to establish internal innovation and improvement programmes often supported by KM initiatives. Some of these programmes are also fuelled by the pressure of bodies such as the Joint Commission on Accreditation of Healthcare Organisations (http://www.jointcommission.org/), which increasingly tie accreditation to the establishment of improvement and innovation processes within Healthcare organisations at all levels. The later factor, however, has become a powerful cross boundary motivator, in that HMOs, hospitals, and other providers start to see the benefits at sharing knowledge and know how instead of having to invest large sum of money into rediscovering the wheel.

A typical example of this process is the case of VHA Inc. (http://www.vha.com):
VHA Inc. was founded in 1977 as a cooperative consortium between hospital and clinics for volume purchase of supplies and services. Over the years, the association has transformed into an alliance that aims at improving the value of members in more ways than through better price tags only. Accordingly, besides providing industry supply chain management services, VHA has started to promote a variety of services, including facilitating the development of member networks to drive sustainable results. The cooperative, which currently includes more than 2,400 not-for-profit health care organisations in 18 states, works increasingly as a for capitalising not only on bulk buying, but also on collective learning and on clinical and managerial innovation. Examples of these initiatives include organising conferences and symposia for sharing best practices, affinity groups, satellite broadcast and e-learning programmes, and awards (such as the VHA Leadership award)

<u>Rationale for the visits in the US</u>
Considering that an in depth analysis of KM initiatives in the US goes well beyond the scope of the present research, the visit and interviews focused on gathering an overall view that could be used as a broad comparison with the state of the art of KM in the UK. Visits and interviews included:

- The Boston based Institute for Health Improvement, possibly the best known centre of excellence for health improvement in the country

(Jonathan Small, director of Communication and of the KM team; Magde Kaplan, senior communication strategist and KM team leader).
- A New York based leading consultant in the area of KM in healthcare (Carlota Vollhardt, President, Executive Knowledge International LLC)
- Kam Shams, Chairman of the Shams Group (TSG)
- Shirley Eichenwald Maki, Assistant Professor, Department of Healthcare Informatics and Information Management, The College of St. Scholastica, Duluth, Minnesota
- Two representatives of Pfizer International, the leading pharmaceutical and healthcare solutions company

Report on the visit to the Institute for Healthcare Improvement (IHI), Boston

The visit to the IHI took place at the beginning of August 2006. Members of the project met with the director and vice director of the Knowledge Management process unit.

The Institute for Healthcare Improvement (IHI) is a non-for-profit organisation founded in 1991 and is based in Cambridge, Massachusetts. The IHI is an independent legal entity supported by the fees of its associates and by grants. It operates both at the national and international levels. The IHI runs a variety of programmes and initiatives and collaborates with several foreign organisations including several UK Trusts, the Modernisation Agency, and, more recently, the NHSi.

The IHI employs about 70 full and part time staff. Customers include a variety of organisations and individuals from the profit and the non profit sectors. Different programmes and activities are targeted at different organisational levels, form front line medics and nurses to middle and top managers.

The IHI sees itself as a change facilitation organisation build around the "will, ideas, execution" model. One of its core values is "transparency", a principle that all participants to its initiatives must endorse before taking part. In this way, the IHI has managed to constitute both the opportunity and place for collaboration and sharing among different, and at times competing, healthcare organisations.

KM at IHI

The IHI recognises that one of main issues of the US healthcare system is its fragmentation. While, the movement of information is thus a critical aspect of any innovation process, KM is a relatively recent focus for the IHI:

> *"It took us almost 15 years to realise that KM was something worth giving a name and put some resources behind"*

Although it can be argued that IHI trades mainly in knowledge, the realisation of the centrality of KM processes for the success of the organisation arrived quite late and following a now famous "organisational moment":

> *"The story goes that our CEO received a call from Sen. Ted Kennedy. He was looking for some info about the relationship between quality improvement and cost reduction. The CEO stood up from his desk and started walking around the office asking: 'do you have information about this? Do you have this piece of information?...He went from cubicle to cubicle trying to figure out who knew about it. Although the scenario had been played before, it had never hit this level of the organisation. So we all said: 'Time out! There must be a better way of doing this"*

Following the event, the organisation established a KM team composed of half a dozen full time staff.

At the IHI KM is loosely defined as the processes through which ideas can be corralled and put in a place and form that is easily accessible for anyone who can use them, both internally and externally.

Although a variety of processes are used for obtaining such broad scope, the IHI KM strategy is mainly based on the exploitation of its (very popular) website. In this sense, according to one of the informants, the website has become "the technical solution to the KM problem in IHI".

The website, which has been built in order to reflect the collaborative nature of the IHI, is not governed centrally by a single "webmaster" and can be updated and enriched by a number of authorised individuals from the IHI galaxy of projects. The role of the KM team is not that of collecting and publishing data, as much as putting in place the processes for the community to manifest itself on the site. The principle is that of the self help: "we are not the team to which you handle things and say 'here'".

This model follows a broad discussion in the IHI during which the idea of a Knowledge manager as a librarian was abandoned in favour of a much more facilitation-oriented approach.

The work of the KM team at IHI is thus that of governing the KM processes, not K itself:

> *"We do not manage the K, we design the processes—we are not KM doers, only facilitators".*

The KM team works in particular on helping those who have the knowledge to make it available for as broad an audience as possible ("until it becomes useful for someone"). Activities include harnessing information, corralling and organising data and stories, providing advice on how to structure content, creating and delivering templates.

The KM team is divided in two subgroups, one focused on making the site work and look good (the "content team") and another focused on designing

and maintaining the publication processes and momentum (the "KM process team"):

> *"For a while now we have worked with project managers to convince them to put their work as quickly as possible on the website. We call it the 'Feed the website first' principle".*

Project managers, who are often content experts, are encouraged and to publish progress documents, minutes of meetings, and materials on the restricted part of the website, so that other project members (but also other projects) can have access to their work in progress.

Once things get more finished, the KM teams help the project participants reconfiguring their material so that it can be published in the public part of the website.

The IHI uses a variety of other methods for broadcasting their information. This includes articles and publications, media exposure, white papers, videos. Most of these documents, however, live a double life, in that they always find a space on the website.

As well as using its website, the IHI broadcasts its information using its projects as conduit. Joining one of the IHI communities such as the "Impact Network" means, thus, becoming part of an information circulation network.

The "Impact network", which currently includes 220 organisations, is the main innovation community at IHI. Organisations which are motivated enough to commit the necessary time and resources can apply to become part of it. The network includes a number of hospitals, medical practices, and research centre from different countries including the UK. Activities comprise the "Leadership community" (which organises opportunity for exchange and reflection for top managers and leaders), the "Front Line Action Teams" (which have a clinical focus and usually pursue one of the "campaigns" promoted by IHI), and exchange events, from workshops to large conferences and gatherings.

The impact network, both for its size and diverse memberships, constitute one of the major achievements of the IHI. The Impact network has in fact allowed collaboration between competing organisations that have few other opportunities to learn from each other.

Other initiatives

The nature of the US healthcare industry make large K sharing or capacity building programmes very difficult to obtain, in that such initiatives cannot be mandated from the top, but have to grow from the ground, so to speak. According to the interviewees at IHI, most of the KM activity goes on within the HMOs or as part of the activity of professional associations.

Clinical professional associations are especially active in circulating updated information on the latest clinical development. Some of them provide a range of services for their members, many of which could be counted as clinical KM activities.

Besides the IHI, there are other innovation oriented collaboratives which operate at national level. Some, like the Joint Commission on Accreditation of Healthcare Organisations and the American Health Quality Association (http://www.ahqa.org) are mainly focussed on quality and safety issues. For example, the AHQA, which represents Quality Improvement Organisations (QIOs) and professionals working to improve health care quality and patient safety, organises a variety of exchange and learning events.

More interesting from the perspective of the present research is the case of large HMOs such as the VHA (see above), Kaiser Permanente, Ascension, and the Veteran Healthcare System (the nation's largest integrated health care system).

HMOs revenues derive mainly from managing efficiently the entire healthcare value chain. Accordingly, HMOs and similar organisations such as the VHA inc. have a particular vested interest in developing efficient ways for circulating and implementing best practices. This said, the effort main of these large organisation has been putting in place efficient data sharing system that allow patient and clinical information to circulate efficiently from point to point. In this sense, HMOs have adopted a quite restricted and often IT base view of KM. A good example is that of Kaiser Permanente (http://www.kaiserpermanente.org/) which is well known for being especially active in this sense.

Starting in the mid 1990s Kaiser piloted and later rolled out in several of its regions a Medical Automated Record System (MARS) to address the business and clinical needs of the organisation. The system, which was designed to be both a case management and a managerial tool, was intended both as a way of reducing paperwork and slim lining the billing process, as well as a tool to support the quality initiatives of the organisation. MARS operated as a large patient database that contained a variety of clinical and financial data which was then made available to doctors and other health practitioners in different points of the system. Besides collecting data, the system had been programmed to generate reminders and to offer guidelines at the moment of care, based on the history of the patient and on compliance with clinical guidelines.

Over the years, MARS has been integrated with new emerging technologies and has now been substituted by the KP HealthConnect Program. The system, which has been rolled out mandatory to all KP members, integrates all of a patient's information in a single system. The system links medical information with billing, scheduling, and registration data, incorporating a variety of messaging and clinical decision support tools which build on the extensive patient data contained in the system.

Promising future direction for future academic research
According to the interviewees at IHI, the main challenge ahead in the US is still getting a high volume of "very credible success stories that prove beyond doubt that improvement is happening". Collection of evidence is particularly important in the USA where decisions to innovate are always measured against future returns. Accordingly, academic researchers could contribute by refining the process for defining, validating, and documenting improvements.

A second area where further research would be particularly welcome is exploring ways of aggregating data and test the validity of their intervention methods. As one of the interviewees put it:

> *"We know that our initiatives have some impact, but we are often frustrated by the difficulties at aggregating data from a variety of organisation in order to explore the relationship between what we do and concrete results".*

Because of the nature of the IHI, the return on investments can only be measured on a large scale (regions, large networks), a dimension that is often beyond their reach when it comes to evaluation activities.

Finally, a third area for further research would be exploring ways through which participants to the innovation initiatives could become even more responsible for the dissemination of results. The objective here would be designing processes, tools, and practices that would allow participants to update their contribution without totally forfeiting the search for validity (a sort of Wiki of healthcare innovation). Again, the issue is exploring both new forms for communicating improvements, as well as the process through which these can be made available to the wider community.

<u>Interview with Carlota Vollhardt, Executive Knowledge International LLC</u>
KM as information management
In the US, the meaning of KM is very context dependent and varies according to the sector and the period.

Currently, in the healthcare sector the expression "KM" would be very much understood in term of information management. This is because one of the pressing challenges in the systems is overcoming the problems determined by its sheer fragmentation.

According to the informant, the US healthcare system has become increasingly complex because of the proliferation of actors.

In the first place, the private and public insurance system and the model of partially or totally managed care have introduced a variety of new actor in what used to be a quite simple doctor-hospital-patient system. Each of these new organisations introduces a layer for complexity, new processes, and new requirement in the system:

" a GP might have patient who belong to up to a dozen of private and public insurances…each of them would have different forms, different procedures, different requirements…most of the require authorisation before treatment…"

Second, the "suing" culture and the fierce competition have nurtured a system based on narrow specialisation:

"Many doctors and centres become hyper specialised…your nose doctor will look at your nose and know everything about it (and be insured against liability), but will ignore the rest and, in certain cases, will also be illiterate about other aspects…"

Third, the increasing proactivity of patients and advocacy groups, and the related protection of personal data and record, introduces yet another source of fragmentation.

The result is a system in which "doctors are overwhelmed by bureaucracy" the costs go to the moon.

Within this context, the Grail is finding a way of integrating all this information, rationalising the processes, automatising some of thee processes, and let machines (instead of scores of administrators) catching up with the constant updating of forms and procedures.

Fir this reason, KM is mainly understood as the search for systems that can translate language and reconstruct a unitary view of the patient. The challenge is of such tall order because the problem is not technical but organisational and political. The issue is navigating among several organisational and clinical/professional lingoes', procedures, and liability.

On the KM buzzword

According to Dr.Vollhart, the term KM has a very bad reputation in the US, especially due to the hypes and failure in the 1990ies.

"…people confused data collection systems and IT without business focus with KM …when these systems failed to deliver any value the term became connoted in negative terms"

During the last decade, several firms, including large healthcare organisation, invested large amounts of money in building large repertoires of best practices "which costed a lot and turned out to be scarcely useful"
Companies discovered soon that lessons learned were totally disregarded because:

- Learning takes place within a social context and not in the solitary relationship with a computer
- lessons count as such only when they are validated and legitimated by some kind of authority

- Decontextualised lessons require a significant amount of work to brought back to life – and such work is often a disincentive to the use of this type of systems
- Lessons learned tend to go through a process of "ageing". The database needs to be continually maintained and enriched otherwise, they become unusable

The consequence was that KM got a bad name and that companies turned mostly towards social technologies, which had some influence also in the healthcare sector.

According to Dr.Vollhart, however, this trend is in the process of being somewhat reversed and this for three main reasons.

First, there is a new generation of business focused KM systems that have proved highly successful. A recent example is the Wal-Mart case. Wal-Mart has developed a sophisticated KM system, which links in an intelligent ways a variety of sources of information and business process. Famously, for example, the company linked the national weather forecasts with records of past sales and with the supply process. Whenever the systems detects significant variations in the weather patterns (big storm, blizzards, heath waves) it triggers the delivery in the area of items that in past have been purchased under similar circumstances. So that at Wal-Mart you will hardly find the sign "shovels sold out" during a big snow shower.

The success of this new business focused information management has revived the interest for this class of solutions.

A second powerful driver is the demographic of the US workforce. Many US companies are facing the big problem of skill shortage consequent to the exit of the baby-boomer from the job market. The mass leave of this generation is creating transitional problems that have been compounded by the failure of the US educational system to produce enough engineers and technical staff. The result is that "a twenty years old engineer is often surrounded by late fifty colleagues with the prospect of having to replace them and all their experience". Therefore, the emerging challenge is that of capturing this expertise, not so much for improving the existing business process as for surviving and keeping the existing one going.

Finally, the growing attention for safety is also a driver for a renewed attention for KM issue. Here the novelty is the extension of existing practices in new areas. One should consider , in fact, that some practices of sharing lessons have always been or have become routine in many organisation, where they have been absorbed in the accepted form of governance. These activities are carried out without reference to KM issues although they might descend from KM initiatives which took place long ago. This is especially true in team oriented organisation, where a dimension of "learning" is often present in the very process of project management, that is, is something that is expected and required a spart of the daily practices.

If you think of teaching hospital, for example, the practice of sharing clinical knowledge among the members of the team has always been there.

Now the concern for safety means that these practices are being extended to new roles and figures, from nurses to other staff, although the medical structure is still there and is a real problem for what concerns sharing.

Summary of the current states and future developments
The reality of healthcare organisation is that, with some notable exception, they are all laging behind other industrie for what concerns both data integration and KM. For exmple, the big consultancies have all developed fairly efficient and well maintained KM systems (the key word here is well maintained: these companies have specific staff who go around, collect stories and information, edit it, and then makes it available for everyone to use, so that people actually lern to trust these sources). No healthcare organisation that I know have started to seriosuly address these issues.

Yet, competition is so intense that you start seing healthcare organisations moving fast. In this sense , HMOs are ahead of the pack because they have all the intersts to go down this way.

Kam Shams, Chairman of the Shams Group (TSG)
Shams Company: IT Knowledge Management Systems
Mr. Sham considers that Shams Company is one of the first organisations in the US to work with Knowledge Management ('…the concept of looking at all data across all the modalities, across the organisation, even across the community…') concepts. Shams Company works mostly with physicians and hospitals. In fact, it has worked with 4,000-5,000 hospitals all over the US since 1993. Shams Company has some fundamental tools such as Knowledge Management architecture, strategy, technology and warehouse. The data warehouse and analytical tool is called GALAXY. However, its customers may use complementary tools according to their specific needs such as GALACTIC and ASTRO. "…If you have data on paper, we have a tool called GALACTIC. If the organisation wants to ... share information … with hospitals, communities… we have a product called ASTRO…" http://www.shamsgroup.com/collab.htm

Knowledge Management as an emerging discipline
Mr. Shams explained that Knowledge Management is an emerging discipline. He said that physicians and hospitals started automating 20 years ago with back office applications, and are now moving to clinical applications. He said that over the last 10 years, hospitals and physicians' offices have been accumulating large amounts of data, which has been split out in many databases. According to Mr Shams, it is estimated that healthcare data is growing at a rate of 70% per year, of which 40% of the data is on paper.

Therefore, he added that Healthcare managers are looking for more real time. They want to run their organisations in a lean manner. They want to be more proactive than reactive, accessing data when they want it and in the form in which they want it. In progressive healthcare organisations,

there is an awareness that there is a goldmine of data that can be analysed to create new opportunities at lower costs, to enhance clinical care.

> *"…You can look at Knowledge Management as a luxury in few progressive organisations and only one academic centre that I know in healthcare is actually promoting it…."*

He also commented that the healthcare environment, at least in North America, is rapidly changing. He positively observed that the competition generated in a capitalist system such as the US is a good and necessary incentive to improve Healthcare conditions.

> *"…the US market is a capitalistic market place…we have a lot of experimentation and competition…organisations are cultures, cultures behave based on motivations… Profit is not a dirty word here in [the US] Healthcare. There is a shortage of funding, so new ideas take a long time to penetrate into the main stream… it will take a little longer, but the best practice will come out… If we do not do it [Knowledge Management], I do not care if it is Europe or America, we can bankrupt our country…"*

Some main challenges for implementing effective Knowledge Management systems

Mr. Shams commented that some main barriers to implementing effective Knowledge Management systems in Healthcare are: 1) Resistive cultures and leaders to change, 2) Non effective IT Knowledge Management systems, 3) Users' analytical inability and 4) Best practices' sharing difficulty.

Resistive culture and leaders to change: He commented that some leaders and cultures do not welcome changes such as Knowledge Management implementation.

> *"…When you apply knowledge strategy you move from lack of accountability… to complete transparency… and a lot of managements do not want to be accountable…"*

Non effective IT Knowledge Management systems: He explained that a good IT system for Knowledge Management needs 1) an architecture, 2) a strategy and 3) extraction technology that is capable of obtaining data from any of the required systems and to

> *"…bring it into a Knowledge Management platform and remodel the data in a new analytical framework, truly designed for best practices and business intelligence… If the systems do not do that, you should not even spend your money, [because] you are just going to be frustrated… All systems in the market place do not do that… they do aspects of that…"*

Users' analytical inability: Users need analytical skills to get the best out of the Knowledge Management technology.

Difficulty in sharing Best Practices: He commented that all the initiatives have two major themes in their agenda, which are sharing the data, and best practices in the US. He agrees with the Alberta social science research team that information can be shared, but organisations find very difficult to implement someone else's best practices. "…It only gets implemented when people inside a hospital or a physician's office believe in it… How do you believe in something that is so new and radical…? You believe in it, if you get a chance to use it…". He added that the governments can provide best practices, but they could only be implemented and sustained by practitioners, not managers. "…Practitioners know all the implications of the practices…" He emphasised that to make this possible, you need a good Knowledge Management system.

Importance of academia to educate about Knowledge Management
He said that the marketplace is skeptical about Knowledge Management. He believes that one of the challenges is educating people that Knowledge Management is the right strategy, and allowing those who are skeptical to use and value the technology. He thinks that academia has an important role to play in educating people about this matter, because academics can create workshops and seminars to develop those future leaders who will go out into the healthcare field and transform it. He said that there are about 150 universities and colleges that offer either two year or four year Masters programs in HIM within the US. "…I have given workshops to the faculties of that organisation. I have tried to preach this concept, but it is slow…"
Future research recommendations

Analytical skills development:

> *"…I would like to see further research…on how we think analytically… I know it can be taught…that you have a great technology, but that does not mean that the person is capable of geting the best output from it…"*

Existing IT Knowledge Management technology: He recommended the study and benchmarking of existing IT Knowledge Management technologies.

<u>Shirley Eichenwald Maki At The College of St. Scholastica, Duluth, MINN</u>
Terminology: Knowledge Management vs. Information Management
Shirley Eichenwald Maki is Assistant Professor at the department of Healthcare Informatics and Information Management, the College of St. Scholastica, Duluth, Minnesota. Assistant Professor Eichenwald commented that the term Knowledge Management term to the identification, collection, storage and dissemination of the knowledge assets of the organisation. Meanwhile, Information Management is commonly related just to the collection of clinical and financial data from primary sources. She mentioned that although her institution as well as others is moving more towards Knowledge Management, they have retained their current name more in relation to Information Management so far because of reliability and identity purposes.

Some main Knowledge Management initiatives in the US

According to Professor Eichenwald, there are several interesting initiatives that cover different aspects of Knowledge Management in Healthcare at the national level in the US.

American Health Information Management Association (AHIMA): AHIMA is the premier association of health information management (HIM) professionals. AHIMA's 50,000 members are dedicated to the effective management of the personal health information needed to deliver quality healthcare to the public. It was founded in 1928.

Healthcare Information Technology Standards Panel (HITSP): HITSP was formed by a cross-sectoral group of stakeholders involved in developing and coordinating the standards that will support the National Healthcare Information Network (NHIN).

National Healthcare Information Network (NHIN): NHIN is a comprehensive, knowledge-based system capable of providing information to all who need it in order to make sound decisions about health. In Washington, policymakers view the creation of a national healthcare information network as a top priority. The government has already spent $139 million to support regional healthcare information networks.

American National Standards Institute (ANSI): ANSI announced standards for the emerging field of electronic healthcare records (EHRs) and floor surface safety.

Healthcare Information and Management Systems Society (HIMSS): HIMSS is the healthcare industry's membership organisation, which exclusively focuses on providing leadership for the optimal use of healthcare information technology. HIMSS represents more than 20,000 individual members and over 300 corporate members that collectively represent organisations employing millions of people.

Universities: Professor Eichenwald also indicated that some of the main US Universities working on Knowledge Management in Healthcare are Pittsburg, Harvard, Duck and Stanford.

5.3. Australia

A summary view of the state of the art of KM in Austrlia was obtained thanks to an interview with with Professor Enrico Coiera, Foundation Chair in Medical Informatics and Director of the Centre for Health Informatics (CHI)at the University of New South Wales Sydney.

In its website, CHI claims to be “Australia's largest research group in this emerging discipline…”. It mentions that “Building a sustainable health system for the 21st Century will require the reinvention of much of the present day system, and require the intelligent use of information and communication technologies to deliver high quality, safe, efficient and affordable health care…”. There are 25 researchers working in this centre.

Non National Strategy for the Healthcare sector in Australia – Dark Ages
Professor Coiera was not aware of a single national strategy for the healthcare sector in Australia. He commented that the national government is responsible for primary care and age care, but the 6 states are responsible for their own hospital systems. He explained that "each state has a different hospital system and then within those systems they all have different ways of localising …it is a very messy system… I think we are probably like you [the UK], in the Dark Ages still". He does not consider Knowledge Management to be a specific discipline per se. He explained that many issues of Knowledge Management such as organisation of knowledge, dissemination of knowledge, and retention of knowledge are certainly all concerns of the overall health strategies of different initiatives in Australia.

Successful examples of ICT and electronic systems used in Healthcare Knowledge Management
Professor Coiera explained that there are some very successful examples of the use of ICT and electronic technologies used in Healthcare Knowledge Management such as:

The Clinical Information Access Project (CIAP), Australia:
He explained that CIAP is a provision of on-line resources, guidelines, text books (evidence-based practice) for 55,000 nurses, midwives, doctors, allied health, community health, ancillary and library staff working in the NSW public health system. He mentioned that this project has been running since about 1995 and might be one of the world's largest on-line knowledge repositories available to a single group. He believed that it has had very well received success, which is not organisation-based, but simply profession-based. He considered that it is very passive and people just use what is there. http://www.ciap.health.nsw.gov.au/

Electronic prescribing systems – Australia:
Also, he indicated that 95% of primary-care or general practitioners in Australia use electronic prescribing systems, inbuilt alert checks for drugs interactions, and checks for the dosage, which involve qualified knowledge.

Veteran Affairs (VA) Hospital in America –The US:
When he was asked to mention some international examples, he answered that the Veteran Affairs (VA) Hospital in America is a good example of a successful international organisation that employs ICT systems for Healthcare Knowledge Management.

National E-Health Transition Authority (NEHTA) – Australia:
Moreover, he mentioned that NEHTA Limited, http://www.nehta.gov.au/, a not-for-profit company, has been established by the Australian State and Territory governments to develop better ways of electronically collecting and securely exchanging health information. He commented that "…it is a place where they [the state and territory governments] all work together…". However, he did not comment on how successful and welcome this initiative has been.

Some main challenges for implementing effective Knowledge Management Systems

Too prescriptive Electronic Health Records: He stated that ICT systems have not been correctly applied in all Knowledge Management issues. For instance, he thinks that the Electronic Health Record is deficient and not the best way to support Knowledge Management. He said that these systems tend to be very prescriptive and formal. He believes that there is no reason why they could not be much more permissive. "They should allow you to pick the tools that you need rather than being guided to a formal pathway".

Uninformed population on health care information technology: UniHe indicated that one of the main challenges to implement good Knowledge Management processes in Australia is a very much uninformed population on health care information technology.

> *"…so we are asking them to solve various sophisticated and complex problems with no full understanding of these domains [information technologies] so consequently they are not even in a position to make informed decisions…".*

5.4. Finland

To gain a genral view of the state of the art of KM in Finalnd we contacted and interviewed Niilo Saranummi, Research Professor in Health Technology at the Technical Research Centre of Finland (VTT).

Professor Saranummi, commented that he considers Knowledge Management at two different levels: macroeconomic levels across the country and at the care service oriented micro-level. He said that the challenge is to find a good balance between the two.

He also mentioned that IT systems have been used to transfer information among the different districts. However, he agreed that best practices sharing is a big challenge.

He has been working in Knowledge-Intensive Service Activities in the Finnish Healthcare sector.

The focus of KE practitioners has been to put emphasis on codified knowledge (i.e. to discover new ways of effectively representing healthcare related information). Practitioners from KM have concentrated on macro/policy aspects on how healthcare-related information can best be disseminated to support knowledge recycling and the creation of new knowledge. This contrasting approach by practitioners from these two domains is leading to the emergence of the knowledge age in healthcare.

5.5. Summary of findings

5.5.1. What is the state of KM in other countries?

The contacts with experts abroad indicated that the UK is ahead of the KM game with respect to many other OECD countries. None of the countries examined seem to have reached a level of awareness and a number of

initiatives for the systematic management of clinical and service knowledge as the UK.

We found that the term "knowledge management" has a bad reputation in the healthcare sector of other countries besides the UK. In some Canadian environment, the term is resisted for fear that the adoption of models derived from the private sector could or would compromise the strong egalitarian and social values at the basis of the Canadian "Medicare" system. At the same time, many Canadian healthcare practitioners are be suspicious of the term which they associate with an excessively manipulative and intrusive technique on the part of managers.

In some parts of the US the term has acquired a very bad reputation in the late 1990s thanks to some spectacular failures and as consequence of the generalised incapacity of large "best practice" data banks to deliver any significant benefit for the organisations that set them up.

Apparently, in Australia and in Finland the term has simply less currency in the healthcare sector than it does in the UK.

5.5.2. What is the prevailing approach/focus?

The prevailing focus and approach to KM issues reflect the conditions and challenges of the national healthcare sector. In this sense, and unlike in the private sector, there is no consensus on how to approach the issue of how to managing knowledge in the healthcare sector.

Canada is the only country where we found a national strategy for the management of healthcare knowledge. Since the late 1990s, the Canadian Government has endorsed "Knowledge Translation" as a primary way of improving the health of the population, providing more effective health services, and strengthens the health care system. The development and implementation of the national Knowledge Translation strategy is delegated to the Canadian Institutes of Health Research (CIHR). The CIHR understands Knowledge Translation (KT) mainly in terms of capacity building and exploration rather than benchmarking and exploitation of existing knowledge. It gives priority to social networking as the main technology for achieving these goals, eliminating in this way other possible approaches. The Canadian approach to KM reflects in part the nature of the local health care system. Although in many respects the system operates under the same constraints as the NHS (universal care free at the point of delivery), unlike it is highly decentralised and devolved both in terms of governance and type of care delivered. Accordingly, there is much less scope for large, centralised initiatives and for large cross boundary networking activities and systems and the focus is much more on regional initiatives and programmes. At the same time, the reduced sizes of the ambits of these initiatives make their management and implementation much less overwhelming than in the NHS.

Unlike Canada, the nature of the USA healthcare sector does not allow the emergence of national KM policy. The system is highly fragmented and

populated with actors with different and often contrasting interests and expectations. Transaction costs are a significant burden which absorbs a significant part of the available resources (and profits). Accordingly, in the US KM is first and fore mostly perceived as intelligent and advanced data integration. Although there is awareness that there is a goldmine of data that can be analysed for creating new opportunities at lower costs and for enhancing clinical care, improvement oriented Knowledge Management is still considered a luxury in most organisations.
Because of the nature of the system, in the US the attention and initiatives aimed at circulating and managing clinical and especially service knowledge are concentrated within two types of organisations: HMOs and independent agencies. Because they manage the entire healthcare value chain, HMOs have a direct vested interest in harnessing the benefits of the lesson learned in one part of their systems. At the same time, independent agencies, such as the Boston based IHI are the only type of organisations which can span the existing boundaries, promote the encounter among and establish collaboration between different healthcare organisations in view of the pursuit of common goals, such as patient safety or clinical improvement.

In all the surveyed countries there seem to be a strong preference for social processes and social technologies as ways of identifying, circulating, and sharing clinical and service knowledge. Most of the advanced technologies observed in all the Centres of excellence visited would count as social technologies, that is, technologies which support the virtual meeting, dialogue, and conversation of different types of actors. It must be added, that in consequence of the high level of take up of ICT, in the US the use of web tools for KM purposes seems more advanced and common than in the UK.

Although the discourse of Evidence Based Medicine seems to be gaining increasing attention, we found much less focus of the circulation and implementation of guidelines and protocols in other countries than in the UK. As consequence there seem to be less emphasis on the development of tools capable of supporting this process.

A common theme emerging from our contact with the most advanced healthcare research centres in North America is the increasing centrality granted to patients as knowledgeable actors in the system. Many of the most advanced and path breaking initiatives and technologies we encountered were aimed at addressing the knowledge needs of patients and at developing ways of empowering and enabling them to contribute to the existing healthcare process and knowledge base.

5.5.3. What are the opportunities for future research?

*Comparing KM models.*_Even within the narrow limits of the scoping study it emerged that different countries have adopted very different strategies for what concerns the management of clinical and service management. A first and obvious direction for future research is deepening the understanding and comparing the benefits and pitfalls of the different approaches

Translating to the UK the existing successful KT roadmaps and methodologies. The scoping study has identified some outstanding case of knowledge transfer programmes, such as the SEARCH initiative, which could constitute a potential model for similar initiatives in the UK.

Studying the process and motivation for using "evidence in action". The Canadian model shows that a critical aspect for enhancing knowledge translation is focusing on the process through which knowledge is mobilised and put to work. Accordingly, a very promising area of future research is studying in details the process of knowledge use and mobilisation, as well as investigating what drives professionals to adopt certain courses of action. This might lead to the development of a new generation of end-user centred knowledge technologies and tools that can sustain this type of processes and in general the process of knowing in working.

Evaluating and measuring improvement outcomes and the value for money of KM initiatives. Most of the interviewees suggested that academics have a primary role in impartially evaluating and measuring the outcome of existing initiatives. There need is of collecting, aggregating, and analysing data as well as case materials. The collection of evidence is particularly important in those contexts, such as the USA but also the UK, where decisions to innovate are always measured against future returns.

Addressing the knowledge needs of succession and mobility. As in other countries, the NHS is constantly affected by the problems derived from succession and from high mobility of expert personnel. Accordingly, a promising area for future research is identifying processes and methodologies that can facilitate these processes and prevent the dispersion of knowledge consequent to the exit from the organisation(s) of its most knowledgeable members.

Integrating patients in the healthcare sector knowledge ecology. From the contacts with expert abroad it appears that some of the most exciting avenues for future research and development will take place in the area of patients' involvement. Opportunities for future research in this area include both deepening the understanding of the ways in which patient knowledge can be easily harnessed and mobilised, as well as the development of innovative intermediation technologies that empower patients by transferring them the relevant and necessary service and clinical knowledge.

Evaluating alternative institutional model for promoting KM. Finally, an interesting research question raised by the comparison between the UK and other healthcare systems (but also with other industries) is whether the knowledge management and knowledge transfer needs are better served by internal initiatives and organisations or by autonomous organisations such as the IHI or SEARCH. The results the scoping study suggest in fact the need to deepen the understanding of which are the benefits and the inherent limitations of the two models and approaches to governing innovation and improvement processes in the healthcare sector.

6. LOCAL NHS TELEPHONE SURVEY

6.1. Aim

The aim of this element of the project was to identify the views of a range of West Midlands NHS stakeholders on current knowledge management issues in their organisations. This was a scoping study designed to produce a rapid overview in a limited time. It was also designed to forge relationships with local NHS organisations with a view to future collaboration.

6.2. Methods

6.2.1. Sample and setting

Guided by the advisory group, we contacted Medical Directors in Acute Trusts, Directors of Public Health in Primary Care Trusts, and Directors of Human Resources (HR) and/or Education and Training in both primary and acute settings. Clearly this limited range of informants will have influenced the findings which should be interpreted accordingly. We sampled all primary care and acute sector trusts in the old West Midlands South SHA area (Herefordshire, Worcestershire, Warwickshire and Coventry). In addition we also purposively sampled trusts in the Birmingham area so that organisations in a large urban area would be included in our sample. Emphatically, this was not a survey of a random or representative sample designed to give results which are generalisable across the NHS. It was simply intended to give a "view from the ground" from some key stakeholders in local organisations.

6.2.2. Recruitment

Individuals were identified from organisation websites and by direct telephone contact. Letters of invitation were posted to each individual. Letters were followed by repeat requests via email and fax. Fifteen individuals agreed to take part: eight Directors of Public Health, four Medical Directors, and three Directors of HR or Training.

6.2.3. Interview process and content

Telephone interviews were conducted at pre-arranged times in August and September 2006. A semi-structured interview schedule was piloted and used for the interviews. The schedule is included in Appendix 1. The order of questions was determined by the flow of each individual interview. Interviews were audio-recorded with permission and a narrative summary was written based on each interview.

6.2.4. Interview analysis

Two members of the research team independently listened to each interview and read the narrative summaries. These team members then met to discuss emerging common themes. These team members then revisited the data to validate the presence and prominence of these themes.

6.3. Findings

6.3.1. The Discourse of Knowledge Management in Acute and Primary Care Trusts

'Knowledge' was understood primarily in terms of information requirements. This was the case throughout most of the interviews, particularly those within Public Health, and perhaps most clearly demonstrated in the responses to this first question. For example one Director of Public Health when asked to comment on the sort of knowledge and expertise used in their work they replied:

> *"So we are talking about access to any…any knowledge at all, any sources of information?"* (DPH2)

When this was confirmed the interviewee proceeded with the following,

> *"Well In terms of the classic Public Health triad of information there is the…, the first is about is the state of health and what's going on out there? So it's sort of how many, how bad, that sort of thing. The second big set of information is about how well things work or don't work. And the third bit of information is about what is already happening. Each of those three things…the idea of what we do in the PCT is to triangulate those".* (DPH2)

Despite a widespread tendency to talk mainly in terms of information there was an occasional reference to the use of experiential knowledge. For example one Medical Director stated that,

> *"What I use in my work is firstly years of experience because obviously that's really quite critical in trying to understand how health services develop and therefore how care is delivered".* (MD3)

When asked whether they saw their work as involving the management of knowledge there was quite a wide range of responses with a number of processes mentioned. Some understood knowledge management as simply a normal part of their everyday work, for example,

> *"I'm probably just doing things that I take for granted. I use various websites and do a combination of routine looking for information and knowledge on the internet and other sources and disseminating the findings of that and talking about those with staff at meetings".* (DPH8)

Others saw the knowledge management component of their work much more explicitly and strategically, for example a Director of Public Health saw the interpretation of information as a major facet of their (and the Trust's) knowledge management work:

> *"Interpretation and sense making is major part. People try to make sense of [information] for others. So in a sense our consumers of that information are quite a wide range of people. So the PCT Board wants to know what's going on, the Government want to know what's going on about health in our particular area, Hospitals, GPs, Councils…with*

> *differing levels of 'health literacy'. But also there is a duty to the public, to release a statutory report for them. And we want to provide lots of information for them to help themselves. It's about sympathizing but also presenting it the way we want to get a particular message across".* (DPH2)

The final sentence of the passage above also reveals a process of knowledge manipulation for the public good.

Additionally, a number of interviewees mentioned their own professional reading as an essential way to manage knowledge both for themselves and others. For example,

> *"We have our own professional reading, I read the British Medical Journal, there are articles which come out of that, which if I think they have got significant policy implications I'll bring those and I copy those for the key individuals that are heading up those areas".* (DPH6)

Others were somewhat confused by what the term Knowledge Management included and what it did not include. For example when a Human Resources specialist was asked whether they saw their work as involving the management of knowledge they replied,

> *"I haven't done until I read the questions that you sent to me, and I must admit I had a quick look up in one of (colleague's name) books about KM and I thought actually, yes it does, most definitely".* (HR1).

In a similar fashion a Director Public Health expressed their reservation around the term as follows:

> *"Oh yes, but it depends how you define management of knowledge. Certainly we use it in order to highlight health problems and to analyze over time how we are doing in terms of interventions. So it's a major tool in the work I am supposed to do".* (DPH1).

This notion of confusion around the terminology was a particularly prevalent theme throughout the interviews. When asked whether Knowledge Management was a term which had been heard often in the workplace the overwhelming response was in the negative. In fact for some the terminology was clearly an emotive issue. A Director of Public Health, for example, gave the following response:

> *"Well clinical governance is more likely than not to have heard that sort of term. So all the people I work with use the term. But I think people in the services wouldn't know what the hell we were talking about. It's not immediately appealing to members of the clinical profession because they can't understand why it's called knowledge management when really most of the stuff we get is information. So it seems to them that it's just a bizarre term. Knowledge is something that you get from*

wise people, isn't it? So would you class NICE guidance as knowledge? I wouldn't put it in that category". (DPH8)

While not so critical in tone a number of other interviewees expressed an undoubtedly negative sentiment in relation to the term Knowledge Management. For example:

"KM probably has too many syllables in it for our GPs". (DPH6)

"It's a jargonistic phrase that I haven't come across before". (HR1)

"I made a mental note to say to you, the abbreviation KM must be something that you made up because it's not something that is widely used within Public Health". (DPH1)

"The answer is absolutely no because when I got the letter through I sort of charged around a couple of the Executives and said 'what do we do about knowledge management?', and people just said 'well, I've never heard of it'. (MD3)

Despite the trend indicated above there were a small number of interviewees who were clearly more aware and comfortable with the term. For example,

"I certainly know it [KM]. It is periodically mentioned at work. I can't say that it's necessarily flavour of the month but it is knocking about the ether". (DPH7)

"Yes, certainly more so more recently, over the last few years. But yes it is a term we are familiar with". (DPH3)

There was no discernable difference between Primary Care and Acute Trusts. Some Directors of Public Health had no knowledge of the term while other had, the same was true for Medical Directors in Acute trusts and Human Resource representatives.

There was variability in the currency of the term KM, some terminological confusion, and a lack of a consistent discourse around KM in healthcare. However, there was consistency in the discourses around two areas both of which could be seen to be knowledge management activities under different names: Evidence-Based Medicine and Clinical Governance.

6.3.2. The Practice of Knowledge Management in the Acute and Primary Care Trusts

A considerable proportion of respondents reported that the management of knowledge was not an explicit concern of the organisation because much of what could be thought of as Knowledge Management was implicit in the routine work of health professionals. This sentiment is captured by the following excerpts:

"*There are phrases such as that within individual aspects of the PCTs services. But I don't think its one of the PCTs key objectives as a whole but it is implicit in what the other objectives strive to do."* (DPH2)

"*People do do it without putting that as a title to it. There does seem to be a culture in this organisation of people wanting to openly share information and knowledge they've got with others".* (HR2)

"It's a terminology issue. Within Public Health we have people who are paid as epidemiologists, they spend their lives managing public health information and arguably knowledge as well. So within PH we would recognise it more than in other bits of the organisation because…but I guess its knowledge in terms of analysis and interpretation of data. If that is knowledge then within Public Health we would give it a higher rating than the organisation as a whole. That's largely because Public Health would like to think it's an evidence based specialty and KM is how you demonstrate evidence. You need to manage knowledge in order to produce an evidence base". (DPH5)

"Maybe [KM] is going on in a sort of piecemeal way. Or in a sort of subliminal way, or in a way that is integrated in other things so I don't notice it. But it's not something that strikes me as a high priority, but I handle knowledge all the time I suppose. So, you know, the emails I pass around, new information, NICE guidelines get passed around very efficiently. So I don't know if that's [KM]". (MD4)

However, when pressed further, most interviewees were able to provide a number of examples of initiatives that might be considered Knowledge Management. Interestingly, when giving examples of Knowledge Management the interviewee was often slightly confused as to whether what they were describing was in fact Knowledge Management.

This was perhaps mostly clearly evident in examples which could be categorised as clinically based Knowledge Management initiatives. These were initiatives or systems in place as part of the overall function of the organisation that while not labelled as a Knowledge Management initiative certainly involved some recognisable features of Knowledge Management.

For example a number of interviewees mentioned the role and relevance of Evidence Based Medicine, NICE guidelines and Clinical Governance. When asked whether the efficient circulation, sharing and use of knowledge/expertise was an explicit and present concern for the management of their organisation, a Director of Public Health replied,

"it is very explicitly acknowledged within the clinical governance strategy…. It is regarded more as a clinical governance issue rather than a general management issue." (DPH7)

Additionally, when asked whether 'Knowledge Management' was a term which they had heard mentioned often in their work a Medical Director replied,

> *"Not specifically. It's in there as a pillar of clinical governance. We have had KM committee, but no longer. It is part of the portfolio, but not a big part.".* (MD2)

The interviewee was subsequently asked what had become of the KM committee. The reply is indicative of the linking of KM with Clinical effectiveness.

> *"A lot of its functions are absorbed into the trust wide education committee. Where the librarians meet. The previous one was very focuses on KM as a pillar of clinical governance. So it was about NICE guidance, guidelines, clinical effectiveness. The other part of it is absorbed into the clinical effectiveness committee. That approves guidelines and makes sure they are up to date. It's been subsumed into clinical effectives and education".* (MD2)

There was frequent reference to Clinical guidelines as a means of knowledge management; this is demonstrated in the following excerpt:

> *"Well the clinical one that jumps to mind is something we are doing at the moment which is adopting standardised guidelines, where there's a thing called the bedside guidelines partnership that was originally developed in north Staffordshire. And we have had our own guidelines but we think it is probably better if we join in with everybody else and go with that for our trainee doctors. So that's a pretty important knowledge dissemination issue. We have a clinical governance department who does horizon scanning for NICE guidelines and NCIE recommendations, which is a national knowledge thing really. Those NICE outputs are systematrically managed through the governance system we have".* (MD4)

Clearly the NHS as an organisation is built upon what are fundamentally knowledge intensive processes and much of the inbuilt organisational systems are inherently concerned with the management of knowledge.

In addition to these 'inherent KM' systems there were a number of initiatives that were more explicitly concerned with Knowledge Management. For example one interviewee mentioned the use of Monthly Journal Clubs during which important new articles would be appraised for there evidence and policy relevance,

> *"The Public Health information team has a monthly journal club in which articles which are appraised for both evidence and policy relevance are discussed so, for example, the last month we looked at the Sure Start appraisal that was in the British Medical Journal and we invited people that were involved in the Sure Start programme from*

other discipline such as education to come and have a debate about what the implications might be". (DPH6)

Clinical networks were also mentioned in a number of the interviews as a forum in which people could meet to discuss areas of common practice, examples are provided by a Medical Director and a Director of Public Health respectively,

"We are involved in all the clinical initiatives that we are automatically in involved in. Such as the cancer networks the intensive care network. The cardiology network and children network etc. So we are involved in those and some of us are involved in running those as well. So for example, I'm the lead physician for the Arden Cancer network as well as Medical Director for here. Several of or commission carry lead roles in various other networks". (MD1)

Well we certainly have clinical networks, those tend to be at local or regional level. I think we have some specialist networks at a regional West Midland level. So we have clinical networks. (DPH3)

It should be noted that the usefulness of such networks were questioned by the some interviewees for lacking widespread participation and for other factors as illustrated by the following comment:

"I think the problem with networks is that some of them become neither the one thing nor the other, they are not a unified voice for gaining clinical consensus around pathways and they are not an effective way of bringing sense into the commissioning process. So they are stranded somewhere in between where they don't have complete clinical sign up and they certainly don't have sign up from the commissioners. So there is a bit of an uneasy relationship in some areas of network activity". (MD1)

Another initiative was described as a Practice Sharing days/event. These could be organised either within and by the organisation or at a Strategic Health Authority level. During these events people, units and/or organisations would demonstrate their best practice in order that other may learn from their experience.

Well we are members of the cancer network and the cardiac network. And they hold days when there is the sharing of good practice. And there is also, for the Public Health fraternity, there are …something about curry, basically you go for a whole day and you put on display and talk about what has been done to disseminate good practice, and in talking about what you have done you set a context about where it would fit within an overall knowledge basis. (DPH6)

As indicated above there was some interesting work around training and learning. For example, one interviewee discussed the use of e-based learning systems which were an attempt to move training away from the

formality of the classroom and into the more contextually relevant environment of the clinic.

A variation on this was the Protected Learning Time initiative at one Primary Care Trust. This particularly interesting initiative is explained as follows:

> *"… we have a Protected Learning Time , regular monthly sessions to which all professionals in Primary Care are invited. There are a whole range of parallel sessions within that and we use those Protected Learning Days as a way of disseminating what we want in the way of standards and policy around things like smoking cessation, diet and flu immunisation".* (DPH6)

A further education and training based initiative was a process for mentoring and training new recruits into the importance of Knowledge Management. This is described by a Medical Director as such:

> *"one of things that is really important is to engage people soon after they join an organisation. To some extent we can do that with new doctors for example. That's through a process of mentoring and we have a view that we should engage consultants even in their first year of appointment in getting them to understand their responsibilities around the management of their area and not just expect everything to be served up on a plate for them but actually become involved in service improvement".* (MD1)

Finally, there was a frequent use of library services to support learning both within individual trusts and through national programme such as the National Library for Health, though this seemed of marginal importance.

> *"There is a strategy involving libraries and making the services available for people and training in doing literature searches and that sort of thing. So there is a strategy around that as a part of clinical governance that we are anxious to preserve library facilities and increases peoples' skills in critical appraisal. And having proactive information and knowledge updating rather than reactive. So all that is done fairly well".* (DPH8)

In addition to the traditional library there appeared to be an increasing role for e-libraries as indicated by the following two comments:

> *"We also have a virtual library service, which I don't know as much about as I should but they have learning portals which accesses all sorts of …and there are national learning virtual medical libraries that we are part of. I'm not a great user of them but the certainly exist. So there is, whatever it is called, the National Electronic Library for Health".* (DPH5)

> *"Locally we have invested, I don't know what the numbers are, but all staff have access to a Knowledge…an Electronic library system, a knowledge management system. From their desktops or from a point fairly close to their workstations. They can even access those from home with the appropriate passwords. So we have invested quite a lot".* (DPH7)

A separate variety of initiative might be thought to include those which were embedded with the organisational processes. This effort is captured by one Director of Human Resources who remarked,

> *"Senior management have tried to embed this way of working (KM) in the organisation rather than as an add on. They see it as an everyday way of working.* (HR2)

A particularly clear example of this is the way a Medical Director attempted to decentralise Knowledge Management so that it was not entirely dependent on the work of the Executive Team.

> *"One of the things which we wanted to achieve was to have the understanding, to identify those individuals, first of all who had ability around doing this. And who could lead these things individually because there is a limit to the amount of time the Executive team can spend as individuals involved in the micro management and part of problem is finding individuals at middle management level who will take the same approach and will actually take the initiative and will not be just become constrained by a process of saying 'no' to everything because it's the simplest and safest way to keep out of trouble. So its wanting to develop a group of people who will be wanting to take the initiative with particular projects and feel that they have the, they don't need to refer back on an hourly bases to make decisions. We are developing, we are discovering who those individuals are what we would want to do, is have a more systematic approach to this where we can provide more formal training".* (MD1)

In a second organisation there was evidence of a programme of knowledge retention in which highly experienced members of the organisation were retained, unfortunately the following description does not reveal how this was achieved, nevertheless it is an interesting example of a working knowledge retention into the processes of the organisation,

> *"One of the things we do talk about is corporate memory. That is a way of ensuring there is a smooth transition of knowledge. So, one of the things you'll probably understand about Trusts is that the most permanent members of staff, of course, would be the non-management team. So the people responsible for running the Trust are people who come and go and if they are really good they move on quickly and if they are really bad they move on quickly, if they are in between they will move on some time. So we have a turnover of staff. It's been important at times when we've seen how staff are turning over in key*

areas that we've taken steps to secure certain posts to ensure that that sort of corporate memory is retained so you don't get a new team coming in and having to start from scratch and taking paths that are therefore inappropriate". (MD3)

A similar notion of learning from experience through embedding KM into organisational processes was evident in the following description of a 'learning before doing' process:

"Each programme manager is charged with the responsibility of seeking out the status, so when the programme was being designed and strategy being formed, and evaluating how we are doing, is supported usually by a Public Health, either trainee or practitioner or consultant, with some evidence or appraisal. So they use the library and we have the (abbreviation) as sort of literature and the university contact, although much less now then we used to, to kick start the setting the context and the fundamentals, if you like, the foundations of what works and what doesn't work and what we should be majoring on". (DPH6)

6.3.3. The Future of Knowledge Management in Acute and Primary Care Trusts

One of the key directions emerging from the collection of responses was toward a greater systematisation as a result of the creation of larger department. This was seen primarily within the context of reorganisation facing Primary Care Trusts. Part of this process involved a greater degree of collaboration between organisations. This dynamic is portrayed by the following two extracts:

"I think there will be a trend to become more systematic about how information and knowledge is used and to develop processes for managing knowledge. The time scale will be difficult to say. Whether it will be rapid or slow, I think it will develop slowly rather than rapidly. I think, in relation to health improvement within Public Health with a larger department there would be more scope to develop a more systematic approach. For no other reason than the increasing volume. So I think the trends are in that direction towards having amore systematic system for this". (DPH3)

"The PCTs are merging. The new Director of Public Health for (County name) PCTs is likely to be a joint appointment with (name of County Council). There are two things that this might produce. Firstly there might be closer cooperation between (county council's name) research and analysis section the Public Health bit of analysis of information locally. But also it's likely that the Public Health doctors in (name of County Council) will go together to work from one base. And that's always a very useful thing to do because there are economies of scale". (DPH1)

A further direction mentioned related to the greater use of Information Technology both as a means of collecting information and making it more

available. In particular there was an emphasis on getting information and knowledge to practitioners in out of office situations, for example,

> *"In terms of using knowledge and evidence it's about people having access to a quality controlled and up to date source of information. So it's something they can trust but it's also something on tap when they need it. Then, its less of a public health thing and more harking back to a more clinical agenda…Traditionally the information you need to make a decision wasn't available, you have to go away to a library and sit and look through 200 books to try and find it . More use of handhelds and better organisation of the information people need and use would help. Some of this happens through guidelines that are circulated and protocols. But you can only put so much in those. There is always going to be some things that you have to go away and look up. Whereas if you had something more interactive you could do that in a more timely way".* (DPH2)

Within the Primary Care Trusts in particular it was envisaged that there would be an increased level of recruitment into positions around KM including mostly Information Specialists. This clearly evident in the following remark,

> *"The whole service, even though it is local level, could do with employing information scientists whose job it is to provide useful and meaningful information in a timely and up-to-date fashion. Certainly, within Public Health we have long wanted that sort of role. Its not just somebody who can do the statistical calculations but people who have time to source the literature and review it and present a conclusion for whatever the issue is".* (DPH5)

6.3.4. The Challenges Facing the Practice of Knowledge Management in Acute and Primary Care Trusts

One of the core challenges noted was around the current inadequacy of PC skills among clinical staff. This was clearly an issue for the following Director of Public Health,

> *"Where we have been less inclined to invest has been in training clinical members of staff to use computer/ICT, that's still an issue…I think the bit we have not done nearly well enough is to make sure all our staff are IT literate, know how to search for the appropriate evidence and know how to interpret that evidence appropriately. Almost all staff, clinical staff very very clearly, but also managers who are looking for evidence to support certain policy directions. I think some sections, particularly HQ type staff, have been much better supported in learning IT type skills than say your average district general nurse".* (DPH7)

An interview with a Human Resources specialist highlighted one of the costs associated with inadequate PC skills. When asked about the whether more could be done around Knowledge Management the answer was as follows,

> *"Gosh, id start right at the very beginning with induction and I'd start with some of the very basic skills. I would like all staff to have better PC literacy. Because so much of the information we share comes from an e-source and I would speculate that 75% of our clinical staff aren't PC literate at all. So that outs them on the back foot in terms of receiving information. I think also the consequence if you have a low level of PC literacy you don't necessarily have an understanding of how this information can be disseminated, shared, picked up and used. I don't you have quite the vision, the remit of it".* (HR1)

Insufficient time was also mentioned especially in relation to an overabundance of information. The complaint centred in the fact that there is currently too much information and not enough time to analyse, interpret and do anything else with it. That sentiment was captured by a number of Directors of Public Health as shown in the following comments:

> *"Our problem is that we don't have the time to access this information and do things with it. The other source of information that is new is from General Practice, from the QUAF information and QMAS data. Which I haven't been able to do anything at all with, which a very rich source of information for the future, which we could get a lot of information from. It's quite frustrating, because, especially with the internet, there is much more information available now than when I was a trainee, but I just don't have the time to access any of it".* (DPH2)

> *"I think most people a so busy in their professional lives that if they are lucky they'll take 30 sec to scan what's in there but its not consciously, actively giving space and time and saying 'I must do this part of staying in touch".* (DPH6)

> *"All of that requires a KM system that works but its also need people with enough time to use it and I suspect people would say that this knowledge is all very well but I don't have time to read it anyway so it doesn't matter. I suspect that is a significant barrier for lots of people, they would like to spend more time using the knowledge that is out there, its about having the time to do that and then to use that in your practice. Whatever your job happens to be".* (DPH5)

As mentioned previously there is currently a major reorganisation underway within the West Midlands Strategic Health Authority that is impacting upon Primary Care Trusts. One of the characteristics of this reorganisation is the heightened sense of uncertainly. This was mentioned as one of the key factors working against the development of Knowledge Management. As one Director of Public Health cautions,

> *"The drivers in the opposite direction will be resources. With the reorganisation there will be a struggle for resources with people having to focus on core activity".* (DPH3)

Another Director of Public Health explained that they had not been able to formulate a strategy for Knowledge Management because in the context of reorganisation they had been unable to bring in the necessary human resources. The situation is described as such,

> *"We've been virtually a single handed Department Public Health PCT and although we have had access to colleagues in neighbouring PCTs who help us to gather and analyse information, because we had the NHS freezes on recruitment prior to the big reorganisation, we weren't able to appoint our own PH analyst. I think had that been possible we would have had A) a strategy and B) been in a better position with regards to a systematic collection of information and its analysis".* (DPH4)

A further challenge facing Healthcare professional related to the work of embedding Knowledge Management into organisational processes. The major issue raised here was around the need for visible senior management support. For example,

> *"We have found that unless the executive directors are involved, in those meetings its difficult to take them forward. The most effect ones have been the ones that we have led jointly, so it deals with the clinical and the operational issues. And on the clinical side we have the support of the director of nursing, which I critical. We have found that it's no good just sitting in your office answering your emails etc unless you are involved and out and about. It's very difficult to take these things forward".* (MD1)

The same sentiment was expressed by another Medical Director who explained that,

> *"But whatever we do the response comes back that you need to be on the shop floor. Which is very difficult when you have 3 sites, 4000 employees and 6 full time directors but that's what people say they want, and the things you do in terms of briefs and cascades and electronic methods the answer comes back that that's all very well but I want to see you there shaking my hand".* (MD2)

The final challenge raised, and perhaps the most troublesome of all, was around the need for a change of culture within individual organisations and in the NHS generally, especially among some of the older more traditional elements where there existed a level of scepticisms towards new ideas like Knowledge Management. This situation was explain by a Medical Director as follows,

> *"Part of the problem is that we have many people in our organisation that have been here for a long time and may not have a very, they may have become a little bit blinkered in their view. They need to have the scales lifted from their eyes so they see there is a much more enjoyable and productive way of working and taking initiative. So I think some kind of process around this is what we are intending as part of our*

business development programme. And some form of training needs to be incorporated in that." (MD1)

6.4. Conclusions

It is clear that there is a great deal of diversity in the various initiatives used at a local level within the UK Healthcare sector. Despite a widespread absence of an established Knowledge Management discourse within the PCTs and Acute trusts there were many initiatives that could be thought of as being, to a greater or lesser extent, Knowledge Management. Certainly the discourses of Evidence-Based Practice and Clinical Governance were prominent. The fact that most interviewees thought in terms of clinical processes and information requirements illustrate not a lack of Knowledge Management but rather that these organisations are steeped in the processes. Knowledge Management often happens without it being consciously thought of as an exercise under that banner.

7. FINAL WORKSHOP

7.1. Introduction

Davide Nicolini (DN) introduced the workshop, the purpose of which is to (1) provide feedback on a six months scoping study, (2) establish a dialogue with attendees and (3) gain as much input as possible from attendees on where to take this research work in the future. The slides from this workshop are included as Appendix 2.

7.2. First Presentation: What does it mean to manage knowledge in the health care sector? Evidence from the literature and from a stakeholder consultation

This presentation included the results of the UK stakeholder interviews, the literature review and the visits and telephone interviews with experts outside the UK.

Main findings presented:

Constraints. A major constraint on making progress on Knowledge Management (KM) issues was a tendency to think KM was something just for either managers or IT geeks. The issue of sustainability within the NHS led to people asking themselves if it was worth getting into KM. It is difficult too for people to learn from other sectors because of the difference in language used. Also, people do not trust IT.

Fragmentation (1). KM in the NHS has multiple interpretations. KM areas are compartmentalised. With such different perspectives and with so few links, each of these many initiatives has to waste energy fighting for survival.

Fragmentation (2). Some organisations are engaging in KM, e.g. NHS Direct, National Patient Safety Agency. However, the researchers found evidence neither of a written strategy nor of a common language or theoretical reference. Without a strategy, there is the danger of reducing KM to tactical initiatives (e.g. E-learning becomes E-training).

Networking. The favoured way of sharing knowledge within the NHS is through networks which seem to be resilient to all the moving around within an organisation that is in continual flux. However, not all networks worked because of the way they had been set up, e.g. hierarchical barriers.

Mobilisation. One respondent referred to a gap between having new knowledge and making that knowledge work. Sharing knowledge by itself is not enough; knowledge has to be mobilised too.

Other countries. What happens in the UK replicates other countries, although some things could be learnt. E.g. Canada has a national strategy that translates the results of research into practice.
Ways forward. There is a need to make it clear that managing knowledge is not a peripheral activity and to consider the patient as part of the ecology

of KM. And a need to move to mobilisation: "How do we make the knowledge work for us?"

Q&A and feedback for 1st Presentation:
The NHS is not risk-averse; it just doesn't like taking on new technology until that technology has matured.

Pilot studies are a good way of showing someone else how you've been successful in getting something working.

A lot of clinicians and managers are frightened of knowledge. There is a need to train people about the usefulness of knowledge.

A national strategy would kill the idea; it would be better to approach KM locally. A national strategy does not deliver the detail needed on the ground.

There is ample knowledge around, but a problem in getting it from place to place. How do you get clinicians to write things down?

Funding. Going back to the issue of implementing KM at a local level, is the funding available? What financial resources are available? Currently, you have to make a business case for each individual case.

7.3. Second Presentation: What practices for managing knowledge are used by the West Midlands Health Sector organisations? Results of the telephone survey

This presentation included the results of the local NHS telephone survey.

Main findings presented:

Awareness of KM is varied, ranging from a total lack of awareness to one Medical Director reporting a management structure in "a very large organisation" that is organised around KM.

The knowledge requirements for Acute Trusts are more broad than for PCTs who are more focused on explicit knowledge e.g. patient safety, HR issues. With Acute Trusts, knowledge is more of a process.

A broad spectrum of initiatives is being used to manage knowledge (see slide).

The way forward is seen as:

- More systematic and collaborative, through creating larger departments during the process of re-organisation.
- More electronic, through a new computer system making knowledge more accessible.

- More human resources. At present there are not enough information specialists.

Challenges include:

- Inadequate PC skills through not making sure all staff are IT literate and therefore cutting them off from receiving information on best practice.

- An over-abundance of information and insufficient time to do anything with IT.

- The uncertainty of re-organisation and accompanying struggle for resources.

- Any KM that took place between organisations seemed to occur at the level of individuals rather than at an organisational level.

- Asked whether KM was taking place between NHS organisations such as PCTs and Acute Trusts, the researchers replied that no-one mentioned it taking place.

- Acute Trusts seemed to be doing more than PCTs and are focused more on learning, an important element of KM.

Q&A and feedback for 2nd Presentation:
Knowledge needs to be managed. There needs to be a directive to get it going. Every clinician is trying to find the best evidence-based knowledge but does not know where to find this. Ninety per cent of knowledge is generic (i.e. agreed between practitioners) and 10 per cent is localised.

Asked whether the survey covered the management of tacit knowledge, the researchers responded that it did but that responses were all geared round explicit knowledge. When respondents were asked for a wider definition, this was still so.

A distinction should be made between KM and Knowledge Work, which is working with knowledge and something that engages everybody.

Local initiatives. A few people stressed the need for KM initiatives to take place at the local level, for example by addressing questions such as “How do you do handovers between shifts?” and “What do you do after meetings?”. It was also stressed that to obtain good quality of data for KM requires local reconciliation of the data.

In response to a suggestion to use terms other than KM, e.g. diffusing knowledge and organisational story-telling, the researchers responded that part of the scoping study was to find out if there is a discourse of KM within

the NHS. Further research will take note of this discovery and may follow such a tactic.

7.4. Third Presentation: How does KM in the healthcare sector compare with the state and history of KM in the private sector?

Some practices work well for some organisations but not for others. This could of course be due to other reasons such as not adapting so well to change.

People who have the same kind of job can learn from each other through peer networks, communities of practice, knowledge marketplaces etc.

There is no one best practice, but there are lots of good practices.

Q&A and feedback for 3rd Presentation:
Unlike the NHS, the private organisations illustrated are single organisations and so governance must be fundamentally different. The researcher agreed that there are many differences from a governance point of view and that, also, private organisations have more money.

One workshop participant requested more specifics on how KM made positive changes to these private sector firms. The researcher responded that these companies had wanted to reduce their costs and advised those in the NHS to judge what are your hospital's priorities and whether you can apply KM to get you above the line in that area.

Focus on building up trust so that someone will give someone else something because they know from their experience that they will get something back.

There are networks within the NHS, e.g. Doctors' Net, and these arise from a need, rather than because somebody has created them per se. Knowledge-sharing between trusts does occur, but there are anti-initiative government barriers such as the government ruling on intellectual property rights.

7.5. Plenary discussion

One theme that emerged is the difference between active KM and passive KM. So maybe research should look at the psychological aspect of who actively participates, rather than be driven from the top.

The timing of when KM is delivered is crucial. KM is valuable only when delivered at the appropriate time.

Research and innovation priorities in the NHS are "help us balance the books by 1st March!".

One criticism of NHS Live was that it encourages people to report successes, but not failures. And the NHS can learn from failures. It was also pointed out that successes do not get copied exactly to other organisations because people always want to implement things in their own way.

During the workshop, various people have referred to Clinical Governance. There does seem to be commonality with KM but it is not entirely clear what the differences are between Clinical Governance and KM.

One workshop participant would find information on how individuals learn and how organisations learn very useful.

Although the NHS has a lot of networks, some of these networks do not ever appear on the radars of Directors and it is not known whether these networks are working effectively.

8. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

8.1. Introduction

The present scoping project aimed to investigate the current KM concepts, policies and practices within the UK healthcare sector in view of identifying priorities for future R&D activity. The study explored the ways in which KM is perceived as useful or otherwise, trying to shed light on the KM initiatives that currently exist both at a local and national level. By comparing these initiatives with examples of best practice from other countries and other sectors, we attempted to identify the most promising areas where there is a need for innovative and path breaking academic research and development. In the following sections we summarise the results of the different research activities and identify a list of promising areas for future research.

8.2. State of the art

The research showed first that the discourse of KM has little currency among NHS members. The idea that an efficient management of knowledge should be a high priority in a knowledge intensive organisation such as the NHS is still only shared by a minority of its members. There is thus both a lack of awareness and a lack of a vocabulary for addressing this types of issues, especially when one moves away from acute trusts and teaching hospitals and look into primary care or non teaching establishments.

The research also revealed that multiple meanings and interpretations are attached to the idea of managing what we know. In particular, there is a widespread recognition that different types of knowledge (clinical evidence-based, managerial, and patient centred knowledge) require different approaches. However, the research also revealed that while there is still a prevailing attention for the management of evidence-based and clinical knowledge, there is pressing need for devising ways of harvesting the existing managerial and service knowledge, as well as for aligning patient centred knowledge with other types of information.

Both the literature review and the field work provided ample illustrations that the ways of understanding and managing knowing reflect and sustain the existing professional and cultural boundaries within the NHS. The existing organisational cultures within healthcare constitute a powerful barrier to the circulation of knowledge.

Finally, the research indicated that a key issue concerns quality, not quantity. In general, we found that there is a proliferation of medical knowledge, information and data, to the point that medicine has reached a crisis point. The search is thus for mechanisms, processes, and supporting tools which integrate and filter data according to the need and time constraints of the end users.

8.3. The situation on the ground

The research indicated that there is a wealth of initiatives and programmes that in different ways tackle the issue of improving the effective

management of knowing in the NHS. A significant amount of KM in the NHS goes on under different names and hence is sometimes not counted as such. Examples of initiatives which were clearly identified as good practices of KM were the National Library for Health, NPSA, the Clinical Networks, and NHS Direct. In general, it emerged that the NHS is using or experimenting with some of the more modern techniques of KM (from virtual communities to knowledge portals, from social marketing to blogs, from theatre to interactive videos). In this sense, the UK is considered ahead of the KM game with respect to many other OECD countries.

In spite of all this activity, there was a lack of an explicit and systematic attention for this topic at strategic managerial level. While the importance of knowledge issues in the NHS has produced a "vision" which is clearly recognisable and well disseminated, this has not been translated (yet) into a clear, recognisable, and unitary strategy. Thus, unlike in the private sector, both national and regional level NHS organisations have only seldom developed an explicit KM strategy or comparable policy or appointed a Chief Knowledge Officer. The result is a lack of a common language and framework so that there is both dispersion and disconnection between initiatives. Central policies may be conceived without any regard for the often negative impact on the knowledge processes in the affected organisation. The lack of a clear and explicit intent means that promoting KM initiatives often requires fighting for resources and justifying them. This is in contrast to the well established discourses of Evidence-Based Medicine and Clinical Governance in the NHS (both of which can be said to constitute knowledge work).

While there is thus a need for a more systematic approach to the ways in which knowledge is managed, the research also suggested that a national strategy for KM might not be the best way forward. The cause of improving the quality of knowledge management in the NHS might be better served by a series of successful pilot experiences which tend to promote cultural shifts without the constraints which comes with nationally set strategic priorities and targets.

The research also found that in the NHS social networking has emerged as preferred way for managing knowledge. Not unlikely the private sector, most of the current initiatives of KM in the NHS are based on social processes of sharing and mutual learning. The research has also found, however, that some of these initiatives have not yet incorporated the experience and learning developed in the private sector, so that at times some of the knowledge networking initiatives produce suboptimal results. This holds in particular for some of the mandated network initiatives, which appear incapable of overcoming some of the existing barriers to the circulation of knowledge across organisations and professional cultures.

Together with a preference for networks, our research uncovered a certain bias for initiatives aimed at the dissemination of existing knowledge. However, our research showed that this approach disregards the fact that knowledge management implies both the circulation of ideas or evidence

and the need to put this to work. Accordingly, our research found an emergent shift of interest from the dissemination to the mobilisation of knowledge, in line with what happens in other leading edge contexts such as in the USA and Canada. The idea is that knowledge has greater value when shared and implemented, and hence the need is not only for better ways of circulating existing knowledge, but also for improving the absorptive capability of the healthcare organisations.

Finally, the research indicated that while the UK is considered a beacon for what concerns the explicit attention to the management of knowledge, it lags behind in the use and exploitation of IT to support this. The research has thus found out that the lack of infrastructure and IT skills limits the exploitation of some of the opportunities offered by the new technologies. For what concerns the nature of the most promising KM technologies, the research found an emerging consensus around the idea that the most promising technological development are likely to be those which address three major issues:

- the integration of existing data on the basis of end users needs and practices;
- the use of information for promoting health (in collaboration with patients);
- the creation of virtual collaborative spaces.

8.4. Some of the main challenges emerging from the research

The research suggested that future efforts in this area should be focused on the following priorities. Please also see Table 4.

8.4.1. Raising the awareness and sharing with other sectors

There is a need to continue to raise the awareness for these topics. This should be done at two levels. First, there is a need to develop the KM discourse in the NHS, so that the organisation can address more systematically its knowledge needs and the efficiency of existing knowledge processes. Second, there is a need for producing evidence on the approaches which have worked well and which have not as well as to set up demonstration projects which could support the case for a better way of managing knowledge. Academic research should support both these efforts.

8.4.2. Understanding the link between ways of managing knowledge and governance

On the one hand this challenge concerns how existing and novel forms of knowledge management developed both in the healthcare sector and elsewhere, could support clinical and corporate governance in the NHS. On the other hand, there is a challenge to "mainstream" the awareness and understanding of knowledge processes in the NHS so that policy initiatives do not end up interfering with the effective flow of knowledge in the organisation.

8.4.3. Learning to nurture networks and communities

One of the challenges ahead is learning how to harness the power of social networks as ways of sharing and producing knowledge. This includes the development of sustainable models of networking, the identification of suitable technologies, and the emergence of appropriate forms of network governance. The emerging differences and tension between mandated and non-mandated networks raise the issue of which form of governance methods are suitable for sustaining and nurturing these phenomena which, as shown in other industries, need to strike a delicate balance between management and autonomy.

8.4.4. Tying KM initiatives to existing service and business priorities

One of the clear messages from the research is the necessity to tie the effort of improving the ways in which knowledge is managed to the achievement of specific and identifiable business processes and objectives, from (for example) the reduction of waiting lists and hospital-acquired infections to the promotion of safety.

8.4.5. Moving from the categorisation to the mobilisation of knowledge and expertise

The challenge is shifting the attention from the current emphasis on knowledge categorisation and circulation to what has been defined as "knowledge mobilisation". The idea of mobilisation emphasises that knowledge has greater value when shared and implemented. The challenge is thus supporting the entire process through which knowledge is produced, circulated, and applied in a new situation, providing tools and roadmap for improving each of these steps.

8.4.6. Harnessing the power of information and ICTs

The challenge ahead is not circulating more information but rather less and more targeted and relevant information. At the same time, the challenge is to find the appropriate format and mode of delivery for such information. While emerging technologies are likely to play a central role in this process, the general perception of our informants is that future tools will have to be designed around the effective needs of the users in the NHS.

8.4.7. Bringing the patient in

The challenge here is to find more sophisticated and sustainable ways of entrusting patients with the necessary knowledge both for using the existing services efficiently and for contributing competently to the healthcare processes in which they are involved.

Table 4: Summary of findings			
Literature Review	**Stakeholder Interviews**	**Visits and contacts outside UK**	**Local NHS telephone Survey**
Fragmented Knowledge	Discourse with little currency among NHS members. Lack a vocabulary for addressing this types of issues.	The term "knowledge management" has a bad reputation in the healthcare sector of other countries besides the UK.	Widespread absence of KM discourse
Proliferation of medical knowledge	Multiple conceptions and strategies on how to manage knowledge.	The prevailing focus and approach to KM issues reflect the conditions and challenges of the national healthcare sector.	Great knowledge requirements within Acute Trusts
Preference for local/tacit knowledge	Distinction between clinical evidence-based, managerial, and patient centred knowledge. Conceptions reflect professional/occupational position.	In Canada the focus is on capacity building and exploration rather than benchmarking and exploitation of existing knowledge.	Prevalence of implicit KM
The use of IT as a knowledge management tool		In the US KM is first and foremost perceived as intelligent and advanced data integration.	Focus on IT, Networks and Education as mechanisms of Knowledge Management
The use of social networks as a knowledge management tool	Networking as an emergent strategy. Are networks the panacea? Emergent distinctions between mandated and non mandated networks.	Strong preference for social processes and social technologies as ways of identifying, circulating, and sharing clinical and service knowledge.	Importance of operational proximity and shared goals/values
The use of education and training for KM	A drift from dissemination to mobilisation.		
Professional groups act as boundaries	Conceptions and approaches still reflect professional and occupational position.	Increasing centrality granted to patients as knowledgeable actors in the system.	The inhibiting dimension of professional boundaries for knowledge sharing
Govt regulations strengthen boundaries	Dispersion of initiatives, sustainability. Difficulty to establish a dialogue and learn from other sectors, risk of reducing a strategic vision to tactical initiatives.	UK is ahead of the KM game with respect to many other OECD countries.	
Culture of IT scepticism	NHS IT risk adverse.	Scepticism towards IT based solution following failure of large "best practice" data bank spectacular failures in the late 1990s. Renewed interest for IT but KM more closely related to business goals.	
Insufficient IT skills	Insufficient IT skills and equipment.		

8.5. How can academic research make a difference? A provisional innovation agenda for promoting KM in the healthcare sector

On the basis of the results of this scoping study, and in light of the feedback received during the final workshop, we suggest the following areas in which academic research is likely to make a difference. Please also see Table 5.

8.5.1. Evaluating and measuring improvement outcomes and the value for money of KM initiatives

Very little formal and in depth evaluation has been carried out. Academics have a primary role in impartially evaluating and measuring the outcome of existing initiatives. The need is to collect, aggregate, and analyse data as well as case materials to deepen the understanding of which approaches have worked well and which have not. At the same time, academic research can foster the dialogue between the NHS and other contiguous sectors, favouring the translation of KM expertise from other service-related and knowledge-intensive industries to the healthcare sector.

8.5.2. Exploring the links between knowledge management and clinical governance processes

Knowledge management is often perceived as a cornerstone of clinical governance. However, the practical ways and models in which KM could support clinical governance are still poorly understood. At the same time, this scoping study suggests that in the NHS the way in which knowledge is conceptualised and discussed is strongly related to what people do with it. That is to say, the choice of words and labels, as well as the form and channel in which the information is circulated, often determines its fate and whether it will be used or not. Academic research can help by developing models of how KM can be used to support clinical governance and also to understand which discourse of knowledge is most appropriate for the various cultures within the healthcare system.

8.5.3. Improving the capacity to learn from accidents and mistakes

This project supports the growing corpus of evidence showing the structural difficulties that inhibit the NHS from appropriately managing its knowledge processes so that it can learn from mistakes, failures, and accidents. Little is known about whether the NHS learns from its errors, why this often is not the case, and what can be done about it. In addition, the NHS has not yet harnessed the wisdom and expertise on these topics developed over the last decades in other sectors.

8.5.4. Providing guidance on how to foster and support networked learning (both face to face and virtual)

In spite of the widespread use of networks as a way of circulating and sharing learning, very little is still known about the processes and facilitators of effective “networked learning”. By studying the results and experiences of the existing learning networks within the NHS and in other

industries important lessons could be learned to support these mechanisms better.

8.5.5. Improving the New Service Introduction capability of the health care sector

The research revealed the necessity to focus on knowledge mobilisation and improve the innovative capacity of the NHS organisations. Academic research could provide a vital contribution by supporting the translation of the existing wisdom on New Service Introduction from other knowledge intensive sectors and by developing models, toolkits, and road maps that assist NHS practitioners and organisations in their efforts to implement innovative practices and processes.

8.5.6. Exploring how knowledge influences decision making

From this scoping study it emerged that we understand little about how information and evidence are actually used in practice on the front line and in boardrooms, i.e., the two main places where NHS resources are actually committed and used. Accordingly, a relevant topic for future research is deepening the understanding how knowledge informs managerial decisions, and how it manifests in the language of managers.

8.5.7. Providing tools and guidance for packaging evidence

More work is necessary in order to identify effective ways of packaging and circulating existing information. Two promising areas for future R&D are the development of tools and technologies aimed at reaching and involving patients and the public, and experimenting with new media and interactive methodologies as ways of influencing both NHS practitioners and patients. Ideas that emerged as ways of reaching out and influencing a broader public include the use of theatre, digital television, direct marketing techniques, new web social technologies (blogs, video clips).

8.5.8. Addressing the knowledge needs of succession and mobility

The NHS is constantly affected by the problems derived from succession and from high mobility of expert personnel. Accordingly, a promising area for future research is identifying processes and methodologies that can facilitate these processes and prevent the dispersion of knowledge caused by frequent NHS re-organisation or by the departure of knowledgeable staff from organisations.

Table 5: Research themes emerging from the scoping study and sources of validation					
	Literature review	**Stakeholder Interviews**	**Visits and contacts outside UK**	**Local NHS telephone Survey**	**Final workshop**
Exploring the links between knowledge management and clinical governance processes	*	*		*	*
Improving the capacity of learning from accidents and mistakes	*	*	*	*	*
Providing tools and guidance for packaging evidence	*	*	*		*
Improving the New Service Introduction capability of the health care sector		*	*	*	*
Evaluating and measuring improvement outcomes and the value for money of KM initiatives		*	*		*
Providing guidance on how to foster and support networked learning	*	*			*
Integrating the patients in the KM process		*	*		*
Exploring how knowledge influences decision making		*		*	*
Addressing the knowledge needs of succession and mobility		*	*		
Addressing the knowledge needs of succession and mobility		*	*		
Developing new tools for capturing and storing electronically service and clinical knowledge	*				
Comparing KM national models of KM			*		
Developing new tools for online collaboration	*				

APPENDIX 1

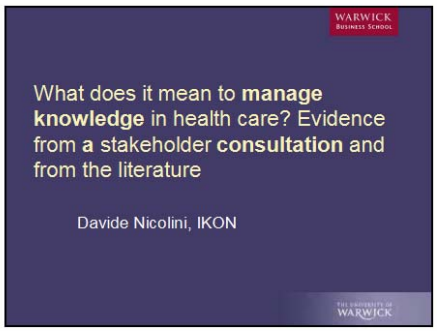
Semi-structured interview schedule for telephone survey

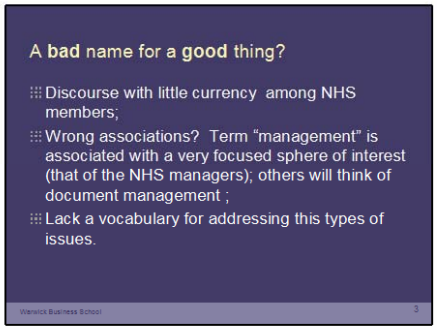
Subject	Questions
Relevance of KM issues	I would like to start by asking you to comment on your position and the sort of knowledge or expertise that you use in your work:
	Do you think of your work as involving the management of knowledge?
	Is 'Knowledge Management' a term which you hear mentioned often in your work?
	Is the efficient circulation, sharing and use of knowledge/expertise an explicit and present concern for the management of your organization?
	On a scale of 1 to 5, how would you rate the importance accorded to these issues in your organization
	Do you have a strategy on how to manage knowledge and expertise? Do you plan to adopt one?
	If yes, did you allocate any funds for implementing it?
Initiatives	We are going to move on now to questions about specific initiatives. I am going to ask you about specific initiatives in your organization designed to improve the process of acquiring, conserving, organizing, retrieving, displaying and distributing what is known . Do you take part in any national initiative such as "Clinical networks", "Do once and share", "Map of Medicine"?
	Do you have other local projects or initiatives aimed at improving the way in which clinical and administrative know how is shared and used? Can you briefly describe these initiatives? Who promoted them? Who championed them? Who was involved? How long did they last? What happened in practice? On a general level, what sort of things worked well, and what didn't?
Further information on existing initiatives	A widely used definition of knowledge management is *"the systematic process of identifying, capturing, and transferring information and knowledge people can use to create, compete, and improve"* [American Productivity and Quality Center]. (Used by the British Medical Association) Are there any other initiatives in your organization that would fit this description?
	You have mentioned some interesting work/projects/initiatives/tools. What is your role in relation to those? Who is/are the persons dealing with these matters in your organizations? Has some part of your organization been more active than others in this area? Who would you suggest we contact for knowing more about it?
	How do you see these Knowledge Management initiatives developing over the short-term, medium-term and long-term OR are you planning any new initiative in the near future
What else could be done?	Are you happy with the way in which learning, evidence, and knowledge are addressed in your organization? Do you think more could be done? If so, where would you start
Follow-up	If the University of Warwick were to pilot some initiatives in this area would you be interested to explore possible ways of collaborating?

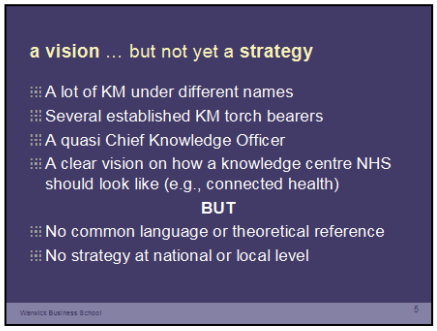
APPENDIX 2

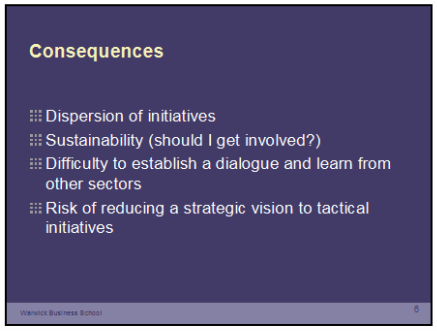
Slides from final workshop held at NHS Institute on 3rd October 2006

A1: First presentation









1

a de facto preference for **social networking**

- In the land of EMB, protocols, and guidelines networks everywhere!
- Networking as an emergent strategy (or fashion?)
- Combinations of factors: NHS IT risk adverse; in a sea of change networks are resilient structures, nature of the core task
- Are networks the panacea? Emergent distinctions between mandated and non mandated networks

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A drift **from** dissemination **to** mobilisation?

- "*The systematic process of identifying, capturing, and transferring information and knowledge people can use to create, improve, and compete*" (adopted by the BMA from AAPC)
- The tricky bit: putting knowledge to work!
- From dissemination to mobilisation: knowledge has greater value when shared **and** implemented

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How this compares with **other** countries?

- UK ahead of the KM game (how to make the giant dance)
- *Like in the UK*
  - *Term in disrepute, multiple meanings, focus on networks*
- *Unlike in the UK*
  - *Canada: focus on knowledge translation and capability building; national strategy, great attention to the patient as part of the knowledge ecology*
  - *USA: data integration first; KM promoted by external agencies*

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What does the literature say?

- Highly fragmented state of medical knowledge and need for collaboration across organisational and professional boundaries
- Proliferation of medical knowledge, information and data: "medicine has reached a crisis point"
- A preference for local knowledge and tacit knowledge vs. generalised and explicit

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barriers **and** enablers of **km**

- Professional groups act as boundaries
- Governmental regulations actually strengthen the boundaries within the field and run against the logic of cooperation
- IT risk adverse

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three types of **initiatives** studied in the literature

- Most studies on Informatics/IT based KM
- Socially based (focus on informal communications, practice and collaborations)
- H.R. driven initiatives (focus on issues such as CPD and education)
- Has the academic literature been looking at the wrong thing?

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Ways forward
Raising the awareness
Learning to nurture networks and communities
Bringing the patient in
From categorisation to mobilisation
Preventing the NHS tendency of reducing everything to the lowest common denominator
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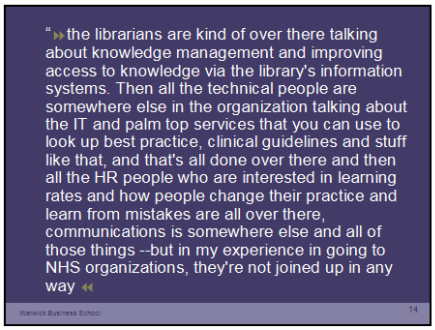
"the librarians are kind of over there talking about knowledge management and improving access to knowledge via the library's information systems. Then all the technical people are somewhere else in the organization talking about the IT and palm top services that you can use to look up best practice, clinical guidelines and stuff like that, and that's all done over there and then all the HR people who are interested in learning rates and how people change their practice and learn from mistakes are all over there, communications is somewhere else and all of those things --but in my experience in going to NHS organizations, they're not joined up in any way
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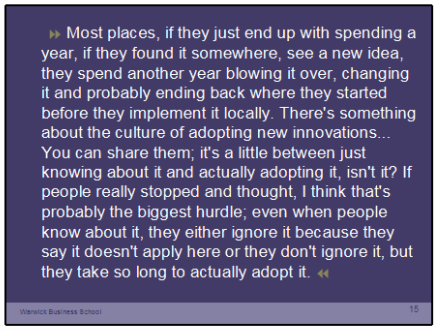
Most places, if they just end up with spending a year, if they found it somewhere, see a new idea, they spend another year blowing it over, changing it and probably ending back where they started before they implement it locally. There's something about the culture of adopting new innovations... You can share them; it's a little between just knowing about it and actually adopting it, isn't it? If people really stopped and thought, I think that's probably the biggest hurdle; even when people know about it, they either ignore it because they say it doesn't apply here or they don't ignore it, but they take so long to actually adopt it.
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"I see more attention and focus on knowledge management in the UK than I see in most of the countries, if not all of the countries"
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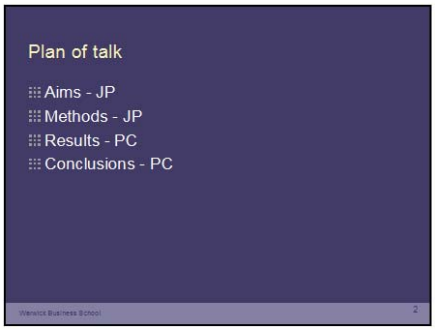
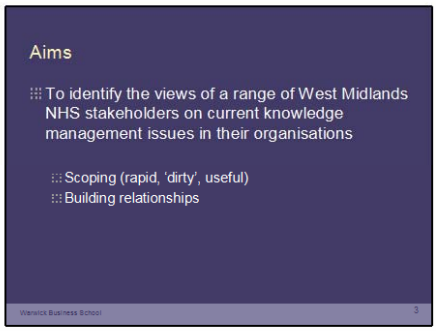
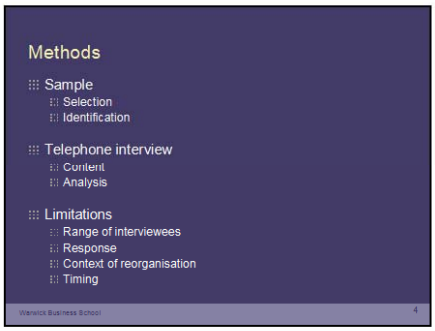
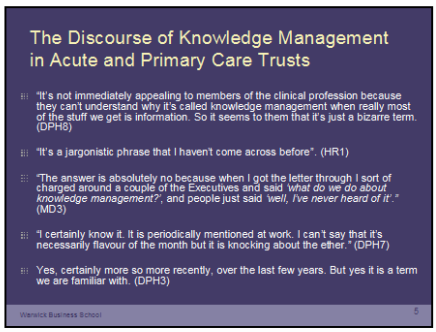
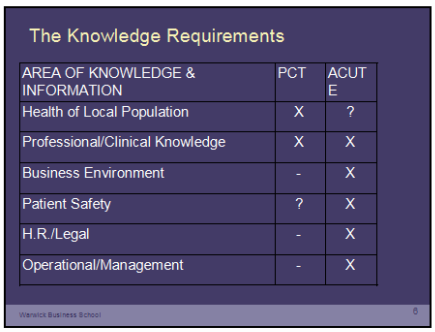
A2: Second presentation











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The Implicitness of KM in Healthcare?

- There are phrases such as that within individual aspects of the PCTs services. But I don't think its one of the PCT's key objectives as a whole but it is implicit in what the other objectives strive to do.(DPH2)
- People do do it without putting [KM] as a title to it. (HR2)
- Is it implicit? I feel that we start a loop but we never quite complete it. I think it should be implicit. Is it? No, I don't think it is. I think we circulate information and assume people are able to interpret it and put it into action and there's a great percentage in our organization that don't do that.(HR1)

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Embedding KM in Organisational Processes

- Built into structure
  - "As part of our management structure we have designed that in a way that should allow…we are a very large organisation so we have got roughly 5 parts which should be running their own area and their management team should be focused on doing things that way. So we have tried to organize our structure to approach [knowledge management]". (MD1)
- Decentralized
  - "One of the things which we wanted to achieve was to have the understanding, to identify those individuals, first of all who had ability around doing this. And who could lead these things individually because there is a limit to the amount of time the Executive team can spend as individuals involved in the micro management and part of problem is finding individuals at middle management level who will take the same approach and will actually take the initiative and will not be just become constrained by a process of saying 'no' to everything because it's the simplest and safest way to keep out of trouble. So its wanting to develop a group of people who will be wanting to take the initiative with particular projects and feel that they have the, they don't need to refer back on an hourly bases to make decisions". (MD1)
- Learning Before

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Which initiatives helped manage knowledge?

- Clinical
  - Evidence Based Medicine
  - NICE Guidelines
  - Clinical Governance
- Social
  - Monthly journal clubs
  - Clinical Networks
  - Practice Sharing days/event
- Training and Learning
  - E-based learning systems
  - Protected Learning Time
  - Mentoring new recruits
- Information Technology
  - Decisions Support Systems
  - Handhelds
  - E-bulletins
- Libraries
  - Magazines

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The Projected Trends (and Opportunities) for KM in the West Midlands Health Economy

- More systematic
- More electronic
- More accessible
- More human resource
- More up-to-date
- More collaboration
- More sources

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The Challenges Facing KM in the West Midlands Health Economy

- **Inadequate PC skills**
  - Importance of e-sources (lack of skills means cut from receiving information)
  - *I think the bit we have not done nearly well enough is to make sure all our staff are IT literate, know how to search for the appropriate evidence and know how to interpret that evidence appropriately.* (DPH7)
- **Insufficient time**
  - *"I think most people are so busy in their professional lives that if they are lucky they'll take 30 sec to scan what's in there but its not consciously, actively giving space and time and saying 'I must do this part of staying in touch'."* (DPH6)
  - Overabundance of sources – information overload
- **Insufficient expertise**
  - *[we should] be trying to appoint some good quality information analysts. The trouble is they are pretty think on the ground. There is a dearth of personnel out there. Presumably because the NHS doesn't pay enough.* (DPH1)
- **The uncertainty of reorganisation**
  - *"The drivers in the opposite direction will be resources. With the reorganization there will be a struggle for resources with people having to focus on core activity"* (DPH3)

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The Problems in embedding KM

- **Need for visible senior management sponsorship**
- "We have found that unless the executive directors are involved, in those meetings its difficult to take them forward. We have found that it's no good just sitting in your office answering your emails etc unless you are involved and out and about. It's very difficult to take these things forward". (MD1)
- But whatever we do the response comes back that you need to be on the shop floor. Which is very difficult when you have 3 sites, 4000 employees and 6 full time directors but that's what people say they want… and the things you do in terms of briefs and cascades and electronic methods the answer comes back that that's all very well but I want to see you there shaking my hand. (MD2)

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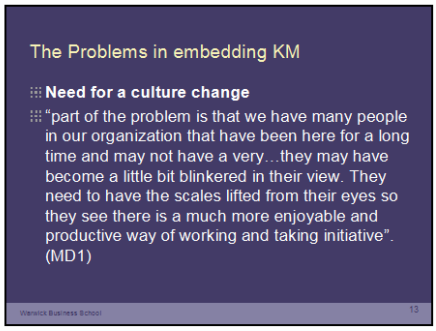
The Problems in embedding KM
Need for a culture change
"part of the problem is that we have many people in our organization that have been here for a long time and may not have a very…they may have become a little bit blinkered in their view. They need to have the scales lifted from their eyes so they see there is a much more enjoyable and productive way of working and taking initiative". (MD1)
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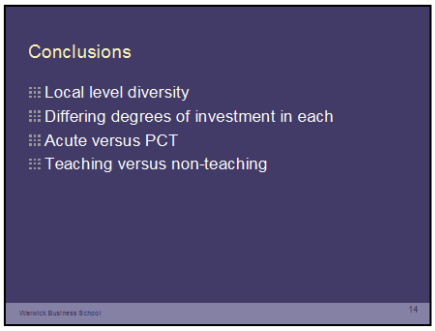
Conclusions
Local level diversity
Differing degrees of investment in each
Acute versus PCT
Teaching versus non-teaching
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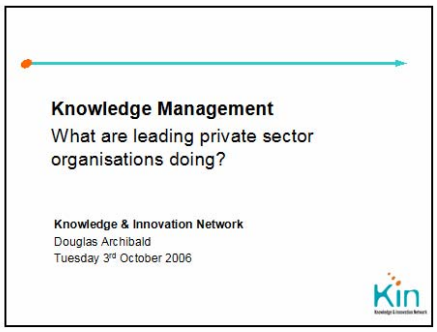
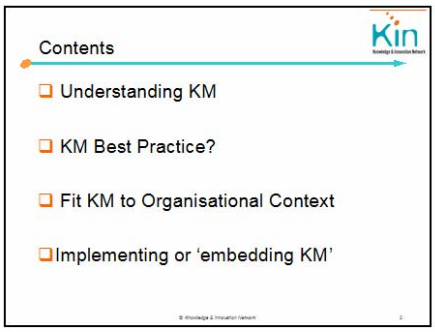
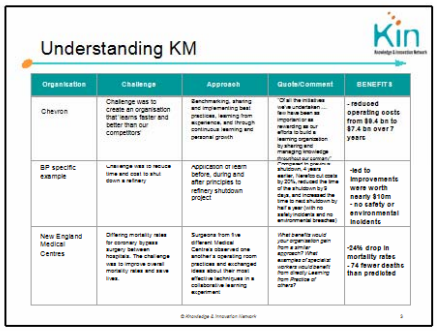
14

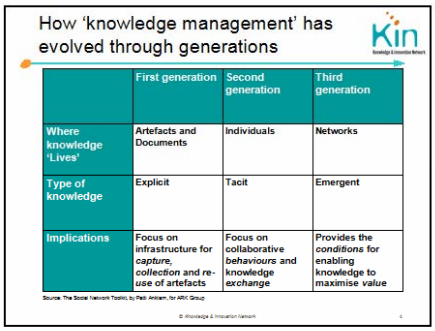
3

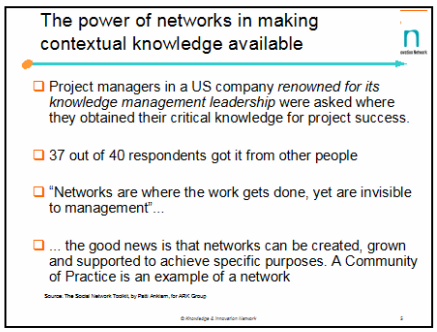
A3: Third presentation

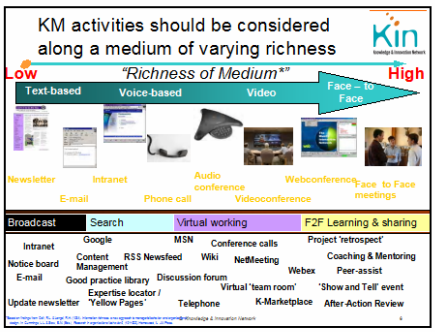












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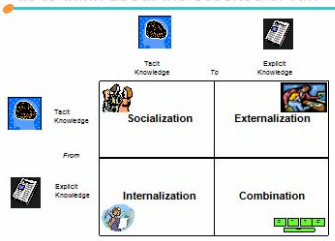
Nonaka & Takeuchi's 2 x 2 can help us to think about the essence of KM

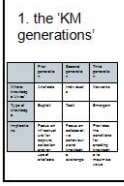


Understanding Knowledge Management

There are many different ways to think about KM … and even more definitions. These are often overcomplicated.

The essence of KM can be summed up below:

1. the 'KM generations'



2. The 'Richness' continuum

3. The knowledge sharing 2 x 2

KM Best Practice?

- Lots of Good KM Practices, Tools & Techniques.
- Application needs to be driven by organisational context e.g. culture, roles and specific goals/challenges
- Some practices have worked well for some org's. Others have tried the same and it has not worked, often due to:
  - Poor change management
  - Poor alignment with organisational/employee priorities

Key Message

- It is not the KM 'practice' itself but the appropriateness for the challenge and how it is delivered that counts

Some KM Tools and Techniques that may be of particular relevance to NHS

Peer Network/Community focus

- **Communities of Practice/Clinical Networks**
  - To support ongoing peer learning and knowledge sharing in professional groups
- **Knowledge Marketplaces/Q&A**
  - To help facilitate real time efficient exchange of knowledge (peer to peer) between
  - To validate demand for knowledge from members of a particular community
- **Expertise Location**
  - To support immediate 'connection' to experts in a particular community
- **Social Network Analysis**
  - Help identify experts, brokers
- **Virtual Collaboration**
  - Better use of virtual collaboration to support knowledge sharing across hospitals? Does or would this work culturally in NHS?

Other Learning and Sharing

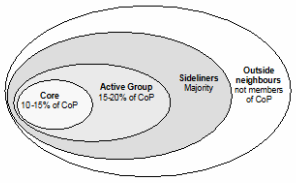
- **Learn before, during and after**
  - e.g. Building in systematic learning to procedures and reviews. Example from Olicci's. Probably already happening.
- **Knowledge Retention & Transition**
  - To help ensure that knowledge is effectively transitioned from NHS experts to others. Often used when 'knowledge is at risk'
- **Storytelling**
  - To help ensure that examples of successful improvement are effectively communicated throughout in NHS

This list is not exhaustive e.g. Knowledge Audits. More examples can be provided on request.

Peer Networks/CoPs: to support ongoing learning and knowledge sharing between professional peers

CoP = Community of Practice

'… a group of individuals make a collaborative effort to improve their practice'



Types of CoP Focus

helping communities - providing a forum for members to help each other solve day to day problems

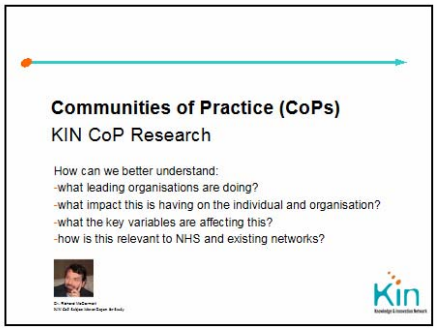
learning communities - providing an environment for members to support learning e.g. from each other's experiences/practices

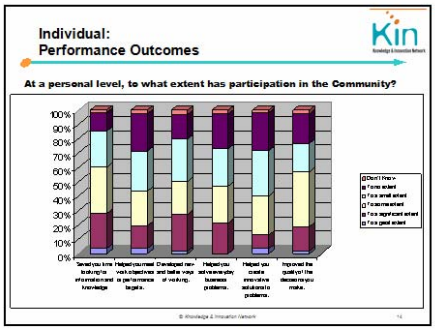
best practice communities - developing and disseminating best practices, guidelines and procedures for use

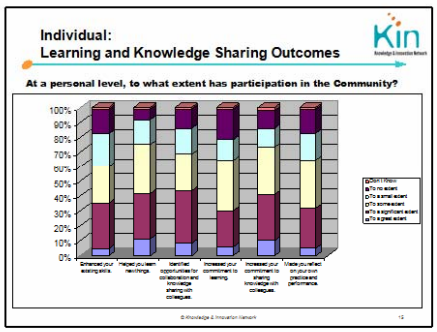
knowledge stewarding - organising, managing and stewarding a body of knowledge from which members can draw

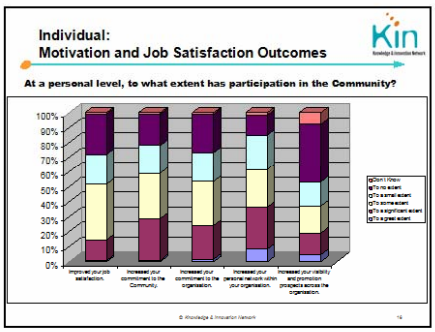
innovation communities - create breakthrough ideas, knowledge and practices

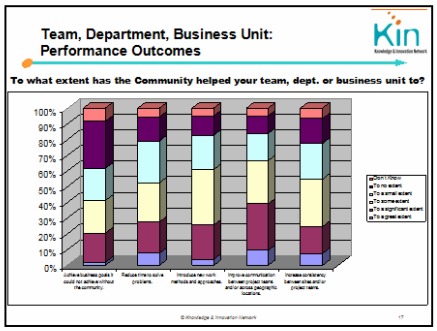
The focus or types of communities will typically involve a mix of all of these things and will typically change over time

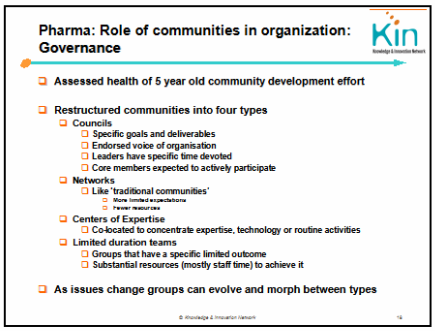

Communities of Practice (CoPs)
KIN CoP Research
How can we better understand:
-what leading organisations are doing?
-what impact this is having on the individual and organisation?
-what the key variables are affecting this?
-how is this relevant to NHS and existing networks?

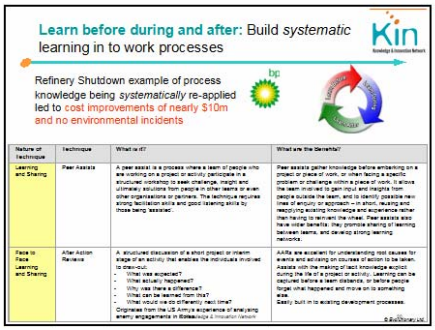

Individual:
Performance Outcomes
At a personal level, to what extent has participation in the Community?

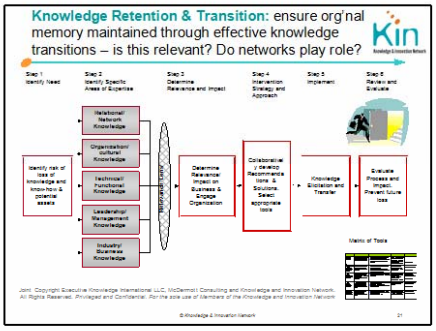

Individual:
Learning and Knowledge Sharing Outcomes
At a personal level, to what extent has participation in the Community?


Individual:
Motivation and Job Satisfaction Outcomes
At a personal level, to what extent has participation in the Community?


Team, Department, Business Unit:
Performance Outcomes
To what extent has the Community helped your team, dept. or business unit to?

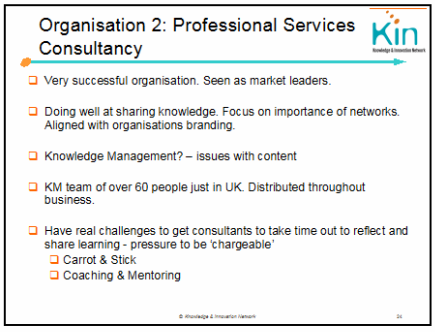

Pharma: Role of communities in organization:
Governance
Assessed health of 5 year old community development effort
Restructured communities into four types
Councils
Specific goals and deliverables
Endorsed voice of organisation
Leaders have specific time devoted
Core members expected to actively participate
Networks
Like 'traditional communities'
Centers of Expertise
Co-located to concentrate expertise, technology or routine activities
Limited duration teams
Groups that have a specific limited outcome
Substantial resources (mostly staff time) to achieve it
As issues change groups can evolve and morph between types


Learn before during and after: Build systematic learning in to work processes
Refinery Shutdown example of process knowledge being systematically re-applied led to cost improvements of nearly $10m and no environmental incidents
bp
Nature of Technique
Technique
What is it?
What are the Benefits?
Learning and Sharing
Peer Assists
A peer assist is a process where a team of people who are working on a project or activity participate in a structured workshop to seek challenge, insight and ultimately solutions from people in other teams or even other organisations or partners. The technique requires strong facilitation skills and good listening skills by those being 'assisted'.
Peer assists gather knowledge before embarking on a project or piece of work, or when facing a specific problem or challenge within a piece of work. It allows the team involved to gain input and insights from people outside the team, and to identify possible new lines of enquiry or approach – in short, reusing and recycling existing knowledge and experience rather than having to reinvent the wheel. Peer assists also have other benefits: they promote sharing of learning between teams, and develop strong learning networks.
Face to Face Learning and Sharing
After Action Reviews
A structured discussion of a short project or interim stage of an activity that enables the individuals involved to draw out:
What was expected?
What actually happened?
Why was there a difference?
What can be learned from this?
What would we do differently next time?
Originates from the US Army's experience of analysing enemy engagements in Bosnia
AARs are excellent for understanding root causes for events and advising on courses of action to be taken. Assists with the making of tacit knowledge explicit during the life of a project or activity. Learning can be captured before a team disbands, or before people forget what happened and move on to something else.
Easily built in to existing development processes.


Knowledge Retention & Transition: ensure org'nal memory maintained through effective knowledge transitions – is this relevant? Do networks play role?
Step 1 Identify Need
Step 2 Identify Specific Areas of Expertise
Step 3 Determine Relevance and Impact
Step 4 Intervention Strategy and Approach
Step 5 Implement
Step 6 Review and Evaluate
Relational/ Network Knowledge
Organisational/ cultural Knowledge
Technical/ Functional Knowledge
Leadership/ Management Knowledge
Industry/ Business Knowledge
Identify risk of loss of knowledge and know-how & potential assets
Retirement Curve
Determine Relevance/ Impact on Business & Scope Organization
Collaboratively develop Recommendations & Solutions. Select appropriate tools
Knowledge Elicitation and Transfer
Evaluate Process and Impact. Prevent future loss
Matrix of Tools


Fit KM to organisational context
Horses for courses
You need to start with the organisation: culture, nature of jobs.
KM approach will even be different within organisations depending on profession e.g. Scientists, Consultants, Engineers, Salespeople etc.
NHS context (Managerial, Professional, Customer)
Lessons from some different types of org's. Reflections on learning's most relevant to NHS
Oilco Services
Professional Services/Consultancy
FMCG
What is the same?
What is different?
What is less clear/depends?


Organisation 1 - Oilco
Global oilfield services company
Approximately 40,000 employees. Workforce predominantly Scientists and Engineers.
Technical Communities as key way to
develop and maintain knowledge
connect experts (Experts validated by community)
Plus support centre for 'field operatives' (NHS Direct)
CoPs seen as key to organisational success: operations and innovation


Organisation 2: Professional Services Consultancy
Very successful organisation. Seen as market leaders.
Doing well at sharing knowledge. Focus on importance of networks. Aligned with organisations branding.
Knowledge Management? – issues with content
KM team of over 60 people just in UK. Distributed throughout business.
Have real challenges to get consultants to take time out to reflect and share learning - pressure to be 'chargeable'
Carrot & Stick
Coaching & Mentoring

4

Organisation 3 – Strategy Consultancy

- Knowledge and their people is their key competitive advantage and key to 'high performance'.
- They invest heavily in developing and maintaining it.
- Knowledge sharing built into the organisation
  - Processes (learn before, during and after)
  - Roles and Responsibilities (central and in line)
  - Reward & Recognition
  - Technology & Systems

Implementing KM

- NOT a useful term
- Really more about Change Management than Knowledge Management
- People, Process and System view
- Take a phased and piloted approach to KM activities.
  - Find willing partners who have a problem KM can help with.
  - Pilot initiatives with them.
  - Deliver for them.
  - Show value and scale Up

Organisation 4 - FMCG

- Fairly new to 'formal KM'. Small team of 4 people.
- Organisation has grown over last 10-15 years (approx 30,000 employees). Now no longer a big family so knowledge sharing challenges due to scale.

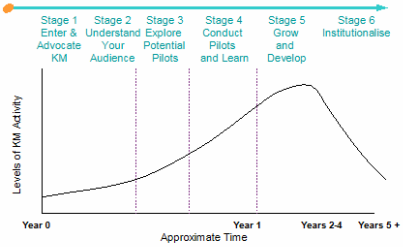
Key points

- Focus on senior mgt priorities – how can KM help them achieve their goals?
- Global Practice Groups – to address intractable problems
- Seek out problems and help business address with KM
- Support where required e.g. Engineers WIKI.

Top 10 tips for 'embedding' KM

1. You must be able to articulate how your KM activities will help your organisations priorities
2. Understand why knowledge is not being shared and build a solution which works with your culture
3. Start small - do 1 or 2 things which will have a big impact
4. Add activities one at a time, based on business "pull"
5. Find a "home" for KM in existing business processes and tie into people's jobs
6. Keep your focus on your main, strategic themes
7. Seek out people's problems and show how KM provides a solution - do not try to sell KM per se
8. Build friends in high places who will champion your cause
9. Learn from others, adapt what they do and don't be afraid to try
10. Always deliver what you promise and measure the business impact

KM: a phased, piloted approach



Points for discussion

- What is the same for NHS?
  - What are you doing that is the same?
    - Could you be doing it better?
  - What should you be doing but are not?
- What is different/not appropriate?
  - What practices from private sector are not appropriate/less applicable?
- What is less clear/it depends?