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INSTITUTIONALIZATION AND DE-INSTITUTIONALIZATION PROCESSES IN THE UK HEALTHCARE SYSTEM: THE ROLE OF EMERGING TECHNOLOGIES

By

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This thesis is the conclusion of a journey that spanned more than three decades. For the first time in 40 years, I am no longer a student or about to enrol for a degree course. This is obviously not to say that I will stop studying; many people have instilled in me the love of learning (and of disseminating knowledge to others) that will serve me well in the future. I would especially like to thank my mother (Vonyei Guah), late father (Samuel Guah) for starting me out right; my godmother (Rev. Sister Nancy A.J. Kingston, FMM) for picking up the pieces and keeping me on the straight path during those vulnerable days in Sanniquellie, Liberia and helping me to see the opportunity that I was able to take advantage of to achieve my dreams.

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"It is always happy time, when Daddy is at home"

Michael Appopo Guah, 2004

DECLARATION

This thesis is presented in accordance with the regulations for the degree of doctor of philosophy (PhD). The work described is entirely original and my own, unless otherwise indicated. None of the material contained hereafter has been submitted for a degree at any other university. The interpretations in this thesis are the sole responsibility of the author, and do not in any way represent the views of the NHS organisations, staff, partners or Warwick Business School at Warwick University.

Appendix A contains a list of publications that have been produced, directly and indirectly, from the research undertaken in this investigation. It contains one book, seven journal papers, four book chapters and twelve conference papers.

ABSTRACT

This thesis is a result of a research project that examines the Information Systems strategy of the National Health Service (NHS). The researcher followed the process of implementing a Primary Service Provision (PSP). PSP is an initiative by the NHS Information Authority (NHSIA) to develop and establish a National Programme for Information Technology (NPfIT)—a means of providing a useable electronic health record nationally to the UK.

Five case studies are presented in the thesis, containing:

1. Two primary care facilities;

2. Three secondary care facilities;

These cases were developed as a result of studying the internal processes, decision and support paths applied individually in the NHS.

The research approach adopts qualitative and interpretative analysis that includes longitudinal case studies. This multiple case study approach has an embedded design incorporating the components of work business processes as subunits to enhance insight. Data was collected predominantly from interviews supported by archive material, documents, and direct observation. Overlapping cross case, and within case analysis was undertaken, using Activity Records, Strategic Choice Analysis, and concepts supported by various researchers in the past (Avgerou & Cornford, 1993; Davenport, 1993; Eisenhardt, 1989; Galliers, 1991). While it might be possible for similar processes to result in different solution when adopted in another research context, in these seven cases quite different approaches were taken. The Thesis

concludes that while the core processes were the same across the cases, the following

issues combined together to lead to quite different approaches in each case:

1. The detail of the IS strategic processes;

2. The variation in the contexts;

3. The logic of the decision process as they evolved; and

4. The view of the actors involved.

The researcher is of a strong belief that as time progresses and experience is gained

and the situation with NPfIT evolves, the various actors would change their views

towards IS strategy. This could result in changes in the overall NHS IS business

model and healthcare delivery process support. This assumption, however, could be

affected by the appearance of very little transfer of knowledge—across different parts

of the NHS—regarding past experience with IS implementation.

The author argues that NPfIT mainly serves to diffuse information and

communication technologies in the NHS. As a result the NPfIT is changing the way

by which the NHS competes and meets the needs of it patients, the business model

and the value-creating processes. New opportunities are also taking place introducing

new healthcare delivery processes and modifying the existing processes.

PART 1

THE   RESEARCH   STUDY

CHAPTER ONE

INTRODUCTION

1.1   Introduction

This chapter is divided into five sections. The first section details the context of the research study. A brief section follows this on the National Health Service (NHS) information systems (IS) strategy narrating the researcher's journey from institutional theory to saturation theory during this research into IT in healthcare processes. The next section details the rationale of this research study, followed by a brief justification of the research methodology. To set the thesis into context this chapter contains brief descriptions of both the NHS Information Authority (NHSIA) and Egton Medical Information Systems (EMIS) before concluding with a focus on institutional and IS factors and their interaction over time in the UK healthcare industry.

This thesis reports on a research study that took place for more than 3 years, involving more than 300 interviews and many other interactions. During that period, the NHS Information Authority (NHSIA) has been pushing through a highly complex procurement process—termed the National Programme for Information Technology (NPfIT). This project is valued at £6.3 billion to cover all aspects of emerging technologies in the NHS for a period of 10 years (NHSIA, 2003). However, as many previous implementations of NHS technological change have resulted in failure (Collins, 2003; Eccles et al, 2002; Lauchlan, 2000; Marshall et al, 2003), the NPfIT project is utilising the Application Service Provision (ASP) business model (Currie et al, 2004; McGinity, 2003). To prevent further failure, researchers are questioning the nature, origins and applicability of various e-business models—including the ASP

business model (Caldwell, 2002; Howcroft, 2001; Kraemer & Dedrick, 2002; Chatterjee et al, 2002).   Improvement in the rate of successful IS project implementation may lie in concentrating on human and organisational aspects, rather than the technological ones (Scott-Morton, 1991; Davenport, 1993; Coombs & Hull, 1995; Bloomfield, 1997).

This thesis DOES NOT attempt to interpret the political strategy for the present or any other UK government in dealing with the NHS. What the thesis provides is a review of the current reform of the NHS using the lens of Institutionalisation of Information Systems in healthcare processes. There is much to support the view that the human, political, social and cultural aspects of information systems (IS) strategies need to be taken more seriously (Moad, 1993; Belmote & Murray, 1993; Mumford, 1995).

There have been several changes in the NHS strategic approach to IS over the last few years. This thesis uses a variety of empirical models to unpack the dynamics of institutional changes taking place in the NHS. Some of these changes include the longitudinal cradle-to-grave electronic health records (EHR) and horizontal, local Electronic Patient Records (EPR) which provided the joint focus of the 1998 NHS IS strategy called 'Information for Health' (DoH, 2000). This strategy subsequently was referred to as integrated care record system (ICRS)—in a strategy document called 'Delivering 21st Century IT Support'. ICRS is a system of 'closely coupled' electronic care records at the heart of the NHS IS modernisation programme (Wanless, 2002).

In the 4th quarter of 2003, the initiative began to award contracts to private service providers under the National Programme for Information Technology (NPfIT). This is now the preferred nomenclature for the electronic care records that form the centrepiece of the NHS IS modernisation programme. Contracts were signed with Local Service Providers (LSP) and National Application Service Providers (NASP) to deliver the NHS care records service. The core of NHSIA strategy for NPfIT is to take greater control of the specification, procurement, resource management, performance management and delivery of the information and IS agenda. To deliver the necessary applications, services and IS infrastructure required within a timeframe that is both sensible and ensures value-for-money, NPfIT needs to run a procurement process that is as rapid as the NHS culture allows. Such a vibrant procurement process brings to the NHSIA the benefits of maintaining management focus and better engagement of prospective suppliers (see Appendix D) and the delivery of tangible change closer to the entire NHS workforce.

- **FIGURE 1 -**

The ICRS will be a broad, continuously expanding and maturing portfolio of systems and services to create, store, share, transfer and give access to health records. A key part of this consists of the tools to support the patient journey along care pathways (see figure 1.1). It will include each organisation's patient records and a nationally-shared summary of patient information, called the 'NHS spine'.

1.8   Chapter Summary

The purpose of this chapter has been to introduce both the topic of interest to the research and the contents and structure of the thesis. First, the chapter has set the

scene for the research. Then a description and discussion of the objectives of this thesis—which is not an explanation of the government's political strategy for the NHS—and the expected contribution of the research and rationale for the research were provided. An introduction of the research methodology used in the thesis was followed by an overview of the chapters and the contents of the proceeding chapters. Chapter two reviews the nature of the enduring debate with NHS IS.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

This chapter serves the primary purposes of setting a context and framework for the research, and developing sharper research questions (Yin, 1994).   It follows the theory of Stevens et al (1993) who listed the four main functions of a literature review chapter as:

   i. The provision of a conceptual and theoretical context in which the topic for research can be situated;

  ii. The provision of a brief up-to-date account and discussion of literature on the issues relevant to the topic and to the reader;

 iii. The provision of reasons why the topic is of sufficient importance for it to be researched; and

  iv. The discussion of relevant research carried out on the same topic or similar topics.

The chapter begins by setting the context of IS in the NHS, presenting a framework (see Figure 2.1) showing the structure for IS procurement, followed by a brief section on the NHS IS strategy involving NPfIT. The next section details the context of the research study through the theoretical lens of institutionalism. The chapter also looks at the literature on emerging technologies, including ASP and Web services. It further details the current trends in healthcare management practice that influence emerging technologies. The chapter then details web services, providing context along with the positioning of the paradox of IS supply process and adoption. This is

then followed by a review of issues relating to governance of IS in the NHS and concludes with implications for symbolic structure in the NHS.

- **FIGURE 2.1 -**

This framework (see Figure 2.1) represents the national strategy for IS in the NHS. It shows complexity in decision-making, which deters efficiency and cost-effectiveness in delivering 'best value' to the NHSIA. This further increases the difficult process by which investment into IT is struggling to bring 'business benefit' into the NHS (Metters et al, 1997). Constant delays in IS procurement and deployment results in the NHS having slower and less consistent availability of health care data for practitioners (Laerum et al, 2001). Procrastination in the IS procurement process also affects up-to-date budget control and analysis as well as technology implementation and use (Wanless, 2002).

2.9   Chapter summary

According to Currie and Willcocks (1998), the role of information systems is changing from one of automating support functions in a quest for greater efficiency to one where core business processes are being transformed and wider strategic benefits are sought. Hammer (1990) considers IS as the key enabler of organisation process, which he considers as "radical change". He prescribes the use of IS to challenge the assumptions inherent in an organisation processes and procedures that have existed since long before the advent of modern computer and communications technology. This chapter has explained the NHS drive to invest in emerging technologies to improve IS support for its core healthcare processes.   Despite much IS investment, the NHS has been slow to adopt new IS-enabled methods and practices. This has been

echoed at local Trusts level as well as the NHSIA, as organisation-wide reform has been met with an alleged unwillingness by many parts of the NHS to embrace change (McGauran, 2002; NHSIA, 2003; Pencheon, 1998; Wanless, 2002). Inefficient and outdated practices still permeate the NHS, as many IS vendors find it increasingly difficult to penetrate the various decision-making hierarchies (Wanless, 2002).

It is clear from the discussions in this chapter that no one generic strategy for emerging technology has been successful in the NHS. In its strategy, the NHSIA has considered patient care objectives with a focus on healthcare processes. The chapter has also shown that attempts to add on an e-commerce facet to the NHS traditional business structure without re-engineering their traditional processes are not likely to succeed. Moreover, since NHS systems tend to be pervasive and are continuously evolving, an integrated approach is called for.

In conclusion, the NHS has embarked on a piecemeal strategy for developing their web services framework (under a larger integrated framework). The difficult decision was whether to concentrate on the patient pathway first or the supplier side—or both. A critical factor for assessing this strategy is achieving real benefits from the potential emerging technologies.   Such benefits will accrue only with fundamental transformation of strategic choices, internal processes (organisation structure and processes), the IS platform, and the IS architecture's (Venkatraman, 1991). Unfortunately, the NHS cannot disregard conventional 'functional structuring. The NHSIA IS strategic plan requires cross-functional co-operation and skills in business analysis, systems development, project management and organisational change (NHSIA, 2003).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Introduction

The term "methodology" was previously used to describe different approaches to deal with a combination of problems in business systems and procedures (Avison & Fitzgerald, 2003).   A research methodology is a recommended collection of phases, procedures, rules, techniques, tools, documentation, management and training used to develop systems or accomplish a research project.   This chapter traces the methodology of the research work in order to study the research robustness.   After the introductory section, the chapter gives a general overview of qualitative research that describes, illustrates, and qualifies qualitative approach through examples.   The chapter describes what led to the use of a qualitative rather than quantitative method.   Adopting Yin (1994) and Remenyi (1991) approaches to research, the chapter details our case study protocol.

The basic construction of the research design follows the eight steps for building theory from case study research as proposed by Eisenhardt (1989) which comprise:

1. *Getting started:* definitions of the research question;

2. *Selecting cases:* specifying the population;

3. *Crafting instruments and protocols:* multiple data methods, qualitative and quantitative data, multiple investigators;

4. *Entering the field:* Data collection methods, overlapping data collection and analysis;

5. *Analysing data:* within-case and cross-case pattern matching;

6. *Shaping propositions*: replication and not sampling logic, iterative approach;

7. *Enfolding literature*: comparisons with the literature; and finally

8. *Reaching closure*: theoretical saturation.

The chapter also details the process of doing a PhD project using a combination of literature review, case study and interview. It also discusses philosophical perspectives, which inform qualitative research.

3.11   Chapter summary

This chapter has described and discussed the research methodology applied to this study. Qualitative research was employed to understand the research topics, validate and understand the findings and to obtain the required data (Eisenhadrt, 1989). The philosophical approach underlying this research was critical research. Five in-depth case studies were used as a strategy of inquiry. This multiple case study approach has an embedded design incorporating the components of healthcare processes as subunits to enhance the insight. The data collection techniques used in this research was self-report questionnaire, interviews, work-related documents reviews and observations. Data was collected predominantly from interviews, supported by archive material, documents, and direct observation. Overlapping cross case, and within case analysis was undertaken, along with various concepts supported by theories integral to the analysis carried out.

The chapter has detailed the basic construction of research design, following Eisenhardt's eight steps for building theory from case study research (1989). It has also provided an explanation for the selection of the aforementioned issues before inducing a model developed within this thesis.

PART 2

THE CASES

CHAPTER FOUR

(CASE STUDY I)
SOUTH WARWICKSHIRE LOCAL HEALTH COMMUNITY

4.1   Introduction

This is the first of five cases presented in this thesis. In this chapter the reader is given some background information about South Warwickshire Local Health Community (SWLHC). That is followed by a discussion of the specific IS strategy used by SUHT. The case reviews SWLHC strategy for implementing NPfIT, noting various lessons learned and discusses the current objectives of SWPCT IS strategic plans. The chapter serves to illustrate the current intentions of the local IT team in enabling NPfIT within SWLHC together with the wider strategic agendas of South Warwickshire Primary Care NHS Trust (SWPCT) and South Warwickshire General Hospitals NHS Trust (SWGHT) for the period 2005-2008. The case also includes funding details for IT over this period and the current known deliverables of NPfIT together with both antecedent and dependent projects on the programme. In addition the wider IT projects of both SWLHC are highlighted.

The researcher highlights linkages between the strategic intentions and business drivers of SWLHC, the strategic and operational drivers for IT, and the delivery schedule of the projects. These serve to provide evidence of the following:

- The key risks faced by SWLHC in the programme together with the proposed mitigation actions

- The governance and delivery structures which will be used to deliver the programme

- The approach that SWLHC will take to the management of change including process redesign and the delivery of benefits

The case ends with discussions of potential benefits that the NPfIT initiative brings to SWLHC employees and patients, namely:

- Controls access to patient information in the hospital databases;

- Reduces risk of medical error;

    i)   Causes phased managed implementation.

    ii)   Ensures that plans are communicated.

    iii)   Ties in with business planning ensuring service in the right place at right time, etc.

The case also details barriers to NPfIT implementation, namely:

- Existing functionality may be hard to replace;

- While the cost of LSP systems is not fully understood, it may be too high and unaffordable for some Trusts;

- Interfaces of LSP systems may be difficult to setup and manage;

- The IS supplier market could be decimated to the degree that there is no support for incumbent systems.

4.8   Chapter summary

This case study brings to light several issues with the existing IS governance model which highlights fears that the correct outcome of the project may not be delivered. Every health authority seems to be fulfilling a role-based obligation. But the existing

knowledge in the NHS is not totally being used. That knowledge can be captured in the shape of review cycles, existing contract databases, competitive research already on file in various regional NHS offices, alliance data usually reported in regular newsletters by different organisations in the NHS and delivered via email and filtered into obscure folders because no one has the time to read everything, and in the white papers published on public Web sites by the NHS partners—knowledge containing an immense amount of useful information that could easily be reviewed as part of a complete decision-making cycle. Instead, partners with significant skills in the region will remain in the dark until the implementation of NPfIT is completed. This does not take advantage of the valuable lessons learned by existing IT vendors with previous contracting experience in the region until those same mistakes have been made for a second or third time.

While this might seem like a well proven IS governance model, it only ensures a modest method to minimise inter-Trusts disputes and budget conflicts. Those governance models—based upon the notion that resolving the national vs. local tension is important—must give way to a broader means of participatory decision making by moving beyond the boundaries of an institution.

It requires that individuals serving as representatives for specific unit or functional group within the NHS or its partners must shift their behaviour. This would lead to a more actively engaged work force within a more pluralistic, multi-dimensional model within the NHS where IS governance expands to include partners, service providers, and communities of GPs within and beyond the boundaries of the NHS.

At the local level, this means both Trust Boards would be required to confirm the contract indicating their agreement to the following:

- The proposed delivery sequence of projects in NPfIT together with antecedent and non-related projects

- The funding implications for the LHC over the period 2005-2008

- That the delivery arrangements and risk management processes are of sufficient robustness for a programme of this size.

CHAPTER FIVE

(CASE STUDY II)
SOUTHAMPTON GENERAL HOSPITAL,
SOUTHAMPTON UNIVERSITY HOSPITAL TRUST

5.1   Introduction

This is the second of five cases presented in this thesis. This chapter begins by giving the reader some background information about Southampton University Hospitals NHS Trust (SUHT). That is followed by a discussion of the specific IS strategy used by SUHT. The case reviews previous IS strategy of SUHT, noting various lessons learned and discusses the current objectives of SUHT IS strategic plans, incorporating NPfIT. It discusses potential about benefits that NPfIT brings into the institutional mix for SUHT employees and patients, namely:

- Controls access to patient information in the hospital databases;

- Reduces risk of medical error;

    iv)   Causes phased managed implementation.

    v)   Ensures that plans are communicated.

    vi)   Ties in with business planning ensuring service in the right place at right time, etc.

The case also details barriers to NPfIT implementation, namely:

- Existing functionality may be hard to replace;

- While the cost of LSP systems is not fully understood, it may be too high and unaffordable for some Trusts;

- Interfaces of LSP systems may be difficult to setup and manage (see Figure 5.1);

- The IS supplier market could be decimated to the degree that there is no support for incumbent systems.

5.8   Chapter summary

This case study has described the approach taken by SUHT to establish and implement emerging technologies strategy, with the objective of ensuring consistency in the provision of prompt and effective resolution of IS problems and supporting the smooth and efficient operation of the hospital. The case study has examined in turn the details of the process of implementing strategic plans from the national authority that looks at emerging technologies available to the NHS.

We can conclude, in the case of SHUT, that the technological factors like scalability, the managerial aspects of speed and focus, and the behavioural aspects of price and flexibility were the key drivers of the model. The inhibitors of the model were poor connectivity, lack of trust in the model, reluctance to be locked into long-term contracts with suppliers, lack of customisation, poor choice and suitability of software applications from NPfIT, and few opportunities to integrate disparate applications across technology platforms and business environments.   Sometimes assumptions are made about systems required in the NHS and what is clinical in the true sense.

It has briefly looked at the SUHT approach adapted to decision making and using the concept from institutional theory and understanding of the alignment of the critical activities in the NHS systems network. It later transpired that this was the only case where alignment supported a proprietary solution to support hospital core activities with a locally inspired IS strategy, and demonstrated the power and influence of an aligned view.

CHAPTER SIX

(CASE STUDY III)
EAST LEEDS PRIMARY CARE TRUST

6.1   Introduction

This is the third of five cases presented in this thesis. In this chapter the reader is given some background information about East Leeds Primary Care Trust. That is followed by a discussion of the specific IS strategy used by East Leeds PCT. The case reviews previous IS strategies of East Leeds PCT, noting various lessons learned and discusses the current objectives of the strategic plans. It discusses potential benefits that the IS strategy brings to the PCT employees and patients, namely:

- Controlling access to patient information in the hospital databases;

- Reducing risk of medical error;

    vii)   Causes phased managed implementation.

    viii)   Ensures that plans are communicated.

    ix)   Ties in with business planning ensuring service in the right place at right time, etc.

The case also details barriers to NPfIT implementation, namely:

- Existing functionality may be hard to replace;

- While the cost of LSP systems is not fully understood, it may be too high and unaffordable for certain Trusts;

- Interfaces of LSP systems may be difficult to setup and manage;

- The IS supplier market could be decimated to the degree that there is no support for incumbent systems.

6.8   Chapter summary

This case shows that the actual data, which should be stored on the integrated healthcare database being introduced by NPfIT, is more difficult to assess. It is being suggested here that the NHS SPIN should be available at a summary level while more detail information should be maintained at the local level of varies primary care or secondary care institutions. But clinicians should be given the capability to access this data when they need further information.

If the NPfIT database is to be based around the primary care record, all GPs must record full, accurate details on patient contacts and treatments. East Leeds PCT has made several efforts in getting around this problem but still requires a great deal of work to achieve.

CHAPTER SEVEN
(CASE STUDY IV)
UNIVERSITY HOSPITAL BIRMINGHAM NHS FOUNDATION TRUST

7.1   Introduction

This is the fourth of five cases presented in this thesis. In this chapter the reader is given some background information about University Hospital Birmingham NHS Foundation Trust (UHB). The case reviews previous IS strategies of UHB, noting various lessons learned and discusses the current objectives of UHB IS strategic plans. It discusses potential benefits that the NPfIT brings to UHB employees and patients, namely:

- Controlling access to patient information in the hospital databases;

- Reducing risk of medical error;

    x)   Causes phased managed implementation.

    xi)   Ensures that plans are communicated.

    xii) Ties in with business planning ensuring service in the right place at right time, etc.

The case also details barriers to NPfIT implementation, namely:

- Attempt to replace certain existing functionality may prove difficult;

- While the cost of LSP systems is not fully understood, it may be too high and unaffordable for certain Trusts;

- Interfaces of LSP systems may be difficult to setup and manage;

- The IS supplier market could be decimated to the degree that there is no support for incumbent systems.

7.8   Chapter summary

This case, with its characteristics of the few highly vibrant Trusts in the NHS, helps to explain how different institutional frameworks generate distinctive patterns of sectoral and technological specialisation. Such patterns have enable UHB to be more or less effective in dealing with particular kinds of institutional problems and innovating in different ways.   As a result, the NPfIT initiative—with emerging contrasting institutional arrangements—has displayed different kinds of economic development and specialisation.

Institutional frameworks that encourage such lock-in, therefore, reduce the risks associated with long-term commitments and so facilitate both authority sharing and the development of organisational process improvements. Individual NHS Trusts can also inhibit IT supplier's ability to adapt to radical technological and industry-specific change.

CHAPTER EIGHT

(CASE STUDY V)

ADAN MEDICAL CENTRE - SEDGEFIELD PRIMARY

CARE TRUST

8.1   Introduction

The fifth case study looks at an example of the implementation of IS strategy in a primary care environment. It examines a General Practice (GP) surgery in the North East of England with a typical workload for an average GP in the UK.

As with the previous case studies, it begins with some background information about the surgery and the environment in which the information system is meant to support. The case reviews previous attempts by the Adan Medical Centre (AMC) to use an electronic patient record system in a rather ambitious plan of a 'paperless surgery'.

This case points out some IS governance issues in the NHS leading to an introduction of a framework. This case also illustrates some integration issues of IS in the NHS, emphasising the disengagement of systems between primary care and secondary care.

8.8   Chapter summary

AMC found that much of the information relating to its customers resided on different systems, lacking a single point of responsibility and control. The data sources relating to patient demographics and secondary care, long-term illness, and social care also reside in different places. Patient Intelligence solutions on the market today do not

have built-in ability to connect to the types of information AMC needs to create the key performance indicators reports without creating direct access to each information source (Guah & Currie, 2004). The direct access approach would create problems with redundant and overlapping data. The approach would also create a hard-wired, not scaleable, solution. An effective solution must consolidate and deliver the information to the patient intelligence package. To provide a consolidated view of this information, the AMC would need to undertake a lot of manual work, such as creating a data mart. However, a data mart or data stage would not meet the need for delivering real-time access to the information.

The use of the information system to empower staff, observed in this case study, can be put into a wider context. It reinforces the message that a socio-technical approach, which encourages active user participation in the development and operation of information systems are likely to be viewed more positively.   It also provides some important new insights about the management of IS projects that should be particularly valuable to practising managers within the NHS.   In particular, it is important that the cultural impacts of future IS implementations are explicitly evaluated and effectively managed.

The findings here also imply that:

- *Successful implementation of strategic plans*: Trusts that had their planes well integrated with their business plans and were consistent in focusing both in process and implementation issues did overall better than the rest of the Trust (planning effectiveness).   NHS Trusts with inconsistent strategic alignment

levels and low levels of technical integration and function integration output integration will perform poorly compared to the rest of the NHS;

- *Communication of strategic direction of the practice*: Medical practices with strategic integration managers who were well informed about the business plans and were involved in both IS and NHS corporate IS strategy did overall better than those without.

- *Small size flexibility and internal coordination*: Small trusts with the ability to utilize IS resources according to their needs for functional coordination (i.e. they had similar levels of functional integration process and output) did better than Trusts which spent more resources on process than required by their internal business functions.   Small trusts with high levels of technical integration and strategic integration are, in general, good performers.

PART 3

THE ANALYSIS

AND

CONCLUSIONS

CHAPTER NINE

CASE STUDY ANALYSIS

9.1   Introduction

This chapter gives a combined analysis of the five case studies to elicit data collected during the study and interpret different scenarios within IS strategy and implementation of emerging technologies. As such, the aim is not to provide a theory that describes how success or failures in NPfIT are achieved or cases of a successful or unsuccessful NHS IS strategy model. Instead, it aims to analysed in detail some of the issues that are associated with the institutionalisation and de-institutionalisation of IS in the NHS, as seen in the preceding chapters.

Most studies of NPfIT value and healthcare organization IS strategy test some type of model with data (Hen 2005; Kreger, 2003; Laroia, 2002; Mark, Pencheon, & Elliott, 2000; Perseid, 2003; Wu & Sawy, 2003). These studies involved crucial research design, where the type of data collected depended on the model and the researcher's objectives. These are only a few of the number of possibilities:

1. The cost of IS or a specific project in the healthcare industry

2. Impact of NPfIT on the healthcare industry

3. A group of firms working in healthcare

4. A single firm working in healthcare

5. A part of an healthcare organization

6. Groups of individuals working in healthcare

As seen in the previous five chapters, studying the process of IS implementation or one specific project, aimed at showing business value from technologies, is extremely difficult. The researcher therefore sought research designs which focus on the institutionalisation of IS in health sector. The study of the implementation of a single comprehensive IS project in the NHS was able to show a relationship between investment in IS and the performance of the NHS. Looking at a variation of Trusts shows a multiplicity of scenarios across the NHS. Banker and Kauffman (1990) demonstrated that probably the most popular unit of analysis for organization value studies is the individual organization or a subunit of that organization. It was easier to find a direct linkage between a specific NHSIA initiative (like NPfIT) and the individuals or subunits that use it than to look for some type of general return from the NHS investment in IS. There are usually goals for a specific initiatives (like NPfIT) and it is easier to predict its impact because the researcher can study the system in depth. Knowing such goals and with a prediction of impact, the research chose performance or value measures that are likely to be influenced by the resulting technology: The more closely related the performance measure is to the objectives and purpose of a system, the greater the likelihood of finding results (Banker & Kauffman, 1990).

The researcher found it very difficult to quantify IS itself in the NHS. Several researchers have used binary measures when there is a control group by comparing organizational subunits or individuals having technology with those that do not have it (Baskerville, 1993; Beniger, 1986; Rai et al, 2002; Weill, 1993). This proved unconvincing, as it may be able to measure only the intensity of use of emerging technologies. For example, Weill (1993) found that a variable he called "conversion

effectiveness" played an important part in the relationship between investment and performance. This thesis has shown in Cases 1 and 2 (chapters 4 and 5, respectively) that a single unit in a large organization can make appropriate use of a large organisation project. These agree with Weill's findings indicating that the organization must convert its investment into NPfIT that have the potential to be productive for the organization. The notion of conversion effectiveness, therefore, applies equally well to economic or organizational considerations, as demonstrated in case. This can be summarised as 'the more specific and precise the measurement of NPfIT strategy, the greater the likelihood of finding meaningful results' (Guah & Currie, 2004).

9.8   Chapter summary

Our strategy in the field was one of building on small-scale studies to develop evidence of the strategy for NPfIT model in the NHS.   Such evidence of the business value of NPfIT initiative can be demonstrated in a large number of small contexts. However, there is no guarantee that by adopting IS strategy on a national scale (as planned in the NPfIT), the NHS will necessarily derive value. It is as easy (or maybe easier) to mismanage IS as any other part of the organisation. As a result, it is too much to expect the sum of all investments in technology to necessarily manifest itself in national healthcare benefits to the public.

It is clear from these cases that the depth and complexities of the issues that surround the implementation of large-scale NPfIT by a government organisation, and its diffusion throughout a large national structured health service, are far greater than generally have been considered. While the NPfIT may suggest means of reducing the

impact of some of the factors involved, others strategies used by the NHSIA to implement IS in the NHS may not be amenable to treatment. Either way, it is critical that IS strategies incorporate a much more sophisticated appreciation of the complexities of the healthcare processes than traditionally has been the case. These cases bring out the fact that implementation of IS strategies across a national healthcare network carry high risks unless such complexities are taken into account.

The thesis has tried to extend certain theories on institutional perspective by incorporating more detailed notions of how the introduction of a comprehensive programme of IT is linked to the restructuring of a large organisation, and by explicating dynamic processes that lead to the impact on patients of the NHS. Through the use of case study on the reconstitution of a national healthcare organisation involving various elements of both technology and organisation the thesis has elaborated new theories of the integration of IT and organisational design. The thesis has pointed out how rationalisation in the NHS differs from existing organisational theories with illustration from the NHS implementation of NPfIT which intersects between IT and a national healthcare organisational form and medical practice.

Taking the results here, together with existing literature, results in a theory of institutional structuration. This is based on the mutually reinforcing relationship with elements of the organisational context that are parts of further elements of the larger institutional context. While our data might not have provided compelling evidence that the institutional reform practices shaped the institutional context of the NHS, the data effectively suggest how the changing of the institutional dynamics by the

implementation of the national programme affected the re-structuring of Europe's most monolithic organisation. Further research would use longitudinal data that would benefit from further exploration into the existence of several multiple mutually reinforcing relationships referred to in this part of the thesis.

CHAPTER TEN

CONCLUSIONS AND CONTRIBUTIONS

10.1   Introduction

This final chapter builds on the findings identified in the analysis chapter and details

the main contributions to the body of knowledge. The research set out to determine:

- the complex and multi-dimensional characteristics of IS strategy in the NHS;

- whether emerging technologies (especially ASP and web services) models

  enhance IS efficiency and operations in the NHS, given the disappointing results

  from ASP business assessment, after the dot.com era;

- the constructs for institutionalisation of IS in the NHS;

- to develop researched cases that provide current additional evidence to the many

  researched cases found in the literature on emerging technologies in the health

  sector;

- to explore whether the implementation of the NPfIT, by the NHSIA, would bring

  value to patient care, and influence staff perception of IS.

The answers to these questions are necessarily multifaceted and context specific.

They will be addressed in depth in the discussion that follows.

What emerged from this research is a framework (see Figure 3.5 in chapter 3) that

encompasses most of the critical issues that have to be addressed when adopting and

implementing emerging technologies model in the NHS. In this new framework, the

NPfIT initiative is viewed to be pivotal for NHS reform. This enabled a study of the

anticipations, explanations and evaluations of the different experiences and

consequences of the implementation of emerging technologies model in the NHS to be undertaken. Before this thesis, there was no widely known theoretical framework that had been developed to demonstrate institutionalisation and de-institutionalisation process of IS in healthcare. As a result, this framework made an important contribution to both institution theory and healthcare IS literature. In addition, the research made an important contribution to the medical IS practise in the academic world. A contribution has also been made to the research world in the form of a model that encompasses critical issues and areas providing a point of reference. The researcher could also claim, to certain degree, a practical contribution. Suggestions for future research in this area are included and the chapter concludes with summary of the contribution.

10.9   Summary

This thesis has identified within the discussion on technical requirements for an EHR that there are a range of levels of process complexity that could be implemented. This underpins the implementation of national service frameworks and can support a real need for implementing shared care. Each instance of implementing NPfIT has involved extensive local design and tailoring, which are likely to be different at other localities (Guah & Currie, 2004). Thus, there may be risks to the overall rate of progress, in mandating the structure and content of NPfIT at this point, even though progress in this direction is likely to be desirable from the viewpoint of clinical governance and ensuring high quality of care nationally.

The NHS is replete with disparate inter-organisational systems. In recent years, the UK government has advocated the adoption and diffusion of ICT with healthcare perceived as an important area. Against this background, this thesis has deepened the understanding of the adoption and diffusion of inter-organisational systems in the NHS by isolating a specific emerging technology, namely, ASP and web services models. As a loosely coupled software components delivered over Internet standard technologies, a web services enabled project (like NPfIT) can progress the NHS e-society credentials.

The implementation of care pathways support is being built into the NPfIT as outline in several NHIA strategic plans for the next few years (NHSIA, 2003). One advantage of using specifically designated service providers is the need for accountability and flexibility. NHS information need/processes are subject to change as lessons are learnt in the care process. This has been identified in other industries where workflow management is seen as separate from the data repositories.

The security risk profiles of each possible choice are different as are the ways that risks can be managed (i.e. critical points of potential failure and how countermeasures are selected and implemented). As part of this selection process to determine the EHR architecture, there is a comparative security risk assessment for each. There needs to be an evidence of risk judgement for each option in the system security procedure of NPfIT.

The theory of how the NHSIA roles shape strategic change developed in this thesis significantly advances the researcher understanding of both the diverse nature of the

NHSIA influences on the implementation of NPfIT and the intractable difficulties associated with the delivery of improvements in the healthcare process in the NHS. The theory, grounded in real-world practice, is of immense value to both practitioner and academic alike—a worthwhile achievement considering that much of IS-related improvement is considered to be too divorced from medical practice.

The thesis concludes with a quote from Wanless Report (2002), the document upon which the NPfIT was established:

> *Without a major advance in the effective use of information and communications technology, the health service will find it increasingly difficult to deliver the efficient, high quality service which the public will demand. This is a major priority, which will have a crucial impact on the health service over the future years.*

The researcher sees the NPfIT in the like of a combination of mission-oriented government technology-development policies, strong professional identities, weak intermediary associations and the general features of free market economies to facilitate the development of project-based NHS modernisation agency. This agency focuses on generating radical—apparently competence destructive—innovations in the short to medium term but highly needed patient-focus systems in the long-term. However, the delivery of decomposable technologies and institutionalised standards governing inter-component operability, as well as strong and appropriate conditions, are crucial requirements for the NPfIT project to flourish since it enables niche healthcare IT supplier market to develop, and reduce entry barriers by limiting the need to produce new technological systems and invest in complementary assets for the NHS.

APPENDIX A

LIST OF PUBLICATIONS FROM THIS RESEARCH

JOURNALS

GUAH, MW, & CURRIE, WL (2005) 'NHS Obtaining IS Value via ASP Strategy', *International Journal of Services Technology and Management on "Issues and Trends in E-Business Technologies"*, Volume 6, Number 1, pp. 20-39.

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GUAH, MW, & CURRIE, WL (2004) "Key Performance Areas for Web services in Healthcare' 12th European Conference for Information Systems (ECIS). FINLAND. **June 2004**

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