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Healthcare Knowledge Management

Issues, Advances, and Successes



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4 Healthcare Knowledge Management and Information Technology: A Systems Understanding

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Abstract

Healthcare knowledge management (HKM) has developed into a topical field of investigation. Much of this stems from the current investments in information technology (IT) in health, the application of hi-tech information management systems for the capture, recording, and retrieval of health information, and the prevalent thinking that “the machine can do it all.” The world of IT is a world of glitter and myth, which gives the impression that anything can be achieved at the click of a mouse. In contrast, the world of human activity is an extremely complex domain of thoughts and beliefs, culture and rituals, and individual comprehensions and apprehensions, none of which can be captured even by the most sophisticated IT system.

Although it is easy to become mesmerized by IT in knowledge management, it is the consideration of the wider organizational, political, and socio-cultural dimensions that can enable any information system and any knowledge management strategy to work with effectiveness. Concentrating solely on IT will mean adopting a one-sided view of HKM, ignoring the whole gamut of socio-cultural, political, and ethical dimensions of working in a healthcare organization.

What is required is an approach that recognizes the whole picture and embraces holism, rather than reductionism, in understanding the complexity of human cognition: in other words, a systems understanding of HKM.

Bearing from this understanding, the intention of this chapter is to present an argument in favor of a systems understanding of the role of IT in HKM, in the UK context, which can enable an effective comprehension of the opportunities and challenges associated with the same.

4.1 Introduction

Technology can be of tremendous aid in the capture, recording, and retrieval of information. This can lead to direct benefits for improvement in the quality of care, clinical audit, performance management, and, above all, knowledge management

(KM). A detailed analysis of IT systems implementation within a National Health Service (NHS) trust is presented. This exercise has been conducted using a viable systems model (VSM) exercise. The arguments and analyses presented in this chapter are akin to the opinion that, in any KM and information systems project, the human and the technical aspects should not be regarded as two disparate dimensions, but as interactive subsystems within one larger system.

The research leads to an argument in favor of a systems understanding of the role of information technology (IT) in healthcare KM (HKM), in the UK context, which can enable an effective comprehension of the opportunities and challenges associated within this domain. In the UK, the responsibility of the provision of health and social care welfare is under the UK Department of Health (DoH) and Social Security, which was formed in 1966 as a result of a merger between the Ministry of Health and the Ministry of Social Security [1]. The DoH is answerable to Parliament for the strategic control and direction of the NHS and social services [2]. This chapter will mainly draw insights from relevant contributions in the field of KM, from the policy context of the DoH, and from some of the findings from an investigation within a particular primary care trust (PCT) in the UK. A PCT is an NHS body to commission primary care services in a specific area.

These insights have been informed by systems thinking, which has also informed the methodologies employed to approach the situation.

4.2 Systems Thinking and Healthcare Knowledge Management

Systems thinking is a particular perspective in management thought, which seeks to approach a situation with a holistic view, rather than considering parts in themselves. It operates with the philosophy that *the whole is more than the sum of its parts*. Hence, rather than concentrating on parts per se, a systems approach would encourage one to observe the dynamics between the parts and how they interact and give character to the whole. It encourages the observer to be *systemic* rather than being *systematic*. A systems approach is an organization aspires to relate to all possible operative dimensions, viz. culture, people, technology, time, place, etc., within which organizations and their activities are positioned and within which they function.

As a fundamental critique to Descartes' [3] "reductionism," the systems approach is a revolutionary paradigm to approach, analyze, and comprehend organizations with holism, creativity, and criticality. Tracing back to established writers like Bernard, Wiener, and Von Bertalanffy in the 1940s and 1950s [4], systems thinking emerged as a challenging state of mind to visualize organizations as "goal directed," "purposive," "structurally interdependent" entities which exist in a "dimensional domain," yet changing its domain by its action. As Reed [5] remarks:

... the starting point for the systems framework is a conception of organisation as a goal-oriented, purposeful system constituted through a set of common underlying abstract variables or dimensions relating to structural properties which are geared to the functional needs of a more inclusive social system.

Descending from the Greek verb *sunistanai*, the word systems originally meant "to cause to stand together" [6]. Senge et al. [6] note that perception plays a crucial role here, as it fundamentally depends upon the observer who perceives what causes the system to stand together. Hence, the systems thinker is continually negotiating and renegotiating with a "boundary critique": a process where knowledge not only diverges from the observer, but also culminates into her/him from the environment. Sparrow [7] advocates that systems thinking is "about boundaries" and that our analysis is to be directed towards the generative mechanisms of systemic structures, yet which cannot be structurally reduced. The important message it carries is that the boundaries that healthcare organizations normally create between departments (IT, human resources, performance management, learning and development, commissioning, etc.) are not only based on insufficient and reductionist understanding, but also create artificial divisions between people. In this regard, Starbuck and Mezias [8] found in their research that organizations define their responsibilities and their environments "very narrowly," leading to a kind of a pathological compartmentalization; and this has to be overcome to achieve an intra-firm collaborative synergy.

Systems thinking can be of great benefit in approaching and designing an effective strategy for HKM. When there seems to be tremendous emphasis on IT to aid HKM, a systems perspective can help understand that providing an efficient IT infrastructure may serve as only one element, albeit important. IT can largely facilitate information management, which is the preceding stage to KM. The ability to capture relevant understanding pertaining to HKM demands transcendence from information management to KM. This is an interplay of both objective and subjective dimensions, which is beyond the provision of just an IT infrastructure. Objective dimensions would include consideration of the hardware and software elements for the recording, storage, and retrieval of information; and the subjective dimensions would include stakeholder participation, co-generative learning, and the ability to devise a strategy of how healthcare service providers can best make use of available information. KM is not just about the availability and accessibility of information through IT, but also how to harness the power of creative action that organizational members can engage in as a result of this availability and accessibility and its interpretation. Holistic approaches, facilitated by systems thinking, help link the human and technical aspects in HKM.

The analysis and understanding of the human element is of utmost importance in considering the successful introduction of new IT/communication systems. Whereas a reductionist approach may consider human and technical aspects in isolation, a systems approach will consider both the human and technical aspects as interconnected dimensions within one larger system. During (and before) the

introduction of IT to facilitate KM, it has to be recognized that the technology is delivered to suit the users, and the users are adept in the usage of the technology. Rather than users existing for technology to work efficiently, technology ought to exist for users to work effectively. It will be relevant to note here that Mumford [9] developed a socio-technical methodology called ETHICS (Effective Technical and Human Implementation of Computer-based Systems). The key lies in getting the human and technical balance right. A failure to do so may result in the failure of entire projects, no matter however advanced the technology is. In this context, Clarke [10] notes that, although the development of information systems is functionally a technological and networking exercise, the system essentially has to work within a “social framework.” The inability to recognize this has led to a large number of high-profile failures in IT systems implementation, including cases like the failures of the systems of the London Ambulance Service and the London Stock Exchange System [11]. Clarke [12] notes:

The London Ambulance Service (LAS) computer-aided dispatch system failed on 26 October 1992, its first day in operation. From its inception, the system has been treated as a technical problem, to which a viable solution could be found. But LAS exhibited social and political dimensions which the technology-based approach proved ill-equipped to address.

Understanding of the socio-political and cultural dimensions for the design of an information systems project may not be treated as an isolated one-off event, but as an iterative and ongoing process, so that the complexity in this context may be captured. As Davenport [13] comments: “One reason that Knowledge Management never ends is that the categories of required knowledge are always changing.” The project may be designed to begin with stakeholder participation, leading on to co-generative learning from experiences. Please refer to further reading for a detailed discussion of co-generative learning. Only after the identification of these needs should investments be made to devise IT systems suited to the stakeholders’ needs. Only this may lead to an effective strategy for HKM. However, once this stage is reached, the actions ought not to come to an end. As Davenport said, “one reason that KM never ends is that the categories of required knowledge are always changing.” Thus, the route towards an effective HKM ought to be an iterative process. This idea has been conceptualized in steps in Figure 4.1.

The idea is not to present Figure 4.1 as a recipe for HKM, but rather as a conceptual model which appreciates the iterative criticality of HKM.

Systems approaches, in general, and critical systems thinking (CST) in particular, may greatly aid planners and designers to be critical of boundaries, and to be accommodative of stakeholder ideas whilst devising an information systems strategy for HKM. This may enable information systems design to be inclusive and more attuned to human requirement. According to Midgley [14], there are three fundamental commitments of CST:

- Critical awareness: examining and re-examining taken-for-granted assumptions, along with the conditions that give rise to them.

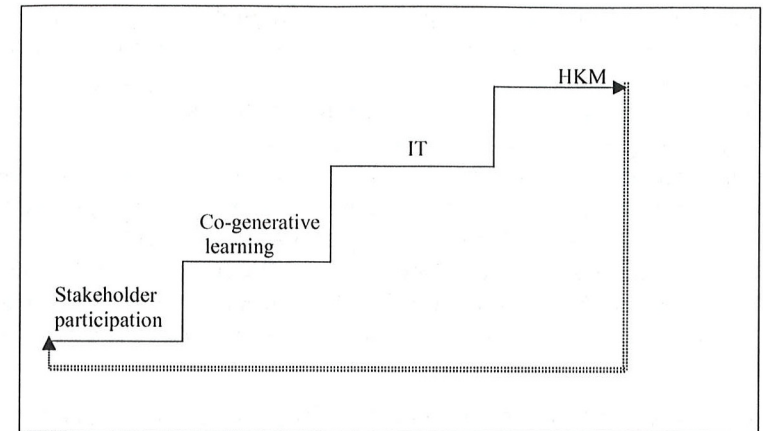


FIGURE 4.1. The route to an effective HKM.

- Emancipation: ensuring that research is focused on “improvement,” defined temporarily and locally, taking issues of power (which may affect the definition) into account.
- Methodological pluralism: using a variety of research methods in a theoretically coherent manner, becoming aware of their strengths and weaknesses, to address a corresponding variety of issues.

A critical awareness is vital for HKM because, as has been addressed above, KM may be in danger of slipping into mere information management. Moreover, a boundary critique and re-examination of taken-for-granted assumptions will facilitate comprehending subsystems as part of a whole, rather than individual parts in themselves. This will help understanding the interlinkages between systems, and how the system evolves as a result of this interaction. Hence, CST can be a handy approach to devise an effective organizational development strategy, working particularly within rigid NHS boundaries and departments of the various strategic health authorities (SHAs), the PCTs, and the acute care trusts.

4.3 Healthcare Knowledge Management in the UK Department of Health

Concepts of HKM and learning are not entirely new to the NHS. Documents produced by the DoH, like *The new NHS—modern, dependable* [15], *Our information age* [16], *Information for health* [18], *An organisation with a memory* [18], amongst others, specifically strategize the management of knowledge in a learning environment. The NHS has also established the NKS, where the “K,” which stands for knowledge, replaces the “H,” which stands for health. The NKS seeks

to “meet the needs of professionals, patients and the public for up-to-date, cross-referenced, evidence-based information by fully integrating the development of NHS knowledge systems” [19].

Presently, the NHS has invested over £6.2 billion (which independent observers claim will cost up to £30 billion) to put in place the National Programme for Information Technology (NPFIT), which is expected to deliver all management services electronically, like patient booking, service provider choice, prescription, and information sharing between the primary, secondary and tertiary sectors. The NPFIT is by far the most ambitious project of the NHS in the field of information systems and KM. The NPFIT is currently in its implementation stage, involving the following six stages according to the *National Programme Implementation Guide*, 2005 [20]:

0. *Preparation for implementation.* This must begin several months prior to the start of the implementation stage and consists of undertaking a series of activities that ensure that local health communities (LHCs) are ready at an organizational level. Activities in this stage should include an assessment of LHC maturity, gathering high-level planning information, benefits realization planning, and business justification.
1. *Initiate.* This includes sponsorship, resources, financial approvals, and other commitments ending in a signed-off project initiation document.
2. *Local design.* This has three elements: survey, local design (or tailoring of national/local service provider design), and procurement. This stage may be relatively short if a national application (e.g. “choose and book” or “electronic transcription of prescription”) is being implemented.
3. *Prepare for go live.* This includes the undertaking of those activities required to prepare the process, people and IT environments for the deployment of the new solution, including hardware and network upgrades, clinical risk checks, data cleansing, testing, and training;
4. *Go live.* This includes the activities required to progress a new local service and the supporting systems, from test to live status are undertaken in a particular location; this is also commonly referred to as “cut over” or deployment. This stage may be relatively short.
5. *Support.* This includes the transition from users being directly supported by the local implementation teams, handover, deployment verification acceptance, and lessons learned.

The DoH has given considerable autonomy to local trusts to adopt and implement the above stages according to their local requirements and needs. Hence, the NHS appears to have made considerable strides in the area of KM and information systems with introducing some of the most impressive initiatives in the field of healthcare management.

However, setting aside the strategies and implementation documents, there seems to be a worrying degree of skepticism amongst the actual users regarding their involvement in the design and implementation of the systems, and an

apprehension that, as a result of this, the new strategies are doomed to failure. For instance, when the Radio 4 *File On 4* survey was conducted, only 7% of the 500 general practitioners (GPs) and hospital doctors felt that they had been “adequately consulted,” and a further three-quarters of doctors were not confident that the system will succeed [21]. The major danger of current HKM in the UK is that there is increasing attention being paid to the sole IT element, without realizing the importance of considering IT as an element of the wider system; and there is a lack of perception of a holistic picture of how and where different initiatives fit in, whereas the issue of HKM is endowed with extreme complexity and an effective and holistic healthcare service is a synthesis of a myriad of considerations. It is some of these apprehensions that Section 4.4 will turn to.

4.4 Analyzing Healthcare Knowledge Management: A Case Study

This section explores some of the insights and findings that have come to light as a result of a systems investigation on KM and information systems strategies of a particular PCT in Yorkshire. Let us call it PCT-1. Funded by the Economic and Social Research Council, this research project started as an initiative to inform a cardiac informatics protocol in line with the National Service Framework for Coronary Heart Disease [22], but it soon evolved to be a robust investigation into health informatics and KM strategies for the local area, with specific attention to NPFIT.

It was realized that, to approach the situation in a holistic manner, it is essential to understand where PCT-1 fits into the entire NHS system, and what kinds of constraints and opportunities it receives under the DoH. The method adopted to approach the situation was a VSM. Pioneered by Beer [23], and inspired by neurocybernetics, VSM is a structural analysis of any organization (in the state of a known-to-be viable system) to reveal its constituent parts and study how they interact with one another. The VSM was designed by Beer as a generic model which can be applied to any organization across time and space. He advocates that this model sets out to explain how systems are capable of independent existence due to the prevalence of fundamental laws of viability. The VSM is a structuralist endeavor to study not the system per se, but the relationship between the constituent systems.

VSM studies organizations in terms of five subsystems. “System 1” is the *implementation* system, where the actual operation of the organization takes place. Therefore, there may be several Systems 1. Each System 1 has its own localized management and deals with its own local environment. “System 2” is the *coordination* system, which is responsible for maintaining a harmonious balance of functions between each System 1. “System 3” is the *control* system, which ensures the optimal materialization of policies and goals in the subsystems of the larger organization. There is also a “System 3*,” which gives System 3 direct

access to the operational level through the "Audit channel." "System 4" is the *development* system, which Beer calls the "biggest 'switch'" in the organization [24]. This system is responsible for information passage between System 5 and the other subsystems, as well as for gathering information from the contingent environment. "System 5" is the *policy-making* and executive unit of the VSM, which Beer calls the "multimode," an elaborate and interactive integration for managers [25]. Based on the urgency and necessity, System 2 will filter information before passing it from System 3 to System 1. This link is called the "algedonic link." These five systems follow the law of "recursion" throughout the subsystems, which imply that all the five systems exist and operate within each system. As Beer advocates, VSM is a generic model, in the sense that a single person will play the role of all five systems if an organization is comprised of only one person.

A VSM for PCT-1 was conducted in September 2005, by the author with a performance analyst from PCT-1, with the objective to understand how the position of PCT-1 within the NHS structure facilitates or constrains its ability to take into consideration user opinion and perspective in implementing new IT strategies, which thereby impinges upon the effectiveness of the KM agenda. The VSM was applied as a guide in facilitating a better comprehension of the position of PCT-1 within the larger NHS.

According to the DoH strategy, the NPfIT was designed to be implemented in five waves, as below.

1	General Practice
2	PCT, Community, District Nursing, etc.
3 & 4	Acute/Maternity.
5	Ambulance.

The VSM referred to in this chapter was an initial attempt to understand the PCT-1, and considers the DoH as the system in focus. The recursion levels within the system have been studied in detail in subsequent VSMs. Considering PCT-1 as the primary implementation system for the DoH policies, the following systems were identified.

System 1: PCT-1 and other local PCTs.

System 2: does not exist; occasionally fulfilled by System 3.

System 3: SHA.

System 4: Accenture/NHS local IT service.

System 5: DoH.

A VSM placing PCT-1 as System 1 is given in Figure 4.2.

The four PCTs in the area were identified to be the Systems 1, the implementation system, named PCT-1, PCT-2, PCT-3, and PCT-4. It was found that responsibility for implementation of the NPfIT strategies lies in the PCT level, where the PCTs have considerable autonomy over how they choose to deliver the goals of the DoH.

The coordination system, System 2, seems to be a gray area, the reason being the absence of any formal body to coordinate between the four PCTs. Coordination

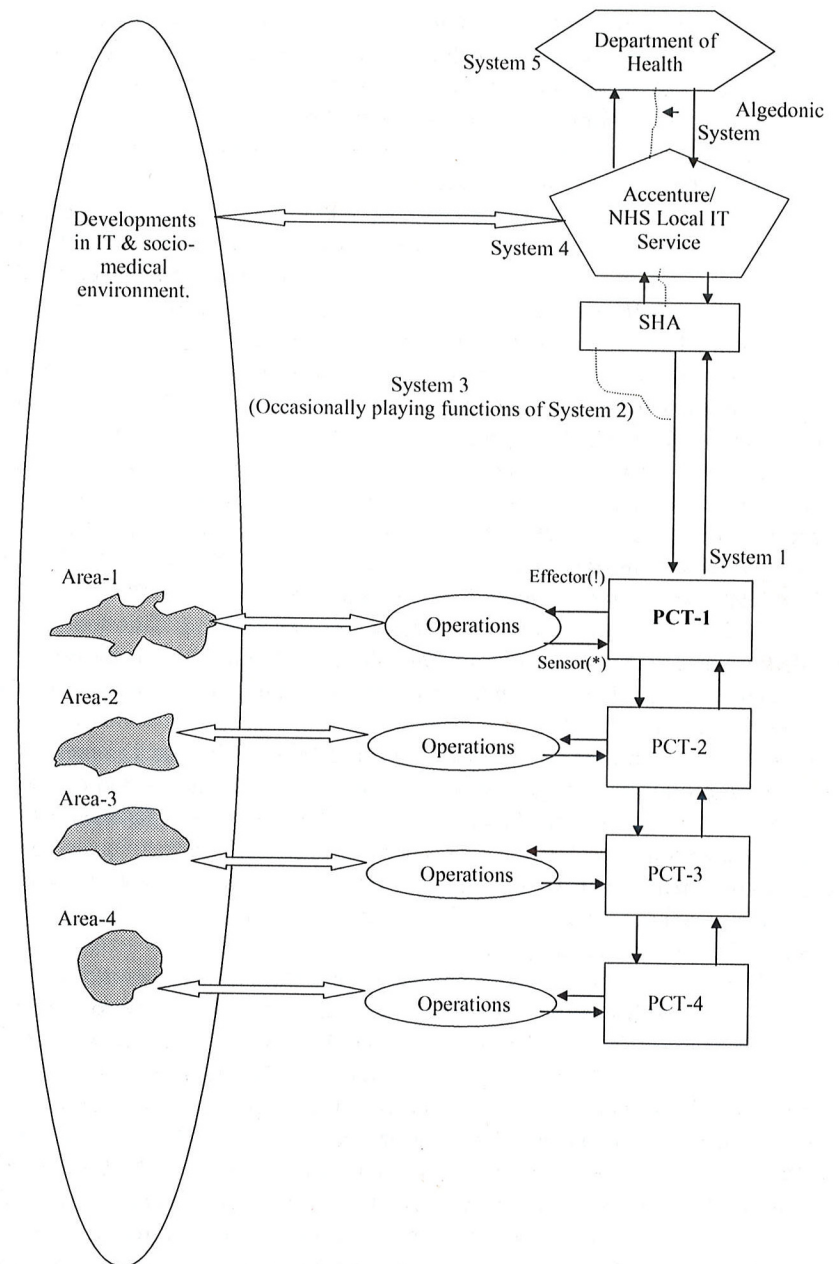


FIGURE 4.2. VSM for PCT-1.

occurs at an ad hoc level and there is no formal practice of inter-PCT linkage in this regard, apart from the fact that the Workforce Development team from the PCTs meet in the SHA once every 8 weeks. The PCTs report to the SHA, but there is no formalized body for coordination between them. They may share interests, but overall they are autonomous. Hence, we concluded that there is no formalized System 2, but the SHA occasionally plays this role.

System 3 is the control system. However, it was agreed that, in the present context, the control systems may not be considered as “control” per se, but more as a monitoring system. This function is fulfilled by the SHA, which oversees the work of the PCTs. However, the SHA does not hold any decision-making power over the PCTs. The SHA can only ask; it cannot demand.

System 4 is the “development” system, and this role is responsible for information passage between System 1 and the other subsystems, and gathers information from the environment. Dealing specifically with the implementation of IT systems within the NHS, it was agreed that the service provider for the region, Accenture, usually fulfills the functions related to this. Along with Accenture, the NHS local IT service also has a joint interest in the development function of the NPfIT, in terms of passage of information between System 5 and the Systems 1. Accenture and the NHS local IT service have direct communication with the PCTs.

System 5 is “policy,” the highest level of decision making. This function is fulfilled at the ministerial level at the DoH. The DoH commissions the services and indicates the specifications, with some degree of flexibility, within which the services are to be delivered.

From the above model, it was identified that PCT-1 (System 1) operates as an autonomous entity, with its own independent decision-making body. It deals with its respective geographical area, i.e. Area-1. Each localized management has a set of instructions which it receives, based on which it will instruct its operational environment of actions. This is the “effector” function. From the operational environment, activities are monitored and transmitted back to the localized management. This is the “sensor” function.

The absence of a formalized coordination system means that there is no effective communication or linkage between the PCTs. Learning from any improvement in one PCT probably does not get transferred to another. The only systems which bind the PCTs are the payroll system, personnel records, and the informatics service, which is central to all the PCTs. Coordination at this level is entirely in terms of IT.

The SHA is the monitoring body, but it does not control the functioning of the PCT. The PCTs have been given autonomous roles on how NPfIT is to be implemented. There is no audit channel (3*), as the SHA oversees the PCTs directly anyway. Therefore, there is disparity in the progress different areas are making in this regard. Some PCTs are performance managing, some are in the initial stages of developing a performance management system, and, in some, performance management does not exist at all. PCT-1 claims high standards in performance management.

The PCTs have their own NPfIT targets, and delivery of these targets is PCT based, not SHA based. The DoH just issues the directives of what is to be delivered and the PCTs make their own decisions on how these will be delivered. For instance,

the creation of a central electronic staff record was a DoH directive. To meet the demands of such directives and improve IT literacy, PCT-1 had recently invested in a hi-tech training center.

Hence, in a way, it can be advocated that PCT-1 is not controlled by any superior body for the implementation of the NPfIT. The higher bodies only issue directives and express a desire for what is to be implemented. Therefore, it is the responsibility of the PCT to design an effective strategy for involvement and stakeholder participation in the implementation of the new system. The PCT should interact with users, but there is no evidence that this is taking place.

The DoH had an anticipated time-frame for the desired implementation of NPfIT, within the constraints of time and resources. In this first wave/stage, user opinion was not given due attention, which bred skepticism of the new system and clinicians’ possessiveness of their old systems. In this stage, the DoH seemed to perceive the new system totally in terms of IT, and overlooked the socio-political and human dimensions of change and work culture. Therefore, the second wave characterized “community focus groups,” in which the individual local environments of the respective PCTs were taken into account, enabling Accenture to understand the complexity of the situation. A critical benefit from this was to illustrate and reinforce the very localized and specific ways healthcare is provided to a target population. Whilst services are similar in overview, their delivery differs markedly between PCTs and their recipient public. It is believed that the NPfIT solution will introduce uniformity without removing the flexibility with which services are tailored to their local communities. The community is itself a complex phenomenon, and it differs from PCT to PCT. The local factors and services of each PCT are different. Issues around social services and child welfare and their relation to civil society have not yet been addressed. This is a muddy area and full of complex issues that need clarification. It would be easier to indicate that many PCTs host services such as Sexual & Reproductive Health, Dentistry, and Prison Health, etc., some of which may be included in the initial NPfIT provision; however, there are areas where there are provisions which are out of the scope of the NPfIT program, e.g. the armed forces.

When the DoH issues its directives, it also allows a degree of flexibility, with the core element (e.g. the patient identifier) remaining intact. The flexibility may include the decision of the PCT of how to record patient information and make this available to other clinicians. Accenture and the NHS local IT service are responsible for consideration of the environmental factors and the hardware/software element of the new system. Accenture shares an interest with PCT-1 in the implementation of the NPfIT. Accenture and the NHS local health informatics service are answerable to the DoH for the delivery of services.

The “algedonic link,” which transmits information directly from System 1 to System 5, based on urgency, may be activated in this situation if the IT security system in the PCT is threatened by hacking or other failure. Action to rectify any such fault may be directed directly to Accenture or the NHS local IT service.

The VSM analysis carries a mixed message about the level of consistency and standardization of the implementation of the NPfIT. The technical and human dimensions have been treated as entirely disparate concepts, with the assumption

that, once a technology strategy is imposed, people will automatically adapt to it. Hence, although the DoH appears to grant flexibility to the PCTs to the manner in which they choose to implement the NPfIT in terms of local needs and user perspective, this is just pseudo-flexibility, as the DoH already has an established model of a high-tech information systems project, which it aspires to put in place. This has resulted in the end users in PCT-1 being left isolated and feeling imposed upon by the grand plans of the DoH.

The above opinion is reinforced by findings from questionnaire surveys that were being conducted amongst practice managers and GPs in the PCT-1 area. The objective of these surveys was to throw light on the level of awareness and involvement of clinicians and grass-roots-level management in the NPfIT.

Twenty-seven questionnaires were sent out to GPs and nine responses were received. All the GPs who responded indicated that they have not been involved in the planning and design of the NPfIT, and only one GP felt that the NPfIT will work as per the expectations of the DoH. There was one GP who was not even aware of the NPfIT until they received the questionnaire. In answers to the open-ended questions, whilst many GPs anticipated a good service support from the NPfIT, critical comments were also featured, and one GP commented that they are not confident that the system will work, and anticipates the system to be "beset with huge problems." Another GP commented that they did not know how the new system will impact on the quality of services. The main issue that was featured in most of the responses was that the system ought to be user friendly if it has to gain acceptance amongst clinicians, and patient confidentiality was noted as a priority. However, GPs do feel "pressurized" to shift to new systems all the time. Other interesting comments noted were that NHS IT strategies are a "waste of money" and are "laudable but impractical."

Similarly, 27 questionnaires were sent out to practice managers and 16 responses were received. Of these, only five felt that they have been involved in the design and implementation of the NPfIT, and 11 felt that they were not. In response to the open-ended questions, there was generally good anticipation from how the NPfIT will change the manner in which information is shared at present. Whilst practice managers did agree with the potential benefits that may be derived from the NPfIT, some answers did reveal issues of concerns as well. One of the interesting comments was skepticism with the change in the system, when GPs already feel committed to paper records. The issue that was mainly featured is the availability of adequate training to use the new system.

4.5 Afterword

The above investigation into the KM and information systems strategy of the NHS carries a mixed message for such strategies. The case study of PCT-1 depicts a road map towards an ambitious system which will be of tremendous assistance to addressing issues like maintaining information consistency, avoiding duplication, timely information sharing, and reduction of medical errors, carrying the message

that a sound IT support strategy is not only desirable, but also necessary. And taking this into consideration, it is commendable that the NHS has a strategy which has the ability to address the issues mentioned above.

However, as this chapter demonstrates, the basis on which this strategy is founded creates a separation of the human and technological dimensions as two disparate aspects to be designed and delivered in isolation. This is a *systematic*, but not *systemic*, approach, with dangerous consequences. Whereas a systematic approach would break down the organization into departments and strategies into disparate chunks and approach them part by part, a systemic approach will look at the problem situation as a whole and attempt to understand not only how the different dimensions interact with each other, but also how the whole system evolves as a result of it.

The requirement is that of an effective "combination of human and computer-based resources that results in the collection, storage, retrieval, communication and use of data for the purpose of efficient management of operations..." [26]. In this quotation, it is crucial that we understand that what is important is both the human and the technical element, hence the "combination" of "human" and "computer-based" resources. The management of knowledge does not parallel the management of information. Whereas the latter may be *achieved* by adequately placed hardware and software, the former may be *attained* only by understanding how humans establish a working relationship with the organizational and IT provisions, within the climate of organizational activities.

Therefore, this chapter may be concluded with the opinion that there have been promising developments in the area of information-systems-enabled knowledge management in the UK healthcare sector, but there have been pitfalls as well. However, the recognition of such issues is the first step towards resolving them. And as it has been emphasized in this chapter that this should be regarded as an iterative process designed for continual learning. A systems perspective to approach and comprehend situations can enable a holistic understanding of integration of initiatives, inclusion in stakeholders, and an attempt towards greater effectiveness of organizational strategy making.

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Further Reading

For a detailed discussion on co-generative learning refer to:

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