

**Developing an Inclusive & Balanced Approach
to the Implementation of
(Mental Health) Information Systems:
A Critique of the Theory and Practice Dialectic of
Systems Implementation**

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by

Andrew Mark Burnham, BA (Hons), MSc

Department of Health Sciences
University of Leicester

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'Cheshire Puss' she began'... 'Would you tell me, please, which way I ought to go from here?' 'That depends a good deal on where you want to get to,' said the Cat. 'I don't much care where - ' said Alice. 'Then it doesn't matter which way you go,' said the Cat.

'-- so long as I get somewhere,' Alice added as an explanation. 'Oh, you're sure to do that,' said the Cat, 'if you only walk long enough.'
Alice felt that this could not be denied...

Lewis Carroll (Alice's Adventures in Wonderland, p35)

Abstract

Developing an Inclusive & Balanced Approach to the Implementation of
(Mental Health) Information Systems: A Critique of the Theory & Practice

Dialectic of Systems Implementation

Andrew Mark Burnham

There is substantial evidence concerning the inability to achieve desired results and impact through what are commonly described as IS or IT projects, or implementation. The UK health sector provides a fertile ground for research, at a time of unprecedented investment, but with what is perceived to be a relatively poor record of achievement. Mental health services are held to be particularly problematic.

This thesis explores the part played by technical, informational, organisational and human aspects, the relationship between these, and how in practice they are interpreted within what is defined as IS implementation.

The aims were, a) definitional, concerning the specification of IS implementation, b) context appraising, to examine the impact of the *host* (mental health) context on both process and results, and through these c) problem solving, to propose an approach to IS implementation based on theory and practice.

Drawing from interpretive theory, soft systems methodology and social cognitive theory an in-depth, longitudinal comparison study was performed, principally focussing on a single UK mental health Trust, and a directorate within that Trust. A multi-method approach included document review, questionnaire, structured and semi-structured interview, definitional exercises, focus groups, and action research.

Findings concern the inability of organisations to manage the complexity of the process of implementation within challenging, multi-faceted contexts. To address the causes rather than symptoms of this difficulty it is necessary to re-interpret implementation itself, and its human element. A broad definition was proposed as a basis for an inclusive and balanced approach, and an Interface Management toolkit was produced.

It is proposed that implementation should be considered and approached in practice as a dialectical situation, interpreting implementation as change within an organisation which encompasses technology. Alternative existing and proposed ideologies of change are suggested to frame a productive relationship between theory and practice.

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As I undertook an in-depth study over a number years I am appreciative of the contribution of the hundreds of people who work(ed) within what became known as "the directorate" and "the Trust", and also those in other organisations. I thank them for supporting the research, and giving their opinions freely, particularly all those who undertook interviews.

I hope that some of you will read this work and somewhere you can see the results of your own contribution and feel that it was worthwhile.

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I apologise both to my friends - I hope now to get to some 'nighters (Dave), and spend more time at the Dojo (Alex, Jen et al) - and to my family for the selfishness of this exercise and hope I can make it up to you. Thanks mum (Up the City!) and Alan; the Parkers; to my Grandma I am particularly happy to prove that I wasn't lying when I said that I would hand it in one day; and to Alex, Matt,

and Nick (from jumpers for goalposts to pints in the pub). Finally, thank you Kathy - the *Northerner in my Soul* - for being there every step of the way and helping me realise what my priorities are.

*"We who are young, should now take a stand,
Don't run from the burdens of women and men,
Continue to give, continue to live
For what you know is right.*

And we just keep on keeping on

We just keep on keeping on"

Curtis Mayfield

KTF

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Abbreviations

| | |
|--------|---|
| BCS | British Computer Society |
| BMA | British Medical Association |
| CATWOE | Customer/Client, Actors, Transformation, Weltanschauung, Owner, Environmental constraints |
| CL | Clinical Staff |
| CPA | Care Programme Approach |
| CSSA | The Computing Services and Software Association |
| CTIS | Comparative IS implementation & use - other Mental Health Trusts (Study element) |
| DR | Comparison study bibliography document reference |
| DU | Study directorate IS users |
| eCPA | Electronic CPA |
| EHR | (Lifelong) Electronic Health Record |
| EPR | Electronic Patient Record |
| EX | Staff external to the study Trust |
| DoH | Department of Health |
| GP | General Practitioner |
| HA | Health Authority |
| H&O | Human and Organisational issues |
| HIS | Health Informatics Service |
| I&B | Inclusive & Balanced approach to IS implementation |
| IBM | International Business Machines Corporation |
| ICRS | Integrated Care Records Service |
| ICT | Information & Communications Technology |

| | |
|---------|---|
| IM | Interface Management or Interface Manager |
| IM&T | Information Management and Technology |
| IMHER | Integrated Mental Health Electronic Record |
| IS | Information System |
| [IS] | Information System staff (shown as [IS] within Results) |
| ISA | Trust-wide attitudes to IS and its use - study element |
| ISMH | Information Systems In Mental Health |
| IT | Information Technology |
| kbs | Kilobytes per second |
| LIS | Local Information System (Study element) |
| LSP | Local Service Provider |
| MHIS | Mental Health Information System |
| MIS | Management Information System |
| MIT | Massachusetts Institute of Technology |
| MS | Microsoft |
| NAO | National Audit Office |
| NHS | National Health Service |
| NHS CRS | NHS Care Records Service |
| NPfIT | National Health Service National Programme for Information Technology |
| NSF | NHS National Service Framework |
| NT | Microsoft PC operating System - New Technology |
| N3 | NHS New National Network of IT infrastructure |
| OASIG | The Organizational Aspects of Information Technology Special Interest Group |
| OBS | Output Based Specification |

| | |
|--------------|--|
| OED | Oxford English Dictionary |
| Ofcom | Office of Communications |
| Oftel | Office of Telecommunications |
| PAC | Select Committee on Public Accounts |
| PAMS | Professions Allied to Medicine |
| PC | Personal Computer |
| PID | Project Initiation Document |
| PM | Project Manager |
| PRINCE | Projects in Controlled Environments |
| Resp. | Study respondent |
| SCT | Social Cognitive Theory |
| SDLC | Systems Development Life Cycle |
| SHQ | Service Headquarters IS development (Study element) |
| SISD | Service Information Systems Development (Study element) |
| TAM | Technology Acceptance Model |
| TM | Study Trust manager |
| TS | Trust Staff Survey |
| TU | Study Trust IS user |
| TWIS | Trust-Wide Information System (Study element) |
| W3C | World Wide Web Consortium |
| WTE | Whole Time Equivalent |
| WWW / Web | World Wide Web |
| XP | Microsoft PC operating System - no definite meaning, though possibly “Experience” |
| Y2K | Year 2000 |

Chapter One

Introduction

Chapter One: Introduction

When the Organizational Aspects of Information Technology Special Interest Group (OASIG), a Department of Trade and Industry supported group, reported their findings in “The performance of Information Technology and the role of human and organizational factors” they concluded that:

“80-90% of IT investments do not meet their performance objectives; the reasons for this are rarely purely technical in origin.”

“Around 80% of new systems are delivered late and over budget”

Clegg et al (1996, Section 1.iv.)

It is not difficult to accept that things need to improve. A clear starting point for research is the belief that getting *IT* (information technology) or *systems* to work as desired is a problematic matter. Beyond this point however, as implied by the title of the OASIG report, things become more complex, notably by perceiving the need to consider the role and impact of non-technical, human and organisational issues. Relatively simple conclusions such as these however lead to many questions including how to identify what it is that is failing, why and how this happens, what it is that needs to be improved, how improvement can be generated, and who has a role in this process.

1.1 Systems

IT represents only one form of system. The word “*system*”, from the Greek word “*systema*” is derived firstly from “*syn*” meaning “*together*” and, secondly, from “*histemi*” meaning “*to set*”. A *system* can thus be judged as being a plan or scheme according to which things are connected as a whole. It is the bringing together of different and perhaps diverse elements in a co-ordinated fashion for a purpose (Jenkins 1987), as a definable entity:

“System as a complete entity consists of two or more parts, with relations to each other and to an environment. Every part has an effect on the totality”
Johanessen, Olaisen and Olsen (1999)

Whilst the focus of this thesis is *IT*, or what will more precisely be defined (section 1.5.1) as *information systems* (IS), as systems they do not exist in isolation. They operate in the midst of a variety of other systems (Forrester 1968).

It has been claimed that as a range of systems exist e.g. biological, social, political, economic, governmental and so forth, Systems Theory has identified and expressed universal principles that help to explain the success and failure of systems:

“Independently of each other, similar problems and conceptions have evolved in widely different fields.” (Von Bertalanffy 1968). Von Bertalanffy argues that the traditional method of analysis - reduction towards the interplay of elementary units - stands in contrast to systems-based emphasis upon a concept of “*wholeness*”. Problems associated with organisational or information systems are thus not readily explained through concentration on respective units in isolation: problems should be considered in relation to the “*whole*” and to unifying principles of systems. This is what Checkland (1999) describes as *“The principle that whole entities exhibit properties which are meaningful only when attributed to the whole, not to its parts”*.

1.2 The growth of *Information Systems*

As recently as June 21 1948, at Manchester University, the Small-Scale Experimental Machine successfully ran the world's first computer program (Computer 50, 2001). Building on such scientific breakthroughs, in 1975 William H. Gates co-founded a computer software company named Microsoft. By 1992 Gates had become the world's richest man (Microsoft 2002a) and 6 years later Microsoft became the world's richest company by market value (Forbes 1999). In the UK, in 1998, it was reported that there were over 1 million "IT workers" in the country, a number greater than were employed within the coal-mining industry at its peak (Computer Weekly 1998, p6).

From relatively limited origins e.g. military, university and scientific use, as technical possibilities have increased, the applications of IT and use of IS have spread broadly. Beyond similarly limited functionality e.g. payroll systems and transaction processing, and with few, particularly few non-technical users, IS use has extended to touch a far wider user community in an increasing range of ways. For the general population the meaning of the terms *computers*, *IT* and/or *Information Systems* has changed from a relatively remote technicality or "science", towards normalisation and routinisation of use and representation as an everyday interface either at work or at home. The application and use of IT and IS has thus both broadened, in terms of wider use, and deepened in terms of its greater functionality.

Perhaps the single most dramatic demonstration of the changing face of functionality, use and in turn the meaning of IS and IT for the general population, concerns the growth of, and growth of the use of, the World Wide Web (WWW or the Web), the tool that brought user functionality to the pre-existent Internet. Development of the Web has been rapid in its impact on industrialised society. Tim Berners-Lee wrote a hypertext editor named "WorldwidEweb" in 1990. This was soon followed by the first Web server, "info.cern.ch", and by September 1994 the World Wide Web Consortium (W3C) was formed (Berners-Lee 1998). Web technical

functionality and content, and general use and impact have since then increased rapidly.

Research by the Office of Telecommunications (Oftel) and by its replacement the Office of Communications (Ofcom) charts the increase in use of PCs (personal computers) and the Internet within the UK. By 2001 a majority (52%) of UK homes were reported to have a PC compared with approximately 40% in January 1999 (Oftel 2002a, 2002b), and the figure had further increased to 59% by January 2004 (Ofcom 2004). It was also reported that in 2001 half (49%) of UK adults used the Internet, and that homes accessing the Internet had increased from just 10% in January 1999, to 45%. Homes accessing the Internet had further increased to 50% by January 2004 (Ofcom 2004). In comparison by 2001 only 20% of UK adults had access to the Internet at work.

In order to appreciate the significance of this growth of computing technology it is necessary to recognise the links which exist as systems are both part of larger systems and are themselves comprised of sub-systems. What is described as an *information system*, within a health care setting for example, will be made up of many elements and can be considered as a system. In its operational context it will also be an element of a wider system for delivering health care. It will also consist of subsystems, to facilitate the collection of data from clinicians, to generate statistics relating to government targets and so forth.

Technical, informational, human or social, communication, political and organisational systems are necessary to the existence and determine the nature of information systems in the context within which they are located. These systems are not isolated but influence each other. Information systems, and the associated application of technology, do not exist in a form of technical vacuum, isolated from non-technical aspects. Any attempt to introduce and use information systems within the context of presumed isolation from other systems or without regard to their relationships will fail.

By extending the scope of what an IS is defined to consist of, or be influenced by, beyond the strict limit of physical technology, tasks of interpretation are set. What is accepted to be part of an IS, and where its boundary lies for example relies in part on interpretation, and one interpretation may gain precedence over others. When considering the application of IS to organisational contexts, an apparently technical matter, such as the need for data capture within an IS, can instead be regarded as a more complex situation. That situation can be influenced by interpretation, motivation, manipulation and a lack of commonality ranging for example from the definition of data elements to the appreciation of, and significance attached to, IS. The scope of IS is therefore influenced by indeterminacy of facts which leads to the existence of a collection of gaps of understanding, certainty and clarity.

The relationship between IS as a system and other organisational and human or social systems determines that the IS has impact and consequences beyond the existence of a technically specified product. As an example the use of a single item of technology such as a monitor or computer screen has a high level of clarity concerning its cost, physical dimensions, its use through attachment to a computer and its ability to provide visual display of information. Even in this example however choices are made including who receives new equipment and has larger or smaller screens, whether the casing is coloured the traditional cream or what is regarded as more fashionable black, and currently whether it is appropriate to purchase bulky cathode ray tube models or alternatively those with flat screens. These choices rely on the power to make decisions regarding purchasing, allocation to IS users, and the choices may be interpreted to relate to status, priority and favouritism.

IS however are far more complex, comprising many elements, requiring definition of actions and data elements and flows, involve the development of new human and organisational roles and relationships, are perceived as providing the means for the organisation to change, or to support a change which is defined in other terms. This complication brings with it an incentive to manage and the dangers of not addressing

the interpretation, expectation, attitude and behaviour of the organisation, and groups and individuals within it in relation to IS.

Within a human and organisational context there are implications of system interlinking. Specifically doubt is cast regarding the degree to which an information system can usefully be judged outside of the working context that gives it meaning and where it is interpreted. Similarly the perspectives of all actors in the process of bringing IS into use within the organisation could be seen to be partial and based on the particular assumptions and interests of their perspective e.g. technically or project management based. The assumed and recognised subjectivity of all actors is described within the interpretive perspective as *intersubjectivity* (discussed in relation to IS by Walshaw 1993).

The focus of this thesis is linking technology/IS to its application. This introduces a social context which is determined by thinking about and understanding IS and its application. The translation of ideas and technology into IS is consequently influenced by partiality and subjectivity of perspective, and approaches to IS that are consciously or not, based on partiality.

Whilst the rapid growth of IS can be viewed merely in terms of numbers, such as more computers being used at the workplace and at home, this should not draw attention away from the growth in functionality, and the rapidly changing potential of IS which in turn requires harnessing. As a result just as patterns of use and functionality change so does the meaning or impact of IS. Using the concept of technological paradigms for example IS can be described as developing from a *tool*, to a *machine*, a *strategic weapon*, and most recently as a *channel*, reflecting the use of mainframes through to the Internet and Web (Benbunan-Fich 2002). This demonstrates the acceptance of technology as comprising both the physical aspect, the computer itself, and the intangible uses of that physical artefact (Flores et al 1988) e.g. individualised interpretation of IS not as a technical entity but as a means to access the internet and to book a cheap holiday.

The significance of IS is thus clear in terms of the scale of its presence, amounting to pervasiveness (a term used for example by Lamb and Kling 2003). To broaden understanding of this significance there is also a need to address its use and impact. This leads to examination of the role and penetration of IS into organisational life, creating a need to cultivate them, and questions of how they are interpreted and employed, for what reasons, whose benefit, at what cost, whether they deliver anticipated benefits, and the nature of difficulties that are associated with IS.

1.3 The maturity of Information Systems

Whereas over time there is greater prevalence of IS, and IS do different things, giving greater potential, understanding and utilisation, and the achievement of that potential has not necessarily kept pace.

Whilst pervasive, the IS industry, and equally the IS discipline, cannot be described as being mature. Maturity is defined in terms of fullness of development, as being “*Complete in natural development or growth*” (Oxford English Dictionary 2003), as something “*that has attained an advanced and settled state*” (OED 2003). As a result, the term can be employed in a number of ways to consider the nature of IT and IS. The *newness* of automated IS, as distinct from manual IS is clear.

Advances in the field are very recent, absolutely and in relation to the development of industrial societies. In comparison, other industries and professions can point to long periods of existence and development of status, legitimacy, practice, standards and theoretical underpinning. In respect of the medical profession for example the Hippocratic oath dates back to 4th Century B.C.

Potentiality, and interpretation of the potential of IS however has changed drastically. The following statements made by senior IS figures demonstrate the level of misinterpretation of the potential of technology:

“I think there is a world market for maybe five computers.”

Thomas Watson, chairman, IBM (1943)

“It would appear that we have reached the limits of what is possible to achieve with computer technology, although one should be careful with such statements, as they tend to sound silly in 5 years.”

John Von Neuman (1949)¹

The measure of newness of IS does little to increase understanding of IS. More is required to explain the imbalance between, on the one hand, the pervasive presence of IS - its use, influence and impact - and on the other hand, the lack of certainty and variability of results of attempting to successfully create and use IS. Aspects of relative immaturity can be used to demonstrate where weakness lies within IS - the industry, its application, results, and understanding².

A number of examples of specific or general challenges that have faced the global development and use of information systems and technology, and related industries, provide evidence of problems, volatility and uncertainty, or what can be described as immaturity. The combination of these indicators of relative immaturity is what characterises IS,

- a) The technology itself and its rapid growth, alongside change and obsolescence,
- b) The employment and use of IS in practice,
- c) Understanding of IS, for example the impact and demands of IS, and
- d) Theory that has developed in the IS field.

¹ Quotes reproduced from www.silicon.com, 22.6.2001

² Finlay and Marples (1996) consider specific aspects of maturity, firstly in relation to strategic thinking (Strategic Information Systems Planning - SISP), and secondly use within NHS units, using Galliers and Sutherland's Stages of Growth Model (1991). This is discussed further at 1.5.2.

Aspects of immaturity demonstrate the wide nature of the challenge when interpreting, and, in practical contexts, attempting to achieve desired results through, the use of IS. A corollary of accepting that relative immaturity does not concern mere *newness*, is a concern for the potential endurance of immaturity. It is a misconception to assume that immaturity is a passing phase or that maturity will emerge simply through the passage of time. This is particularly so as maturity may be described in relation to the thoughts and actions of individuals, groups, organisations, IS professionals, the industry, academia, or in economic, technical or social terms. This multi-faceted immaturity in relation to IS is what could be described as the background noise which exists as part of the context within which IS is developed, marketed, sold, applied and used.

This indicates that it is necessary to address not just the IS itself but, firstly *thinking* about IS. A conclusion, that IS and IS thinking are not matched, has been a theme of those who focus on the non-technical aspects of IS:

“... the rate at which thinking about the field has developed has not matched that at which the technology has changed.”

Checkland and Holwell (1998, p9)

Secondly, in order to understand the success or otherwise, of IS, it is necessary to examine not just the technology involved, but also the organisational context within which it exists, and the relationship between IS and the organisation.

1.3.1 Rapid change of IS

The rate of change inherent within the industry can be demonstrated using the example of Microsoft PC software. Specifications for the Windows operating system show a requirement for 512 times more memory moving from v1.01 (November 1985, requiring 256kb) to Windows XP (2001, requiring 128MB RAM or higher)

(Microsoft 2001). Hard disk requirements for these products increased 1,500 times from less than 1MB and 1.5GB (Microsoft 2001). Alongside product change is related hardware requirement growth, with the consequence of change for the individuals and organisations managing and using the products. Change relating to the introduction of new MS Windows desktop PC operating systems has been rapid (Table 1.1):

Table 1.1 An aspect of rapid IS change - versions of MS Windows

| Date | Version |
|------|-----------------------------|
| 1985 | 1.x |
| 1987 | 2.x |
| 1990 | 3.x |
| 1993 | Windows for Workgroups 3.11 |
| 1993 | NT 3.1 |
| 1993 | NT Workstation 3.5 |
| 1995 | Windows 95 |
| 1996 | NT Workstation 4.0 |
| 1998 | Windows 98 |
| 1999 | Windows 98 Second Edition |
| 2000 | Millennium Edition (Me) |
| 2000 | 2000 Professional |
| 2001 | XP |
| 2001 | XP Professional |
| 2001 | XP Home Edition |

Between 1985 and 2001, 15 versions of the Windows operating system were thus introduced (Microsoft 1998, 1999, 2002b, 2002c, 2002d) demanding development choices to be made, the regularising of technical change e.g. PC and related software upgrades, and implications for training and use. In addition to product releases IS staff have to keep up to date with and install officially released Service Packs, and patches. The former are defined by Microsoft as “*strategic deliveries*” or “*a periodic update that corrects problems in one version of a product*” (Microsoft

2002e), whilst the latter are a “*hotfix*” or “*developed on an as-needed basis to combat specific, immediate threats to our customers’ security*” (Microsoft 2002e). In this respect there were 5 service packs for NT3.5, 7 for NT4, and so far 4 for Windows 2000 and two for XP. The number of patches is far greater.

Sales of the most recent version of Windows, XP, were over 17 million in the two months after launch in October 2001, a claimed increase of 300% over Windows 98, and 200% over Windows ME in the same period from their launches. (www.news.com.au 2003). By September 2002 Microsoft reported that over 46 million copies had been sold (Newsfactor Network 2002).

In terms of PC hardware, as the millennium, or Y2K approached, the 1999 third quarter world PC shipment figures showed a 23.2% increase to 28.5 million units (Reuters 1999), and 139m units in 2000 (IDC 2002).

Far from dealing with constancy and predictability, technological change in terms of hardware, software, communications, and functionality is in fact a constant and predictable feature of IS. This presents a challenge to both those that can be described as IS professionals, and more generally to all users of IS. Further to the launch of Windows XP, Steve Ballmer, Microsoft CEO was asked what someone should do if they *only* had a Pentium III powered PC. He reportedly stated that they should buy another PC (Quicke 2003). IDC (a US based IT intelligence and advisory company) reported that for the corporate customer the top 3 reasons to buy a PC were *capacity problems, compatibility with new technology, and software upgrading* i.e. due to technology changes creating obsolescence and forcing purchase (IDC 2002).

Technical change has repercussions for the length of IS use and resultant obsolescence of hardware, software, and equally, related skills. The Massachusetts Institute of Technology (MIT) estimate that by 2007 there will be 500 million obsolete

PCs in the US, and their lifespan may drop to 2 years by 2005, from 4-6 years in 1997 (MIT Green Computing 2002).

Rapid growth, change, obsolescence and thus uncertainty therefore present a challenge to IS professionals, and users - organisations, groups and individuals alike³. In the former case there is the management of technological change, considering compatibility, capacity and so forth, and the skills of knitting together and supporting the many elements that comprise modern network systems. In the latter case challenges may include the impact of changes on functional processes, training implications, costs etc. Although IS concerns technical elements that are essentially predictable and logical, the extent and area of certainty is very limited.

1.3.2 Reliability of IS and IT

A further element of the challenge of deployment and use of hardware and software is reliability. Whilst millions of copies of their products are sold, Microsoft admit that they inherently contain weaknesses, seen most obviously in relation to susceptibility to computer virus attacks. They describe software development as “*an imprecise science*” and with resultant bugs the need for patches will always exist (Microsoft 2002b).

More broadly the employment and use of IS in practice in terms of the lack of achievement of goals, or of absolute failure of IS or IT is regarded as a global issue (Sauer 1993). Whilst literature may feature specific sectors of the economy, or regard some as more problematic than others the existence of challenges and problems is universal. There is, as a result, a host of *IS failure* literature and research largely pointing to *what went wrong* with IS related projects and systems (examples include Ewusi-Mensah and Przasnyski 1991; Standish Group 1994; Keil 1995; Clegg et al 1996; Masters 1998; Collins and Bicknell 1998; Liebowitz 1999;

³ IS professionals may also be regarded as users of IS but a distinction can be drawn between IS professionals who analyse, design, develop, install etc. and others who use what has been analysed, designed, developed and installed.

Lyytinen, King and Bergman 2000; Donaldson and Jenkins 2001). This is written from a variety of perspectives identifying technical and non-technical failure or weakness and is produced by a range of academics, government and related organisations, industry journalists and consultancies.

From an academic/research perspective the tone may be relatively restrained:

“Despite the many well known success stories of the use of Information Technology to deliver benefits to the organization, there is considerable evidence that the implementation of Information Systems can be hazardous”.
Land (1999a)

From a UK government perspective there is a depressing and continuing catalogue of reports of failed projects and more lists of failings, weaknesses and recommendations. Regarding the Libra project, the National Audit Office (NAO) for example pointed (NAO 2003a) to a poor history - “*IT systems in magistrates’ courts have been inadequate for many years*” (NAO 2003b, Executive Summary, p1) - re-stating common conclusions that IS in practice is not established to support organisational development, and that business process and IS change should not be disassociated. This was just one more report that followed others, notably including “Improving the Delivery of Government IT Projects” which itself discussed 25 previous reports during the 1990s concerning “*problems with Government IT projects*” (Select Committee on Public Accounts, 2000, Introduction and Conclusions and Recommendations).

Consultancies report at global and national levels concerning performance giving an impression of the potential scale of the problem. In 1994 the Standish Group reported that in the US over \$250 billion was spent each year on IT application development, but that 31.1% of projects were cancelled before completion. They estimated that in 1995 \$81billion would be spent on cancelled projects (Standish Group 1994, Introduction).

Similarly the IS industry press regularly feature analysis and failure reports, often with blunt messages and lurid headlines, such as “*Government does not learn from IT failures*” (Huber 2002), “*Farrago, debacle or fiasco?*” relating to official reports of public sector IS failure (Sharpe 2002a), and conclusions are drawn as to the regularity of failure:

“Not all computing projects fail - only most of them. Now and again serendipity sees a company or government department buying and implementing a system that does as much as half as what was originally intended.

But these moderately successful aberrations are rare and tend to be on a small scale, barely noticeable among the debris of the crashes.”

Collins and Bicknell (1998, preface, p13)

These illustrate a widespread acceptance of a significant rate of absolute failure, or failure to achieve desired results. The impact of failure reporting is limited though as it does not consistently address a range of issues which go beyond the identification and attribution of blame for failure.

Available literature concerning the use of IS is often based on a *factor* approach which highlights the range of identifiable issues that can be associated with either perceived success or lack of success within projects and systems. They typically include, for example, a lack of senior management support, and lack of user involvement. The limitation of this approach lies in whether or not such factors are considered within, and given meaning by interpretation of, the context and process within which they feature, including interaction between any factors:

“... the factors approach, whilst it takes some account of the human and social aspects of IS implementation, has a rather static feel to it, with no

consideration of the dynamics of the process of organizational implementation."

Walsham (1993, p214)

This approach therefore provides less clarity in relation to more complex issues such as, a) the relevance and effect of IS organisational context, b) identification of symptoms and causes of problems, and discrimination between them, c) the varying nature of systems and thus challenges, d) why failure continues, and e) whether a revised approach to IS practice and/or thinking can be suggested. Alternative means of approaching the issue include use of the process model, a user-centred focus, and focus on the dynamics of organisational change.

What the current failure literature does demonstrate is that there is not a match between the growth and spread of IS, and the contemporaneous growth and spread of successful IS. There is significant and continuing failure amounting to over half of large, complex IS development (Gartner and Standish, quoted in Lyytinen, King and Bergman, 2000)

1.3.3 Y2K and the Millennium Bug

The years leading up to the year 2000 featured a global debate as to the likely societal effect of what was specifically a historic computer programming technique. Fears and uncertainty were equally high across government - "*But, if this goes wrong... the lives of millions of people will be severely damaged....*" (Robin Guenier, Taskforce 2000 Executive Director, 1998, p8) - and more generally, with predictions of "*massive Y2K failures*" (Deckmyn 1998).

Fears were particularly acute where essential services, notably health services were supported by IS:

“Millennium bug ‘could kill NHS patients’

National Health Service patients could die because insufficient time and thought have been devoted to the Millennium bug, a Commons report said yesterday”.

Shrimley (1998)

In the event, despite the predictions and warnings, interpreted for example as “*Taskforce 2000: Stay at home for a month*” (Wakefield 1999) the impact was far less than expected and the world’s attention soon turned to other issues. As reported by the BBC - “*UK relief over bug*” (news.bbc.co.uk 2000a) - planes did not crash and the lights did not go out.

Whilst arguments persist as to the effectiveness of preventative action and the scale of longer term effects some conclusions can be made. Firstly, the industry failed to accurately, coherently or consistently interpret the nature of the potential problem and its impact. Secondly there was great uncertainty as to the effectiveness of action taken in response to the problem (news.bbc.co.uk 2000b).

The source of this seeming global obsession was based on programming practice dating back to 1959 resulting in abbreviations in the COBOL language, and the impact on date change interpretation i.e. from “1999” to “2000”, or what was in practice, and most significantly “99” to “00”. From this origin concern about the issue expanded to an extent that there were in excess of 59,000 Websites dedicated to *the bug* (Science Museum 2002). Despite the Y2K issue being due to a strictly technical cause the fascination of the issue lies in its knock-on non-technical impact, its interpretation and resultant level of fear. The impact, ironically, was huge in social terms but less so in directly technical terms.

Behind the headlines the Y2K issue demonstrated, in perhaps the most extreme way, the inextricable link between the technical entity and its organisational and social interpretation and impact. The issue illustrates the limitations of considering

the technical and non-technical in isolation (Doherty and King 1997, 2001), where the boundaries lie between the IS and its context and use (Schar 1998, Bloomfield and Vurdubakis 1994), and what the nature of that interface is at these boundaries (Peppard 2001; Peppard and Ward 1998).

1.3.4 IS as a discipline and a profession

What the IS discipline is and where it is going have been themes of an on-going academic debate, since the early 1970s (Weber 2003) demonstrating what has been described as discipline *anxiety* (King and Lyytinen 2003):

“...we maintain that, after 30 years, insufficient progress has been made in establishing this collective identity”/
Benbasat and Zmud (2003, p184)

Opinions vary not only regarding what the discipline is, but whether either a clear identity or a specific core has been achieved, and whether either one is of primary relevance. One view is that an identity can be established by defining “*core properties*” (Benbasat and Zmud 2003) that distinguish the discipline from others. Conversely it is argued that if there is “*borrowing and applying intact*” (Benbasat and Zmud 2003) the theories of other disciplines then a separate IS identity will not exist:

“In short, I believe the identity of a discipline is established through the contributions it makes to theory. The core phenomena of the discipline are circumscribed via the theories ‘owned’ by the discipline that account for these phenomena”.
Weber (2003, p vi)

Whilst there is agreement that IS research has, and continues to be, interdisciplinary, agreement does not extend to whether the search for a distinct or a new theory is either desirable or likely to succeed. The benefits of diversity seen by some are

equally liable to be interpreted as a threat to the discipline's core properties, or that a central characteristic is absent (King and Lyytinen 2003).

Demonstrating concern for the development of the IS discipline and associated professions, is the issue of academic positioning, and professional and discipline redefinition within Europe and the US. This extends to the naming of institutions. The change of emphasis at University of Gothenburg's Department of Informatics was illustrative, moving from information systems and administrative data processing to informatics, where informatics is seen as being concerned with technology and its cognitive and social context, described as "*the intertwined complex of people and information technology*" (Dahlbom 1997) or "*the study of the structure, behaviour, and interactions of natural and artificial computational systems*" (University of Edinburgh 2003).

In addition to the issue of positioning, professional development and redefinition have meant various branches of "Informatics" have developed. The term "Health Informatics" has been created, emphasising effective use of what is described as "Information Management and Information & Communications Technology" (NHS Information Authority 2001, 2002a, 2002b), alongside terms such as "Medical Informatics" and "Nursing Informatics". Within the NHS, organisational redefinition has seen a variety of titles applied to IT or IS related functions with various acronyms being used, including IT (Information Technology), ICT (Information & Communications Technology), IM&T (Information Management and Technology), HIS (Health Informatics Service), and most recently through the NPfIT (NHS National Programme for Information Technology), and the creation of IS-related LSPs (Local Service Providers).

An alternative perspective is to minimise the importance of discipline positioning, challenging the perception, for example, that diversity is a weakness - "*diversity in IS expand(s) the foundation upon which knowledge claims in the field are based*" (Robey 1996). Preoccupation with issues such as whether Universities have IS

departments, or are a part of others, such as maths, computing, management, engineering etc. can be regarded as directing attention to the social construction of legitimisation rather than what is crucial to the future of the discipline. Consideration of how the discipline is theoretically and organisationally based should be less of a concern than carrying out work which achieves high levels of both theoretical depth and usefulness. In the pursuit of this goal King and Lyytinen argues that the discipline needs “*synthesizers and theory spanners*” across disciplines:

“... the IS field might very well have its greatest social value at the intersections between established fields than in the middle of any of them”

King and Lyytinen (2003, Slide 33)

1.4 IS and the NHS

Evidence suggests that the history of use of information, and use and achievement of aims of IS has been particularly problematic within the UK public sector. Within the public sector the NHS is held up as a particularly challenging context with mental health the most problematic. A series of reports highlight either failure or on-going difficulties involved with government IS and IT:

“In the past, Government IT projects have too often missed delivery dates, run over budget or failed to fulfil requirements”

Cabinet Office (2001, p5)

“... Government departments must have the IT systems in place and working. However , for more than two decades, implementing IT systems successfully has proved difficult for a number of them.”

Select Committee on Public Accounts (2000, Introduction)

External views are similarly critical and regular, pointing to “*expensive and embarrassing failure*” (CSSA 2001) and the regularity of audit commission and

Parliamentary committee reports concerning public sector IS “foul up” (Sharpe 2002b).

There is ample literature to show that health services suffer particular difficulties in making successful use of IS (Heeks 1999), being self reported - *“Historically, the NHS has not used or developed IT as a strategic asset in delivering and managing healthcare.”* (Department of Health, 2002a, p1, and 2002b) or through government supported research:

“Excellent performance is open to all and is more related to good management than to any other single factor.

...some differences were perceived comparing different sectors of the economic activity... The health sector was perceived as performing rather poorly in the field of IT.”

Clegg et al (1996, Findings, 8.vii)

This raises questions of whether there are features of these contexts that may present particular difficulties and thus go some way to explain either on-going lack of use and impact of IS (Lindner and Le Bas 1997) or project failures. Mental health services can be used as a context within which to consider these questions, where evidence shows that there is historically a lack of both success and also impact, and therefore:

“...clinical information management in mental health services is poorly developed with information systems very variable. There has been little investment in information technology; and where electronic systems have been developed, this has often been led by local champions in the absence of any standardised models.”

Department of Health (1999, National Service Framework for Mental Health)

The urgent need to improve performance has been heightened by a number of recent developments within health and mental health that make specific demands for achievement through IS. These have included,

- a) The creation of a “lifelong electronic health record” (EHR), and “Electronic Patient Record” (EPR) (Burns 1998, Information for Health).
- b) Requirements of the mental health National Service Framework (NSF) (Department of Health 1999).
- c) An Integrated Mental Health Electronic Record (IMHER) and Electronic Care Programme Approach (eCPA) (Department of Health, 2001a, Mental Health Information Strategy, p5, Executive Summary).
- d) Targets which have included 100% of consultants to have PCs by March 2003, 100% of clinicians and support staff to have broadband access (>128kbs) by December 2005, and to be both “*actively implementing*” EPR by March 2003, and fully implemented by December 2007 (Department of Health 2002a, Delivering 21st Century IT Support for the NHS, p1).
- e) The “£2.3bn” NHS National Programme for IT (NPfIT) from 2002, including the four main elements of national electronic bookings; national electronic prescribing; a broadband New National Network of IT infrastructure, known as N3, linking all NHS sites and staff; and electronic records, re-titled Integrated Care Records Service (ICRS) and subsequently the electronic NHS Care Records Service (NHS CRS).

A key step towards generating and achieving these plans and targets was the Wanless Report (2002), commissioned by the Treasury and which recommended the doubling of NHS IT budgets to over £2bn p.a. from 2003 (Arnott 2002a, 2002b). By March 2004 under this programme, including additional agreements to employ IS

Local Service Providers⁴, contracts for over £6bn had been signed (NPfIT 2004a, p2). The basis for such a radical step was clearly related to past activity, described by the Wanless report's author as a “... *particularly poor ICT investment record of the UK health service*” (Wanless 2002, Chapter 3, p55).

Whilst the National Programme is in its early stages the IS press have been quick to stress the difficulty of both the task - “*The NHS National Programme is a minefield*” - and of the context in which it is based:

“*Medical IT is complicated: much more complicated than, for example, banking IT. It needs more money thrown at it: the whole NHS systems it underpins first need fundamental reform. Health service IT is widely acknowledged, at least in private, as a can of worms...*”

Network News (2003)

Commentators and those directly involved have as a result judged that the necessary scope and priority of this programme needs to reflect what are perceived to be greater than technical challenges i.e. cultural, institutional, managerial and political (Riley 2003). Christopher Bland, Chairman of BT highlighted past failure and the scale of non-technical demands after winning contracts worth several £billion - “*The single biggest problem is in ‘organisation and culture’*” (In Collins 2004a, p1). He was reported to add that “*BT was well aware of the history of major IT projects in the national health service which, to put it politely, has been chequered*” (In Collins 2004b, p4).

Quite what the features are of the organisational and cultural context within which IS is introduced and used, how these are discovered, addressed, and their impact, has significant potential to influence the nature and relative success of IS. This focuses attention on what exactly needs to be done, and what issues are relevant to the achievement of aims of IS. In light of the history of use of IS, and the range of

⁴ England was divided into 5 areas or clusters, each with an LSP.

current challenges and IS-related developments, the NPfIT has both been “*reported to be the largest IT programme in the world*” (NPfIT 2004a, p1) but also “*the biggest IT gamble in the world*” (Christopher Bland, quoted in Collins, 2004b, p4).

1.4.1 The use of IS within Mental Health

In 2001 the Department of Health described their mental health information strategy in terms of current inadequacy:

“The strategy is a product of the programme to implement Information for Health. It acknowledges the poor state of information provision in mental health settings...”

Department of Health (2001a, Executive Summary, p1)

Computerised IS have been used internationally within mental health since the 1960s (Sarris and Sawyer 1989). Their use has extended to, and been reported upon and reviewed widely across Europe, North America and Australasia. MHIS were defined in the 1980s by Bennett and Trute as follows:

“An MHIS is a computer-assisted mental health information system capable of storing large volumes of data, integrating diverse data elements, rapidly completing complex data analyses and providing a systematic, well structured retrieval of information” (1983, p1).

This definition, no doubt relating to its age, stresses functionality that would be unlikely to be excluded from any current IS. Alternatively a MHIS can now be defined as an information system using computer technology specifically designed to process and manage mental health information and particularly clinically related information in addition to or as distinct from administrative information, and that is used directly by clinicians or to reflect, support or influence clinical activity. This emphasises a direct relationship with clinicians and clinical activity, and the

increasing - and perhaps routinised - use of IS either by the generality of those working within the NHS, or specifically by clinicians.

A significant characteristic of much of the IS implemented within mental health from the 1960s onwards has been seen as its predominantly administrative or managerial rather than clinical basis (Tefft 1983, p36). Where IS within mental health predominantly concern non-clinical rather than clinical services, their relationship with that clinical service may be weak. Relevant issues include what they achieve, who uses and/or benefits from them, and what exactly is it that we mean when we talk about either IS within mental health, or alternatively, mental health information systems.

The distinction needs to be made between, on the one hand IS which have a clinical motive and concern clinical activity, care provided and outcomes, and on the other, those which are based within mental health but predominantly concern administrative, financial or managerial functions. In addition, IS within mental health may merely refer to IS technology which is located within mental health environments. These distinctions need to be recognised in terms of defining alternatively specific *mental health information systems* (MHIS) and more generally *information systems in mental health* (ISMH) i.e. non-clinically specific or administrative systems, within the mental health context, and also general use of IS or computers.

Both UK and international literature concerning IS within mental health invariably turns to problems, inadequacy or a lack of either successful or general take-up, demonstrated by Australian research: "*Despite the early introduction of such systems and potential benefits, the diffusion of IT in this area has been slow*" (Lindner and Le Bas 1997).

Analysis of this field with regard to the differentiation of system types should avoid an over-simplification that IS in mental health is poor. A number of themes can be

identified concerning the problematic nature of IS within mental health (in the UK and generally) both currently, and over the past 40 years. These themes are:

- a) The general lack of penetration of IS within UK mental health services, although relating to specifics of this field, also relate to the consequences of being part of the NHS,
- b) The actual technology that has been developed and made available within mental health, directed towards either clinical or non-clinical uses and impact,
- c) Specificity of demands made of IS within mental health and the ability or inability of IS to meet these,
- d) The organisational and professional context of use and implementation - the relationship between IS and the human and organisational environment of mental health.

Difficulties that relate to being part of the NHS per se are liable to apply also to mental health. The most substantial recent review of information within the NHS, the Wanless report (2002) stated variously the UK health services' relative lack of take-up of IS - "*The UK has been relatively slow to adopt new technologies, leaving it lagging behind many other countries*" (Annex C, p156) - its lack of success - "*The UK has a particularly poor record on the use of information technologies in the health service*" (Annex C, p156) - and the current "poor" status of IS (Chapter 6, section 6.18, p101). By pointing to the need for doubling of spending and radical change through the NPfIT a relatively low level of "ICT" investment was also criticised, amounting to 1.5 per cent of spending in the UK compared to 6 per cent in the US (Annex C, p156)

Significantly the Department of Health's Mental Health Information Strategy (2001a) had previously felt it necessary to state the need to make mental health "*an equal*

partner" (p1) in the general NHS Information for Health strategy (Department of Health 1998) alongside acknowledging the prevailing inadequacy of information within mental health. A nationwide consultation exercise (Department of Health 2000b) for the Mental Health Information Strategy pointed to basic shortcomings which made mental health particularly poorly off even in relation to the NHS in general, including inadequate basic IT literacy and skills, poor infrastructure and inadequate funding. A comment made concerning mental health services in general was that it is the "*Cinderella of Cinderellas*" [sic] (Department of Health 2000b, section 3.5.2).

1.4.2 Mental Health Information Systems (MHIS)

MHIS that have been developed have aimed to create patient-tracking systems to aid clinical management, the documentation of services provided (for funding or other purposes), performance indicators, management of service integration, and for planning and evaluation. Patient-centred databases such as case registers have also been implemented as a response to the shift towards community based rather than centralised institutional mental health care in the 1960s, in the UK for example prompting MHIS in Nottingham (Jones et al 1972) and Camberwell (Wing and Hailey 1972), and again in the 1990s, in for example, Leicestershire.

Internationally (ten Horn et al 1986) and within the UK (Hare and Wing 1970; Wing 1989) results have been variable and relatively unimpressive with a tendency for small scale, localised and/or short-lived IS. In 1993 a review of existing MHIS by the Royal College of Psychiatrists' featured just 7 systems, using the criteria that they were established and supported services in "*at least one district*" (Lelliott, Flannigan and Shanks 1993, Introduction, p vii). It noted that whilst other systems may exist they were excluded as they were based on single PCs, had limited functionality or were adaptations of other systems such as community health IS. Though the pace of change within IS generally is great, evidence suggests that within mental health services widespread effective use of IS has not been achieved.

In 2001 the Department of Health still reported the tendency for stand-alone products in mental health, prevalence of “*making do*” with IS that did not meet specific needs, and use of multiple systems that resulted in multiple data entry. Existing systems were criticised as they tended to collect management information but did not support the delivery of care, inadequate feedback was given to those that collect information, they were piecemeal, and not integrated. Disadvantages of supplying and/or developing mental health software were stated to be its specialist and complex nature, the relatively small market size, and a belief that the NHS is predominantly focussed in other areas rather than mental health: “*IM&T suppliers to the NHS have understandably given priority to developing acute hospital information systems*” (Department of Health 2001a, p14).

There continue to be examples of technology not being available to meet the particular clinical informational needs of mental health Trusts. Reasons given include the challenge of integration of information, analysis & design being complex and time-consuming, with no existing systems that meet Trust specification (Haywood and Shuff 2002), and the inability of current MHIS to cope with the richness of text-based information relating to care and treatment (Hunt 2002).

In addition there are questions as to what use IS has been put to and whether it has, by merely mechanising existing processes, failed to reach potential (Procter 2004). Perhaps reflecting either a relative lack of development of MHIS, limited specialist skills, or the perception of the mental health sector as a niche market, the LSP awarded the contract for the Eastern and North East England clusters under the NPfIT did not have specific mental health experience. As a result those defined as “early adopters” of new IS under the NPfIT in Eastern England were offered an adaptation of an existing non-mental health IS.

It remains unclear whether what is available and proven is capable of effective use and impact in non-clinical and clinical terms. Equally given the limited history of IS-

related success, knowledge and skills, it is open to question how capable the mental health field is of either creating successful IS or understanding what is required.

It is also questionable whether mental health is different, whether it has significant characteristics that provide either distinct or more difficult challenges than other sectors of the economy, or within the NHS and the acute sector. In 2001 the Department of Health Mental Health Information Strategy pointed specifically to poor existing information sharing, communication, and co-ordination across both systems and agencies. The aim of the strategy was therefore to address both current inadequacy and the increasing demands for integration: "*It maps out a path from existing inadequate mental health information systems to the provision of integrated information systems to support integrated care*" (p1).

Although other contexts experience some of the same challenges, and have others of their own, the wide range of characteristics of mental health services do present a significant challenge to the achievement of successful IS (Leginski et al 1989; Glover 1996; Department of Health 2000a, 2000b, 2000c, 2001a; Burnham and Horan 1998).

Firstly the structure and composition of services is critical. There has been a shift from care being provided in large institutions to a range of smaller community based care environments. Care is provided by multi-disciplinary care teams - including psychiatry, psychology, nursing, occupational therapy, primary care, and social care - and through both general and specific services applicable to a range of problems associated with mental illness e.g. homelessness, drug and alcohol use. Recent further developments have included integration and overlap with social care services, and the provision of multi-agency care creating associated issues of agency boundaries and co-terminosity. Further complications of structure arise from the establishment of "target" services, such as the high priority which has been given to the development of new specialist care teams and services that include assertive outreach, early intervention and crisis resolution.

Secondly, the nature of mental illness - and the interventions it occasions - means that care pathway options are often obscure, and may last for many years. Mental health care may be provided consistently within in-patient environments or within a range of community settings, and through short but recurring care episodes, provided by many healthcare professionals. In addition difficulty of defining and studying care outcomes is associated with the range of interventions, multiple diagnoses, and the fact that many facets of patients' lives can be affected over long periods of time.

There is a range of demands made of these services which have an informational consequence. These include issues of public safety, related to associated clinical responsibility and clarity of what care is being provided, when, where and by whom. Similarly there is an emphasis on the management of risk, notably where the co-operation of the patient cannot be assumed e.g. in taking medication. The prominent legal framework within which the services operate also includes the issues of (informed) consent and compulsion of care e.g. Mental Health Act 1983 (Department of Health 1983) and its implications and associated powers. They are required to operate a Care Programme Approach (CPA) (and formal NHS evaluation examines the existence and adequacy of related information systems i.e. operation of eCPA (electronic CPA) (Department of Health 2000a).

There is consequently a particular concern for security, confidentiality and data protection issues including relationships with the legal system, and specific legal requirements. Equally however the services rely upon appropriate sharing of information across the multi-disciplinary teams and multi agency involvement. This results in a reliance on communication and co-ordination of care.

Information itself is influenced by a lack of common process, language and of definitions e.g. what is involved in a patient review, and what day care or an out-patient clinic consists of. Information is also often generated in the form of

descriptive notes, over a prolonged period, rather than being well-structured or coded. Within health services however there is a current national programme to apply a universal clinical coding system⁵ and to move towards national integrated care records, featured as a central aim of the NPfIT.

Recent IS and health related literature has repeatedly addressed the issue of consultation and the role of clinicians contributing, or through (non) acceptance and use, determining the success of the NPfIT. There are fears as to the consequence of the continued remoteness of the majority of them (Procter 2004) with Prof. Aidan Halligan being appointed joint Director General of the NPfIT in March 2004 to focus on clinician involvement⁶. Stressing the problem to be lack of belief amongst clinicians that systems would be of use to them, a distinction was made between positive and negative attitudes to IS per se, and attitudes and behaviour related to impact and to specific (clinical) benefit.

The relationship between mental health staff and IS has been a common concern, whereby the 2001 DoH Mental Health Information Strategy hoped for culture change through the seemingly banal wish to develop IS that would “*give staff and service users the information they want at the time they want it.*” (Department of Health 2001, p47). It also pointed to the lack of a “*positive information culture*” (p14), and a culture that saw information collection as a burden. Those consulted specifically requested the inclusion of “*cultural factors*” within the strategy and perceived problems to exist regarding the relatively low priority by managers and clinicians to data quality, collection, interpretation, low confidence in information, anxiety about sharing information, and disputes about data ownership (Department of Health 2000b, 2000c). The role of staff and their attitudes and behaviour has been the subject of widespread concern, extending to suggestions of positive resistance to IS within mental health (Lindner and Le Bas 1997).

⁵ The current project is to develop the SNOMED system although clinical coding has a controversial history associated with the Read code system (NHS Executive 1998).

⁶ In September 2004 the Department of Health announced that Prof. Halligan was to leave this post (Department of Health 2004).

Where the NPfIT associates attitude with IS related benefit a greater and more complex problem emerges. The challenge associated with IS within mental health is (1) to understand and manage the influence and links between past experience of IS within mental health, (2) the success (or otherwise) and impact of MHIS, (3) levels of investment and priority given to IS, (4) the complexity of demands of the field, (5) whether these are recognised, (6) whether there is an expectation that current and future developments will provide a reason to be (more) positive, and (7) variation and/or commonality between the various staff groups and their relationship with, and attitude and behaviour towards, IS. This substantially broadens consideration beyond simplistic questions such as whether doctors in mental health like computers.

These issues concern both MHIS and ISMH, and whether there is a distinction which needs to be examined, between general attitude towards IS and attitude and behaviour towards IS in the specific organisational context within which it is given meaning. Judgement of NPfIT for example should be on its ability to go beyond purchasing IT and providing infrastructure, and towards its impact upon clinical services and use by clinicians. This includes many issues such as whether there is direct data entry by clinicians, the quality of data, changes to working practices, any effect on the clinician-patient relationship, and the handling of security and confidentiality.

Through detailed examination of the mental health context the wide range of challenges relating to IS is demonstrated. Mental health can be described as a particularly problematic context for IS. This is because the range, combination, and nature of these challenges - across technology itself, thinking, and practice, and the human and organisational context that links these - is unique, rather than the mental health context being uniquely difficult. IS in mental health can be better thought as usefully illustrating the challenges and barriers that apply more generally. Such is the range and severity of these however, and such is their interconnectedness, that it

is unwise to respond to them by attempting to ensure success through rigid application of a particular structured methodology, particularly if it neglects human and organisational issues and/or does not address the nature of the associated organisational change desired or anticipated. An alternative approach is to consider that the achievement of what can be termed IS implementation⁷ is faced by an array of inter-related barriers. A means to understand and perform IS implementation in any context is not to seek a means to ensure success but to recognise that each context features its own barriers and that each unique implementation process involves identifying, interpreting and responding to these.

1.5 Computing, information systems and implementation

The field of *computing* has its own terminology, concepts and assumptions that lie behind them. As is the case in more established fields a distinct language and jargon has developed.

Beyond what can be described as the technical sphere of hardware, software and communications technology, a distinct language also exists in relation to non-technical, human and organisational (H&O) issues regarding *computing*, concerning processes and roles for example. Thus, there is definition of who a *systems analyst* or a *project manager* is and what they do, and how a term such as *information systems implementation* may, or equally may not be deemed to consist of, and contrasted with *computer*, *computing* or *IT*.

Interpretation of the meaning of terminology will reflect the particular perspectives and attitudes of those who are working within, or are affected by, the field of *computing*. The significance of this increases as IS becomes pervasive. If there is ambiguous or changing definition, or a lack of clarity then there is potential to produce a variety of interpreted meanings. This can lead to a lack of understanding

⁷ Defined in section 1.5.

of the issues that surround *computing* and may have a significant impact in the contexts within which computers are used.

Although it is possible to arrive at a definition of IS, what any particular IS - and ISs in general - will be understood as, by those involved with it, interpretation will always extend beyond any definition, no matter how widely it is couched. The knowledge, beliefs and assumptions of participants will be variably inflected by presupposition and idiosyncrasy of use of referring expressions. Discourse between participants can also be viewed as, amongst other things, cross cultural and inter-cultural statements, subject to the influence of background knowledge or presuppositions (Stalnaker 1974, 1978, in Arko 2001). Further complexity is added to the communications process when "motive" is considered within it. When communication takes place between individuals or groups within an organisation, concerning, for example, information systems, this context, like any other, is laden with interests:

"Within the walls of a social establishment we find a team of performers who cooperate to present to an audience a given definition of the situation."
Goffman (1959, p231)

This can be described as the intention to manage impressions within communication, or as impression management (Arndt and Bigelow 2000), defined as "*any behavior that has the purpose of controlling or manipulating the attributions and impressions formed of that person by others*" (Tedeschi and Riess 1981, p3). Sustaining legitimacy and presentation of change during innovation, for example within hospitals (Arndt and Bigelow 2000a, 2000b), has been one area in which this has been examined. Typically defensive techniques were found to be employed, including excusing change, disclaimers, concealment, excuses and justifications. In contrast assertive techniques were found to be used concerning specific health services offered, involving making positive claims to enhance reputation for competence,

ability and experience. Alternatively, such assertive impression management may be termed “spin”.

The significance of definitions and interpretation of entities is heightened by both the lack of maturity of IS and its pervasiveness. The conclusions arrived at by OASIG (1996, p1) refer, for example to the terms “*IT*” and “*systems*”. Within the NHS the huge investment which has followed the Wanless Report was titled “The National Programme for ***IT*** in the NHS” (author’s emphasis). The title could reflect “*IT*” as a simple and well-known term. Alternatively it could reflect an emphasis towards technical infrastructure and away from non-technical issues e.g. use of information with NHS. This seemingly inconsequential issue of terminology is therefore a cause for concern for those with an interest in improving the NHS, and a potential indicator of assumptions and attitudes.

To understand the nature of IS and the perceived success or failure of its use it is necessary to consider *definition and clarity* within IS. Definition and clarity are in turn given substance through the understanding of terms and concepts, and the particular interpretation of them by individuals and organisations. The relevance of this issue is how lack of clarity and weakness of understanding are related to attitude, to decision-making and behaviour in the organisational context.

To avoid misapprehension and uncertainty it is necessary to ask what understanding exists and how terms, processes and all aspects of the context of *computing*, including the role and impact of *computer* use itself, are interpreted. This can be applied to a host of situations where practical questions are raised and decisions made, explicitly or implicitly, resulting in particular behaviour. Examination of the nature of understanding, and how it may develop, change and vary between individuals, groups and organisations, is a means by which to identify, and interpret attitude, behaviour and ultimately the performance of the organisational and physical manifestations of *computing*.

1.5.1 A definition of information systems

Thus far the term *computer* has been used liberally. This term is vague in the field within which it is being discussed, although both the words *computer* and *computing* are widely recognised and are in frequent common usage. In this common usage they define a physical entity and the act of using that entity respectively. They are used in practice to describe all things represented by what can be alternatively described as *Information Technology (IT)* and/or *Information System (IS)*.

In contrast, the term *computer* is sparingly used within the profession and field within which it is associated, and only used in specific circumstances. Generally the term *PC* is conventionally used instead to describe that physical entity. This itself only strictly speaking describes a particular form of *computer* i.e. a machine with a local hard and floppy or other form of external disk or storage device, placed on the desk of users for their direct use. This differentiates such machines from, for example, a web or file servers.

Interpretation and the application of definitions to terms and phrases, and to the entities themselves that are described, happens both explicitly, and implicitly each and every day. There is also continuing change in the use of terms such as data, information, computer science, information technology (IT), information and communications technology (ICT), information systems (IS), management information systems (MIS), and Informatics. This concerns how they are defined, and how and when they are used, perhaps interchangeably, by whom. Their use also reflects impression management and the desire to portray a description that has moved beyond the technology.

The term Information Technology (IT) was first used in 1958 when Leavitt and Whisler (1958) stated that "*the new technology does not yet have a single established name. We shall call it information technology*" (p41). It was defined as:

“An information technology, involving the computer processing of information, mathematical programming for decision making, and simulation of higher order thinking through computer programs, will have far-reaching impact on managerial organization.”

Leavitt and Whisler (1958)

At its simplest IT can be regarded as referring to the technology of computing and communications, thought most easily as the hardware. Interpretations change as the technology itself changes. The narrow focus on hardware can thus be combined with the inclusion of related practice or services, for the purpose perhaps of widening the presumed scope of expertise and value and marketability of practitioners:

“Information technology refers to the collection of products and services that turn data into useful, meaningful, accessible information. The information technology industry has several major facets: computer hardware, software and services. Often telecommunications hardware, software and services are also included in the definition.”

The Information Technology Association of America (2001)

ISWorld Net, an academic organisation based on the Internet (Association for Information Systems) state that lack of consensus exists and *information systems* and *management information systems* are terms that can be used alternatively.

They give the following definition:

“A definition of a management information system, as the term is generally understood, is an integrated, user-machine system for providing information to support operations, management, and decision-making functions in an organization. The system utilizes computer hardware and software; manual procedures; models for analysis planning, control and decision making; and a database.”

Davis and Olson (1984, pp. 5-6)

Other definitions stress for example, change through technology and organisational demand:

“An IS is a formal, deliberately planned technological innovation composed of man, machine, and procedures that is introduced into an organization in response to a perceived need on the part of one or more organizational members.”

Kwon and Zmud (1987, p241)

A distinction can be drawn between structural and functional definitions of an information system (Hirschheim, Klein and Lyytinen 1995). The structural perspective emphasises elements such as people, processes, data, models and language, as a collection or structure that exists for an organisational purpose. The functional perspective refers to a technological means for handling linguistic expressions, emphasising understanding and meaning - *“IS facilitate the creation and exchange of meanings that serve socially defined purposes such as control, sense-making, and argumentation”* (Hirschheim, Klein and Lyytinen 1995, p11).

The purpose of the IS, within its organisational context, as opposed to its technological means is now commonly emphasised:

“An information system provides support to management functions and operational activities within an organizational context and will usually, although not necessarily, involve the deployment of information and communication technologies”.

UK Academy for Information Systems (UKAIS 2003)

The emphasis on organisational use and impact of systems that include physical information technology and software broadens the concept and reflects a blurring of *the system* and business processes (Orlikowski 1991) and a shift from a technically dominated focus:

“This [IS] may be thought of as marking the organizational need to manage the use of IT in relation to an organization’s activities and intentions.”

Checkland and Holwell (1998, p9)

The various definitions stress either, a) elements (its structure), b) what an IS does (its function), or c) why it exists (its purpose). Within the boundary of the information system, there is an explicit or implicit assumption of an organisational context, people, and information which is interpreted. This assumption results in implications for what it takes to achieve, what can be perceived as, successful IS. Each element, the fulfilment of each function, the achievement of purpose, and the inter-relationship and dependency between each, is a potential source of weakness and failure. Each, not merely the information concerned, need to be interpreted and understood, supported and sustained to provide an opportunity for success.

Taking all of the above into consideration, the broad definition of “Information System” used throughout this study is,

*An **information system** exists to support organisational (or contextual) purposes, as a medium for collecting, storing, processing and communicating information, which is comprised of people, an organisation, technology, processes and information. Its existence relies on, and is given meaning by, both the relationships between each element and by human activity, understanding and interpretation, relating to the system, its purposes, demands and so forth. Like any system it is required to exist as a coherent set of inter-dependent components with a common purpose.*

1.5.2 A definition of information systems implementation

There is no universally accepted definition of either the term *IS implementation*, or what should be understood by the term⁸. Keen’s assertion, made in 1977, that “no

⁸ In relation to IS, terms such as deployment, development and introduction are in common usage and have been included within quotations and text thus far, without clear definition.

consistent definition of IS implementation has taken root", was argued by Kwon and Zmud (1987), to remain true. In "A Look at why Information Systems Fail" (1999), Liebowitz discusses "factors" of failure in relation to a number of IS development stages, the last of which is named "**implementation and maintenance**" (p65) (author's emphasis). In contrast, Ciborra (1999 and 2002) describes implementation in terms of actual achievement of a goal, or the "*transition between the conception of a vision and the realization of that vision*" (2002, p59).

Within the traditional Systems Development Life Cycle (SDLC) the term *implementation* has been equated to what could equally be described as *physical* or *systems introduction* i.e. getting the product of a development into its working context, developing the hardware and software and converting to the new system. This reflects segmentation of developmental stages. The implementation stage is seen to follow from, (1) project initiation and selection, (2) feasibility study (sometimes defined as a single stage), (3) systems analysis, (4) systems design, and as a precursor to (6) maintenance, and in some models, (7) evaluation (Robinson and Prior 1995, p2). This SDLC can therefore be described as a "*linear, sequential*" approach (Yourdon 1989, p80)⁹ or as the "*waterfall model*" (Boehm 1981) where project phases are sequenced, and signed off before others commence. The definition of distinct stages is reflected in PRINCE2, the standard project management methodology within the UK public sector (Central Computer and Telecommunications Agency 1997; Bentley 2000).

The definition of this implementation stage can extend to other elements related to the system itself and its use - "*The testing of programs and systems and the development of supporting manuals and documentation*", and "*phasing in of the new system using an appropriate management method*" (Skidmore and Wroe 1994, p15), and "... *both coding and the integration of modules into a progressively more complete skeleton of the ultimate system*" (Yourdon 1989, p92).

⁹ Yourdon variously describes the Project Life Cycle, Classical Project Life Cycle, Semi-Structured Life Cycle, Structured Life Cycle, and Prototyping (in Boar 1984).

This narrow concept of implementation is found in practice through methodology:

*“Many standard methodologies use the word **implementation** in the description of the systems’ life cycle, but mean no more than systems testing and hand-over”*

Land (1999a, p1)

Implementation can, and often has been equated to a stage, following specification, analysis and design, involving introduction of a IS product:

“The activity of proceeding from a given design of a system to a working version of that system, or the specific way in which some part of a system is made to fulfil its function....With software, use of the term normally implies that all major design decisions have been made so that the implementation activity could be relatively straightforward.”

Oxford Reference (1991, p216)

Technical literature leans towards relatively narrow, technical interpretations of the term, typified as follows: “*Implementation - At some point, the finished system needs to be turned over to the users, and brought into production*” (Dorsey and Koletze 1997, p6), where the major tasks are defined as plugging in, switching on and user training. Such concepts of what IS implementation is and encompasses rely on a technical focus, a means to define a step within a broader, and perhaps linear, technical task where one step follows another and commences when the previous is completed:

“In general, implementation has been thought to simply be the last phase in the systems development process. It has been regarded as little more than the delivery of the developed product to the client”.

Hirschheim (1985, p157)

These definitions largely remove the systems being implemented from their context. The implementation is seen as the point at which the IS meets the organisation and its users. At its simplest a project is regarded as being concerned with developing a technical product and then installing or introducing it to an organisation. A product focus can be seen to exist with an IS being interpreted as comprising hardware, software and the communications technology that links them, and the IS implementation being dominated by the progress of that product. This neglects the organisational context with which it must have a relationship to give it meaning.

A positivist perspective of IS (described by Walsham 1993; Checkland 1999) assumes its primary driver, meaning and potential is its physical/technical product - *technological determinism* (Hirschheim 1985). IS development techniques such as prototyping and project management methodology such as PRINCE2 perpetuate a technical or product focus. When adopting practice underlying assumptions need to be examined including what it is believed technology itself can achieve, whether it has the potential to do anything that could not be done before, or has the capacity to do things differently or more quickly. In practical terms any organisation needs to ask what difference the technology itself can and will achieve and what role it has in the aims defined within the decision to implement IS. In terms of the meaning and interpretation of technology we should not assume shared, objective or pragmatic judgements. Both Hirschheim (1985, p3) and Checkland and Holwell (1998, p55) refer to the *seductive* nature of technology in terms of "appeal" and "glamour" respectively.

IS have far greater meaning than the mere tangible technical product, reflecting dictionary definitions of the general term *implementation*, beyond its IS context: "*to put (a plan or a system) into operation*" (Cambridge International Dictionary of English 2002). This shifts the definition to a broader view of what implementation may be comprised of, the IS having an evolution rather than being an object springing into life, integrated within the organisation (Sauer 1993). When Sauer

(1993) for example states that a system has to “*initiated, developed, implemented, operated and maintained*” (p10), as per the SDLC, a sequential perspective still persists however.

In arriving at a less narrow definition of IS implementation we must consider whether one is referring to more than a step in a predominantly technical sequence of actions. The former is a stage of *physical implementation* or *introduction* of an IS product¹⁰, described by Franz and Robey (1987) as a “*discrete event or activity*”, and “*an inaccurate picture*” (p206). The latter is an on-going *implementation process* (Kwon and Zmud 1987) that delivers results in relation to organisational needs. This recognises a process as a “*continuous action, or series of actions*” (OED 2003), taking place over time (Franz and Robey 1987), given meaning by “*the accomplishment of some result*” (OED 2003).

IS implementation should therefore be considered a process, though its start and end points can be variously defined. It commences when a decision has been made or a thought has emerged which has IS-related implications:

“*The implementation of a computer-based information system is an on-going process which includes the entire development of the system from the original suggestion through the feasibility study, systems analysis and design, programming, training, conversion and installation of the system. Many authors refer to implementation only as the final stage in the systems life cycle.*”

Lucas (1981, pp. 14-15)

The definition of what implementation is in any context must be related to, amongst other elements the nature of the IS product itself. IS can be described as being of increasing significance, towards being tools of strategic change (Rogerson 1989). In

¹⁰ Whether implementation is assumed to be a stage or a process however, it does not dictate whether any perspective will or will not be technically, or IS product focussed.

terms of health IS for example they are functionally defined e.g. as clinically-based, patient centred, financial, administrative and so forth, and geographically defined e.g. departmental, hospital-wide, regional, and national. As a product the concept of what implementation is will vary greatly according to whether the system is developed from new, is a customisation of an existing system, is taken off-the-shelf for this particular purpose, or is a standard product used broadly within the field. Equally there will be the question of who carries out the technical work of developing this product. This could include, individually or in combination, local staff with IS responsibilities, clinicians, the organisation's IS or IT function, commercially contracted developers, or the developers and specialists in, or sellers of, that product. There are many possible combinations of what the technical work may comprise and who may carry it out. The larger and more complex the development the greater the likelihood that there will be combinations of products, means of developing them, and actors involved. In terms of developing and introducing technical products the task varies greatly as does the role and responsibility of the organisation concerned. This is heavily system type, and organisationally context dependent.

An alternative approach to differentiating between definitions of IS implementation is to separate technical implementation, from the non-technical. This can be variously described as highlighting the *social* (Klein and Hirschheim 1987; Nygaard 2002), *organisational* (Franz and Robey 1987; Walsham 1993; Doherty and King 1997; Checkland and Holwell 1998), *human and social* (Walsham 1993) or *human and organisational* (Lyytinen and Hirschheim 1987; Clegg et al 1996; Bryant 1998). This separates for example the concept of the presence of IS, its technical components and its functional adequacy, from its use and impact, in relation to personal, group and organisational needs, and the meaning conferred to it by social activity such as interpretation.

Whilst other definitions move away from a technical bias, they may equally assume a continuous and iterative focus rather than a single, perhaps technical, stage.

Critically, the appreciation of IS implementation as a feature of organisational and social activity and change (Pettigrew 1985; Pettigrew and Whipp 1993; Goodstein and Warner Burke 1993; Truex 1996) does not merely refocus definitions of implementation from a particular stage but has implications for practice, what skills and competencies are required, and demands placed. To understand IS implementation it is necessary to recognise and understand the human or social process, or as Walsham describes "*the dynamics of the process of organizational implementation*" (1993, p214). In this respect the issues of organisational implementation can be regarded as a *linking theme* needing to be considered throughout the process i.e. practically how technology is to be used, what informational needs exist and how social/human and organisational matters relate to each task that is part of implementation.

This broadens the scope of the concept of IS implementation and of issues of relevance to it, with a focus for example on its existence as a form of organisational change, and thus the influence of both organisational and individual behaviour (Lucas 1981).

The relationship between IS, and an organisation which will use that IS, specifically through implementation, is thus a further aspect of the definition of IS implementation and central to an understanding of it. Ciborra (2002) argues that a weakness of systems methodologies lies in their ritual, abstract and sanitized models which fail to address the human element within implementation - "*They dislodge the problem of human existence out of the development and use of systems*" (p104). A key element within definition and practice, is the nature of the relationship between humans and the organisation on the one hand, and the system and technology on the other.

The term "*host organisation*" or "*host*" accurately reflects the supposition that through the implementation process an organisation should and will affect the IS, and vice versa. This term has a significant derivation, its Latin roots describing the crossing of a boundary by an "*ambiguous stranger*" (Ciborra 2002, p110), with the potential

for friendship to develop or an enemy to be created. The term *hospitality* relates to the Roman concept of creating a bridge between strangers and settlers within the city. Hosting the stranger implied developing a relationship as a means to merge cultures. The interaction between the elements thus creates a new situation through innovation and learning which affects the host, the stranger and what results from their relationship.

This leads to related issues such as how that relationship is managed and how human attitude and behaviour may affect it. The organisation and its needs may implicitly or explicitly be perceived and treated as the dominant member within the relationship, or this may alternatively fall to the IS and to the IS implementation. The tone and development of this relationship will thus affect the nature of IS implementation and its results.

Whilst the significance of non-technical issues may be recognised there remains a potential weakness if the issues defined as relevant are also considered entirely distinct from what can be regarded as the technical. If we take a dichotomous perspective - technical vs. non-technical - and address an individual or range of technical or non-technical issues, this presents a danger, not only of neglecting the other part of the dichotomy, but also of downplaying or neglecting the relationship, or interconnectedness of the two. As a result a further essential element within the definition of IS implementation is the importance of the meeting place involving, a) the technical, and non-technical elements of IS, however they are defined, and b) the IS and the host organisation. This has been described as the *boundary* (Bloomfield and Vurdubakis 1994) but perhaps more constructively can be termed the *interface*.

The earliest conventional meaning of the term interface, used since the 1880s, was as a surface or “*face of separation*” (OED 2003). This interpretation of interface is one that is reflected within IS - “*A common boundary between two systems, devices or programs*” (Oxford Reference, p229). An alternative definition however, stresses the commonality between systems and the interface in terms of a shared ground

rather than a boundary or merely one-dimensional meeting-point, an area of common interest, or “*A means or place of interaction between two systems, organizations, etc.; a meeting-point or common ground between two parties, systems or disciplines*” (OED, 2003). Furthermore the relationship between the elements, and the effect of one upon the other needs to be considered, where the term *interface* can also be defined such: “*a situation, way or area in which two things or groups can come together and have an effect on each other*” (Cambridge International Dictionary of English 2002). What needs to be considered therefore is not just where what can be defined as technical and non-technical issues become close or meet but where and how they affect each other i.e. the interface *between* the elements.

Whichever definition of implementation is chosen significantly influences what is deemed to be relevant to that implementation. The definition equally relates to an understanding and interpretation of what an IS is and means to an individual, group or organisation, to an appreciation of systems theory and its implications and the task - “*IS implementation is defined as an organizational effort to diffuse an appropriate information technology within a user community*” (Kwon and Zmud 1987, p231). There remains substantial potential for ambiguity and need for clarification of the perspective of those interpreting the term.

Common definitions of “implementation” reflect a lack of general theoretical or practical agreement concerning definition of IS implementation and acceptance of its content, and in systems theory terms, the wholeness, and interconnectedness of elements. This concerns therefore not merely *what* IS implementation means, but the demands it places, and *how* it can be carried out (Land 1999).

From the foundation of the definition of IS implementation shown at 1.5.1, motivationally, **IS implementation** can be described as a translation of an idea into, and given relevance by, a contextual or organisational reality i.e. it is given meaning through its relationship with a host.

Elements of the implementation are interconnected with each other rather than isolated. It is a dynamic process rather than a static, single stage or event, for example as part of a systems development life cycle. As a process it consists of activity which features iterative elements rather than being restricted to one-off steps, and should not be thought of as a state of affairs, end point, an object or *an implementation*.

Rather than pertaining to merely or predominantly a technical product, IS implementation concerns a host of technical and non-technical, informational, human and organisational issues. It involves the relationship between the technical and non-technical, where there is both substantial common ground - what can be called an *interface* - between, and blurring of, the technical and non-technical. This can be interpreted as an *arena of common interests* (a feature of system interconnectedness).

Whilst the characteristics of any technical hardware and software element may vary, IS implementation should always be considered to be in large part a social process involving and influenced by the attitude and behaviour of individuals and groups. Whilst both the ambitions of implementation and features of the host context will affect their characteristics the existence of essential human and organisational challenges remains a constant e.g. the challenge of IS implementation as change, the need to integrate technical innovation with organisational processes, the impact of human reactions etc.

In summary, IS implementation is determined by the nature of, and relationship between what can be described as technology, practice, and thinking, within the pursuit of *getting IS to work in the context of a host organisation*.

1.6 Evaluation of IS implementation

Most commentary and analysis of IS failure, from preference, consider implementation as a technical and/or end stage position. In doing so, much of the social, organisational and psychological aspects of the impact of change are discounted. Yet implementation, as a complex but manageable process involving many actions over time, can obviously fail for non-technical reasons as well, so there are good reasons to look at the interactions of technical and non-technical aspects of implementation if a more comprehensive and less ad hoc explanation for IS failure is wanted. Approaching IS failure on such a broad front is, however, hampered by how little the historical account of health, particularly mental health, IS informs us about which issues - from amongst the technical and non-technical ones already considered - may be of greater relevance. Given this, themes of enquiry which inform the method adopted in this study are described which give an account of the scope and interconnectedness of the various issues which inform the idea of implementation.

By proposing broad definitions of IS (1.5.1) and IS implementation (1.5.2), beyond the focus of the easily recognisable elements of IS, technology (as tangible products) and practice (observable human activity), other issues become relevant to its evaluation. Current weaknesses of IS implementation and its reporting, such as incoherence and narrowness, concern the (in)adequacy of definition, (non)existence of clarity, level of understanding, and nature of interpretation of IS and its implementation. A collective term *thinking* can be applied to these aspects when combined with both existing IS related theory, and other human factors, notably *perception* (Davis 1989), and *social-cognition* (Bandura 1986; Compeau, Higgins and Huff 1998) which examines factors we see in every day life situations such as expectation, anxiety and attitude.

IS implementation can be characterised as uncertain and difficult as IS affects an organisation in a wide variety of often poorly understood ways (Farbey, Land and Targett 1993). Analysis has broadened from a technologically deterministic

perspective of IS and IS implementation and consideration of technical failure, with additional consideration given to human and organisational matters. They too, however, have been presented as isolated factors of failure, such as a lack of senior management support interpreted as a cause of failure.

There remains a tendency to match the factor approach to implementation and its research with a similar, static, factor approach to failure, and its audit and evaluation. It is also predominantly retrospective. This can be interpreted as a weakness in addressing symptoms rather than causes of failure, neglecting the linkage between factors or causes. Two of the headline conclusions of the Select Committee on Public Accounts (PAC), which reviewed not a single case, but public sector implementation failure throughout the 1990s were that, a) “*senior management*” have a “*crucial role to play*” as development champions, and that b) “*high quality project management skills*” need to be developed (PAC 2000). This points to basic organisational features, leadership and skill, rather than providing great insights into weakness of IS implementation. Whilst not incorrect it does not tell us about demands, complexity, and perceived weakness of the process or help understanding of the nature of IS implementation. By continuing to focus on practice that is demonstrated in relation to IS, or the technology itself, predictable and limited conclusions will result, which are not sufficient to explain the nature of the accepted difficulty. These conclusions include that better, newer or different IS could be employed (technically focussed), spending more would help (resource focussed), that whatever is being done it should be done *better* with better people (project/talent focussed), or to suggest ways in which specific errors encountered could have been avoided (factor and practice focussed).

The OASIG report (Clegg et al 1996) highlighted the IS industry’s own perception of its problems, and causes of failure, notably with regard to implementation. The report’s author summarised a weakness of the current situation:

"Unfortunately whilst there is a great deal of work identifying the problems, there is much less on what can be done about them."

Clegg (4.02.2002, e-mail to author)

In 1985 Hirschheim also criticised the then current status of "*implementation research*", and indicated that a gap existed when arguing in favour of acceptance of IS implementation as a social process rather than a rational phenomenon:

"The published product of implementation research has been a proliferation of platitudes based on user involvement, evolutionary change, information analysis, change agents, prototyping and the like... Unfortunately, many of the postulated solutions are superficial, obvious, or both".

Hirschheim (1985, p158)

Questions asked in many IS related reports concern why implementation keeps going wrong and how it can be done differently. Given the evidence of continuing problems of achieving success, Klein and Hirschheim's (1987) belief, that the future of IS research lay in study of the fundamental reasons of unresolved practical problems, still appears both relevant and necessary.

In relation to health IS, Herbst et al (1999) argue that identification of clear outcomes and benefits is difficult and there is very limited existing evaluation literature despite enormous world-wide investment in health service IS. This supported the suggestion made in the British Medical Journal that evidence was lacking to support UK IT investment (Lock 1996). Similarly the Institute of Public Policy Research (Bend 2004) concluded that there continues to be a lack of evidence of value through IS within UK health services and primarily associated with this is inadequate evaluation.

Although there is growth of use and reliance on IS, notably within the NHS, there is not a concomitant growth of understanding, particularly in relation to the value of IS

and the process of IS implementation. With this weakness it is necessary to consider how general principles of theory and thinking can be applied to real-life organisational challenges. Equally however we need to consider how the developing technology and its application and use is interpreted and impacts upon theory and understanding.

The study of context describes how IS implementation, with its technical and non-technical elements, is played out in reality, revealing the processes and actions involved. To improve the potential for success of IS implementation within any context there is a need to recognise and understand the impact of the context on the process of implementation, to differentiate between the symptoms and causes of problems and to apply methods, a methodology or an approach appropriate to that context (Westrup 1996). Whilst this iterative learning process of theory informing practice, of practice informing theory and so forth, appears a relatively simple concept, available evidence tends to indicate that this is not so in reality (Checkland 1998). With recognition of continuing and repeated failure, explanations need to focus beyond technical or product failure. As Collins (1998) observed in his study of “computer disasters” a difficult reality is that failure tends not to be spontaneous or easily blamed on ignorance as project managers are perfectly well-aware of the rules of project management. Within health and mental health IS research specifically, contextual issues identified as influencing implementation have included its hidden agendas, power and assumptions (Myers and Young 1997), non-rational social activity such as “*drama and ritual*” (Westrup 1996), and the ways in which individual and team reactions and professional practice work against intended change (Legare and Douzou 1995).

The challenge for evaluation reflects the current situation regarding IS utilisation and its implementation, which can be characterised as,

- a) Successful (this being a matter of definition and interpretation) development or implementation of IS is not accepted to be the norm.
- b) Actual speed of IS growth and change is not matched by its maturity or that of the IS industry and professional.
- c) Use of IS does not match understanding of it by organisations, groups and individuals.
- d) There is wide variability of IS penetration, knowledge, attitude, expectation, use, skill, and impact across a variety of organisational contexts.

1.6.1 Evaluation of MHIS and ISMH implementation

As there is a relatively limited history of use and impact of IS within mental health there is also a limited field of MHIS and ISMH study from which to develop a better understanding of them and their relationship with their host. There is less still MHIS implementation evaluation.

The lack of penetration, success, and significant impact, of MHIS suggests a specific context where there is inadequate knowledge regarding what IS achieve and why they may fail to deliver desired benefits. This knowledge gap however is part of the general *gappiness* within the field of MHIS, and IS more generally, which concerns clarity, understanding, skills, impact, and history of achievement. The gap between the concept and reality of desired change, and formal rationality and behavioural reality for example presents a particular threat to the NHS (Heeks, Mundy and Salazar 1999). The urgency and importance of addressing it is increased in the context of the NPfIT which is in the process of investing several £billion into IS within UK health services. Given the background of IS in health services this ambitious undertaking has much to prove and many people to convince.

The distinction drawn earlier between, on the one hand MHIS, and ISMH on the other, relates to issues of ambition, scope, demands and potential impact of IS within the host. Doubts expressed regarding the relevance of NPfIT to clinicians merely echo existing questions relating to these issues within health and specifically mental health. Conceptualisation and then implementation of physical IT and of administrative IS presents a lesser challenge and has been a more common task than MHIS. This produces IS that is indirectly relevant to the clinical service but not necessarily reflective of clinical process, decision-making or care activity. Neither is it reliant on clinical involvement or direct input, either in terms of the IS or its implementation.

Given the complexity of the mental health context, issues such as definition of terms, to be translated into data items, presents a considerable challenge. Beyond this however, to understand the difficulty of implementation of ISMH, and more so MHIS, it is necessary to interpret implementation not merely as a social process but also as a form of organisational change. Means of study are required which concern the nature of the change which is undertaken in practice rather than merely the end result of change. This concerns the change required to create what is desired, and how it relates to existing assumptions by the organisation of itself:

“When investigating the management of change, what is needed are research methods that allow for the process of change to be explored and understood rather than concentrate on measuring the outcome.”

Iles and Sutherland (2001, p75)

By re-appraising what it means to implement - what assumptions are made, what issues are considered and neglected, what is considered relevant, what expectations exist and so forth - there will be better understanding not only of what results from the process of implementation but also of how that process is inextricably bound to what results.

There is neither an established theoretical framework nor practical evidence-base of tried and trusted methods within the challenging context of mental health to conduct IS implementation. It is necessary therefore to examine what is required in order to evaluate MHIS and ISMH and their implementation. Accepting the proposed definition of implementation requires examination of its complexity, its social basis, and the roles of, and relationship between thinking, practice (and behaviour), and technology.

In-depth examination of the implementation process is the means to address the relationship between theory and practice. This concerns the need to better understand the constantly evolving, rather than static relationship, between a system specification and the end-product; methodology and its performance; formal roles and behaviour; expressed attitude and actual behaviour; expectations and reality and so forth.

1.6.2 Research themes

The major subjects and perspectives to be considered and employed within this attempt to understand the task of getting IS to work in the context of a host organisation are described in the form of a conceptual map (Figure 1.1). This demonstrates the logical progress of the task through related themes, thereby considering the research or theoretical perspectives associated with them. It reflects theory spanning (King and Lyytinen 2003) whereby issues, and related literature and research, can be included within the study according to their relevance to the stated problem of IS implementation, and the broad definitions of both IS and IS implementation. By employing an approach that was not restricted to pre-defined issues, perspectives etc., an implicit danger of drift from this aim was recognised. Whilst progress was made in varying thematic directions, each step should be grounded (Strauss and Corbin 1998; Smit and Bryant 2000) upon knowledge thus far developed in relation to how actual performance of IS implementation can be informed.

- (a) An important area of study is the formal components that comprise an IS and its purpose, shifting from the generality of the physical technology and information, through the nature of IS - as a form of system - towards evolving specialisms, disciplines and professions, and to their focus i.e. health and mental health information and its particular nature, role and impact. This can be described as the first interconnected strand of the implementation study, *Information & Technology* (strand 1).
- (b) What IS Implementation is perceived as, what it involves and whom it is that takes part in the process should be addressed. From the generality of how such a task is carried out through project management, attention is turned to how specific IS implementation is performed. This includes examples of practice, success and failure, and what technical and non-technical issues are, or are not, addressed. It extends to identify the various human actors involved, their roles and relationships and the impact of this on IS implementation, alongside the perspectives and characteristics of both those considered to be IS professionals and those comprising the *host* of the IS. Taking the theme of practice a step further there is consideration of possible consequences of the host and IS relationship for IS implementation practice, potential to inform an approach, method and develop tools to support the task. These related issues are what comprise the strand *IS Implementation & Practice* (strand 2).
- (c) What does IS implementation mean to individuals, groups and organisations, how does it affect them and their work, and how, in turn, do they affect it? This involves examination of the experience of IS implementation in terms of how individuals, groups and organisations think, the attitudes they have and develop, and the behaviour they exhibit. It recognises the significance and role of what is not so immediately physically obvious or necessarily the subject of IS method/methodology, or implementation reports. It uses evidence from the specific context of mental health services to address whether, and if so how, the issues of thinking, attitude and

behaviour can be included within a definition of what IS implementation is and involves. The impact of broadened definition should be applied regarding understanding of IS as systems, how implementation should be approached and why it appears to be such a difficult task. This is what is described as the strand of *Thinking, Attitude and Behaviour* (strand 3).

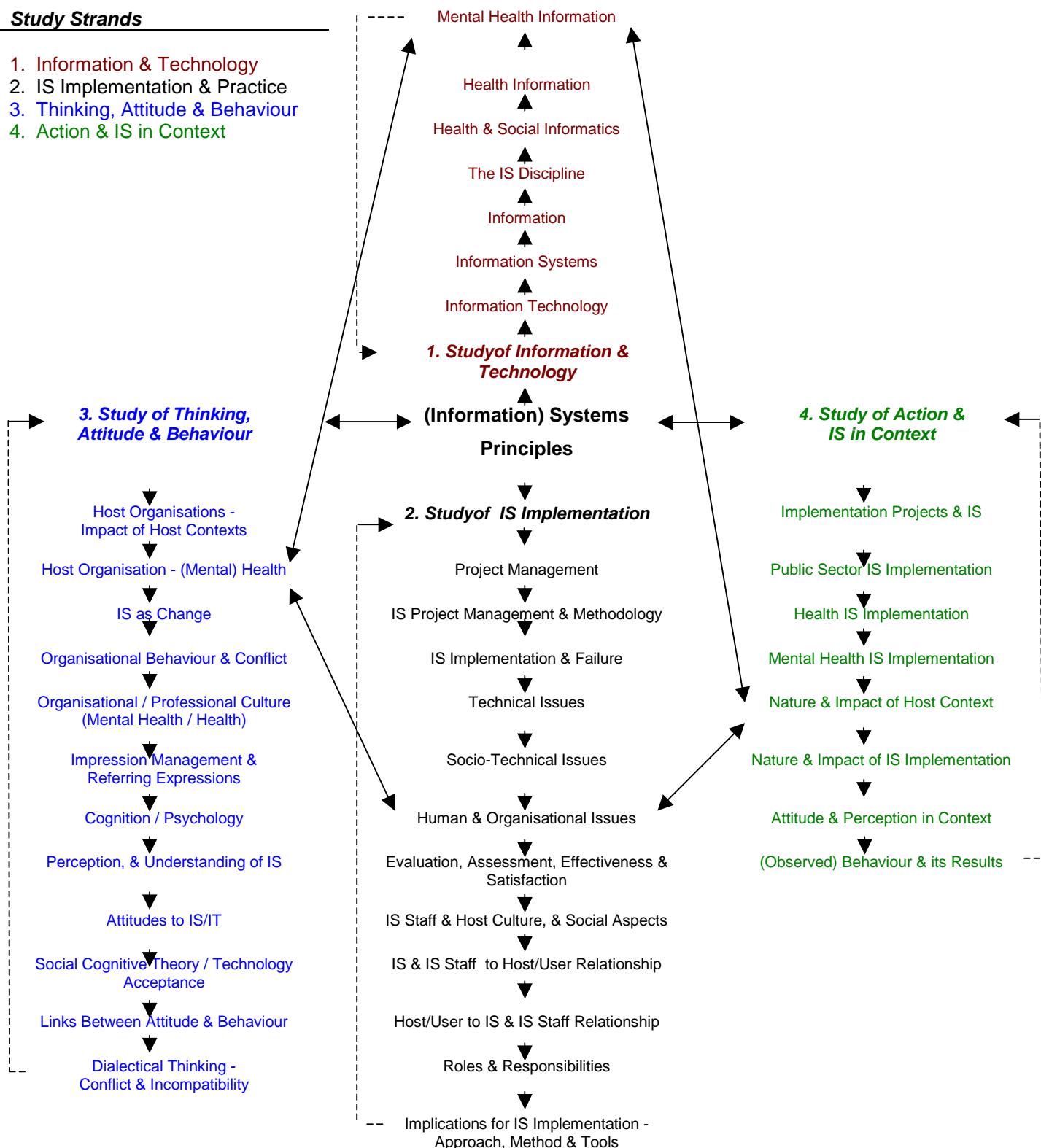
(d) What is IS implementation in practice, rather than in theory, how it is approached, received and perceived by organisations, groups and individuals? This involves the meeting of practice and what is interpreted as needing to be done to implement IS, by all actors, within the particular context within which it will take place. It involves examination of what happens in reality, looking at case research and examples of reported IS implementation. It deals with what results from the interaction between an IS and the IS implementation process on the one hand, and on the other, the host organisation in which it is located. The nature of the *host context* and how its characteristics influence the implementation process is thus considered, with specific contexts narrowing towards mental health. Using practical experiences attention shifts to analysing and understanding behaviour, attitude and perception. This is described as *Action & IS in Context* (strand 4).

Each strand contains a number of issues where, from a general theme, there is a logical progression to specific areas that are demonstrated to be relevant to the research aims (1.7). Within the strands, the development of themes facilitated feedback as elements provided an insight into the earlier issues in the strand (shown by a broken arrow in Figure 1.1).

The relevance of the organisational context of IS implementation is reflected in each strand as a linking theme throughout (shown by a solid arrow in Figure 1.1). As a result strands are related through contextual elements - defined variously as mental health information (within strand 1), human and organisational issues (within strand 2), the implementation host organisation (within strand 3), and the nature and impact of organisational context (within strand 4).

In addition, a further linking theme within the conceptual map is the means of examining the issues defined in practical circumstances, comparing available research evidence with live examples, and of testing theory and methods being developed through the exercise. Through this it is possible to ground investigation on evidence gained and to include consideration of existing theory and method(ology), emerging thought and events within IS, government and health.

Figure 1.1 Conceptual map of MHIS and ISMH evaluation



1.7 Research aims

The aim of this study was firstly to improve understanding of the nature of IS implementation and the challenge that it presents, and secondly to suggest possible approaches to implementation. As a result the question can be addressed “Do we really understand the nature of the challenge of IS implementation?”, and if not, how can progress be made? From this, how do we recognise and define the problems faced, and go about solving problems?

Although there are lessons directly for the NHS mental health context, the emphasis on both thinking and the development of practice means there is likely to be wider relevance of the work. This is at a time when the NHS is undergoing its greatest ever IS investment, yet by its own admission is subject to significant weaknesses of implementation and use of IS (encompassing IT and information). There is clearly a need therefore to identify both what the challenge is, and how it can be addressed.

This work is an exploration of how this can be done, in both practical and theoretical terms. Whilst it is clear that IS involve complex and demanding technical elements that require specific skills, there is ample evidence to suggest that the difficulty of achieving successful IS implementation goes beyond the technical challenge i.e. as quoted initially regarding failure to meet objectives “*the reasons for this are rarely purely technical in origin*” (Clegg et al 1996, Section 1.iv.)

The aims of the study were three-fold:

Definitional

To examine if it is possible to propose a sufficiently comprehensive definition of “IS implementation” so that it is clear what IS implementation implies and demands, and what it is not.

Context Appraising

By studying the context of IS implementation - organisations, and specifically mental health services - to examine whether, and if so how do, individuals, groups and organisations make the task of IS implementation prone to failure.

Problem Solving

To propose an approach to IS implementation that relies on both consideration of theoretical concepts and evidence found in the practical context.

Chapter Two

Methods

Chapter Two: Methods

2.1 Scope and conduct of the entire study

The study required contact with the organisational context over a period of several years, through a range of methods and with involvement that ranged between being relatively detached to being an integral part of that context. The aims and associated methods required on-going interaction and the research opportunity taken reflected a belief that this would be possible in the given organisational context and would support theoretical and methodological requirements.

The specific requirements of the study opportunity concerned firstly, access to the appropriate organisational context i.e. the NHS mental health sector, and an organisation or organisations using and implementing IS. This context needed to support the aim to include a range of individuals and groups throughout the organization(s), and to examine, compare and contrast their attitudes and behaviour. Access to the organisation(s) needed to support the ability to potentially influence attitude and behaviour through attention to practice.

The *bounded system*¹ defined was a single UK mental health NHS Trust². The Trust was comprised of 4 relatively independent clinical service directorates, defined by patient type or age group, and a range of central services defined as a fifth, non-clinical or corporate directorate. These directorates provided services across a range of in-patient settings, community-based care, and operating from many local physical bases, throughout a county with a population of over 900,000 (Office of National Statistics 2001).

This single case allowed the study to be carried out over a period of 4 years and to focus on a longer period of Trust activity. It enabled both snapshot and longer-term exercises, as part of in-depth access to examine IS implementation as a

¹ Whilst a case study can be described as the process of learning about the case and the product of that learning, the means to do so involves the aim of defining a unique, specific, or *bounded system* (Smith 1978).

² To be referred to as “the Trust”.

process, including the evolution of attitude and behaviour, and their impact on that implementation. It consisted of the implementation and/or use of both mental health information systems (MHIS), information systems within mental health generally (ISMH), and the use of IS throughout the Trust. This allowed a range of exercises within this single organisation to be carried out, thus providing relative consistency of sample i.e. various selections of individuals and groups from the same geographical area, professional background and as staff of the same organisation. The staff of the Trust could be treated as a single entity, with sub-groups of that sample e.g. individual directorate, professional groups across the organisation, and demographic sample.

Within the Trust, a clinical directorate was the work base of the author at the time of the study³. This was a situation with both potential advantages and disadvantages for the conduct of the research (Coghlan and Brannick 2001). On the negative side there were questions of partiality and lack of independence, the author examining an organisation that was known to him, and an organisation, or parts thereof that knew him. The advantages included the opportunity that this afforded, potentially allowing access over a prolonged period and through a range of methods, rather than as a single exercise, and being able to act not merely as an observer, but as an IS implementation manager within a directorate of the Trust. This relied on the ability of that directorate to conduct IS implementation relatively independently of the Trust and its IS function. Although the study was situated within a single organisation a dual focus was therefore possible, concerning firstly general Trust IS implementation and use, which could be observed from the perspective of being a relative outsider. Secondly, as a consequence of being based within a directorate of the Trust, implementation and use could be studied from the alternative perspective of having personal responsibilities for IS in that context.

As IS implementation processes were being undertaken during the period of study in both Trust and directorate there was an opportunity for comparison between a co-located and contemporaneous pair of IS implementation cases. It

³ Although based in the Trust the author was employed by another organisation and was not part of the central Trust IS function.

was a comparison study within the same organisation comprising, firstly, a Trust-wide sample and trust-wide IS implementation, and secondly, a single directorate⁴ of that Trust and its IS. Regarding comparability of results and the influence of variations between cases this significantly reduced the range of potential causes of variable results, with consistency of sample, and similar organisational and professional influences over the same time period. With the presumption of implementation being a complex process featuring a host of technical and non-technical - human and organisational - issues and influences, this was envisaged as a means of drawing conclusions concerning different approaches to implementation.

All study directorate activity took place within the framework of Trust-wide IS, either conforming to general requirements e.g. procurement and confidentiality issues, or relying on services provided by the central IS function e.g. aspects of network infrastructure. Trust and study directorate IS-related activity was contemporaneous, operating within the same environment of NHS mental health service provision within that locality. Each was characterised, however, by distinct purposes whilst also remaining complementary. These study features are shown, demonstrating activity over the period and across the breadth of study focus as **Appendix A - Mental Health Trust Comparison Study Timeline**.

A multi-method approach allowed retrospective and prospective questioning through a variety of approaches, including:

- a) Document review,
- b) Questionnaire,
- c) Soft Systems Methodology definition exercises,
- d) Structured, semi-structured and unstructured interview,
- e) Focus groups,
- f) Site visits, and
- g) Action research.

⁴ To be referred to as “the directorate” or “the study directorate”.

As a multi-themed and multi-method exercise the study was broken down into a number of *study elements*. These elements were defined as either examples of specific IS implementation taking place or having taken place within the NHS Trust, or IS-related study with respect to,

- a) The Trust in general - described as the Trust-wide study,
- b) Within the area of the Trust defined as the study directorate, or
- c) Other Trusts' IS implementation projects.

2.1.1 Trust-wide attitudes to IS and its use (ISA) - Trust-wide study

This study element aimed to establish the level of experience of use of IS and the prevailing attitudes to IS, of staff throughout the Trust. It addressed the theme of attitude formation and attitude to the concept of IS as a matter of general principle or in relation to the idea of what computers are and do, rather than in relation to a specific example of IS. It was conducted prior to other study elements that involved contact with the Trust as a whole.

2.1.2 A Trust-wide information system (TWIS) - Trust-wide study

The TWIS was described by the Trust as a *mental health information system*. This element was concerned with a prospective organisational development as study commenced during system procurement, and continued during physical implementation. A retrospective view was also taken by identifying and examining a decade-long lead-in period, focussing on understanding, attitude and behaviour exhibited during that time.

The project undertaken by the Trust involved the definition of requirements, procurement of an existing product, and introduction of this product with the intention to replace a large number of existing local administrative and clinically-related IS. This was the first attempt to employ an IS throughout the Trust. Previous experience within the organisation had been of a large number of small, diverse, localised and non-integrated IS. The TWIS was intended to result in

horizontal integration whereby all parts of the organisation were expected to become involved.

2.1.3 Local information system (LIS) - directorate study

The LIS was established a number of years before the study was designed and conducted, being conceived in 1990, within the study directorate, implemented by it during 1992, and still being used. Notable features of the system were that it was a psychiatric case register, an MHIS that was implemented as the first attempt to use computerised IS within the organisational context. It was conceived, and partly designed by a clinician, and implemented with little involvement of the Trust IS function.

2.1.4 Service headquarters IS development (SHQ) - directorate study

The SHQ, as an implementation of ISMH, took place during 1998-99. It concerned the establishment of new IT infrastructure, equipment and software applications on a single site within the study directorate. The implementation was managed by the author.

2.1.5 Service information systems development (SISD) - directorate study

The SISD was a study directorate-based information, IS and IT exercise conducted from 2000 onwards concerning the establishment of IT infrastructure and equipment, data storage and use. Implementation took place across approximately 20 clinical bases and 400 staff, introducing many to IS for the first time. This was an exercise to implement and develop ISMH. It was intended to update and integrate systems and parts of the service, and to increase use of IS from relatively low levels, particularly amongst clinicians.

This study element concerned the actual application and development of IS practice to achieve live implementation, and more broadly the observation and management of behaviour within that implementation.

This implementation was the primary source of comparison with the TWIS study element. It was possible to include all stages of the implementation as part of the study element, and to include within practice, consideration of lessons learnt from other prior elements. This implementation was managed by the author.

2.1.6 Comparative IS implementation & use - other mental health Trusts (CTIS)

A further study element was the examination of two other UK mental health Trusts⁵. These were considered on the basis of the currency of their IS implementation and potential for comparison with the primary study pair. One was in the process of implementing an integrated MHIS throughout a Trust, involving a partnership arrangement with a vendor. The second involved an approach to in-house development of clinical information storage, retrieval and use, which was similar to elements of the SISD.

2.2 Themes of the study

Each of the study elements was designed to address particular themes concerning the path from commencement to completion of the process of IS implementation, what they involve and what affects them, and the equivalent path between understanding and practice.

The view of the implementation as a complex process featuring inter-dependent technical and non-technical aspects reflects the interpretive perspective which highlights the central aspects of IS content, context, process and linkage between parts (Walsham 1993a). Equally it can be described in terms of technology, organisational, and less tangible human aspects.

⁵ These will be referred to as Trust A and Trust B.

The examination of the human element of IS implementation was an interpretive exercise with reference to social cognitive theory (Bandura 1969, 1977, 1986, 1997; Compeau, Higgins and Huff 1998) and comprised of five related themes.

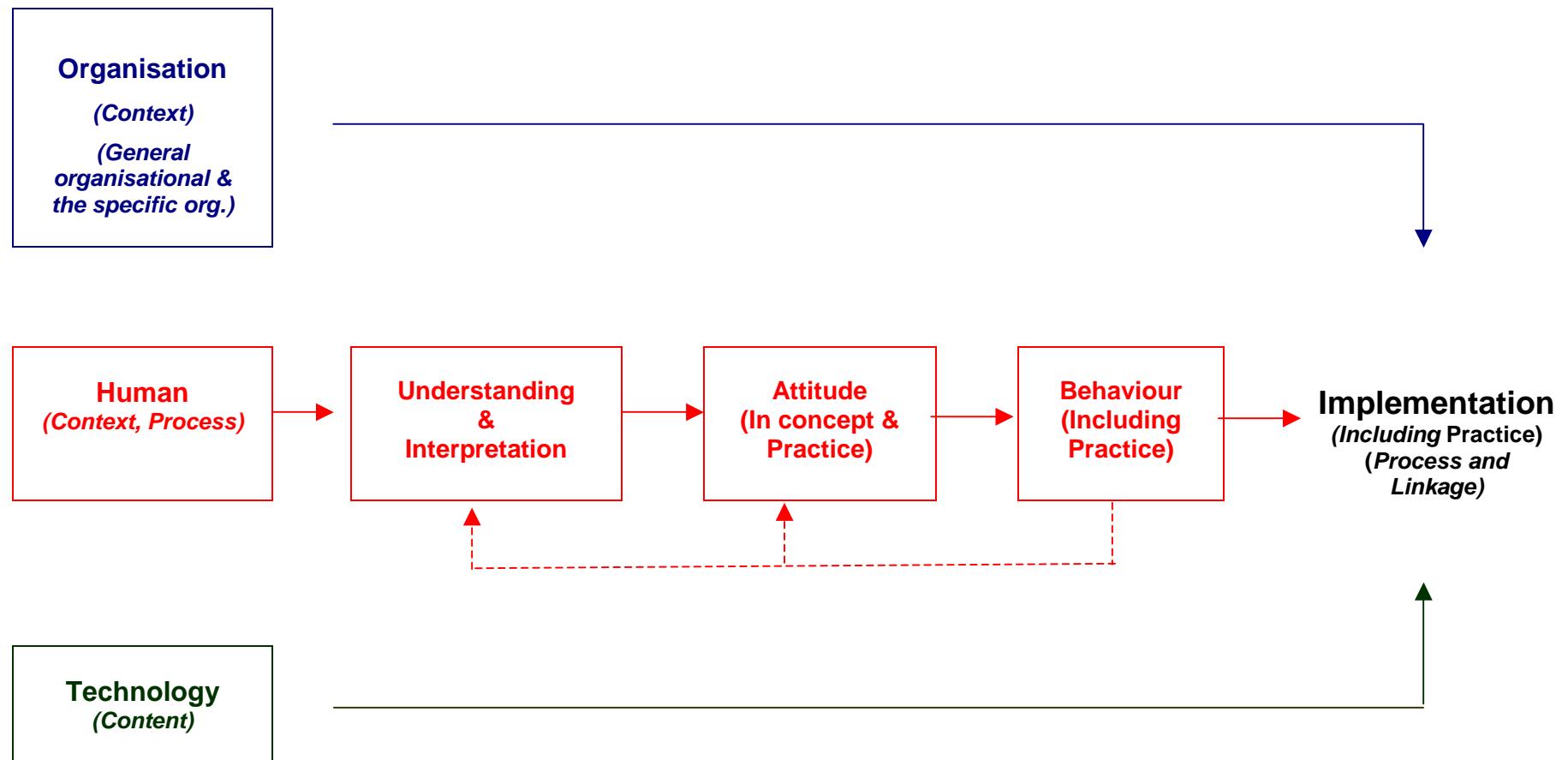
These were:

- a) Understanding and interpretation (as a basis for attitude),
- b) Attitude formation and attitude in concept to IS,
- c) Attitude in context (attitude to IS in the practical context of an IS implementation),
- d) Behaviour (observation of behaviour by all actors), and
- e) Practice (as a sub-set of behaviour to consider the development of IS-related practice)

Each study element centred principally on one of these themes. Individually, and in combination, the elements were aimed to inform an understanding of the links between these themes (Figure 2.1).

A detailed breakdown of the features of each case study element and the nature of its examination is shown as **Appendix B - Comparison Study Method Summary.**

Figure 2.1 Essential aspects of IS implementation



2.3 Theoretical considerations

The study undertaken relied on the recognition of an opportunity to conduct research in the manner desired, in an appropriate organisational context i.e. where it would be possible to examine the practical consequences of definitions applied, understanding and interpretation of IS implementation, and human and organisational activity.

There is growing acceptance of research that attempts to either combine different approaches or consists of multiple methods, whether from a single or multiple perspectives. The combining of the approaches and associated methods has been interpreted as a *pragmatic view* (Easterby-Smith, Thorpe, and Lowe 2002) and means to illuminate the subject (Denzin and Lincoln 1998a, 1998b) since the early 1980s: “*Multiple methods and triangulation of observations can contribute to methodological rigour.*” (Patton 1987, p169).

A pragmatic approach was accordingly adopted for method selection within this study. This is reflective of an interpretation of methods not being mutually exclusive or dichotomous e.g. quantitative vs. qualitative, but being on a continuum with inherent strengths and weaknesses. Methods extended beyond a positivist or technologically-deterministic perspective (discussed by Checkland and Holwell 1998; Walsham 1993) to assume the relevance of and include the means to address social (Bandura 1969), human and organisational (Doherty and King 1997, 2001) and socio-technical (Lin 2001; Lin and Cornford 2001; Cornford 2003) perspectives of IS.

The study examined “*continuous processes in context*” (Pettigrew 1990, p271), or what can be described as a case study, defined by Yin (1994) as “*an empirical inquiry*” that “*investigates a contemporary phenomenon within its real-life context*”. This method, notably as a longitudinal exercise facilitates the analysis of developing relationships and processes, the investigation of historical process and drawing of conclusions such as the influence they play on particular aspects of systems development (Baroudi and Orlikowski 1988; Walsham 1993). The study was framed by recognition of the dangers of drawing comparison between

cases, making assumptions about similarities and generalities where the purpose of the study was to examine what is presumed to be a complex, lengthy process of IS implementation, with human activity at its heart. Study of a low number of cases reflects an acceptance of the inability to identify what can be defined as a representative sample, and the difficulty of comparability and generalisation between cases with many potential differences (Stake 1998).

The longitudinal case study recognises that no situation will be static. As implementation processes emerge from a historical context, are influenced by existing understanding and attitude for example, and take place over a period, analysis of that process and context can be supported through longitudinal case study, or ethnography (Zuboff 1988; Myers and Young 1997).

Interpretivism, the epistemological stance which has developed as an alternative to positivism, in essence, challenges a belief in an objective and exterior reality, in favour of one that is "*socially constructive and given meaning by people*" (Easterby-Smith 2002, p29). This perspective therefore is a means to support the desire to examine human activity of thought and action within IS implementation as it focuses on the complexity of human sense making (Kaplan and Maxwell 1994; Klein and Myers 1999) and so within phenomenology (Boland 1985) it is thought that phenomena may be understood through the meanings that people assign to them (Orlikowski and Baroudi 1991).

This approach has been applied specifically to IS research by Walsham (1993), linking both a theoretical basis and implications for research. Klein and Myers (1999) have subsequently proposed a framework to carry out interpretive IS study. It is consequently more likely to recognise the *intersubjectivity* rather than assume objectivity of the researcher and researched, the relevance of understanding the context within which IS implementation takes place, and the complex process of the intertwining of what can be interpreted as *technical* and *non-technical*.

"Interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors and that this applies equally to researchers".

Walsham (1993, p5)

Within the field of IS and beyond much of the existing literature, research, and the established formal process of accountability and audit e.g. through the House of Commons Public Accounts Committee, Audit Commission and National Audit Office, is retrospective rather than prospective. This is not surprising where a perceived "*failure*" has to happen before it can be defined as such, and analysed. Anything that attempts to address "*what went wrong*" by definition is a retrospective exercise and will be framed by what can be ascertained after the event, and by the assumption of failure. Equally it will be influenced by what it is that is assumed to have failed i.e. potentially an individual, a technical system, project or implementation exercise, rather than, for example the organisation as a whole and its nature, or the understanding of what IS implementation requires.

First-hand examination of the IS implementation process as it takes place, and the ability to ask questions at the time it takes place is precluded by retrospective study and indirect sources of evidence. Studying current implementation thus facilitates direct access, for example, to observe attitudes expressed, behaviour exhibited, and gives potential for direct participation in, or ability to, influence implementation.

Action research, developed by Kurt Lewin in the 1940s and applied within social psychology and organisational development is a participatory method of conducting social research, directly interacting and collaborating with the context being studied (Lewin 1947). It is philosophically based in pragmatism, asking questions and expanding knowledge whilst creating change and solving practical problems (McNiff 1988; Greenwood and Levin 1998; Coghlan and Brannick 2001). Gaining credence within IS research (Baskerville and Wood-Harper 1996; Baskerville and Myers 2004) this method is allied to Soft Systems Methodology, the development of which has involved researchers not just observing, but taking

part in the change process and studying “*myths and meanings*” (Checkland 1999, pA39) that individuals and groups apply.

2.4 Organisation of the study

2.4.1 Establishing the study

Sponsorship of the study was initially established with the manager of the Trust study directorate, and general approval to conduct the research was then obtained from the Trust’s Chief Executive in December 1998. Subsequently co-operation was also arranged with the TWIS Project Manager (PM). In addition throughout the study, co-operation was required from a number of services, sites, groups and individuals within the various Trust directorates. This was achieved through selling the research as a useful and meaningful exercise to a range of people who were either to be facilitators or directly involved in the study, over several years. A network of local contacts - clinicians, administrators, managers and IS users - was established to generate and maintain co-operation and necessary assistance to carry out the various research activities. This was required as contact was made with staff with regard to a number of research tools and over a period of several years.

2.4.2 Timing

Study activity commenced with the on-going directorate SHQ (Service Head Quarters) IS implementation which was undergoing implementation and was followed by the Trust ISA (Trust-wide attitudes to IS) element in 1999. In January 2000 TWIS interviews commenced, continuing into October 2000. Additional follow-up opportunities were also taken so that the final interview did not take place until February 2002. Other elements were designed to be largely completed at the point of initiation of the SISD project, in September 2000. Although an on-going IS, the study of events was completed at the end of 2001. In 2002 the TWIS document review was undertaken.

The context of the study was a Trust undergoing significant organisational change, including the IS-related developments featured. As the TWIS was studied during its implementation process there were concurrent, sensitive issues concerning its management and internal and external perceptions of success or failure. The range of study elements, and the different groups of staff involved in them, allowed the data collection to proceed on a flexible timescale, sensitive to these issues.

2.4.3 Distribution of questionnaire materials

Agreements were made to distribute questionnaires used within the ISA study element through local contacts, using their knowledge of directorates. Questionnaires were then forwarded or delivered by hand to the contact and the exercise was described to them. It was recognised that they could provide an impetus and direct means to encourage response. Alternatively, where requested, the author attended local staff meetings to describe the research being undertaken. As contacts confirmed the number of questionnaires required and details of the organisational units concerned the appropriate number of questionnaires was produced and referenced with an organisational unit code.

Along with an explanatory letter each copy of the questionnaire had an addressed envelope attached. It was thereby possible to increase confidentiality and ease the response process through use of the host organisation's internal postal system. Some contacts assisted this process through personal collection or reminders within staff meetings, or by setting up local collection boxes.

2.4.4 Choice of interview recording method

Regarding the recording of interviews both taping and note taking were tried during piloting and whilst each was feasible the decision made was to use note taking. Reasons for this were:

- a) Interviews concerned on-going, sensitive and potentially controversial organisational activity, and as such there was concern that interviewees may be reticent about being taped.
- b) Often immediate, short responses were offered, reflecting the style of questions asked. The pause offered whilst taking notes however proved encouragement for elaboration. Responses to individual questions ranged widely to over half an hour, and covered other subjects, as desired by the interviewee.
- c) At times responses were made *off the record* and contained expletives and personal criticisms. Taping would constrain such responses.
- d) The manner of response was noted e.g. laughs, hesitations etc., or whether there was need for explanation of questions.

All notes were transcribed either the same or next day.

2.4.5 SISD management

The SISD study element involved the research conducted being integrated with the IS implementation process itself. Activity was consequently fully documented, for example through reports, presentations, reviews and the results of meetings and discussions. A further element of the process involved the author and another member of staff with an implementation role documenting on-going issues and events, discussions, attitudes, and the behaviour of all actors. This was a form of diary used for reference both as part of the implementation and as part of the research.

2.4.6 Other Trusts

Information concerning the development of MHIS within two other NHS Trusts was collected through journal articles, commercial literature, and attendance at

seminars. During personal site visits the research purpose was confirmed, any available documentation was collected and notes made of discussions.

2.4.7 Anonymity & data collection

The sensitivity of the events studied and the position and roles of respondents within the organisation studied placed them in a potentially difficult situation, being asked to reflect upon the performance of that organisation and of individuals.

A standard approach was taken with regard to all research methods. This involved confirming that the author alone would see interview notes and all other responses i.e. completed paperwork submitted by respondents. In the case of the ISA study element and its associated questionnaire there was anonymity throughout, although directorate and professional grouping was recorded. Questionnaires were not sent to specified individuals but in batches, via local directorate contacts, in numbers defined by those local contacts. Identifying reference numbers were added to completed, returned questionnaires when they were received, on a strictly sequential basis.

When individuals were interviewed a respondent number was allocated and references to all named individuals were replaced in notes with either respondent numbers or job titles where this did not allow identification. Data were collected using DataEase, Microsoft Excel, and analysis was undertaken also using SPSS software.

2.4.8 Independence

As he worked within the study directorate and with responsibilities for its IS, the author was known by its staff, but was not known to the majority of staff within the study Trust. Throughout the study it was possible to assert relative

independence⁶ from the activities of the Trust. Specifically, the author's personal involvement in the TWIS was limited to attendance at procurement demonstrations, and comment upon the system's output based specification. The author avoided use of the system itself and any formal involvement with its implementation and was thus unable to develop direct opinion of either the system or the implementation.

Independence of the study was consistently stressed as, despite having full approval, it was not run at the request of, on behalf of, or by the Trust. The study was instead identified throughout as being run under the auspices of the University with whom the research was registered. As an example, University paperwork was used throughout in all correspondence. Recognising possible ambiguity and to avoid any confusion however the author was also introduced within the research exercises as being based in the study directorate, though that role was not associated with this work. It was stressed that the Trust would have no role in data collection or analysis, or see any preliminary or individual results, or the source of the opinions or behaviour upon which they were based. The voluntary nature of respondent involvement was emphasised.

2.5 Tools used

Within both the TWIS and LIS study elements interviews, questionnaires and definition exercises were designed as integrated research tools, performed at the same time. This multi-part process was designed to address the danger of a reduced response rate and dissipated interest that would result from conducting multiple exercises over a period of time but relating to the same general subject area.

The relationship between all research tools, study elements and themes is shown as Figure 2.2. Each research tool was directed to a sample of staff defined as either potential IS users, IS users, IS implementation managers, or IS staff. These samples were not mutually exclusive as for example IS staff could also be

⁶ This is a qualified statement, where intersubjectivity (Walsham 1993) and researcher influence on the research exercise (Klein and Myers 1999) are recognised.

described, in relation to their role as implementation managers and also as IS users.

Trust IS and IS implementation concerned the study directorate. Aspects of the study which concerned the Trust as a whole also concerned study directorate staff, the directorate being part of the Trust, and as they were also members of Trust staff. In contrast directorate IS and IS implementation was discrete. The sample associated with each research tool is shown as Figure 2.3, where the research tool relates to the sample bounded by the box indicated by an arrow.

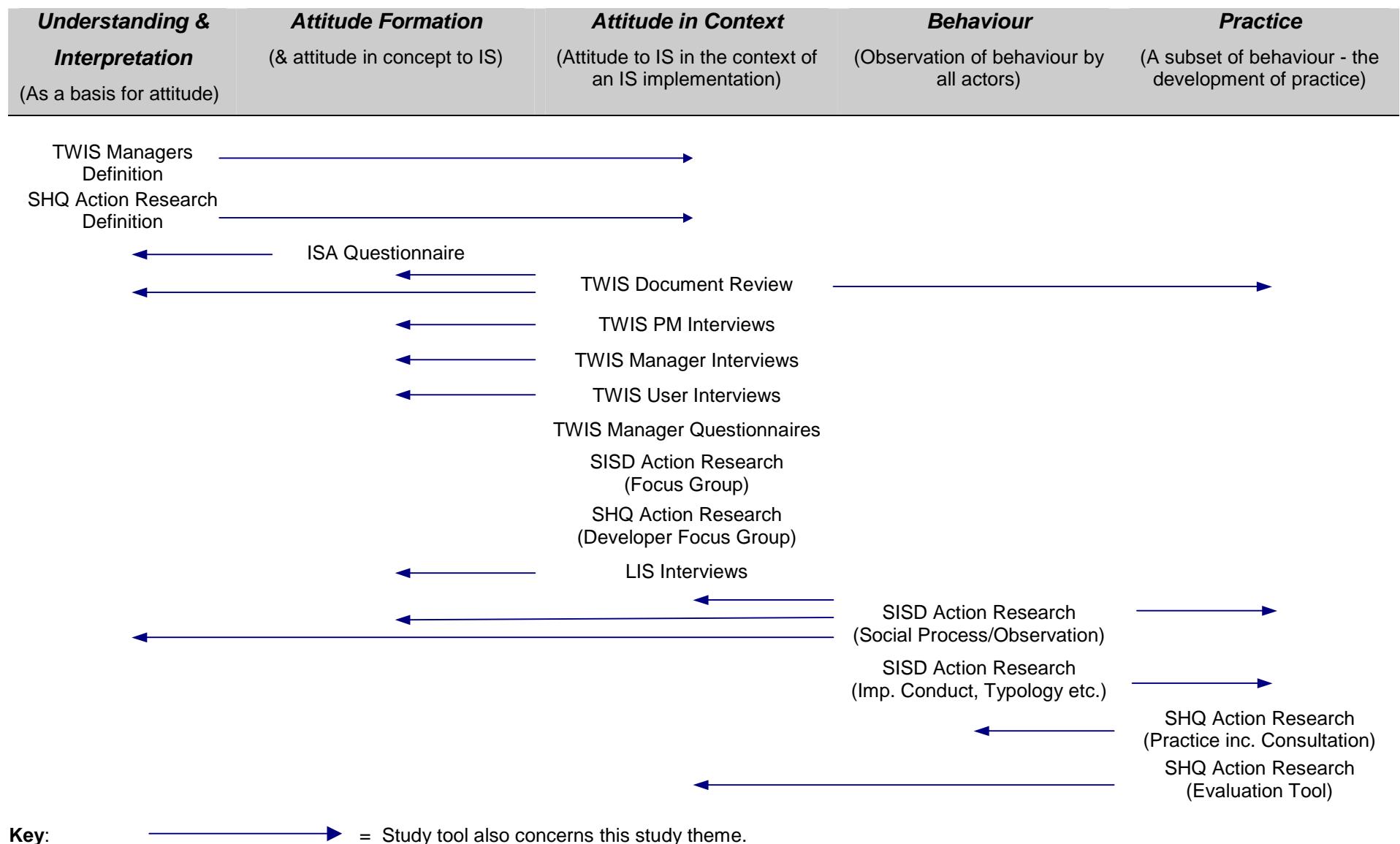
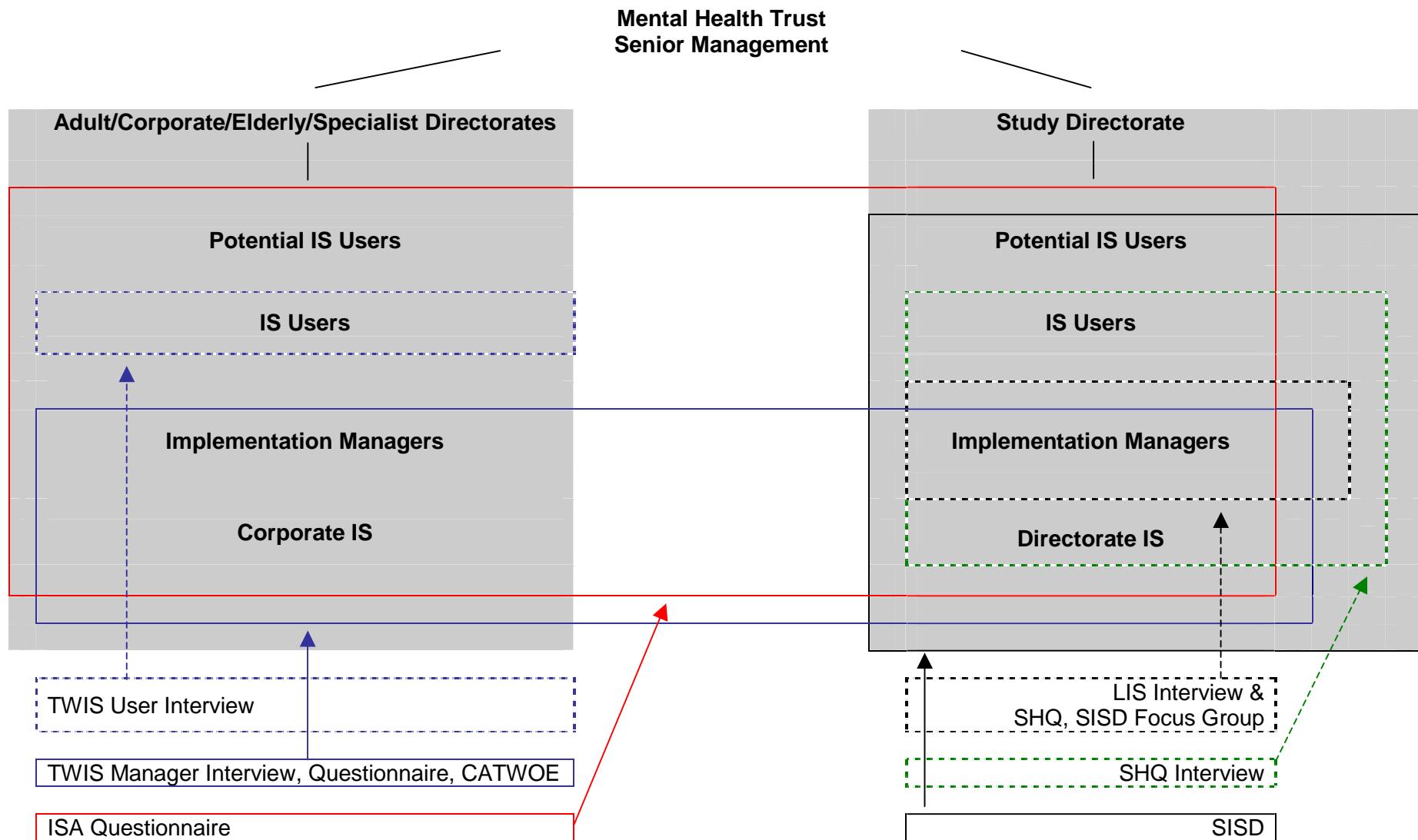
Figure 2.2 Study theme coverage

Figure 2.3 Comparison study research tool samples



2.5.1 Definition exercises

Exercises were conducted which directly examined the issues of definition, clarity and individuals' understanding of basic elements of the IS implementation studied. They were described to respondents as a *Definition Exercise*, the term and wording therein being used to avoid IS terms and potential confusion. (**Appendix C - SHQ IS implementation - Definition Exercise**)⁷.

The exercise was an adaptation of soft systems *Root Definition* and *CATWOE*⁸ (Checkland and Holwell 1998; Checkland 1999). Respondents were requested to initially define a concise root definition of the project being undertaken - *who* was doing *what, for whom, to whom they were accountable*, with what *assumptions* being made, and in what *environment* it was happening - and then the elements that comprise the mnemonic CATWOE (shown as Table 2.1).

Table 2.1 Root Definition and CATWOE

| Element | Defined As |
|--------------------------------------|---|
| Root Definition | Describe in your own words the TWIS project i.e. the core purpose of the system being created - the “deliverable” of the project. |
| C - Customer/Client | The victims or beneficiaries of the system. |
| A - Actors | Those who will perform activities in the system. |
| T - Transformation | What the System Does - The Transformation Process - the conversion of input to output. |
| W - Weltanschauung | The Assumptions that make the Transformation meaningful - The “World View”. |
| O - Owner(s) | The system owner. |
| E - Environmental Constraints | Elements outside the system which it takes as given. |

The SISD study element also involved definition exercises and their use for communication with staff as part of the implementation practice employed. This

⁷ The same format was used for both SHQ and TWIS exercises. This appendix was modified from the original for purposes of anonymity.

⁸ Included as the third part of Checkland's (1998, 1999) 7-stage model, the generation of a *root definition* concisely expresses the core purpose of a human activity system. It is used as a tool within the *enquiry process*, as part of “*exploring the problem situation*” (Checkland and Scholes 1999, p26).

included discussion of the issues being addressed in non-technical terms using the device of a rich picture (**Appendix D - SISD Rich Picture**).

2.5.2 ISA questionnaire

A questionnaire was designed to investigate opinions of all relevant staff, defined as actual or potential users of IS within the Trust. This comprised all non-ancillary staff groups. It concerned attitude formation and attitude to the concept, or in principle, of all current and potential users of IS regarding the general theme of computers and computing within the workplace.

In its construction the primary source of existing research examples was Newstead, Huff, Munro and Schwarz's *Survey Instruments in IS*⁹. A number of potentially significant variables had received little research attention. These included, a) the influence of age on attitude towards IS, b) comparison of attitudes between those who are IS users, and those who have not used IS, and c) the influence of the location of IS use i.e. whether IS experience is gained either at work, or at home.

The questionnaire - **Appendix E - Use of Computers at Work: Staff Questionnaire** - was designed in two sections, firstly, to examine the characteristics of Trust staff based on variables including age and gender, alongside their level of use of IS. Secondly, the questionnaire asked about attitudes towards aspects of IS and measured levels of opinion across the sample. It addressed rules of thumb or heuristic¹⁰ assumptions concerning the use of and attitude towards IS according to the general sample, age, gender, clinical and non-clinical function, organisational location and experience of IS.

Questions requested a personal response to the use, expectation, potential, and impact of *computers*. Although there was a random distribution of questions within the questionnaire, they reflected the various issues defined within Social Cognitive Theory (SCT) (Bandura 1969, 1977, 1986, 1997) and its specific application to IS research

⁹ Originally published in MISQ Discovery, December, 1998, and then available as a *living version* through IS World Net, www.isworld.org/surveyinstruments/surveyinstruments.htm. This gave access to a large number of instruments - over 560 referenced by November 2002 - from a range of journal sources.

¹⁰ From the Greek "heuriskein" meaning to discover, the term heuristics is used in this context to describe "commonsense" rules, where an investigation is "conducted by trial and error" as "a problem-solving procedure that may fall short of providing a proof" (Oxford Companion to Philosophy 1995, p354).

(Compeau, Higgins and Huff 1999) (Table 2.2). Other questions included reflected issues, defined by the author, as relevant and which could be linked to SCT categories.

Table 2.2 ISA question categories - Social Cognitive Theory

| Category | Description |
|--|--|
| Self-Efficacy | Personal belief in ability to use computers. |
| Outcome Expectation (a) | Belief relating to the performance of computers themselves & job performance improvement (efficiency & effectiveness). |
| Outcome Expectation (b) | Personal performance related to the use of computers. |
| Outcome Expectation - Personal | Attitude towards the concept of computing and personal impact. |
| Affect | Affective response - Positive personal feelings towards use of computers i.e. enjoyment. |
| Anxiety | Affective response - Negative personal feelings towards use of computers. |
| Use | Degree of use of computers. |
| The Concept of Computers - Negative Attitude ¹¹ | A development of Anxiety - negative feelings towards computers and computing in general. |
| Supporting Use ¹² | A development of Use - the support and encouragement to use computers. |

In the case of “The Concept of Computers - Negative Attitude” these questions were included in order to ascertain absolute levels of resistance, not to particular uses of computers but to their general use. IS research points to the impact of user support within IS implementation as a contributory factor towards success and failure. Within the Mental Health Trust studied research carried out in 1994 [DR 033]¹³ showed *user training* as the primary demand of the staff. The question category “Supporting Use” addressed whether staff felt they were encouraged to use/in their use of computers within their workplace.

Questions were phrased so that existing knowledge and/or experience of computers was not necessary for questionnaire completion. Instructions were given how to complete the questionnaire and to confirm that knowledge and experience was not

¹¹ Question category added by the author.

¹² Question category added by the author.

¹³ A bibliography of documents obtained through the Trust study is included as **Appendix S - Comparison Study Bibliography**.

required. The questionnaire was piloted with clinical and non-clinical staff from the study directorate and another Trust directorate, and with individuals outside the organisation who were unaware of the purpose of the study. With minor alterations carried out, piloting confirmed that it was not necessary to design separate questionnaires for those with, and without experience of IS.

The questionnaire was designed to be completed within 10 minutes. Staff were asked to give immediate responses.

Wording and content were included to discover the respondent's own attitudes to the use of computers at work, rather than at home - with possibly varying attitude and experience. The words *IS*, *IT*, and *systems*, and the term *information systems* were avoided whilst *computer* and *computing* were used throughout the questionnaire and accompanying documentation. The general concept of IS was thereby addressed rather than any specific systems that may have been encountered. There was no need to consider definitions of technical terms, and, for example, the distinction between IS, IT and systems.

Questions were designed to distinguish between the following:

- a) *Personal* attitude towards IS and *personal use and impact*, and *general* attitude to IS, its general use and impact.
- b) *Current* and *future* IS use and impact, and
- c) *Actual* and *potential* attitude, use and impact.

All questions were closed, with those relating to attitude being in 5-point Likert scale format (Sanders 1984; Davis 1989; Doll and Torzadeh 1998; Bryman 1988, Bryman 1989; Bryman and Burgess 1994). Responses offered ranged from "Agree Strongly", to "Disagree Strongly", with "Neither Agree or Disagree" as the mid-point to reflect both neutrality in IS use, or alternatively non-users' lack of knowledge.

Questions were framed in the following ways to facilitate validation of responses:

- a) Examination of sensitivity to the different emphasis of questions addressing the same subject e.g. an expectation that IS failure does *not* happen, happens *occasionally*, or *regularly*, and the impact of IS use on performance using the similar terms *quality*, *quickly*, and *easily*.
- b) Linked questions allowing examination of any differences in response between questions which were similar, but referred to different users or to a different time period.
- c) The use of opposites and both negative and positive statements to ensure any inconsistency in response would be clear.

2.5.3 Measurement of attitude in the context of implementation

In accordance with the standard protocol employed interviews within the SHQ, TWIS and LIS study elements involved each individual being contacted in writing, further to any prior informal discussion. They were given an explanation of the purpose and nature of the exercise, its voluntary status, and formal support but independence from the Trust. The subject was described as the implementation and use of information systems within the Trust, including its directorates, featuring the particular projects concerned. All interviewees were given the opportunity to select the date, time, and location of their interview.

Upon agreement to be interviewed a letter of confirmation was sent, explaining the details of the exercise (**Appendix F - NHS Trust TWIS Interview Confirmation**), thanking them for their contribution and advising them that notes would be taken, but anonymity preserved. A set of explanatory notes (**Appendix G - TWIS Managers Interview: Interview Subjects**), was attached which confirmed the intended interview subjects, and whilst it was intended to take up no longer than an hour, the interviewee was free to continue discussion or expand the subjects.

All interviews commenced with confirmation of the information given thus far, and by reading a standard explanatory, introductory script to the interviewee (**Appendix H - TWIS Manager Interview Guidance Notes**). This covered the intended theme of the

interview, and re-iteration that it was intended to focus on their own, not any other perspective such as any presumed group or organisational view.

Following the completion of the interview all interviewees were sent written thanks for their contribution, confirming confidentiality of response given (**Appendix I - TWIS Project: Manager Interview Acknowledgement**).

Those being interviewed within the TWIS and LIS study elements were also sent complementary questionnaires (section 2.5.3.3). Explanation of the purpose and subject of the exercise, and how it was being managed was given as part of the same process.

2.5.3.1 SHQ structured interview/questionnaire

A structured interview/questionnaire exercise, **Appendix J - Structured Interview/Questionnaire**, was used to collect data within the SHQ study element. Chronologically this was the first study exercise and thus informed subsequent interviews and questionnaires. The structured interview allowed both explanation of questions and for the interviewee to expand with any explanation of response.

The questions were predominantly linked to a 5-point Likert scale, with an opportunity given for additional explanation of opinion whilst implementation strengths and weaknesses were linked to free text response. The subjects of questions included:

- a) The interviewee - relationship to IS and length of experience,
- b) The project and their role within it (Franz and Robey 1986; Barki and Hartwick 1994),
- c) Attitudes towards the implementation that were encountered (Baroudi and Orlikowski 1988; Karahanna, Straub and Chervany 1999),
- d) Project management and system impact - clarity, impact and technical/non-technical issues (Sanders 1984; Goodhue 1995),

- e) Implementation factors, and strengths and weaknesses,
- f) Technology acceptance factors and systems reliability - usefulness, ease of use, and reliability of technical aspects (Lee, Kim and Lee 1995).

Interviewees were asked to rate their experience of specific implementation factors, and technical elements of the specific IS. The technology was judged in relation to their perceived *Usefulness*, *Ease of Use*, and *Reliability*¹⁴.

A sample of 7 system users within the site was selected for interview to include managers, administrators and staff concerned with IS implementation.

2.5.3.2 TWIS & LIS interviews

Within the TWIS study element a number of unstructured interviews took place with members of staff of 4 of the Trust's 5 directorates¹⁵ to establish contact within these areas and with staff from each Trust directorate. Intended study progress was discussed and confirmed.

Semi-structured interviews were used within both TWIS and LIS study elements, each of which concerned MHIS implementation and use (**Appendix K - TWIS Project Managers Interview: Interview Questions**, and **Appendix L - LIS Implementers Interview Questions**).

Potential interviewees, able to provide contrasting perspectives to the implementation were identified as:

- a) Users of IS - without any formal responsibilities within the implementation, and
- b) Managers of IS implementation¹⁶ - not necessarily defined as managers within the organisation, but within the process of implementation i.e. with some formal

¹⁴ Usefulness and ease of use of the technology relate to the Technology Acceptance Model (TAM) (Chau 1996; Straub, Keil, and Brenner 1997; Venkatesh 1999; Venkatesh, Morris and Ackerman 2000) whilst reliability was added by the author.

¹⁵ The remaining directorate was slower to respond to communication but did become part of the study.

¹⁶ To be referred to as "managers" or "the managers".

responsibility for its conduct. This group may or may not also be users of the IS in question. Specifically however they were selected to include both those defined as *IS professionals*, and *non-IS staff*.¹⁷

The interview schedule for managers was written and edited through discussion and piloting within two directorates. This demonstrated that the interview could reasonably be completed within an hour. Reference to the specific IS in question was avoided.

The interview schedules for the TWIS and LIS study elements included questions primarily concerning the interviewee's own role: when, why and how they became involved in the implementation: its aims, their experience within, and knowledge of, the implementation, and the impact of the system being implemented. Interviewees were asked whether they had any knowledge of particular aspects of the implementation¹⁸. With simply worded questions and others requiring greater interpretation it was possible to identify clarity and understanding in the minds of individuals and comparatively between interviewees. Terms including *implementation* and *influence* were included to prompt the interviewee's interpretation of their meaning. This allowed examination of similar or contrasting opinions, whether interviewees believed that they knew the answer to what was being asked and whether they would be certain in their opinion or question their own knowledge. Interviewees were also invited to raise anything they wished.

The TWIS managers sample was confirmed through discussion with the then current TWIS Project Manager. Criteria were that staff were or had been formally involved in the implementation through the various project groups, through Trust management, or directorate involvement. Individuals were excluded if they had not actually played a role, e.g. current members of groups but new to the organisation, or if they had recently left the organisation. The project manager also suggested individuals who had previously played a significant part but were no longer involved. Contacts within Directorates were consulted to confirm the list of potential interviewees.

¹⁷ This segmentation reflected a theme of the SHQ Focus Group (2.5.3.4) in terms of delineation between the perspectives of individuals as users and implementers, towards the system on one hand, and the implementation process on the other.

¹⁸ The term *project* was used within the exercise and on paperwork, as this was the term most easily recognised within the organisation.

A similar exercise was conducted in relation to the LIS study element. Slight modifications were made to the interview schedule to recognise a different relationship between the implementation and the local Trust IT function¹⁹, and to specifically consider organisational culture and views of the success, or otherwise of what was a well established MHIS. The target sample was restricted to the two members of staff who took part in the implementation and were still using the IS.

An additional set of follow-up semi-structured interviews was conducted with the two members of Trust staff designated as TWIS project managers during the period of study. These were conducted to further investigate the perspective of the project manager, to examine project progress over time, and to reflect on their experience of the implementation process. It examined how their own attitude and behaviour, and how they felt that of others had developed. Particular issues raised included relationships with actors, organisational culture, actor involvement and non-involvement, change to project scope, the nature of the system created and the project manager role (**Appendix M - TWIS Project Interview: Project Manager Follow-Up**, **Appendix N - TWIS Project Interview: Project Manager (2) Follow-Up**). Interviews with the large number of staff whose relationship to the TWIS was restricted to system use were restricted to provide an indicative sample of user experience. Interviewees were selected as relatively experienced users of different modules of the TWIS across Trust teams and directorates (**Appendix O - TWIS Project: User Interview Question Schedule**). The interview included the user and use profile, the introduction of the system concept to the user and their reaction to it, system choice, the performance of the project and the users role, and the attitude of the user to various elements and results.

2.5.3.3 TWIS questionnaire - implementation managers

A questionnaire for completion by the same TWIS implementation managers sample (described in section 2.5.3.2) was designed as complementary to the interviews undertaken (**Appendix P - Information Systems and the TWIS Project: Staff Questionnaire**).

¹⁹ Whilst TWIS was driven by staff from the Trust IT function LIS was driven from within a Trust directorate.

Questions were mostly restricted to Likert-scale responses. The scope for inclusion of opinion as free text was retained through a question regarding project strengths and weaknesses with facility to include any additional comments.

The implementation managers group were asked to judge the technical/non-technical balance of project emphasis, problems experienced, and where they thought more emphasis should be given. Other areas of questioning were the user profile - gender, age, job function, and experience of computers - the project, attitudes, project management and system impact, implementation factors, and strengths and weaknesses.

The questionnaire was distributed to the TWIS implementation Managers sample following the agreement of each individual to take part in the general exercise to seek attitude. It was sent to them alongside confirmation of their interview with an explanation of the exercise (**Appendix Q - TWIS Questionnaire: covering letter**). Completed questionnaires were then collected at interview.

2.5.3.4 Focus groups

Focus groups were employed within the SHQ and SISD study elements. In both cases participants' attendance was requested in writing alongside documentation describing the theme and purposes of the group meeting. After taking place, notes were distributed to attendees for correction or comment.

An Implementation Focus Group was conducted in November 1999 in relation to the SHQ case study element. The group selected were 5 participants in project management, physical implementation and user support. This exercise was scheduled to take place after physical implementation, and their completion of structured interviews, described at section 2.5.3.1., with the subject being their perspective on the implementation process and how they perceived others' attitudes and behaviour issues. Discussion included:

- a) The implementation context,
- b) Reactions and attitudes towards the implementation,
- c) Management of user issues,

- d) Issues influencing use of IS,
- e) Technical versus non-technical issues,
- f) Clarity of roles and responsibilities,
- g) Strengths and weaknesses,
- h) Impact, success, value and use of IS, and
- i) The path from attitude to behaviour.

A second focus group was conducted in September 2002, as part of the SISD case study element. This also was a group of 5 staff, defined as those involved in project management, physical implementation and user support of the SISD. Discussion included, within the context of IS implementation:

- a) Causes of behaviour of actors,
- b) Shifts in behaviour (between defined types),
- c) The cause of behaviour shift,
- d) Definition of attitude and behaviour, and
- e) Implications of this behaviour and possible responses.

2.5.4 Trust document review

Initial communication with a number of staff within Trust directorates and the local Health Authority (HA) revealed that both parties had been concerned with the development of IS within the organisation²⁰, and specifically the concept of comprehensive and/or integrated systems, over a number of years. Documents from both the Trust and HA were collected from 1999 onwards, and collated and analysed in February 2002.

No specific single source or library was identified which held IS-related documentation. Documents were obtained from a number of sources including the current TWIS Project Manager, four managers within Trust clinical directorates, and a member of staff of the local HA who had been involved throughout the process as an advisor to, and participant within, the TWIS project.

²⁰ The organisation took several forms over the period studied with stages of organisational change, as reflected in **Appendix A - Mental Health Trust Comparison Study Timeline**.

2.5.5 SISD action research

The entire implementation process of the SISD was examined from the formation of ideas through to and beyond physical implementation. The SISD commenced in September 2000 as the final major element of the study and as a result comparison could be made between this IS implementation and others studied. Considering the results of exercises including the ISA questionnaire meant that the nature of the user profile and attitude to the concept of computers related to attitude in this context, and to behaviour. The range of themes considered, and results produced were from the same organisation as other study elements, and thus not influenced by any factors relating to varying contextual factors.

Conduct of this study element was determined by the role and experiences of the author as operational project manager²¹ for over a year and thus potentially the primary influence on the implementation. It was an opportunity to move away from a research perspective reliant on the reporting of others, or a retrospective and critical perspective of implementation.

The themes addressed, shown in detail as **Appendix R - SISD Research Themes**, included

- a) Observation of the nature and development of both individual and organisational attitude and behaviour on the implementation process e.g. relationships, roles, conflicts, contributions made etc.
- b) Gathering evidence to compare and contrast this implementation process with others also included as study elements.
- c) Analysis of the role of implementation and of implementation management - what is required, expected, demands made etc.
- d) The relationship between the organisational host and IS staff.
- e) Attempting to influence all of the above through the influential role of project management within the context of attempting to achieve the organisational aim

²¹ The title is used here for convenience rather than to reflect an actual title used.

of IS implementation.

- f) Analysis of the role of *implementation management*²².
- g) To employ, consider the effectiveness, and develop, implementation practice and tools.
- h) In general, to consider the applicability of the definitions of IS and IS implementation formed.
- i) Use results of this, together with the other study elements to examine the nature of IS related technology, practice and thinking, and the relationship between them.

Methods employed included a range of on-going tasks, tools and practice, including a daily diary written by two members of staff, including the author. Others were designed to address specific issues or perceived challenges, for example security and confidentiality. They included both established methods and techniques and those developed or used within the other study elements. In addition, an integral part of the SISD was considered to be the development and testing of tools and techniques.

²² The term *implementation management* is used specifically rather than *project management* to stress the potential variation between these roles, as considered through the study.

Chapter Three

Results

Chapter Three: Results

3.1 Attitude formation & attitude to the concept of computers

3.1.1 Response

Distribution of the ISA (Trust-wide attitudes to IS) questionnaire commenced, within the study directorate initially, on 26th March 1999, and was completed 15 months later, on 20th June 2000. The total number of questionnaires distributed was 1,523 and 812 (53.3%) were returned. This response rate was higher than a 1994 IS related Trust staff survey (TS) which had a response rate of 42% from a sample of 800 [DR033]¹.

Response rates within directorates ranged between approaching half (Adult and Elderly directorates), and two-thirds (study directorate) (Table 3.1).

Table 3.1 ISA questionnaire distribution and response per directorate

| Distribution To | Distribution | % of Total Dist. | Responses | Response Rate | % of Total Response | % of Response - Trust Survey |
|-------------------|--------------|------------------|------------|---------------|---------------------|------------------------------|
| Study Directorate | 343 | 22.5 | 223 | 65.0 | 27.5 | 17.1 |
| Adult | 639 | 42.0 | 309 | 48.4 | 38.1 | 34.8 |
| Corporate | 200 | 13.1 | 104 | 52.0 | 12.8 | 3.5 |
| Elderly | 172 | 11.3 | 83 | 48.3 | 10.2 | 23.3 |
| Specialist | 169 | 11.1 | 93 | 55.0 | 11.5 | 22.1 |
| Total | 1523 | 100.0 | 812 | 53.3 | 100.0 | 100.0 |

3.1.2 Characteristics of the sample²

Approximately three-fifths of those responding were aged 30 to 49 (Table 3.2).

¹ The document referencing protocol within Results is explained at section 3.2.

² Response figures represent valid responses where an invalid response was a missing value. Statistics relate to this valid response rather than all responses. Valid responses to user profile questions ranged between 86.9% and 92.9%. There was a mean valid response rate of 98.7% for opinion-related questions.

Table 3.2 Age of respondents to the ISA questionnaire

| Age Group | Frequency | Percentage of Total |
|------------------|------------------|----------------------------|
| Below 20 | 0 | 0.0 |
| 20-29 | 130 | 17.1 |
| 30-39 | 255 | 33.5 |
| 40-49 | 220 | 28.9 |
| 50-59 | 141 | 18.5 |
| 60+ | 16 | 2.1 |
| Total | 762 | 100.0 |

Most respondents - 70.7% (520) - were female. This compared with 64.5% females in the previous trust survey.

Although job function or profession was defined in relation to the Trust's own categories, it became evident that some staff were not clear as to their membership, some placing themselves within the *other* category. Accordingly re-coding of responses took place to comply with the Trust definitions. Those within medical, nursing and PAMS categories were defined as clinical staff, whilst managerial, administrative and others as non-clinical.

Most respondents were nurses (Table 3.3), and 65% were clinicians, reflecting the response to the TS.

Table 3.3 Job function of respondents to the ISA questionnaire

| Function | | Frequency | Percentage | Trust Survey % |
|------------------------|----------------|------------------|-------------------|-----------------------|
| Clinical | Medical | 32 | 4.3 | 12.0 |
| | Nursing | 347 | 46.5 | 48.5 |
| | PAMS | 104 | 13.9 | 7.1 |
| Total Clinical | | 483 | 64.7 | 67.6 |
| Non-Clinical | Managerial | 45 | 6.0 | 10.4 |
| | Administrative | 192 | 25.7 | 18.9 |
| | Other | 27 | 3.6 | 3.6 |
| Total Non-Clin. | | 264 | 35.3 | 32.8 |
| Total | | 747 | 100.0 | 100.0 |

3.1.3 Comparability of the study pair

Difficulties were encountered obtaining detailed staffing information from the Trust. Although this information was not available at the time of the ISA exercise, figures were subsequently obtained that were current and retrospective. These were on the basis of whole time equivalent (WTE) posts rather than absolute numbers of staff however, and relied on revised functional definitions applied by the Trust³. Comparison of staffing figures with questionnaire distribution and response was thus limited (Table 3.4).

Table 3.4 Trust staffing figures (WTE 1999/2000) vs. ISA questionnaire distribution & response

| Directorate | WTE Staff | % of all WTE | Quest. Distribution | % Distrib. | Response | % of all Response | Response Rate (%) |
|-------------------|-----------|--------------|---------------------|------------|----------|-------------------|-------------------|
| Study Directorate | 322 | 22.9 | 343 | 22.5 | 223 | 27.5 | 65.0 |
| Rest of Trust | 1086 | 77.1 | 1180 | 77.5 | 589 | 72.5 | 49.9 |
| Total | 1408 | 100.00 | 1523 | 100.00 | 812 | 100.00 | 53.3 |

The proportion of ISA questionnaires distributed to the study directorate and the rest of the Trust as a whole closely reflected the relative staff numbers provided. Within individual Trust directorates there was some variation though as the Elderly directorate delayed co-operation. An agreement was then made that there would be distribution to a reduced sample defined by that directorate.

The response rate was highest within the study directorate. The balance of female and male responses within both the Trust and study directorate were similar. There was a higher proportion of respondents from the study directorate within the 30-39 years age range and lower within the 40-49 years age range (Table 3.5).

³ The staffing figures provided by the Trust did not appear to be accurate, particularly regarding the number of clinical staff within the Corporate directorate, but were the only figures available. Distribution to the HQ & Corporate directorates was higher than the WTE figures shown by Trust information.

Table 3.5 Study directorate ISA response vs. other Trust directorates

| | | Study Directorate | Other Trust Dirs. | Trust Total |
|-----------------|--------------|--------------------------|--------------------------|---------------------|
| Age | 20-29 | 37 (18.1%) | 93 (16.7%) | 130 (17.1%) |
| | 30-39 | 78 (38.2%) | 177 (31.7%) | 255 (33.5%) |
| | 40-49 | 44 (21.6%) | 176 (31.5%) | 220 (28.9%) |
| | 50-59 | 39 (19.1%) | 102 (18.3%) | 141 (18.5%) |
| | 60+ | 6 (2.9%) | 10 (1.8%) | 16 (2.1%) |
| Total | | 204 (100.0%) | 558 (100.0%) | 762 (100.0%) |
| Gender | Female | 145 (72.5%) | 375 (70.0%) | 520 (70.7%) |
| | Male | 55 (27.5%) | 161 (30.0%) | 216 (29.3%) |
| Total | | 200 (100.0%) | 536 (100.0%) | 736 (100.0%) |
| Function | Medical | 29 (14.8%) | 107 (19.4%) | 136 (18.2%) |
| | Nursing | 136 (69.4%) | 211 (38.3%) | 347 (46.5%) |
| | Non-Clinical | 31 (15.8%) | 233 (42.3%) | 264 (35.3%) |
| Total | | 196 (100.0%) | 551 (100.0%) | 747 (100.0%) |

A higher proportion of non-clinical staff responded within the Trust's corporate and specialist directorates, compared to the adult, elderly and study directorate. The study directorate had the largest proportion of nurses responding. This response reflected the staffing structures of the directorates as reported later by the Trust (Table 3.6).

Table 3.6 Trust staffing structure 1999/2000 (WTEs)

| Directorate | Clinical Staff | Non-Clinical Staff | Total |
|--------------------|-----------------------|---------------------------|----------------------|
| Study Directorate | 296 (91.9%) | 26 (8.1%) | 322 (22.9%) |
| Adult | 409 (83.1%) | 83 (16.9%) | 492 (34.9%) |
| HQ (Corporate) | 66 (74.2%) | 23 (25.8%) | 89 (6.3%) |
| Elderly | 289 (86.0%) | 47 (14.0%) | 336 (23.9%) |
| Specialist | 111 (65.7%) | 58 (34.3%) | 169 (12.0%) |
| Total | 1171 (83.2%) | 237 (16.8%) | 1408 (100.0%) |

Respondents from the study directorate were less experienced computer users than the average for the Trust, with 22.2% not having used computers at all (17.3% in the rest of the Trust), 50.3% non-users at work (38.7% in the rest of the Trust) and 34.4% non-users at home (31.7% in the rest of the Trust).

There was no evidence therefore that staff of the study directorate had more IS experience. Equally their personal and computer use profiles did not point to significant variations from the Trust in general or provide suggestions why they may have different attitudes towards IS implementation.

3.1.4 Attitudes to computers

Responses to each question on the 5-point scale were combined into three groups - agree, neutral, and disagree (Table 3.7). Staff reported consistently positive views with respect to a range of statements, whether they concerned personal benefit, general use or disagreement with negative statements. As an example there were very similar levels of agreement that computers help accomplish tasks with better quality (78.3%), more quickly (73.9%), and more easily (73.5%).

Table 3.7 Distribution of attitudes to computers

| Agree (%) | Neutral (%) | Disagree (%) | |
|--|-------------|--------------|---|
| Self-Efficacy - ability to use computers: | | | |
| 56.4 | 18.1 | 25.4 | <i>I know more about computers than I did a year ago</i> |
| 53.0 | 28.9 | 18.1 | <i>I am more confident about using computers than I was a year ago</i> |
| 23.8 | 22.0 | 54.3 | <i>I do/would know what to do if computers malfunction</i> |
| 29.0 | 23.4 | 47.6 | <i>I feel confident enough to help others if they have a problem with computers</i> |
| 90.4 | 7.3 | 2.2 | <i>If I have/had a computer problem I don't/wouldn't mind asking for help</i> |
| Outcome expectation - performance of computers: | | | |
| 39.8 | 34.7 | 25.5 | <i>I expect computers not to malfunction</i> |
| 65.5 | 23.2 | 11.3 | <i>I expect computers to malfunction occasionally</i> |
| 17.3 | 30.4 | 52.3 | <i>I expect computers to malfunction regularly</i> |
| Expectation - personal performance related to the use of computers: | | | |
| 73.9 | 16.3 | 9.9 | <i>Generally computers do/could help to accomplish tasks more quickly</i> |
| 73.5 | 21.3 | 5.3 | <i>Generally computers help to accomplish tasks more easily</i> |
| 78.3 | 12.2 | 9.5 | <i>Generally computers do/could help me to accomplish tasks with better quality</i> |
| 56.7 | 26.7 | 16.5 | <i>My job is/would be made simpler using computers</i> |
| 52.1 | 31.4 | 16.5 | <i>Knowing more about computers would help me do my job better</i> |
| 45.8 | 29.4 | 24.8 | <i>The unavailability of computers would/does cause me significant problems</i> |
| 52.1 | 16.0 | 31.9 | <i>I could/can do my job without computers</i> |
| 10.2 | 30.2 | 59.7 | <i>I can/could do my job better without computers</i> |

| Agree (%) | Neutral (%) | Disagree (%) | |
|---|-------------|--------------|--|
| Outcome expectation - personal attitude towards the concept of computing: | | | |
| 72.8 | 20.3 | 6.9 | <i>I think that computers will become more important in my job in the future</i> |
| 60.9 | 28.5 | 10.6 | <i>I think using computers will/would help my career</i> |
| 62.5 | 27.4 | 10.1 | <i>I think that the ability to use computers improves job status</i> |
| Affect: | | | |
| 92.1 | 4.5 | 3.4 | <i>I am willing to learn about computers</i> |
| 81.8 | 13.0 | 5.2 | <i>I do/would prefer having access to a computer than not</i> |
| 77.6 | 16.0 | 6.5 | <i>I wish that I knew more about computers</i> |
| 69.3 | 23.3 | 7.5 | <i>I am looking forward to using computers in the future</i> |
| Anxiety: | | | |
| 27.2 | 20.7 | 52.1 | <i>I do/would use computers only when I have/had to</i> |
| 17.4 | 17.9 | 64.7 | <i>I will use computers only when I have to in the future</i> |
| 17.2 | 27.4 | 55.4 | <i>I am worried that if I don't know something about computers I will look silly</i> |
| 11.6 | 18.3 | 70.1 | <i>The introduction of computers worries me</i> |
| 7.1 | 14.8 | 78.1 | <i>I would rather not use computers in the future</i> |
| Attitude to the concept of computers: | | | |
| 12.3 | 36.1 | 51.5 | <i>I think too much money is spent on computers</i> |
| 6.5 | 22.0 | 71.6 | <i>I don't care about computers</i> |
| 5.3 | 18.8 | 75.9 | <i>I think computers are more trouble than they are worth</i> |
| Usage: | | | |
| 93.1 | 4.0 | 2.8 | <i>I think that computers will be used more in health services in the future</i> |
| 46.2 | 11.8 | 42.0 | <i>I use computers routinely</i> |
| 52.5 | 35.1 | 12.4 | <i>I will use computers routinely in the future</i> |
| 66.8 | 23.8 | 9.4 | <i>If I had more training I would use computers more</i> |
| 79.9 | 13.2 | 6.9 | <i>If I had more training I would use computers more effectively</i> |
| Use Support: | | | |
| 31.8 | 40.2 | 28.1 | <i>Some people encourage me to use computers</i> |
| 31.5 | 39.5 | 29.1 | <i>No-one encourages me to use computers</i> |
| 23.5 | 36.5 | 40.1 | <i>My manager encourages me to use computers</i> |
| 65.5 | 20.8 | 13.7 | <i>I do/would need more support to be able to use computers adequately</i> |
| 42.0 | 34.0 | 24.0 | <i>I think I can/could get adequate support if I have problems with computers</i> |
| 38.1 | 29.0 | 32.9 | <i>I don't have enough time to learn about computers</i> |

A little more than half of respondents reported that they both knew more and were also more confident about computers than a year ago. Approximately 25% disagreed with the statement that they knew more.

Although only 24% thought they knew what to do if computers malfunction and felt confident enough to help others, the vast majority were confident in seeking support. Most respondents expected there to be occasional computer malfunction, and more expected there to be no malfunction rather than regular malfunction.

Most people agreed that computers could be of use to them, approximately 75% believing they can help accomplish tasks more quickly or easily. Questions concerning personalised impact of computer use produced a higher level of agreement regarding computers leading to better quality of work, and less agreement that the job was either made simpler or better. In both latter cases neutrality increased to a greater extent than disagreement with the suggestion. In relation to each of these 5 questions disagreement remained below 17%. Relating to computer impact on work the terms, a) more quickly, b) easier and c) better quality, each associated with *tasks*, thus prompted a higher level of agreement than the terms, d) simpler or e) better, which were associated with their *job*.

There was less agreement, at a level of 45% that significant problems were caused by computer unavailability. A majority agreed that they could do their job without computers whilst 32% reported dependence on the use of computers in their work. This was less than levels agreeing with suggested benefits.

A substantially different response, more positive towards computers resulted from asking whether their job could be done better without computers. Only 10% agreed and 60% disagreed. The response to these questions demonstrated that whilst levels of use and reliance on computers were not at high levels, this did not match belief in their utility. In respect of a number of questions approximately 10% of respondents disagreed that computers could or do bring benefits.

Belief relating to general benefits of using computers showed a consistent, high level of positive response. Over 70% believed that computers would personally become more important and over 60% agreed that it will/would help their career and generally improve job status. Disagreement was consistently below 11%.

Questions concerning affect, or positive associations with computing, were phrased in terms of learning, preferring to have access to IS, knowing more, and looking forward to using IS. Disagreement with questions phrased positively towards computer use was consistently below 10% and as low as 3%. The vast majority (92%) indicated that they were willing to learn but less (69%) were looking forward to using computers.

Whilst 82% stated a preference to access computers, 27% agreed that they used computers only when they had to. When the latter statement was altered to include the phrase *in the future*, agreement reduced to 17%, and further still to 7% with the inclusion of the phrase *would rather not use in the future*. These questions generally produced a higher level of negative attitude and potential resistance expressed through personal anxiety. Positive attitudes towards computers were in the majority in all cases however.

Few people (12%) agreed that too much money is spent on computers. Less than 10% agreed that they do not care about computers or thought that they are more trouble than they are worth.

The vast majority (93%) thought that computers would be used more in health services in the future and half that they personally would routinely use them. The contrast between current and envisaged future use demonstrated the belief that general use would at some point extend to personal use. Compared to the present situation far less disagreed that they would routinely be computer users in the future.

The role of training as an incentive to use was seen positively, 67% agreeing that it would personally prompt more use and 80%, more effective use. Less than 10% disagreed with this statement.

Approximately one third stated that either some people or no-one encouraged them to use computers. Less than a quarter stated that their manager encouraged them.

Two-thirds of respondents suggested that more support was needed for adequate use with only 14% disagreeing, and two fifths agreed that adequate support was available. There were fewer positive responses than in other areas relating to benefits of computers. The statement that there was not enough time to learn produced a relatively balanced response between positive, negative and neutral opinion.

3.1.5 The relationship between computer use, attitude, & other variables

3.1.5.1 Attitude related to computer use

The majority of Trust staff (all directorates combined including the study directorate) had used computers at work, the largest category of use being 5-10 years experience (Table 3.8), and 42% (315) had no work-based experience. A larger proportion of staff - 68% - had used computers at home, the largest category of home use being 2-5 years experience. Although home use of computers was more common, those who were users at work had a longer period of experience.

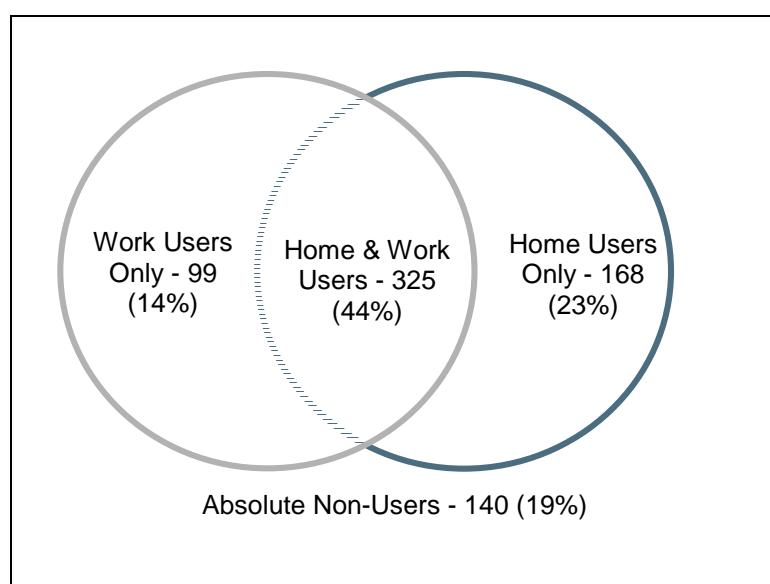
Table 3.8 Trust staff computer experience - users & non-users at work & home

| Period of Experience | Work Users | Percentage | Home Users | Percentage |
|-----------------------------|-------------------|-------------------|-------------------|-------------------|
| None | 315 | 41.8 | 240 | 32.4 |
| 0-6 Months | 41 | 5.4 | 88 | 11.9 |
| 6 Months - 2 Years | 72 | 9.6 | 113 | 15.3 |
| 2 - 5 Years | 99 | 13.1 | 169 | 22.8 |
| 5 - 10 Years | 132 | 17.5 | 77 | 10.4 |
| 10+ Years | 95 | 12.6 | 53 | 7.2 |
| Total users | 439 | 58.2 | 500 | 67.6 |
| Total (all) | 754 | 100.0 | 740 | 100.00 |

Respondents were categorised as either computer *users* or *non-users*, both at work and at home. Combining these categories those with no experience of

computer use either at work or home were termed *absolute non-users*, and those with experience at either or both locations, termed *absolute users*. A quarter of respondents were home users only, whilst a fifth were absolute non-users. There were 44% who were both work and home users (Figure 3.1).

Figure 3.1 Trust staff - work, home & absolute computer use
(Total sample - 732)



There was consistent evidence of greater positive opinion being associated with longer experience of computer use. Those with no or 0-6 months experience of computers at work were a distinctly less positive group. Work users were significantly and consistently more positive towards computers than non-users.

The contrast between attitudes according to the period of work use was repeated in relation to home use of computers. There was evidence of greater levels of positive opinion with longer periods of computer use. Responses were however not significantly different concerning their experience of use support at work, opinion of job status associated with computer use and its likely increased importance in the future.

Home users were found to be consistently more positive towards computers than home non-users (Table 3.9). Absolute users were consistently more positive towards computers and their use than absolute non-users with significantly different responses found in relation to the majority of questions. Home only users also demonstrated higher levels of positive attitude than absolute non-users with a majority of questions producing significantly different responses.

Considering this range of results predominantly significantly different responses were found according to computer use. This included attitude varying according to use of computers at home regardless of experience at work. Those with experience only at home were more confident and believed that they had learnt from this experience. Beyond the positive personal effects of having used computers, home only users were also generally more positive than absolute non-users in a range of areas including looking forward to using computers in the future, being less worried about their introduction, and with greater preference to access computers.

Absolute non-users were found to be consistently and significantly the least positive towards computers at work when comparing this group with home only users, and other users (at work, or at work and home).

Table 3.9 Tests for significantly different ISA responses - work and home computer use

| Question | Work use (all categories) | Work use/non-use | Home use (all categories) | Home use/non-use | Absolute users & non-users | Home only users, other users & absolute non-users | Home only & absolute non-users |
|--|--------------------------------------|-------------------------|--------------------------------------|-------------------------|---------------------------------------|--|---|
| Self-Efficacy (Cognitive) i.e. Ability to use computers | | | | | | | |
| I know more about computers than I did a year ago | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I am more confident about using computers than I was a year ago | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I feel confident enough to help others if they have a problem with computers | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| If I have/had a computer problem I don't/wouldn't mind asking for help | No | No | No | No | No | No | No |
| I do/would know what to do if computers malfunction | Yes* | Yes* | Yes* | Yes* | Yes | Yes* | Yes* |
| Outcome Expectation - Performance (Cognitive) i.e. performance of computers themselves | | | | | | | |
| I expect computers not to malfunction | No | Yes | Yes | Yes | Yes | Yes | No |
| I expect computers to malfunction occasionally | Yes | Yes* | No | Yes | Yes* | Yes* | No |
| I expect computers to malfunction regularly | Yes | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| Outcome Expectation - Performance (Cognitive) i.e. personal performance related to the use of computers | | | | | | | |
| Generally computers do/could help me to accomplish tasks with better quality | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| Generally computers help to accomplish tasks more easily | Yes* | Yes* | Yes | Yes | Yes* | Yes* | No |
| Knowing more about computers would help me do my job better | Yes* | Yes* | No | Yes | Yes* | Yes* | Yes |
| Generally computers do/could help to accomplish tasks more quickly | Yes* | Yes* | Yes | Yes | Yes* | Yes* | Yes |
| My job is/would be made simpler using computers | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| The unavailability of computers would/does cause me significant problems | Yes* | Yes* | Yes* | Yes | Yes* | Yes* | No |
| I can/could do my job better without computers | Yes* | Yes* | Yes* | Yes | Yes* | Yes* | No |
| I could/can do my job without computers | Yes* | Yes* | Yes* | No | Yes* | Yes* | No |
| Outcome Expectations - Personal (Cognitive) i.e. attitude towards concept of computing | | | | | | | |
| I think using computers will/would help my career | Yes* | Yes* | Yes | Yes* | Yes* | Yes* | No |
| I think that computers will become more important in my job in the future | Yes | Yes | No | No | Yes | Yes | No |
| I think the ability to use computers improves job status | No | Yes | No | No | No | Yes | No |

| Question | Work use (all categories) | Work use/non-use | Home use (all categories) | Home use/non-Use | Absolute users & non-users | Home only users, other users & absolute non-users | Home only & absolute non users |
|---|------------------------------|------------------|------------------------------|------------------|----------------------------|---|--------------------------------|
| Affect (Affective Factors) | | | | | | | |
| I am looking forward to using computers in the future | Yes* | Yes* | Yes | Yes* | Yes* | Yes* | Yes* |
| I do/would prefer having access to a computer than not | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I am willing to learn about computers | Yes | Yes* | Yes* | Yes | Yes* | Yes* | Yes |
| I wish that I knew more about computers | Yes | Yes | Yes | No | Yes | No | No |
| Anxiety (Affective Factors) | | | | | | | |
| The introduction of computers worries me | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes |
| I am worried that if I don't know something about computers I will look silly | No | No | Yes* | Yes | No | No | No |
| I do/would use computers only when I have/had to | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I will use computers only when I have to in the future | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I would rather not use computers in the future | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes |
| Attitude to the Concept of Computers - development of Anxiety | | | | | | | |
| I think too much money is spent on computers | Yes | Yes* | Yes* | Yes* | Yes* | Yes* | Yes |
| I think computers are more trouble than they are worth | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I don't care about computers | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| Usage | | | | | | | |
| I use computers routinely | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| I will use computers routinely in the future | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* |
| If I had more training I would use computers more | Yes | No | Yes | No | No | No | No |
| If I had more training I would use computers more effectively | No | No | Yes | Yes | Yes | Yes | Yes |
| I think that computers will be used more in health services in the future | No | No | No | No | No | No | No |

| Question | Work use (all categories) | Work use/non-use | Home use (all categories) | Home use/non-Use | Absolute users & non-users | Home only users, other users & absolute non-users | Home only & absolute non users |
|--|------------------------------|------------------|------------------------------|------------------|----------------------------|---|--------------------------------|
| Use Support | | | | | | | |
| Some people encourage me to use computers | Yes* | Yes* | Yes | Yes | Yes* | Yes* | Yes* |
| My manager encourages me to use computers | Yes* | Yes* | No | Yes | Yes* | Yes* | No |
| No one encourages me to use computers | Yes* | Yes* | No | Yes | Yes* | Yes* | No |
| I do/would need more support to be able to use computers adequately | Yes* | Yes* | Yes* | Yes* | Yes* | Yes* | Yes |
| I don't have enough time to learn about computers | Yes | Yes* | No | No | Yes | Yes* | Yes |
| I think I can/could get adequate support if I have problems with computers | Yes* | Yes* | No | No | Yes | Yes* | No |

Note: Results produced from cross tabulations performed using the Pearson Chi-Square test at a level of significance of both 0.05 and 0.001.

Key:

No = No significant difference between responses at either 0.05 or 0.001.

Yes = Significant difference between responses at level of significance of 0.05.

Yes* = Significant difference between responses at level of significance of 0.05 and 0.001.

3.1.5.2 Use & attitude according to directorate

Use at home by Specialist Services staff was significantly higher (83%) ($p = 0.05$) than staff of other directorates (Table 3.10). Their work use and that of the non-clinical Corporate directorate staff was significantly greater (over 80%) ($p = 0.05$) than the other, clinical directorates (all under 50%).

Table 3.10 ISA questionnaire response - home & work use computer according to directorate

| | | Directorate | | | | | |
|-----------------|--------------------------------|--------------------------------------|----------------|----------------|---------------|---------------|-----------------|
| | | Study Dir. | Adult | Elderly | Specialist | Corporate | Total |
| Home Use | Non-User (% in Dir.) | 68 (34.3%) | 102 (35.2%) | 26 (35.1%) | 15 (17.4%) | 29 (31.5%) | 240 (32.4%) |
| | User (% in Dir.) | 130 (65.7%) | 188 (64.8%) | 48 (64.9%) | 71 (82.6%) | 63 (68.5%) | 500 (67.6%) |
| | | Home Total (% in Home Use) | 198 (26.8%) | 290 (39.2%) | 74 (10.0%) | 86 (11.6%) | 92 (12.4%) |
| | | | | | | | 740 (100.0%) |
| Work Use | Non-User (% in Dir.) | 100 (50.3%) | 156 (52.7%) | 40 (53.3%) | 16 (18.2%) | 3 (3.1%) | 315 (41.8%) |
| | User (% in Dir.) | 99 (49.7%) | 140 (47.3%) | 35 (46.7%) | 72 (81.8%) | 93 (96.9%) | 439 (58.2%) |
| | | Work Total (% in Work Use) | 199 (26.4%) | 296 (39.3%) | 75 (9.9%) | 88 (11.7%) | 96 (12.7%) |
| | | | | | | | 754 (100.0%) |

There were a high number of questions which produced significantly different responses according to the Trust directorate within which respondents were based (Table 3.11). The principle distinguishing feature of the response according to directorate was that the (non-clinical) corporate directorate was predominantly the most positive. There were several examples where the specialist directorate was more positive than the remainder e.g. having more confidence, whether they could do their job or do it better without computers, and whether they would rather not use computers. The adult, elderly and study directorates varied little, although the study directorate produced a number of least positive responses, demonstrating no evidence to suggest that this directorate would be more receptive to the implementation of IS.

Table 3.11 Tests for significantly different ISA responses – gender, age and professional position

| Question | Gender | Age | Directorate | Function (Grouped) |
|--|---------------|------------|--------------------|-------------------------------|
| Self-Efficacy (Cognitive) i.e. Ability to use computers | | | | |
| I know more about computers than I did a year ago | No | No | Yes* | Yes* |
| I am more confident about using computers than I was a year ago | No | No | Yes* | Yes* |
| I feel confident enough to help others if they have a problem with computers | Yes | Yes | Yes* | Yes* |
| If I have/had a computer problem I don't/wouldn't mind asking for help | No | No | Yes | No |
| I do/would know what to do if computers malfunction | Yes | No | Yes* | Yes* |
| Outcome Expectation - Performance (Cognitive) i.e. performance of computers themselves | | | | |
| I expect computers not to malfunction | Yes | No | Yes | Yes* |
| I expect computers to malfunction occasionally | No | No | No | Yes* |
| I expect computers to malfunction regularly | Yes* | No | Yes | Yes |
| Outcome Expectation - Performance (Cognitive) i.e. personal performance related to the use of computers | | | | |
| Generally computers do/could help me to accomplish tasks with better quality | No | No | Yes | Yes* |
| Generally computers help to accomplish tasks more easily | No | No | Yes* | Yes* |
| Knowing more about computers would help me do my job better | No | Yes | Yes | Yes* |
| Generally computers do/could help to accomplish tasks more quickly | No | No | Yes* | Yes* |
| My job is/would be made simpler using computers | No | No | Yes* | Yes* |
| The unavailability of computers would/does cause me significant problems | No | No | Yes* | Yes* |
| I can/could do my job better without computers | No | No | Yes* | Yes* |
| I could/can do my job without computers | No | No | Yes* | Yes* |
| Outcome Expectations – Personal (Cognitive) i.e. attitude towards concept of computing | | | | |
| I think using computers will/would help my career | No | No | Yes | Yes* |
| I think that computers will become more important in my job in the future | No | Yes* | No | No |
| I think the ability to use computers improves job status | No | No | No | Yes* |
| Affect (Affective Factors) | | | | |
| I am looking forward to using computers in the future | No | Yes | Yes | Yes |
| I do/would prefer having access to a computer than not | No | No | Yes* | Yes* |
| I am willing to learn about computers | No | No | No | No |
| I wish that I knew more about computers | No | No | No | Yes |

| Question | Gender | Age | Directorate | Function (Grouped) |
|---|--------|-----|-------------|--------------------|
| Anxiety (Affective Factors) | | | | |
| The introduction of computers worries me | No | No | Yes | Yes* |
| I am worried that if I don't know something about computers I will look silly | No | No | No | No |
| I do/would use computers only when I have/had to | No | No | Yes* | Yes* |
| I will use computers only when I have to in the future | No | No | Yes* | Yes* |
| I would rather not use computers in the future | No | No | Yes* | Yes* |
| Attitude to the Concept of Computers - A development of Anxiety | | | | |
| I think too much money is spent on computers | No | No | No | Yes* |
| I think computers are more trouble than they are worth | No | No | Yes | Yes* |
| I don't care about computers | Yes | No | Yes | Yes |
| Usage | | | | |
| I use computers routinely | No | No | Yes* | Yes* |
| I will use computers routinely in the future | No | Yes | Yes* | Yes* |
| If I had more training I would use computers more | No | No | No | No |
| If I had more training I would use computers more effectively | No | No | No | No |
| I think that computers will be used more in health services in the future | No | No | No | No |
| Use Support | | | | |
| Some people encourage me to use computers | Yes | No | Yes* | Yes* |
| My manager encourages me to use computers | No | No | Yes* | Yes* |
| No one encourages me to use computers | No | No | Yes* | Yes* |
| I do/would need more support to be able to use computers adequately | No | No | Yes | Yes* |
| I don't have enough time to learn about computers | No | Yes | Yes | Yes* |
| I think I can/could get adequate support if I have problems with computers | No | No | Yes | Yes* |

Note: Results produced from cross tabulations performed using the Pearson Chi-Square test at a level of significance of both 0.05 and 0.001.

Job Function categorised as Medical/PAMS, Nursing and Non-clinical.

Table Key:

No = No significant difference between responses at either 0.05 or 0.001.

Yes = Significant difference between responses at level of significance of 0.05.

Yes* = Significant difference between responses at level of significance of 0.05 and 0.001.

3.1.5.3 Use & attitude according to job function

The managerial, medical and PAMS professional groups reported higher levels of home use (Table 3.12) than the nurses, administrators, and “other” group.

Significantly different levels of work use ($p = 0.05$) were reported between staff functions with a mean of 59%. They ranged from 98% use by administrators and 93% of managers, to just 30% of nurses.

Table 3.12 ISA questionnaire response - home & work use computer according to function

| | | Medical | Nursing | PAMS | Managerial | Admin. | Other | Total |
|---------------------------------|------------------------------------|---------------|----------------|----------------|---------------|----------------|---------------|-----------------|
| Home Use | Non-User (% in Function) | 6 (18.8%) | 128 (38.3%) | 20 (19.8%) | 6 (13.6%) | 63 (34.6%) | 10 (37.0%) | 233 (32.4%) |
| | User (% in Function) | 26 (81.3%) | 206 (61.7%) | 81 (80.2%) | 38 (86.4%) | 119 (65.4%) | 17 (63.0%) | 487 (67.6%) |
| Total (% in Home Use) | | 32 (4.4%) | 334 (46.4%) | 101 (14.0%) | 44 (6.1%) | 182 (25.3%) | 27 (3.8%) | 720 (100.0%) |
| Work Use | Non-User (% in Function) | 7 (21.9%) | 235 (69.7%) | 42 (40.8%) | 3 (6.8%) | 3 (1.6%) | 11 (40.7%) | 301 (41.1%) |
| | User (% in Function) | 25 (78.1%) | 102 (30.3%) | 61 (59.2%) | 41 (93.2%) | 187 (98.4%) | 16 (59.3%) | 432 (58.9%) |
| Total (% in Work Use) | | 32 (4.4%) | 337 (46.0%) | 103 (14.1%) | 44 (6.0%) | 190 (25.9%) | 27 (3.7%) | 733 (100.0%) |

Clinical and non-clinical staff home use was not significantly different (Table 3.13) but there was significantly less work use by clinical staff ($p = 0.05$).

Table 3.13 ISA questionnaire response - home & work computer use according to clinical/non-clinical staff function

| | | Function | | | Total |
|------------------|-----------------|-------------|--------------|--------------|-------------|
| | | Clinical | Non-Clinical | | |
| Home Use | Non-User | 154 (33.0%) | 79 (31.2%) | 233 (32.4%) | 487 (67.6%) |
| | User | 313 (67.0%) | 174 (68.8%) | 487 (67.6%) | |
| Total | | 467 (64.9%) | 253 (35.1%) | 720 (100.0%) | |
| Work User | Non-User | 284 (60.2%) | 17 (6.5%) | 301 (41.1%) | 432 (58.9%) |
| | User | 188 (39.8%) | 244 (93.5%) | 432 (58.9%) | |
| Total | | 472 (64.4%) | 261 (35.6%) | 733 (100.0%) | |

Absolute non-use of computers showed a significant difference with 26% clinical staff who were non-users compared to only 4% of non-clinicians.

Job categorisation (medical/PAMS, nursing and non-clinical) produced significantly different responses between the categories defined (Table 3.11). More of the non-clinical group displayed more positive attitude than medical/PAMS and nursing staff. Nurses did report less confidence (self-efficacy) and were less positive about use support offered, although neither of the two clinical groups were consistently relatively more or less positive than the other.

3.1.5.4 Use & attitude according to age

Home computer use was 70-72% amongst those aged below 50 years, who were significantly more likely to be home users ($p = 0.05$) (Table 3.14). There was no significant difference in use at work by age (54% - 63%).

Table 3.14 ISA questionnaire response - home & work computer use according to age

| | Age | | | | | |
|------------------------------|-------------|-------------|-------------|-------------|-----------|--------------|
| | 20-29 | 30-39 | 40-49 | 50-59 | 60+ | Total |
| Home Use: Non-User | 38 (29.9%) | 71 (28.7%) | 59 (27.8%) | 58 (45.0%) | 9 (60.0%) | 235 (32.2%) |
| User | 89 (70.1%) | 176 (71.3%) | 153 (72.2%) | 71 (55.0%) | 6 (40.0%) | 495 (67.8%) |
| Home Total | 127 (17.4%) | 247 (33.8%) | 212 (29.0%) | 129 (17.7%) | 15 (2.1%) | 730 100.0% |
| Work Use: Non-User | 60 (46.5%) | 108 (43.0%) | 83 (38.8%) | 50 (37.0%) | 6 (40.0%) | 307 (41.3%) |
| User | 69 (53.5%) | 143 (57.0%) | 131 (61.2%) | 85 (63.0%) | 9 (60.0%) | 437 (58.7%) |
| Work Total | 129 (17.3%) | 251 (33.7%) | 214 (28.8%) | 135 (18.1%) | 15 (2.0%) | 744 (100.0%) |

Age did not appear a strong determinant of attitude. There were only a few significant differences in opinion across age groups (Table 3.11). These included, a) greater personal self-confidence to help others by those aged 20-29 and less, compared to those aged 50-59, b) more staff aged 50-59 disagreed that knowing more about computers would help them, agreed less that they would

become personally more important and looked forward to using them and, c) more of those aged 40+ believed that they did not have time to learn.

There was not a sliding scale of views according to increasing age although in some areas the 20-29 group displayed more positive attitudes and those aged 50-59 were less positive e.g. concerning future use of computers.

3.1.5.5 Use & attitude according to gender

A significantly higher rate of home use was found amongst males (over 75%) (Table 3.15), but rates of work use were very similar.

Table 3.15 ISA questionnaire response - home & work computer use according to gender

| | | Gender | | Total |
|-----------------|-----------------|---------------|-------------|--------------|
| | | Female | Male | |
| Home Use | Non-User | 181 (36.3%) | 45 (21.6%) | 226 (32.0%) |
| | User | 317 (63.7%) | 163 (78.4%) | 480 (68.0%) |
| | Total | 498 (70.5%) | 208 (29.5%) | 706 (100.0%) |
| Work Use | Non-User | 209 (41.0%) | 87 (41.8%) | 296 (41.2%) |
| | User | 301 (59.0%) | 121 (58.2%) | 422 (58.8%) |
| | Total | 510 (71.0%) | 208 (29.0%) | 718 (100.0%) |

Gender did not appear to be a strong determinant of attitude, with little significant variation in responses (Table 3.11). Only a small minority of questions produced significantly different responses. These related to, a) greater male personal self-confidence to help others and deal with computer malfunction, b) greater male expectation of computer malfunction, c) females disagreed less that they do not care about computers, and d) a higher proportion of females stated that there was encouragement to use computers by some people. Questions concerning outcome expectation and personal performance produced particularly consistent results between genders e.g. agreeing with the link between computer performance and better quality of work.

Personal confidence to help others was the only question where there was significantly different responses in relation to both age and gender, 20-29 year olds and males being more confident.

The profile of computer use demonstrated similar levels of use existed relating to age and gender at work, and between clinicians and non-clinicians at home. In contrast significant differences were found at work where non-clinicians, and Corporate and Specialist directorates were more often users. At home there were more users who were respectively, male, below 50 years of age, within Management, Medical and PAMS job functions, and within the Specialist directorate. In relation to absolute use clinicians were significantly more likely not to have used computers at all.

In general, levels of work use, and disparity across the variables defined, were not reflected by the level of home use e.g. clinical home use 67%, but just 40% at work. As clinicians were less likely than non-clinicians to use computers at work (but not at home) there was a higher proportion of absolute non-users amongst clinicians.

Although the general response was positive to the concept of computers and their use, there were both areas of consistency of response and significant differences. Whilst response based upon age and gender showed little variation, the corporate directorate (12.8% of total response) and non-clinical functions (35.3% of total response) were predominantly more positive in their attitudes to computers. These two groups featured a high level of common membership and high levels of computer users with 96.9% work users in the corporate directorate and 93.5% non-clinical users of computers at work.

3.2 Attitude in the context of IS implementation

A bibliography of unpublished internal documents accessed, produced by the Trust, its directorates and the local health authority is included as **Appendix S - Comparison study bibliography**. Within the following text reference to these documents is made in the format “[DR###]” indicating the document reference number. Attitudes and comments expressed by individual study respondents are referenced in the format [xx] where respondents are categorised as clinicians [CL], external to the Trust [EX], corporate IS staff [IS], Trust managers [TM] (inclusive of managers within the study directorate), Trust IS users [TU], or study directorate IS users [DU]. Where issues were raised by a number of respondents this is indicated as “(# Resp.)”.

3.2.1 Trust and study directorate - attitudes at the inception of implementation

There was a prolonged period of approximately a decade of consideration, and of initial implementation steps e.g. appointments to the position of project manager (PM), before the Trust⁴ formally agreed, in 1998, to implement an IS across the organisation - the Trust-Wide Information System (TWIS). During this time there was admission of relatively poor existing levels of infrastructure, systems and skills within the Trust, highlighted for example within an Information Management Strategy in 1993 [DR010]. Reasons for the delay in progress were not clear in the documentation available.

The aim and challenge of integrating IS in what became the Trust was raised in 1992 when the health authority and Trust concluded that “*The complexity of introducing an integrated system for the MHSU⁵ should not be underestimated.*” [DR006]. Concerns were expressed by the organisation as to potential difficulty in the context of problems of general and local failure of health IS:

⁴ The term *Trust* is used throughout. During the period studied the organisation became an NHS Trust and later underwent Trust merger, changing its name on both occasions.

⁵ The term *MHSU* refers to the previous title of the Trust.

“There have been numerous horror stories in the press about the waste of vast amounts of money within the NHS and other organisations on inadequate or inappropriate IT systems. The MHSU is no exemption to this.” [DR010, 1993, p24].

Despite a potentially challenging environment for implementation 22 of 23 TWIS managers⁶ consulted reported themselves to be enthusiastic or very enthusiastic towards the concept of the system to be implemented. Interviewees showed strong support for the need to improve IS, and specifically to improve and integrate information - *“Hope it is an opportunity to improve data quality and practices”* [TM] - and to influence the clinical service - *“When it works it will have a massive impact on clinical treatment, reducing paperwork for clinicians”* [TM]. Among the small sample of TWIS users⁷ consulted the idea of the system or project was described variously as “excellent” and “lovely” [TU]. Three users (of 4 interviewed) said they had great hope and enthusiasm whilst one observed merely that they accepted that something was needed.

Within the study directorate, through the Service Headquarters IS development (SHQ) study element staff similarly demonstrated support for the concept of implementation and could appreciate its intention - *“The purpose of the system is to provide efficient, up to date, meaningful data to assist the service”* [DU] (SHQ definition exercise). Six of seven staff questioned were very enthusiastic towards the concept of the system. The Local Information System (LIS) as a mental health IS was also viewed positively throughout the directorate as an integral part of clinical development, which would support the establishment of a new service and both the organisational and clinical changes which were happening.

⁶ To be referred to as “managers”.

⁷ To be referred to as “users”.

3.2.2 Trust - comparison of attitude at inception and during implementation

TWIS managers predominantly described themselves as less enthusiastic towards the current status of the implementation than to its concept. Just one of an original 16 very enthusiastic respondents remained so (23 responses). The only respondent that had an unchanged level of enthusiasm, from concept to actuality, remained very enthusiastic. All others reported a decline in enthusiasm (Table 3.16).

Table 3.16 Managers' attitude to the TWIS system concept & current progress

| | Attitude to System Concept | Attitude to Current Progress |
|---------------------|----------------------------|------------------------------|
| Very Unenthusiastic | 0 | 4 |
| Unenthusiastic | 0 | 6 |
| Neutral | 1 | 9 |
| Enthusiastic | 6 | 3 |
| Very Enthusiastic | 16 | 1 |
| Total Frequency | 23 | 23 |

Accounting for the change, faltering progress, lack of impact and a poor relationship between the implementation process and staff at all levels were stated by project team members. It was suggested that users had been “*lost*” over the period when benefits and changes were not realised [IS]. Directorate representatives within the implementation had also mostly “*lost interest*” or left the Trust. The relationship with senior management was said to be “*crap*”, and considered to be “*a main failing*” of the implementation [IS].

TWIS users, initially enthusiastic, all expressed contrasting, though varying views, after experiencing the implementation and using modules of the IS product. Negative views focussed on the system and its support such as having to use the “*wrong module*”[TU] of the IS, and there being a mismatch between the service and system. There was thought to be a build up of problems and lack of progress, particularly in contrast with another part of the newly-merged Trust.

Three of the four users' hopes and expectations had largely been replaced by frustration, describing the disappointment of actual impact: "*There are going to be teething problems... but this is rubbish*" [TU]. The user currently most satisfied showed less general enthusiasm and concern for the way in which the project was carried out and had lower expectations about personal involvement.

Stating what they thought the project would achieve TWIS managers specified various areas of impact including clinical matters (5 Resps.), and Y2K compliance (4 Resps.). A majority of responses however, concerned there being no impact, negative impact or detailed specifically what it would not achieve (13 Resps.). Statements that they did not know or that it was not clear what would be achieved were also common (8 Resps.).

The system, in reality, was also seen as lacking impetus due to the effect of staffing changes [TM] and the lack of management support, involvement and leadership:

"With the big size of the Trust, number of users and sites to expect any more than what have got is unrealistic with so few resources and no clear project management and leadership." [TM].

Positive examples of suggested achievement were less common, but most frequently concerned information (7 Resps.) as either a general concept or relating to statutory and health authority information, and medical records. Most specifically Y2K/system replacement was discussed (4 Resps.) though with reservations: "*The project hasn't had greater aims*" [IS] and "*Has achieved as much as it can*" [TM].

Given a categorical choice about the impact of the TWIS, three project managers believed it would be negative, eight neutral and eleven positive⁸. Interviews produced more neutral or negative (22 Resps.) than positive statements (14 Resps.). The largest number of positive comments (9 Resps.) concerned

⁸ In comparison the SHQ response to the same question was entirely positive.

potential impact⁹, notably 6 regarding the clinical service e.g. “If able to implement the product fully including Clinical - would have lots of benefits for clinicians and would be support for patient care.” [TM].

Those staff defined as being involved with the implementation were believed, by the managers, to be relatively most enthusiastic towards it, whilst the least enthusiastic were those not involved with the management of the implementation (Table 3.17).

Table 3.17 Attitudes found within the TWIS Implementation

| | Those involved in the Imp. | Those not involved | Those you work with | Those beyond your environment |
|---------------------|----------------------------|--------------------|---------------------|-------------------------------|
| Very Unenthusiastic | 0 | 3 | 0 | 1 |
| Unenthusiastic | 7 | 12 | 10 | 11 |
| Neutral | 2 | 8 | 6 | 9 |
| Enthusiastic | 10 | 0 | 6 | 2 |
| Very Enthusiastic | 4 | 0 | 0 | 0 |
| Total | 23 | 23 | 22 | 23 |

This was similar to reports within the directorate SHQ where respondents saw those involved as (very) enthusiastic whilst all believed those not involved to be less so, pointing to both the challenge of change and variation of attitudes between staff.

3.2.3 Study directorate - comparison of attitude at inception and during implementation

Four of the six staff within the SHQ, who reported themselves to be very enthusiastic towards the concept of the system, remained so towards the completion of implementation. The other two respondents had become merely enthusiastic.

⁹ Interviews were carried out in 2000, subsequent to physical implementation of some system elements.

Within the Service Information Systems Development (SISD), performed during the same period as the Trust's TWIS physical implementation, it was found, through a range of consultation exercises and presentations, that it was not difficult to establish enthusiasm and support for the implementation in concept. All staff appeared able to accept that gains would be felt. At an early stage though there was appreciation that this could be described as merely tolerance or acceptance of what it was hoped to achieve. This did not necessarily produce, and potentially contrasted with, a) direct positive contribution in practice during implementation, b) indirect contributions such as freeing the time of staff to allow them to contribute, or c) appreciation of practical consequences of what was being attempted. A significant implementation role, and cause of frustration of SISD implementation managers, became the need to address attitudes that resulted from a lack of appreciation (at all levels of the directorate) of the relevance of issues which were perceived to be non-technical or not relevant to the implementation of IS e.g. the supply of staff information contributing to allocation of staff to system security groups, and thereby granting access to information and facilities.

The primary block to maintaining positive attitude within the SISD was believed by its managers to be technical delay, and specifically failure to establish a service wide network, and thus service connectivity. Enthusiastic attitudes of many were felt not to be robust, and liable to be negated by delay, where there was no immediate clear (personal) gain, or due to unanticipated results of aspects of implementation. Often there was emphasis on immediate, personal and specific benefits, rather than those which affected others/all, or paved the way for future benefit. Similar to the experience of the TWIS, the term "lost users" was coined, stressing that attitudes were liable to shift and that it was very difficult to retrieve the situation once initial enthusiasm had dissipated.

3.2.4 Trust - attitudes expressed regarding IS implementation

Experience of all of the suggested implementation factors was reported by TWIS managers to be more negative than positive. Across the full range of factors negative responses outnumbered the positive by a ratio of approximately 4:1 (Table 3.18).

Table 3.18 TWIS manager questionnaire - implementation factors

| Question | Very Negative | Negative | Neutral | Positive | Very Positive | Total Resp. |
|-------------------------------|---------------|--------------|--------------|--------------|---------------|---------------|
| Communication | 8 | 9 | 5 | 1 | 0 | 23 |
| User Opinion | 5 | 12 | 6 | 0 | 0 | 23 |
| Senior Mgmt. Support | 6 | 9 | 5 | 1 | 2 | 23 |
| User Consultation | 5 | 9 | 5 | 3 | 1 | 23 |
| Feedback & Monitoring | 4 | 10 | 7 | 2 | 0 | 23 |
| Information re System & Aims | 3 | 11 | 6 | 3 | 0 | 23 |
| Clarity of Project Mission | 3 | 9 | 5 | 4 | 2 | 23 |
| Provision of Training | 3 | 6 | 8 | 6 | 0 | 23 |
| Technical Aspects | 1 | 8 | 12 | 1 | 1 | 23 |
| Project Scheduling & Plan | 4 | 4 | 10 | 4 | 1 | 23 |
| Organisation of Groups/Boards | 3 | 5 | 10 | 3 | 0 | 21 |
| Total Values | 17.9% | 36.7% | 31.5% | 11.2% | 2.8% | 100.0% |
| Mean Response | 4.1 | 8.4 | 7.2 | 2.5 | 0.6 | |

Attitudes expressed pointed to severe and protracted problems with the system itself and its performance. Project and organisationally related issues were dominant amongst those raised. These pointed to the processes undertaken, who was involved and how, what was expected of them, how they and the project were supported, and how strategic support did or did not exist or help.

Responses concerned the challenge of a range of organisational factors that were either pre-existent barriers to the project such as relationships, divisions and attitudes, or were highlighted through its existence.

A number of broad, related themes were raised by TWIS managers as cause for concern. They included, (1) project management and progress, (2) (negative) impact on services and staff including clinical impact not being as expected, (3) areas of achievement and non-achievement, (4) organisational culture, leadership and commitment (Table 3.19 - Comparison study results summary (1), row a), (5) (lack of) clarity about what was happening and why (Table 3.19, row b), (6) technology & the system itself, (7) technical vs. non-technical aspects of implementation, and (8) the distinction between an IS, and information itself, the emphasis being on the former.

Organisational understanding was raised, reflecting IS bias versus the fundamental concept of information - “*... don't believe many people see this as an actual information system*” and that it was a “*project with IT bias. The reality is that it should supposedly be an Information project.*” [TM]. A number of interviewees expressed strong reservations related to the organisation, its attitudes and culture, and how this project was progressing, whether or not it was having an impact particularly in operational and clinical aspects of the organisation.

TWIS managers' descriptions of what they regarded to be the best aspect of the project were categorised as *personal* (13 Resps.), *project by-products* (11 Resps.), *system issues* (10 Resps.) and *negatives/follow-up statements* (14 Resps.). Positive attitude was largely associated with human and organisational issues rather than the system itself, and specifically personalisation of benefits in the context of disappointment. This most commonly included discussion of the benefits of communication with others within the Trust (6 Resps.) such as knowledge of other directorates, meeting others within the Trust and sharing ideas and problems, the benefits of being involved in the project (3 Resps.) and learning (2 Resps.). Most comments included an implied or explicit criticism. Whereas “*goodwill*” and “*The amount of responsibility people take on*” were viewed as positives these were seen as being “*in the face of the lack of management support*” [TM]. In some cases an initial *negative* response (7 Resps.) related to there being nothing that could be described as best, or long pauses or laughs.

In comparison TWIS managers' description of the least favourable aspect of the project prompted a more widespread response (95 individual responses), categorised in terms of aspects of the project (22 Resps., 57 Responses), organisational effects/impact (4 Resps., 25 Responses), and system related (8 Resps., 13 Responses). System output (3 Resps.) was criticised alongside there being "*no end result*" yet [TM], denial that a single system can work for all [TM], the impact of many system rebuilds [TM] and inability of suppliers to resolve problems [TM]. The system (5 Resps.) in general was referred to in terms of problems of particular modules, software quality and lack of results particularly when compared to effort made.

The project was criticised in relation to its general conduct, management, communications and decision-making. Focus and finance was believed to be aimed predominantly towards the system rather than making it work. Beyond this the implementation was seen to be "*totally top-down*" [TM] and divorced from, rather than integrated with the operational and clinical service. The lack of operational and clinical involvement was seen to have broad implications, such as (non)inclusion of related issues and concerns: "*Complete and utter lack of Project Team having an ability to understand what an IS is in totality.*" [EX].

Other issues raised were general frustration, the vast amount of time being taken up by the project, the need to continuously force change to a reluctant public, its divisive nature, and negative future impact - "*The system is now a poisoned chalice. The effect of this assumption and problems of being associated with it won't help development.*" [TM]. NHS IT (2 Resps.) in general was criticised and specifically in relation to the specification and procurement process - "*NHS is not very good at IS procurement*" [TM]. Although they expressed feelings of frustration and criticised the current situation, they also made suggestions for improvement and expressed their commitment to the process and belief in the need for IS.

With direct comparison between TWIS managers' experience of what were termed "other IT projects" there was severe criticism of both the project and

organisation. Project management (11 Resps.) prompted entirely negative responses in comparison with other projects, including poor initial planning - “*seat of the pants project*” [TM] - lack of research and system analysis - “*Where it falls down big time*” [TM]. Lack of clarity was criticised regarding roles, accountability, expectation, and project management experience and skill.

The general context of the Trust and of NHS IT provided a point of comparison and source of tempered criticism as lack of success in this case reflected other similar experiences (4 Resps.). Alternatively it was argued that in contrast to typical NHS projects the TWIS existed and worked:

“Compare this with the normal NHS IT project - late, over budget, and it falls over. I think this is unique as it is seen as poor when it is not. It is tarred with the brush of failure unfairly” [IS].

Table 3.19 Comparison study results summary (1)

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|---|------------------------|---|---|---|--|
| Trust Organisational Culture (a) | - | <p>Universally reported as an inhibitor.</p> <p>Resistance to change, to do what was needed, or to compromise.</p> <p>TWIS managers - problems consistent with usual organisational approach & lack of ownership: "<i>The trust wants a new system as long as no work is involved</i>" [IS].</p> <p>Expectation & fear of association with failure.</p> <p>Strong clinical culture: "<i>Consultants are Gods</i>" [IS].</p> <p>Managers lack of ownership & divisions between them & clinicians.</p> <p>IS culture - "secretive" [EX], excludes others.</p> <p>IS view: "<i>Think that this reflects how the Trust regards IT i.e. poorly</i>" [IS].</p> <p>Change required is "<i>culture shock</i>" [TM], little unity or idea of Trust interest vs. individual interest. IS seen as a niche issue.</p> | - | - | - |
| Clarity of Aim (b) | - | <p>Ambiguity & divergent views expressed.</p> <p>Specification does not match the system implemented. Contrast between a trust-wide and/or integrated system versus Y2K demands & a replacement system.</p> | <p>Clear, tightly controlled concept & development.</p> | <p>Clear, tightly controlled concept & development.</p> | <p>Clearly defined through extensive PID, CATWOE, etc. Emphasised through presentations, working groups etc. with emphasis on communication within & beyond the service. Nine specific major aims outlined.</p> <p>More difficult to gain understanding of service change & impact beyond implementation aims.</p> |

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|--|--|--|---|---|---|
| Clear Problems (c) | Through results - variability of existing use & skill shown. Low levels of confidence expressed. Low levels of user encouragement, particularly from managers, was reported. | IT did not meet some clear criteria e.g. mental health act module. Little non-IT emphasis initially. Under-prepared context & lack of understanding of demands and content of implementation. Ambiguous aims. Non-Clinical system base vs. clinical expectation. Lack of clinical input to the project & of data. Appeared to have a momentum of its own, varied from its stated aims, & lack of senior involvement or intervention to ensure the organisation supported the development. Human & organisational issues not focussed upon, including impact on working practice and workflow. Project Manager isolated & IT oriented. Groups express concern regarding implementation issues - training, support, schedules, data quality etc. Lack of senior management support & dedicated project team, particularly in relation to user support functions. Project scope change during implementation. Actual implementation not genuinely trust-wide - selective & partial. | Lack of support. System itself did not develop away from the central base. Did not achieve remote/electronic data input. | Technical delays. Relationship with IT function & reliance on them. Aspects of implementation by IT that were not in-line with host requirements. | Need to convince and retain support of stakeholders, including those sceptical about local IS activity. Large organisational change required. Shortage of human resource to implement. Reliance on Trust IT, and progress largely dependent on their input. Heavy training & induction demand. Difficulty balancing user support issues (training, communications, presentations, working groups etc.) with managing the IT. Waiting for the IT development to happen & then making it work - sudden need to shift emphasis when IT ready. Exacerbated by poor communications with IT function. During early implementation IT-related "facts" changed constantly - very difficult to prepare the ground in this context e.g. the e-mail system to be used, use or not of remote PC management software. |
| Organisation reaction to the System (d) | - | Much local resentment & antagonism with a lack of clarity regarding what was being done. Whilst there was appreciation of a working system there was strong criticism of the organisation's approach, project management & of the system itself. Specific technical problems identified & continuing, causing user problems. Very varied reactions. Concerns lead to Audit examinations. | Regarded by the service & its director as a distinct & valuable tool. Unclear if the wider service appreciated it as suppliers of data without system access or access to reporting tools. | Appreciated as a step forward. Highlighted the need for more general development on the same lines – a demonstration of potential. | High level of initial/nominal support from managers & clinicians. Some local apprehension. Some growing scepticism as used to things not working locally. Variation between support in principal versus active and day-to-day practical input. |

3.3 Behaviour, practice, understanding & interpretation within the process of IS implementation

3.3.1 Trust and study directorate - volatilities of attitude and “the conceptual divide”

There were a number of varying perspectives, attitudes and expectations expressed towards the progress of the implementation of the TWIS, such as:

“It is unique in that it works ... technically it works, and better than I ever thought it would.” [IS]

“...it is close to another fiasco” [IS]

These contrasting views were expressed within a month of each other, in each case by IS staff. Rather than technical issues the second example was related to *“Very poor management of change”* [IS].

Within each case of implementation studied its management was affected by the challenge presented by the variation of experience, assumptions and knowledge, and their impact through attitude and behaviour. Substantial personalisation of attitude was expressed within both the Trust and the directorate study concerning, (1) personal impact of the project/system, (2) previous experience of IS, (3) personal understanding and expectation of IS, (4) what was expected of the project, system, roles, organisational action and how reality differed, (5) individual's priorities and how the system/project challenged or supported them, and (6) personal position within the organisation and profession.

The influence of membership of professional groups also provided a distinct perspective. Within the TWIS the expression of concern regarding clinical involvement (or lack of) and clinical impact (or lack of) was a common theme. In comparison clinical concerns prompted implementation and were integrated within LIS and SISD with distinct roles for clinicians - both medical and nursing staff (Table 3.19, rows c, d).

Members of both the SISD and SHQ focus groups observed that with personalisation of attitude it was a mistake to make and act upon assumptions about the attitudes of individuals towards aspects of implementation. SISD managers reported implementation vulnerability to volatility of attitude with enduring negative attitudes developing from a miscellany of potential problems e.g. an ingrained view such as the system being “rubbish” due to a temporary fault or relating to problems with an isolated IT-related component such as a paper jam in a printer.

Attitudes elicited also demonstrated that a clear distinction existed between the IS and organisational host perspectives. Appreciation of the nature of IS and implementation, its potential demands and so forth, differed significantly between IS and non-IS staff. IS staff stressed the contrast between their own and other's knowledge concerning system selection, technical matters and fundamentals of the implementation, reflecting a lack of local skills and knowledge.

As the two principal IS contexts studied - the Trust and directorate - demonstrated this was more complex than an IS/non-IS dichotomy. Within the Trust there were issues relating to an IS function (and Trust) being recently merged, whilst within the study directorate implementation was heavily influenced by the relative roles of Trust IS and a local directorate IS function. Beyond this, attitudes, assumptions and expectations regarding the process of implementation also varied between IS staff (Table 3.20 - Comparison study results summary (2), rows a, b).

3.3.2 Loss of confidence in the TWIS and its explanation

The TWIS project, approved with a stated focus on integration, clinical information, and Trust-wide scope was reported to be the Trust's “*number one priority*” [in DR047, 1995; DR114, 1999]. As the implementation progressed the system and the project became criticised however both in general and specific terms, demonstrating significant attitude shifts. There were various reports that there was a “*lack of confidence in the system*” [DR156, 1999], and that it was either “*losing credibility*”[DR138, 1999] or “*lacking credibility*” [DR161, 2000].

These views continued, ultimately with audit reports challenging results:

“Although the Trust considers the PAS phase” of the mental health system to be live *“this phase is not yet fully implemented nor is it robust”* [DR172, 2000]. A further audit report carried out in response to the *“views expressed by users”* confirmed that the system did not meet expectations with a *“limited implementation”* excluding some benefits of integrated IS [DR174, 2001] (Table 3.20, row c).

Although interviews were conducted over a number of months there was a consistent acceptance that both significant benefits were yet to be felt and there was a lack of clarity about how or when this would happen - *“Ask again in a year”* [TM]. The lost opportunity - a “waste” or “wasted opportunity” (6 Resps.) - was highlighted, with recent history being described as *“18 months of stagnation”* [IS] following Trust merger. This was related to an absence of commitment from the organisation:

“Issue of how to get more robust and accurate system if don’t have commitment to use. The window of opportunity to take this chance is reducing - it’s over a year since implementation... People are tired of waiting for it, and see it’s no better.” [TM].

There were questions of whether enthusiasm could be maintained over time whilst not seeing particular benefits other than getting through the Y2K barrier. Whereas the task was seen to be *“a long job”* the question raised was *“but who has the patience? Way of the world is ‘Need it now’”* [TM]. The one dissenting voice amongst managers was that of a member of IS staff who strongly argued that the project had been a success on the basis of technical infrastructure and a database having been implemented and functioning reliably. They clearly separated in their mind, and also within their role, the technical system from any organisational aims and impact (Table 3.19, row d).

Table 3.20 Comparison study results summary (2)

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|--|--|--|---|---|--|
| Trust IS Function Perspective (a) | Internal IS function in place within the organisation. | IS function drove the project from original specification, project management, software development & infrastructure installation. With a lack of existing corporate or senior management ownership, & lacking a structure to generate it, this dominant position remained. Guided by wish, a) to get the hardware in place, b) to install something that worked, & c) get it in on time, rather than responding to service need. | Seen to be detached from a local development. Service argues that there was a lack concern for MHIS development. Little involvement therefore. | IS required to be involved with connections between local & central servers. Conducted after period of attempts to improve relationships with the service. Divergent views relating to roles, system set-up etc. however. | Service perspective is that IS function desired as simple as possible system set up " <i>like we've done it everywhere else</i> ". Not used to / prepared for significant input beyond simple installation. " <i>You use as you want</i> " " <i>We'll set it up as you want</i> " in theory vs. " <i>Why do you want it like that?</i> " " <i>We'll do it later</i> " often in practice. Complexity of linking networks etc. alongside desire for basic network structures i.e. security, data storage etc. Differing approaches to set-up within IT. Appearance of experimentation rather than documented, planned, standard installation. |
| IT Responsibility (b) | - | PM was IT based. Input thus from own department. Infrastructure managed by IT staff Network Manager. The software was provided & developed by a vendor. | Little input from Trust IT. | Server set-up & cabling issues with Trust IT. Debate & conflict regarding network management & account/security policies. | Reliant on IT function & need to attach to Trust systems - beyond PM control subsequent to purchase. Shared/blurred/informal responsibilities for PC's, network planning etc. |
| Actual Functionality (c) | - | Basic elements implemented. Reduction towards a replacement database system for clinical contact, statutory reporting & return generator for corporate purposes. Some elements/modules delayed or not completed. Clinical emphasis shifts to post year 2000 secondary phase development Reporting limited, issues of system speed & mismatch with practice. | Achieved & system retained over a long period. System remains centralised however with manual data-entry & low access within the service. | Achieved aims for availability & use. | Problems establishing comms. links to all sites limits use of integrated services e.g. clinical data storage, Intranet application, & communication impact such as by e-mail use. Constraints of technical delay, to deliver fully functioning networks, & links. |
| Intended Functionality (d) | - | Comprehensive MHIS, including modules for Mental Health Act, Care Programme Approach, In-Patient, Out-Patient, Day-Care, Community Care. | Patient-centred, basic patient data, clinical contact, clinical supervision, care structure, text based referral & decision-making information. | Functioning PC LAN, PC applications, better system & operational security & storage, new practices, development of clinical storage, pilot site for service-wide development. | Linked PC LANs across all sites, available to all staff, Intranet functioning for reference & communication, improved data storage, comprehensive system security, service-wide clinical information storage & retrieval system, parallel administrative development, & long-term development aims. |

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|--|------------------------|--|---|--|--|
| Project Manager Background (e) | - | IT (Network) Specialist. Happiest dealing with technical elements, & retained technical leadership. | Director has clinical professional background, with detailed managerial & information knowledge. | IS generalist. Knowledge of the organization & all its sites. | IS generalist. Knowledge of the organization & all its sites. |
| PM's Knowledge of Organisation (f) | - | PM limited experience, & apparent lack of support from within the organisation. Large, diverse Trust. | As clinical & service Director. | PM experience of all sites & close contact with individuals on sites. | PM experience of all sites & close contact with individuals on sites. Assisted by project structure elements & involvement of others. |
| The Big Project Management Challenges (g) | - | <p>The challenge became to get (parts of) a large database system in place in parts of the organisation by a given date (Y2K).</p> <p>The original challenge to introduce a comprehensive, integrated, single MHIS across the whole organisation remains an ambition to be achieved.</p> <p>A long period of development set alongside organisational & health context changes - continuing to wait for clinical impact but will the systems produced remain relevant?</p> <p>Does the organisation understand and is it prepared for the human & org. demands & impact of such a development? - there was no apparent leadership to address this.</p> <p>The potential & actual conflicts between corporate & directorate perspectives.</p> | <p>Specification of a complex data structure & translation into a functioning system.</p> <p>Lack of integration with corporate developments.</p> <p>Ability to sustain & develop a non-standard system using non-standard software.</p> <p>Could it fulfil corporate requirements and local needs as a clinical/research tool?</p> | <p>Technical functionality combining the technical requirements with organisational needs.</p> <p>Combining local needs with IT function priorities.</p> <p>Development of practices alongside the system, & achieving understanding of that demand.</p> | <p>Establishing new networks, linking them, & creating a new user base with accepted & integrated IS use. To achieve human & organisational implementation in collaboration with the technical.</p> <p>To achieve this without authority over or with a close co-operative relationship with the Trust IT function.</p> <p>Agreement & implementation of desired set-up re network structure & security.</p> <p>The resources required to train many new users, & get them up & running.</p> <p>Does the organisation understand and is it prepared for the demands & impact of such a development? - accepted as a major part of the project management role.</p> |

Describing achievements it was stated that beyond the technical elements, the implementation had achieved “notoriety” [TM], reflecting widespread concerns in a variety of areas: “*...believe the project is in a state of chaos, and possible panic. Have no confidence in there being a positive outcome*” [TM]. Shifting attitudes towards actuality rather than the idea or the concept of the TWIS, were largely associated with loss of confidence in the implementation, and specifically the ability of the organisation to achieve aims. Views expressed concerned problems with the product itself (Table 3.19, row c).

Positive examples of suggested achievement were less common than negative, but most frequently concerned information (7 Resps.) as either a general concept or relating to statutory and health authority information, and medical records. Most specifically Y2K/system replacement was discussed (4 Resps.) though in the context of reservations: “*The project hasn't had greater aims*” [IS] and “*Has achieved as much as it can*” [TM]. Clinical issues were discussed (5 Resps.), but as elsewhere they were linked to the words “*might*” [TM], “*if*” [TM] and “*hope*” [TM] pointing to possible future achievement rather than current status.

Areas of disappointment, frustration and uncertainty extended to roles and personal involvement. Whilst “project management” was predominantly identified (15 Resps. in interview) as being specifically responsible for implementation, relating to the PM, project team and formal groups, six of these managers couched their opinion in terms of what the situation “*Should be*”. Alternative suggestions were that there should be users, Trust, Project Board, or senior management responsibility, and an appropriate project manager with greater understanding of the implementation context, rather than IT based PM producing a technical project (Table 3.20, rows d, e, f).

Through questionnaire only 3 managers stated that they would have preferred to have been involved less, 9 being neutral and 11 wanting more involvement. Despite there being clearly tight deadlines and high workloads only 6 managers interviewed reported that their project-related workload was more than expected. More reported it to be less, for example believing it “*frankly ridiculous that so little used*” [CL], and “*I could have had much more involvement if it was wanted*” [EX].

Of the 6 managers reporting that the project involved little work personally, 5 thought that their workload was less than expected. Others demonstrated their inexperience, including PM3 who “*Had no frame of reference so didn’t know what to expect*” [IS]. There were thus both frustration of those who wanted more involvement alongside others that felt overloaded.

Reduction in confidence was prompted by the combination of the scale and range of the task, the inadequacy of the technical product and the limitations thereby created, and the organisation’s approach (Table 3.20, row g):

“Culture and practice change has been massive. The system needed to be robust, and the technical side needed to be reliable. It isn’t so confidence is down and don’t know whether we will get this back.” [TM].

3.3.3 The emergence of mistrust of the TWIS

Long-term negative impact was feared as a result both of the effect of lack of success of the TWIS on existing systems, information and so forth, but equally the affect it was having upon attitudes, beyond merely reduction in confidence:

“I fear that people have now a high level of cynicism about IS and about its capacity to provide useful information... We all would have had to have done something different for it to have worked” [TM].

The implementation in general, including its supposed Trust-wide status was questioned and believed to betray “*arrogance*” by a member of the newly-merged IT department¹⁰. “*...as there has never been a single Trust system*” [IS]. The system, in reality, was also seen by others as lacking impetus due to the effect of staffing changes [TM] and the lack of management support, involvement and leadership.

¹⁰ With Trust merger taking place during implementation two IT functions were also merged.

This was a widespread disappointment:

"With the big size of the Trust, number of users and sites to expect any more than what have got is unrealistic with so few resources and no clear project management and leadership." [TM].

Comparison with the study directorate highlighted that an absence of positive attitude and behaviour was not necessarily associated with the presence of negative behaviour and attitude such as mistrust. In the study directorate implementation managers and focus groups indicated that difficulty was experienced through lack of involvement, neutrality or apathy of staff. Positive attitude was thereby not contrasted with negative attitude and behaviour but rather a lack of an individual's positive input and/or belief that IS implementation was, or was not, anything to do with them. Within the TWIS however there was, in addition to the loss of confidence described, a substantial element of negative attitude, mistrust and hostility (Table 3.19 row c, Table 3.20 row g).

TWIS managers reported a predominant belief that in relation to general decision-making they had no involvement or added that decisions had already been made (13 Resps.). Attendance at systems demonstrations, and system specification and selection were identified as areas where they were involved. Of 19 interviewees who provided a clear idea of their influence 13 reported that they had "*little or no influence*", comments including being "*ignored*" [EX], "*removed from influence*" [TM], and reflecting that "*so many decisions had been made previously*" [TM]. In comparison 6 interviewees, 3 of whom were IS staff, felt they had "*a lot*" of influence.

The inability to contribute, or non-involvement (8 Resps.), and the involvement of relevant skills were a matter of concern, alongside a belief that there had been relatively little discussion of project aims (7 Resps.). Experiences contrasted between those who expressed difficulty in achieving involvement e.g. in accessing documentation [TM and EX], and others who argued that they were consulted but did not feel able to contribute [TM and IS] e.g. commenting that they avoided it "*like the plague*" as "*there were already enough people involved*

who knew nothing" [IS]. One of the interviewees who reported that they did not feel able to contribute also discussed the fact that they were asked to play a central management role in a later phase of the project (Table 3.21 - Comparison study results summary (3), rows a, b, c, d).

System selection led to severe reservations about both the process and the resultant choice of the system. TWIS managers questioned whether the involvement of most of them in selection was relevant, whether the originally stated aims were realistic and whether any system could deliver what was required. The contrast between the theory of how the implementation was or should progress, and reality, was demonstrated by the fact that whilst there was relatively broad involvement in the procurement process, what was not known by the majority of interviewees was that the choice of system was actually both very limited and in the hands of IT staff.

There was little evidence of involvement in defining, debating or developing aims, even PM3 making clear their own lack of involvement. Absence of operational input to decision-making was commented upon with the suggestion that the project manager or "*powers that be*" [IS] were carrying out the project regardless. Practice did not reflect shared understanding of what the decision-making or implementation process was or who should be involved in it, and frustration was expressed:

"There is tension though over raising managerial issues. How many times can you bring up issues of resourcing, over-expectancy, and non-clinical impact" [TM],

and relating to lack of input:

"When the specification was produced the attitude was 'Here's the specification, you have the weekend to comment'. This was a very real issue i.e. people not really given opportunity to contribute fully at this important stage" [TM].

Table 3.21 Comparison study results summary (3)

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|---------------------------------------|------------------------|---|--|--|---|
| Project History (a) | - | <p>At least 10 years discussion & preparation, with a series of major documents such as PID, OBS etc. The project thus had a “history”.</p> <p>Apparent contradiction of waiting for the system & then divergence between what trailed to what the project was.</p> <p>Views that previously there was no “mature marketplace” for MHIS then when judged to have changed, little option actually found through selection process.</p> | <p>A direct immediate response to service creation & clinical need. No existing systems deemed suitable.</p> | <p>Inadequate functioning of existing IS, & delay caused by inadequate funding to support the development.</p> | <p>Several years waiting for funding to carry out the development. Absence of IT infrastructure. Wish for generalised & routinised use of IS for clinical & administrative purposes.</p> <p>System pilots worked on for two years i.e. systems & network structures. Discussions with service Director & operational staff followed.</p> <p>Restrictions to development historically based on lack of funding locally, & lack of infrastructure development within the Trust.</p> |
| Sponsor (b) | - | Not Clear or strong. Project approved by Trust management as a result of the “threat” of Year 2000. | Service Director (clinician). | Service Director (clinician). | Service Director (clinician). |
| Senior Involvement (c) | - | Little apparent. Project Board rarely met. | Service Director (clinician). | Service Director as required. | Actual involvement limited to regular Project Board meetings & some presentations. Intervention made when requested by PM. |
| Senior Support (d) | - | Little is apparent e.g. low profile Project Board role and Project Director. | Service Director (clinician). | Service Director (clinician). | Service Director (clinician). |

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|---|------------------------|---|---|---|--|
| Actual System / Implementation Scope (e) | - | Becomes closer to a replacement system with immediate time constraints of Y2K. Potential clinical impact pushed back to a "second phase". Lack of change to processes, & predominantly the same users as existing IS - low user level against specified aims. Variable take-up within directorates. Intended extension, to non-mental-health part of Trust, during physical implementation, abandoned [DR167] with inadequate "staff, skills and resources [DR172]. | Implemented & used as intended within Directorate. Not extended to general org. use. Remains a centralised database, not distributed within service. | As planned - access and use by all staff on site i.e. clinical, administrative and managerial. | Remained in technical development by December 2002. Implementation across all sites as intended with approximately 400 users introduced to the systems. |
| Intended System / Implementation Scope (f) | - | Specified as a single "Trust-wide" system or MHIS over several years, from initial desire to develop from 1992. Intension - extended [DR092] to newly merged, non-mental health part of Trust. IS reported this to be contrary to their views, with no specification & decision taken out of their hands. | A MHIS for use within a single Trust directorate. Plans made for more general application of data structure across the organisation. | Single site infrastructure, PC LAN & systems use. | Throughout the directorate, to create IT infrastructure on all sites, linking each. To increase use & users of IS, addressing clinical information storage & access. Access to all service information via an Intranet, & communication via networks/Intranet/e-mail. |
| System Security (g) | - | On-going concern relating to "openness" of data across directorates to all staff accessing the system. Particular Directorate objections. Not dealt with at an early stage & continued to cause problems. Some directorates and services asserted greater security & confidentiality needs than offered through system. Security issues not dealt with early from a clinical perspective, understanding impact of services & on clinical & administrative practice. | Restricted user base reduces issues. Network & database passwords applied. | Improving, raising the profile, & standardising practice relating to security & confidentiality was an integral part of the development. This was a significant part of the consultation & induction process. Network security set-up subject of conflict with IT function. The service requested more stringent security than Trust IT generally applied and wanted to apply here. Long negotiation to gain access to and control of network security. Concerns regarding the existing application of security settings by IT function confirmed when service was able to access & manage them. | As per SHQ - improving, raising the profile, & standardising practice relating to security & confidentiality was an integral part of the development. This was a significant part of the consultation & induction. Development of clinical data storage reliant on security plan generated by a dedicated working group. This was applied to the network rather than a database. Intranet development also reliant on adequate & appropriate security - difficult to achieve within context of Trust. |

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|--|------------------------|--|---|--|--|
| User Support & Site Contact (h) | - | Limited resources. Use made of a small number of directorate local experts. Part-time support officer. | Limited to one site so self-contained. | User consultation approach developed - one-to-one support & substantial documentation. | User support function identified & formalised with full-time role created. Contacts set up on all sites, sometimes with both administrative & operational staff. Full-time User Support role created. |
| PM Initiative & Control (i) | - | PM personally regarded their ability to control as limited, but others within the project saw as total. PM personally felt constrained. Project seemed to drive itself from original specification. Different concepts of what the project was. Lack of human & organisational consideration & skill led to technological determinism. | No project manager as such. Director had virtual total control. | Strong within the host but limited by the Trust IT function. Others saw PM as having strong control but the PM personally felt constrained by the role of IT function & inability to direct or influence them. The development was felt by the PM to remain relatively IT deterministic. | Significant but reported to Project Board. Wrote the PID & defined aims. Job then to keep others convinced & on-board e.g. through Implementation Group, Board, Operational Group, site contacts, and Trust IT function. |

3.3.4 Weaknesses in the Trust's approach to IS implementation

Within the spectrum of issues raised describing difficulty encountered examples of specific failings can be identified, which in turn can be linked to a variety of associated problems and respondent criticisms. Each related to clarity and understanding of aims, task and the implementation carried out.

3.3.4.1 The relationship between IS implementation and both clinical information and the clinical service

At a relatively late stage of the TWIS it remained a primary concern that stakeholders and in particular clinicians still had yet to become significantly involved, and instead the project had actually “alienated” [TM] them. This was in the context of a clinician’s negative view of the Trust’s general approach to clinical information, and the need for clinical debate between directorates, and to address “*the pitiful state of clinical information*” [CL] (Table 3.21, rows e, f).

Throughout the period studied there were no clinicians dedicated to the implementation or within influential positions such as project manager or director. The implementation placed extra burdens on existing workloads but means to involve clinicians were regarded as inappropriate - “*What does the OBS mean to Clinicians?*” [TM] - half-hearted or inadequate:

“*Couldn’t afford to release Clinicians to it full-time. Resources was the issue - questioned this again and again. It was done on a shoestring*” [TM].

Clinical issues were expressed as a concern in terms of failure of the implementation’s clinical service impact, of not addressing the reality of clinical processes, and questioning whether the project would go far enough to affect clinicians themselves [TM] despite proposals to change responsibility for clinical data input to clinicians. This situation was compared unfavourably to initial perceptions of what the project was expected to achieve, stated by one as having been presented as “*The answer to the meaning of life for Clinicians*” [TM].

Beyond resources and the competence of implementation management however some believed that clinical involvement was actively avoided as a conscious approach, reflecting a lack of confidence of knowledge of the clinical services and information, and the Trust's approach to clinical information:

“Could have been used well - was the only Trust consultant with responsibility for setting up and running a Clinical IS ... Was little used but should have been” [CL],

“It shows how the Trust deals with information and the clinical service - it is a consequence of the environment.” [CL].

Despite the long period of consideration before the TWIS was approved and considerable weight of documentation it was ambiguous whether this was a project to implement a clinical system, an MHIS, or alternatively ISMH, either initially or through what became defined as a further “clinical”, or second phase.

Beyond the technical capability of the IS the Trust did not recognise or address the significant implications of attempting to vastly broaden access to clinical data. This task would have required clinical input throughout the Trust at a relatively early stage. System and implementation credibility and involvement of some services was consequently affected by the belief amongst directorates and clinical staff that an essential issue had been neglected. Lack of progress was thus reported in 2000 and beyond e.g. at various Mental Health Steering Group meetings.

3.3.4.2 Capability and functionality of the technical product

In relation to the reason for system choice there was a contrast in response. A minority felt that, given the circumstances of the project, there was a clear choice to be made based on limited alternatives or financial reality. The majority of respondents, discussing their role in system selection referred to uncertainty, negative or qualified reasons for the choice (Table 3.21, row e) (discussed in detail at section 3.3.6).

The minority view came from IS staff who were directly involved in the choice of system. They observed that whatever people thought the reality was that this was “*the best of a bad bunch*” [IS], and “*This was the only mental health system*” [IS] that had been considered. There was little evidence that at the stage of short-list selection there was either a significant choice to make, or that systems short-listed provided what was thought to be needed. There was no evidence of an assumed “*mature marketplace*” referred to several years previously by PM1 [DR034, Outline Business Case, 1994], which justified the decision to procure what was described as an “*off the shelf and modify*” type product. With other systems not meeting basic requirements, designed as general health rather than mental health IS or not yet fully functioning, IS staff suggested that, despite their apparent lack of enthusiasm, there was a relatively simple decision to made. In practice the involvement of others within the Trust during the selection process had little or no influence (Table 3.21, row a).

The impression created was that, whatever non-IS staff may think, there was little alternative and the chosen product would have to be made to work, regardless of what the aims were, what the series of specifications asked for, how realistic this was and how knowledgeable, committed or involved Trust directorates were. Reservations and uncertainty were apparently swept aside, when presented with an approaching deadline and the need to make a choice between a small number of systems.

3.3.4.3 The approach to non-technical issues

As the TWIS project progressed and physical implementation took place the general awareness of human and organisational issues, the need to address them, and results of failure to do so, became more evident. Despite this they were not all addressed and problems appeared unresolved. Specific issues raised included, security and confidentiality, Data Protection Act compliance, work practices, processes, data flows, clinical and process definition, standardisation, administrative impact, and user training and support (Table 3.21, row g, h).

An area of continuing discussion and dissatisfaction concerned support to system users, specifically through a helpdesk and training. It was reported that central helpdesk provision was a recurring problem, initially raised in September 1993 [DR010] and problems still discussed for example by the TWIS Steering Group in May 1999 [DR100]. Inability to support this system for reasons of capacity and a lack of expertise was discussed, alongside over-reliance on a small number of local staff, titled “local experts”. It was recognised that the helpdesk personnel knew far less than the existing operational local experts.

The issue of training had clear similarities, with early demands to prioritise, and expressions of concern of the organisation’s history in this area [DR050, 1995]. Subsequently a Training Sub-Group was formed which expressed concern as to the handling of the subject. This was disbanded in 1999 but the issue remained a concern: “*It was agreed that training on*” the system “*must be the Trust’s number one priority otherwise the project will fail*” [DR114]. A dedicated training resource was set up at a relatively late stage and “*inadequate training*” was described through audit [DR174].

Such issues related to the functioning and support of the system and its users and were viewed as under-resourced, and unresolved, despite physical system implementation and daily use, as confirmed by a Completion Report in 2000 [DR159].

Management of the issue of security and confidentiality of data had also yet to be successfully addressed by 2001. It had been expressed as a continuing concern over a long period, (1) described as a key concern in 1994 [DR019], (2) mentioned within requirement specification without any detail of how to address it in 1994 [DR031], (3) the IM&T Manager requested general consideration of the issue in 1996 [DR062], (4) security and confidentiality issues beyond those directly affected by the project were excluded from consideration in 1998 [DR065], (5) the Trust believed it still needed to agree principles on confidentiality, with concern that this project could not do this, in 1999 [DR101], (6) an audit report in 2001 stated concern that system security was open and did not meet requirements [DR174], and (7) access to information regarding one

patient still gave access to all patients on the system i.e. open security, in 2001 [DR176] (Table 3.21, row g).

3.3.4.4 Scope of the TWIS

The struggle to match initial ambition with a project to practically support that ambition was demonstrated. Behaviour and attitudes exhibited and roles played were linked to the fundamental issue of what the project was defined as. This ranged between a “*single generic patient-based database*”, to capture “*all patient-related activity within the MHSU*” [DR011, October 1993], and the less ambitious target of “*... Year 2000 compliance enabling us to continue working into the millennium... will also provide the Trust with a single Patient Index.*” [DR090, April 1999]. In this context, with outstanding questions of IS impact and content, 8 of the 23 TWIS managers did not expect to use that system at all, and only 5 expected to use it daily (Table 3.21, rows f, g).

There was ambiguity concerning what the project would involve and thus what the organisation would have to address. A Project Initiation Document (PID) signalled reduction in project scope, for whilst it concerned a system “*capable of capturing all of the Trust’s patient related activity*” [DR065] it listed exclusions including “*The impact of the implementation on the organisation except in those areas specifically affected by the implementation of the new system.*” In addition it was stated that:

“*Very little ‘organisational development’ is included within the scope of the project and this will limit the extent of the benefits which can be realised from the new system...*” [DR065].

There was a difference between a project largely restricted to physically installing a procured product, and alternatively one to involve all parts of the Trust, to incorporate Trust-wide non-clinical and clinical information, organisational issues and weaknesses, and both initial and on-going development of IS. This issue was also referred to over a number of years, (1) the health authority questioned the narrowness of initial plans (1993), (2) initial project documentation stressed

the breadth of the task (1993 -), (3) aims were redefined with narrowing of the scope of what was to be attempted towards a systems replacement product (1998), (4) project group members challenged the narrow scope of the project and its failure to address fundamentals (1998 -), (5) the health authority questioned skills within the Trust and in general the standard of data/information capture, analysis and use (1998), (6) extension of implementation of the same system to a newly-merged part of Trust decided upon (1999) and abandoned (2000) and (7) audit reports criticised management of the project and the limited nature of what was implemented (2000, 2001).

During the period studied the TWIS also failed to become a genuinely Trust-wide implementation. Two of the Trust's directorates raised issues of security and confidentiality and had well-established IS that catered for clinically-related information. Questions were raised by them as a result, concerning the adequacy of the new system and what benefits would accrue or disadvantages they would feel (Table 3.21, rows e, f).

3.3.5 Awareness of imbalance in implementation

Current project emphasis was interpreted to be directed towards technical aspects. Whilst problems experienced were predominantly seen as technical or equally technical/non-technical a clear majority thought that there should be greater emphasis on the non-technical (Table 3.22).

Table 3.22 Technical & non-technical emphasis & problems within TWIS

| | Project Emphasis Is | Problems Experienced | More Emphasis? |
|-----------------------|---------------------|----------------------|----------------|
| Non-Technical | 0 | 2 | 10 |
| Towards Non-Technical | 1 | 0 | 4 |
| Equal / Same | 4 | 9 | 5 |
| Towards Technical | 7 | 7 | 1 |
| Technical | 8 | 2 | 1 |
| Total | 20 | 20 | 21 |

Expressions of concern regarding the balance of activity were apparent across the period of study but did not appear to have been addressed. Prior to implementation, in 1996, this bias was demonstrated by the neglect of human and organisational issues versus a very detailed technical specification and POISE procurement process, reported by the Project Board:

“It was noted that the project is only addressing the basic POISE procurement issues and that O/D, Medical records, and Data Administration issues are not being addressed. The danger of this is that ... the organisation is unlikely to be able to achieve full benefits from the new technology.” [DR063].

The 1998 Project Initiation Document [DR065] however stated the limitations of the intended non-technical focus.

The lack of balance between IS and non-IS issues was criticised as a least favourable aspect of the project in relation to surprise that it was in reality a “*technical IT procurement*” [TM]. The working experience of PM3 for example was solely within IT, and they saw their technical role as “*greater than would expect from a project manager*” [IS] (Table 3.21, row i). There was a belief in the need to split technical and non-technical matters and thereby recognise the importance of the latter: “*Need expertise, and to split the technical and project management roles. Needs a project manager to pull strings and to avoid getting bogged down in detail.*” [TM].

An imbalanced and limited approach was also noted in retrospect when the Trust considered the establishment of a later implementation phase after Y2K and summarised what had happened thus far: “*The implementation was technically led, the driver being to achieve Year 2000 Compliance and to meet statutory reporting requirements.*” [DR178]. In this context project management was also specifically criticised: “*The Trust acknowledged that the management of ‘the implementation project’ fell well short of best practice in most areas.*” [DR178].

Negative views concerned whether roles played were substantial: “Never very clear about what is happening and what I am doing... well and truly kept out of the way” [TM]. A significant number of interviewees felt that involvement was either late or without clarity or effect. This pattern was in the context of 17 interviewees stating they had some previous experience of IT projects, 9 of which were specifically defined as within a Directorate of the Trust. In comparison 7 interviewees responded that they had no previous project experience, including PM3: “*This is the first. Have gone in at the deep end so hope all will seem easy after this*” [IS]. There was reliance on a small number of individuals within Trust directorates for local implementation and whilst local expert positions were developed alongside limited opportunities for secondment, these were viewed as inadequate support to the implementation.

Whilst some TWIS managers reported little involvement and impact on workload others discussed tight deadlines and great expectations with additional workloads [2x IS, 3x TM] that were “*huge*” [TM], “*not taken into account*” [TM], with argument that there were insufficient resources [IS]. PM3 referred to working “*Ridiculous hours*” and to “*12 months pure hell*”. Some staff, in contrast, felt that they were under-used or that views and input was restricted - “*Could have had much more involvement if it was wanted*” [EX].

PM1 was described by interviewees as having been very closely associated with the project, but when they departed both direction and leadership were thought to be lost. Despite many references to its requirement within early documentation, subsequent ownership by senior managers, clinicians and directorates was weak, and a limited IS perspective became dominant, either consciously, or to fill a vacuum. With this restricted perspective dominating, the activity of implementation became dictated by the imperative to meet basic Y2K replacement demands and to put the technical product into place.

The belief of the dominance of the IS perspective, expressed generally by managers, was confirmed by IS staff themselves in relation to practice employed. They defended this role as appropriate - “*What actually doing was to give: a) a realistic view, b) a wake-up call, c) a balancing act*” [IS] - addressing what they

saw as directorates' unrealistic wishes to have a system to suit their specific needs and assuming that the non-IS part of the organisation was not capable of playing a more significant role. Similarly another IS staff member argued that:

"This was one of the few projects which was technically led by technical people ... got what was wanted from a technical perspective." [IS].

The IS perspective's defence of this stand-point, and practice related to it, was further described by PM3 in terms of the lack of directorate understanding of what IS implementation entails - "*Problem - how to tell managers that they don't understand. They demand that the system fits them*". A problem faced in attempting implementation was that mental health services, directorates and organisations were seen to vary greatly, and were a difficult context within which to implement: "*Very difficult to implement in Directorates when there are no strict rules.*" [IS].

Appreciation of the appropriate range and balance of issues, skills and perspectives and its translation into practice was a long-term and unresolved problem. Within the Trust over the period studied there was demonstration of lack of experience and understanding concerning how an IS implementation involves human and organisational issues, how they should be considered and their implications. There was a failure to develop preparedness for what any such implementation would actually demand of the organisation. In 1995 through an IM&T strategy the non-technical aspects appeared, in principle, to be appreciated:

"Our purpose is to provide care rather than technology... we will ... work as actively on the management processes as we do on the technical..."
[DR053].

Similarly the health authority discussed issues such as data collection and use, and the need to address them before installation of technology "... or there is a very real danger of perpetuating poor practices" [DR069].

The issues of perspective and issue dominance, and the relative exclusion and neglect of others were not overtly addressed. With growing realisation of the impact of a technically and IS dominated implementation significant and increasing tension resulted though from the manner in which human and organisational implications and demands were experienced and managed. It was observed that the implementation involved “*No changes in working practices - just a replacement*“ for three existing systems [DR079], whilst a local expert later withdrew commenting they were “*inappropriately being asked to deal with working practice issues*” [DR156], these being considered late in the day. Eventually it was concluded that in relation to continued bad practice “*Working practice was ignored at the beginning*” [DR168].

A number of interviewees (7 Resps.) correspondingly gave the opinion that operational issues had not been dealt with appropriately: “*needed an operational manager as part of the Project Team to drive it forward*” [TM], an opinion supported by an Implementation Group [DR144]. A substantial lag thus appeared to exist between understanding what skills and roles were required to achieve project aims and questioning of how these were to be developed. The TWIS Human Resources sub-group noted that “...*Currently, we rely heavily on technical mastery without the appropriate infrastructure on how information should be used and handled in the new Trust.*” [DR091], whilst the Training Group observed that “*There is currently no strategy for the handling of information within the Trust and the importance of addressing the issue was acknowledged*” [DR095].

Bias of practice was shown to exist through the lack of inclusion of issues, project elements e.g. evaluation, and human input both generally, and specifically in relation to decision-making, with a limited number of staff involved and a limited range of perspectives represented. The operational and administrative perspectives, and understanding of them was not sufficiently prominent whilst for much of the implementation there was no regular or substantial clinical - medical or nursing - input.

Study of other Trusts (CTIS study element) provided evidence of contrasting approaches taken. Trust A and Trust B were implementing or developing dissimilar IS. Trust A was undertaking what they saw as a long-term process of development of an MHIS in partnership with company with a history of experience within mental health IS. Though it was envisaged to be a large Trust-wide system its implementation was evolutionary rather than subject of a big-bang approach. A particular feature of the implementation process was an emphasis on what was perceived to be necessary preparation, in contrast to another Trust that they were aware had procured this basic product. Trust A emphasised a focus on workflow and the use of complex clinical cases to evaluate needs and the IS which was delivered. Clinical involvement was central to system selection and development within and a clinical group directed progress and a number of clinicians worked full-time on the implementation.

In contrast, Trust B was developing a system with a bottom-up approach, prompted by and designed specifically for clinicians to record, access and present clinical data. Although it could be described as a relatively low-tech solution it relied upon comprehensive pre-existent IT infrastructure. Innovation thus related to clinical practice rather than technology. Implementation was prompted in Trust B through a clinician expressing a need, and leading the change involved. This was agreed to be required as the existing clinical IS was not thought to be a good clinical record i.e. its clinical, rather than administrative use, was limited. This implementation was seen to be consistent with IM&T management within that Trust. The head of IM&T had a nursing background and other senior managers also had non-technical backgrounds, and what was described as non-IT allegiance: "*My allegiance is to the service*" [EX]. This was a conscious shift from previous IT dominance of IM&T within that Trust.

Within the study directorate potential problems of security and confidentiality were an example where appreciation of the significance of an implementation issue and the technical/organisational interface led to appropriate practice. These were more manageable in the directorate - the LIS being implemented as a centralised database with restricted access - but were addressed by early and direct clinical involvement. Within the SISD there was an attempt from the outset

to place a demand on the clinical service to manage security and confidentiality issues alongside IS staff, and not regard them as part of technical development (Table 3.21, row g). As a result the Project Initiation Document defined the priority, the Project Board did groundwork to establish principles, and a small, time limited working group of clinical and IS staff specified precise requirements. To integrate operational, clinical and IS issues there was consultation with all staff groups and a range of documentation was published. As a result of recognition of the need to integrate the IS issues with the operational, areas of clinical practice were reviewed and modified through practice. This however, was not part of established IS practice within the directorate or more widely the Trust, but required building of understanding, creating the forums for communication.

3.3.6 Search for an explanation of lack of clarity

The study directorate IS developments undertaken varied from the TWIS in that there was either a specific clinical demand prompting implementation, and/or they were not product-centred. They were clearly represented as combining service needs, human and organisational impact, and a range of technical changes. An LIS interviewee thus noted the aims of that project were “*Quite clear*” and that “*It was clear in that a system was needed - something needed to be done, to keep information on all people, so these people didn’t flounder.*” [TM]. The SISD was preceded by, and allied to, communications exercises with various stakeholders and staff groups discussing and clarifying aims. A lengthy and detailed Project Initiation Document followed, outlining a project structure based on a balance of perspectives, and with detailed statement of a range of organisational aims which were to be supported by technology (Table 3.23 - Comparison study results summary (4), row a onwards).

In contrast, within the TWIS despite the long-term desire to implement an IS the aims and deliverables became closely associated with a particular product which was procured. The TWIS project became dominated by the implementation of that product, but with less clarity about what that would mean, and disassociation of effort from the functionality desired.

Questions of what, in detail, the TWIS implementation involved and how it would progress was a common theme with individuals expressing both widely varying responses and uncertainty. When asked to define perceived measures of success of the implementation the most common response from managers was that there were “*None*” (8 Resps.), with others stating “*Don’t know*” (4 Resps.) or that there were “*Little*” (3 Resps.). The majority of interviewees (14 Resps.) stated that their reply was assumed rather than known.

Similarly regarding what form of post implementation evaluation had or would take place the predominant answer was “*None/Not Aware of any*” (19 Resps.), confirmed by all IS staff interviewed e.g. “*No plans yet*” [IS], and “*Haven’t a clue*” [IS]. The PM was similarly vague, commenting that they would “*do some post implementation review*” when they felt that they were “*actually post implementation*” [IS].

At an advanced stage of the implementation there was substantial dissatisfaction with lack of leadership and senior management involvement. Direction was seen to ebb and flow depending on personal, individual commitment rather than structured, corporate leadership. The ex-project manager (PM1), who had left the Trust was still most frequently identified (10 Resps.) as providing direction rather than the current incumbent. A number of respondents also suggested that direction specifically *did not* come from the Project Director. There was a belief that in practice things had drifted and individuals were left to take the initiative, rather than there being well-managed, proactive leadership. It was not clear where the project was heading. Reflecting lack of progress one comment in particular specifically questioned understanding of the nature of MHIS, and criticised the system supplier in this case, despite their experience of MHIS:

“They didn’t know about mental health ... then no-one does - it is part of the problem.” [TM].

Table 3.23 Comparison study results summary (4)

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|---|------------------------|---|---|--|--|
| Specification / PID created by (a) | - | IT Manager (PM1) who left the Trust. Several versions created over several years. | Service Director & development company. | Project Manager. | PID by Project Manager, with consultation with central staff group. Specification written by project manager with consultation with Trust IT function & liaison with suppliers. |
| Schedule (b) | - | Series of targets through the 1990's. Shifts to a requirement for Y2K elements. Other elements delayed or not functional. | Not clear project planning, as small-scale in-house development. | Delays related to IT work completion & IT resource availability. Very detailed project plan. | Scheduled IT implementation for January 2002. Delays through 2002 relating to IT & network implementation. Impact on general implementation for systems & functionality. |
| Project Organisation Structure (c) | - | Informal, then evolved during project. Centralised control with small number of dedicated (IS) staff. Later development of local implementation & other groups. Dependent on availability of local contacts. Little Project Board activity. | Informal – no formally designated roles. Software written under contract by development company. | Project Manager role. All else informal, taken up within existing resources. | From project inception a clear formal structure was documented & communicated. Based on balanced structure representing service professional groups, & inclusive involvement of a range of staff. |
| Induction (d) | - | Details not known. | N/A | Detailed, part of approach to integrated consultation & induction – IT use, application use, new features, data storage, good practice etc. Given to all users on one-to-one basis before using new equipment. | Significance attached to individual support & clear basic instruction to facilitate continued use. User Support role created in part to support this. Delayed in places due to non-functioning infrastructure. |
| Number of users (e) | - | Intended to be approximately 700 but severely reduced in initial phase. | Three users of the central system, but manually fed by service clinicians. | Approximately 35. | Aim for 400 (over 300 new users). This achieved for registered and inducted staff. Fewer active/regular users. |
| Review (f) | - | A limited, short report. Eventually a number of critical audit reports followed expressions of concern. | Ad hoc. | Evaluation as part of Part of action research exercise. | Defined through PIG, PB. Outlined in PID. Tool developed through previous project to be used. Delayed however by delay in implementation. |
| Project Driver (g) | - | Original IT Manager (PM1) closely associated but left as system selected. Transferred to PM (also IT based) in practical terms. | Service Director (clinician). | Project Manager | PM, & Information function. |

| | ITQ (Trust) | TWIS (Trust) | LIS (Directorate) | SHQ (Directorate) | SISD (Directorate) |
|--|--|---|---|--|---|
| Funding (h) | - | Reported as adequate & clear in advance. Several years contract & funding term established. Reported to only be forthcoming, along with general senior support for the development through the "threat" of Year 2000. | Struggle for central funding support in the short & long term. | One-off development funding granted. | Unclear, & granted initially only for the Hardware & software as a one-off project. Additional revenue funding eventually gained. On-going struggle for longer-term funding. No subsequent capital funding. |
| Partners (i) | - | Third Party provider of system. Very close working relationship developed with PM. | Software development house. Little IT function role. | Involvement of suppliers. IT function role required in server & network set-up. Challenging relationship with on-going debate over responsibilities. | Trust IT function for network & Hardware installation. Informal negotiation for local network control & implementation of non-standard/non-corporate elements. History of challenging relationship to overcome. |
| Host Context (j) | Widely variable experience. Relatively low level of skills & training. High levels of positive attitude towards the concept of IS. Low levels of encouragement to use, but high expectation of further use & impact. | Relatively low levels of clinical use & clinical information. Very variable IS use, largely directorate led - IT generally follows local request rather than central lead. Lack of strong IS awareness & skill. IT function based on IT infrastructure, & networks rather than functionality, systems analysis etc. "Information" organisationally split from "IM&T". Some awareness & use of databases, though not consistent. | Very little existing use of IS. Applying a clinical requirement for information to IS in a small scale development. | As LIS, but later - growth of use but variable practice & levels of use, & standard & availability of equipment. | Long-term use of a clinical system (MHIS) but centralised. Generally old/poor/lack of IT. Unusual as a local information and IS function exists & is clinical support for this role. Many staff/new users with no experience - aim to introduce many new users i.e. managers, nurses & medics. HQ site well developed only. Varied skills & experience of user base. |
| IS view of Trust Implementation process (k) | - | Problems as services believe they are unique e.g. 5 different models of day care found [IS]. Service reaction that TWIS "nothing like" what had before [IS]. IS Cannot fit around peculiarities but non-IS staff do not appreciate this e.g. will not standardise. Alternative view - services do not fit into ID defined pigeon-holes. Result that have inappropriate IS or fail to do so & practice is incongruent with IS. | - | - | - |

There was a consistent critical theme relating to the broad management of the project, not of dissatisfaction that the project was happening but that no-one seemed to be at the helm, either with uncertainty regarding the PM, or apparent lack of corporate responsibility.

Questioning of appropriate influence and decision-making capacity generally was a consistent theme through TWIS manager interviews - “*Not sure where power lies but clear that power to decide the essentials or power to ‘do something different’ lies above the Implementation Group*” [TM]. Whilst the PM observed that they personally lacked detailed operational knowledge, and that directorates had more influence than they thought, beyond the small project team there was significant belief that they were not able to make key decisions, and power lay elsewhere. PM3 also observed that there were significant decisions already made before they were involved, and felt that these decisions were beyond personal challenge. Whilst IS staff discussed, with regret, a previous history of decentralised IT decision-making, interviewees in contrast reflected a belief that decisions were in the hands of the corporate level of the organisation. It was believed that people were being asked to perform unfamiliar roles, the project had a life of its own and there was a lack of responsibility for the implementation as a whole.

A specific issue of role and lack of clarity discussed by a number of managers (8 Resps.) regarded the project manager. At the time of interviews managers expressed “*uncertainty*” (5 Resps.) about who the PM actually was, whether they had been replaced, whether there was a PM at that time, or alternatively whether 2 other members of staff had become PM. Comments made concerning this lack of clarity included:

“This is indicative as there are current rumours that he is or isn’t the project manager now. How can there be such a lack of clarity about who the project manager is?” [EX], and

“Does [the project manager] know what his role is now?” [TM].

Trust documentation did not make the position clear, merely showing questions being raised as to the position. Confirming the actual situation PM3 personally discussed their own uncertainty over a period of time and the informal way in which they became “*sidelined*”, and removed from responsibility during 2000.

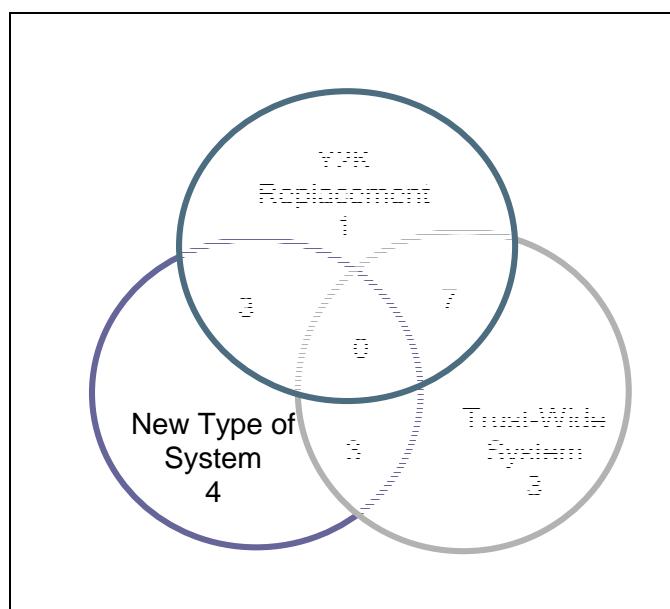
Lack of clarity during implementation was mirrored in matters of how and why earlier significant decisions had been made, reported by both managers and users. The majority of managers (13 Resps.) indicated that they did not know or did not specify a reason why the product at the centre of the TWIS was chosen. Two noted that this was “*A very good question*” [2x TM]. Where the system specification was quoted 3 of the 4 interviewees provided qualifications e.g. “*presume*” [TM]. The large majority of comments were negative e.g. the specification being a reason for product choice, but with the conclusion that the specification “*was crap*” [TM], and the choice was based on the opinion that “*The wrong people looked at it and did the choosing*” [TM]. Those interviewees from the technical or project management perspective displayed greater certainty, and demonstrated reasons, which were at odds with many others. Despite the intention to demonstrate that consultation was being undertaken views expressed showed that there was relatively little knowledge of the products short-listed and the basis for choosing between them was limited.

There was also not a clear understanding of what the IS’s functionally-related *transformation* was or would be. Most responses related to information (12 Resps.) in terms of its collection and storage, with less emphasis on the impact or how this may be different to previous circumstances. It was not demonstrated that the new system was thought to be anything different to those it replaced. The managerial imperative to provide internal or external statistics or information for contracting purposes was highlighted (7 Resps.), seen as “*Little more than a head count*” [TM], or means to meet external requests “*regardless of data quality*” [TM].

Only about half of TWIS managers believed that aims were clear. A variety of alternative types of system were identified as the project deliverable rather than a single, clear suggestion. Written definitions (21 responses) described, in various

combinations, three distinct systems or projects which were an integrated or Trust-wide system, a Year 2000 system replacement, and a new type of system (Figure 3.2).

Figure 3.2 TWIS project deliverable defined by managers through CATWOE definition



These suggestions relied on contrasting assumptions. In terms of Year 2000 systems replacement (11 responses), what was thought to be being replaced varied between an individual system, a number of existing systems, or replacement of all. The Trust-Wide system (13 responses) was generally seen as a “*single*” or “*integrated*” system for use across the Trust. Description of a new type of system (10 responses) on the other hand varied with discussion of new functionality. This included handling of clinical and clinical activity information, tracking of clients and services, complete patient histories, managerial and clinical planning/development/research/audit functionality, and supporting care delivery.

Those interviewees who believed that aims were clear were divided between what they thought these aims were, either alternatively a single system by Y2K (5

responses), or a Y2K compliance systems replacement project (4 responses). Interviewees most closely, technically involved agreed that the aims were clear, and Y2K dependent but saw them in contrast as either a Y2K compliance systems replacement project, or a single Trust system by Y2K.

The background to this position was that from the early 1990s the Trust and the health authority exhibited disagreement and ambiguity concerning exactly what the project and/or aim was - “*...it is highly questionable whether the authors understand the basic concept of a health service information system*” [DR017, health authority memo, 1994]. Trust reports described variously the intention to implement a single integrated system [DR011, 1993], then alternatively, a core system linked to other local systems [DR015, 1993], and scope specifically narrowed to exclude particular aspects and services [DR065, 1998]. A system newsletter distributed in April 1999 presented another distinct motive: “*The current systems within Mental Health ... are not Year 2000 compliant*”[DR090, 1999].

Only Trust IS staff stated specifically how and why the decision was then finally made to proceed. Although a TWIS had been proposed in 1993 [DR011] when it was eventually given the go ahead in December 1998, it was not because of the organisational need identified during the period. Instead a technical necessity was quoted - “*Y2K was the only reason for the project*”, and the Trust was “*Literally threatened with Y2K*”[IS]. Under pressure from IS staff senior management were said to have accepted that this particular implementation had to be undertaken due to technical problems with existing IS, and an immovable deadline.

The third dimension of disagreement and ambiguity concerned understanding of the process of implementation demonstrating why lack of clarity was such a widespread feature. Evidence from TWIS document review, and from questionnaires, and interviews - most of which took place subsequent to Y2K - suggested that over a period of time the organisation, and parts thereof, did not clearly understand what the task facing them was or what they would need to do

to be to able to achieve aims defined. Lack of non-IS understanding was asserted by IS staff (Table 3.23, row k):

"The problem was that they wanted on day one, a system that fitted the Trust like a glove. This betrays a lack of understanding of IS" [IS].

There was not only disagreement between IS and other staff but amongst IS staff concerning the relationship between IS and host organisation, and the host's expectations. Alternatively it was argued implementation either inappropriately tried to fit the service to IS, or the inability to achieve this fit resulted in retention of practice incongruent with IS.

Lack of clarity was enduring. When discussing project failings in 2001, auditors reported not only that "*Failings in the OBS evaluation, inadequate training and the lack of clarity regarding working practice issues, resulted in these failings not being identified prior to implementation*" [DR174], but also that whilst the proposed second phase/re-launch would need clear understanding of user needs, "*The Project Manager is not confident that this understanding currently exists.*" [DR174].

Indications of ambiguity regarding basic aims of the implementation were supported with interviews producing recurring themes about what the project and system actually were, and the contrast between theory and practice - "*Were sold one thing - the big system, when actually it was something completely different.*" [TM]. The breadth and depth of the project and what it would or should include was challenged by interviewees including those with direct responsibility for its management. Whereas for some there was expectation that the project would deal with basic and broad issues, eventually the realisation was that the aims and means were far more narrow - "*I and others expected more and it took a while for the penny to drop ... I wasn't clear what it was about*" [TM]. That respondent described "*My understanding of aims and objectives*" as the least favourable aspect of the project.

3.3.7 Questions of the Trust's ability to adapt to having IS

3.3.7.1 Directorate - behaviour within the SISD

The study directorate faced similar challenges to the Trust in general regarding its relationship with IS. Adapting to the organisational context the role developed by local IS staff extended beyond the technical towards routinisation of use of IS within all parts of the directorate. A long-term effort was made to change the view of IS towards being a support to all and increase knowledge of its uses. The difficult challenge included encouragement of acceptance of general responsibility for IS and need for involvement, and thus to integrate IS related issues within the operational and clinical services.

The earliest study directorate implementation (LIS) was of a centralised clinical database system. Other projects were part of a plan to routinise use of various elements of IS, with the expectation that all staff would become IS users i.e. initially within the service HQ (SHQ), and later the entire directorate (SISD). The reaction and contribution of all staff of the directorate was, as a result, integral to the implementation process. Results that concerned practical human activity exhibited within the context of the implementation process, by IS staff and those within the host organisation were associated with focus group activity, diary recording, and discussion through project meetings, reports and reviews.

The IS facilitated sharing of information, supported communication, and systems were constructed according to the structures and relationships that were said to be appropriate by the service. There was debate within the directorate as to appropriate security and access to information, sharing and communication. This potential tested, and found inconsistency between, the theoretical relationships between groups, teams and physical sites, and actuality e.g. resistance to teams and individuals that should work together having shared access to information, the rights of junior staff to access IS, and conversely whether with restricted access to clinical information via IS the same restrictions applied to physically held information.

Implementation also saw the playing out of organisational strains and conflicts such as attempting to establish processes reliant on administrators and clinical

staff in the context of on-going frustration regarding their relationship and roles. Demarcation of responsibility was raised with the perception of boundaries and how they may be threatened by IS. Administrators thus resented clinical staff that did not follow process and were seen to be taking on the role of doing “paperwork”.

Behaviour often demonstrated a lack of understanding of the relationship between what IS is put in place and its organisational purpose e.g. the use of an intranet to store all policies, not in the desire to use technology for its own sake, but to avoid duplication increase and ease access to those documents. Similarly the integration of clinical data onto a single electronic storage device was intended to support use and sharing of information across the service. A recurring issue detailed in reports, subject to procedure and included within discussion at a series of service meetings was the requirement to enforce communication of staff changes, moves and re-grading. This was an essential precursor to grant or restrict access to IS, and thus control security and confidentiality. Thus whilst a general concern for confidentiality was a professional and organisational priority it was difficult in practice to keep track of changes which affected that.

Benefits were derived where it was possible to share responsibility with non-IS staff, including administrators and clinicians for specific tasks within implementation. Rather than rely upon a general but non-specific desire to “involve” IS users, it was more beneficial to integrate them into the process where their input had most impact and they appreciated the relevance of the task to themselves e.g. through analysis of team setup to develop data storage structures, analysis of appropriate access to information, and to produce an approach to security and confidentiality that made sense operationally. The specificity of the shared task was a means to avoid dulling of enthusiasm and to appropriately target the precious resources of clinical time and interest.

The majority of medical staff remained largely remote from the implementation where their involvement was not required and enforced. There was reticence to challenge their relationship with the implementation due to their status and

workloads and the diversion from other issues that effort to generate involvement would involve.

The SISD did not involve implementation of a single product, but instead involved a range of technical elements and organisational matters. There was found to be a variety of reactions across these areas e.g. enthusiastic use of some elements of IS alongside lack of use of others.

There were unanticipated converts to involvement and use of IS amongst individuals from various professional groups and levels of experience of IS. Particular behaviour in any given situation, and over a period of time, was seen to relate, variously, to those exhibiting positive, neutral or negative attitudes, and with differing understanding of IS and perspectives. The reverse situation was found with consistent starting points of experience and attitude seen to be a precursor to contrasting behaviour e.g. managers with no previous experience and little knowledge either becoming converts to IS and involvement or conspicuously remaining distant from it. Behaviour could not be assumed therefore to fit stereotypes or distinct group perspectives, and was based on a multitude of influencing factors and thought processes, where, as was the case with the TWIS, some of the most critical staff also contributed most. Part of the motivation for behaviour appeared to be the response to a range of issues including the aims or implementation concept, how it was actually practiced, their belief of its impact on the organisation/groups or personally, and their role within the organisation.

3.3.7.2 Implementation theory and organisational reality in the Trust

Comparing the TWIS with other Trust activity (4 Resps.) managers noted that this was consistent with what they experienced generally: "*this has been handled like all other projects in the Trust*" [TM].

Despite the scale and unprecedented nature of the TWIS implementation within the Trust much of the work undertaken was considered as being part of informal rather than formally established roles. Roles and the distinction between

formality and informality were not clear. This reflected the separation of IS related issues from what was interpreted as *normal*, or non-IS organisational activity. Although the project was focussed on a software product, much of the technical or systems support work, was also regarded as informal, or beyond agreed levels of input. PM3 discussed his technical role in this context:

"I see informal as the extent of my technical involvement. Very heavily involved as wanted to, interested, and no-one else to do it. Worked beyond formal limit of role." [IS].

Equally, despite references to the priority of the implementation and the wide implementation scope, the degree to which involvement in the project was seen to be relatively limited was observed, it being seen as a "*very tight-knit concentrated effort*" [TM]. It was felt to be something that "*most staff*" had little involvement in, they did not see the implications [TM], and particular staff such as directorate general managers kept away from involvement [TM]. There was little evidence of many others significantly involved beyond the interview sample:

"See a general Trust approach to management developing where they do not ask questions and don't involve those with experience and knowledge" [TM].

Ambiguity as to commitment and substantial support for the project was displayed throughout the period studied. In 1995 whilst the Chief Executive stated that the TWIS was the Trust's "*number one priority*", they also indicated that it was at this time to be subject to a 12 month delay as it could not meet deadlines "*without incurring substantial risk as a result of the lack of involvement in, and ownership of, the proposed system at Directorate level*" [DR047].

The organisation appeared unable or unwilling to adapt to the task. Examples included the need for secondments from operational directorates, the need for, but absence of, clinical involvement, and the failure to adequately deal with administrative impact, including work practices and data conversion. As far back as 1996 the Medical Representatives Group was reported to have ceased due to

“other commitments”, with clinical staff to be contacted ad hoc subsequently [DR063]. Later, in 2000, senior manager secondment was still being requested [DR159], and greater support for the project was recommended through managers giving dedicated time to the implementation [DR161]. Other organisational issues raised included the lack of a clear, stated link between the organisation aims and information, IS, and IT strategy, and the reliance on goodwill and volunteering to achieve progress.

Interviewees were keen to emphasise that the project could not be taken out of context but was a product of its environment. Discussion of the project being poor (7 Resps.) included the fact that it took 10 years to happen and yet it was then hugely rushed. Interviewees noted the importance of who was or was not involved and the skills required, that “proper” structured management soon disappeared and people reverted to “*just getting on with it*”, an informal method taking over. Lack of PRINCE structured project management was criticised through the audit conducted [DR172].

A lack of definitive project structure and leadership was echoed more broadly within the Trust as a whole. During the period studied the organisation underwent change through granting of Trust status, and both Trust merger and de-merger. Over this time there were 5 Chief Executives. The IS function underwent two mergers, thereby combining three previously separate departments. Tensions between new colleagues were shown with alleged failure to deal with the Y2K issue, and criticism of TWIS project management being directed towards each of the previously separate IS departments from the other.

Documents reviewed also pointed specifically to a lack of continuity amongst important project staff and roles within the TWIS. Five individuals could be identified as Project Manager over the period of the study. The Project Director, Project Manager and System Administrator left the Trust during physical implementation and there were 4 Trust Chief Executives during the period 1998 to 2001 when activity was most intense.

Externally the important relationship with the local health authority was also weak. The health authority challenged the validity of action taken, quality of operation, and specifically basic principles of the IM&T Strategy [DR011, 1993] that was the basis for subsequent development of IM&T. This seemingly uneasy relationship was a long-term issue with severe criticisms of Mental Health Services [DR037, 1994; DR048, 1995; DR066, 1998; DR069, 1998]. Whilst from the perspective of the health authority they felt that the Trust had consciously sidelined their views [EX], alternatively from the Trust project management perspective [IS] they believed they were undermined by the health authority.

The attempt was made to create a trust-wide IS in the context of staff surveys in 2000 and 2001 [DR182; DR183] indicated that affiliation within teams and with the NHS was high but was lower in relation to the Trust itself. Beyond the IS and the project itself users raised particular concerns about lack of organisational unity between directorates and within them. A least favourable aspect of the project was also described as the background to the necessary clinical debate between directorates being that "*Generally they do not actually work together.*" [TM].

Due to the nature of the organisation and its approach to IS, PM3 was in a simultaneously powerful and powerless situation. Whilst for example they stated that the system choice, despite the consultation exercise set up, was in reality their own, they also found themselves unable to drive the project throughout the organisation. Their relationship with senior management was poor and with clinicians, lacking. Directorates and services opted-out, and they found people did not contribute as they would have expected, prompting PM3 to comment, with regret, that "*I know what people are like now*" [IS].

Reduction of senior management support after PM1 left was also referred to:

"The replacement project manager was put in place without the knowledge, experience or support to bring the project to fruition. Don't feel that senior management passion and interest has been there to make it a success" [TM].

Although managers pointed to the dominance of the IS function within the TWIS implementation the majority (14 Resps.) argued that either there was no source of direction or impetus, or it was difficult to identify. The variety of comments reflected general lack of direction - “*Not sure - feel the project is a “rolling stone” - no particular identifiable source of direction.*” [TM], and a lack of communication: “*In some instances it has been quite vague. It is now very vague. Couldn’t tell you now what is happening.*” [IS].

Interviewees placed strong criticism of project management within the context of sympathy for PM3¹¹, being in a very difficult position, lacking either experience or organisational credibility, and facing what one called “*an impossible task*” [TM] with a “*complete lack of senior management commitment*” [TM]. This related to both specific decision-making and failure to be accountable for it:

“*Treated as a hot potato from Day 1 - tossed from one person to another. Result is that succession of people come in, think the situation is a mess, realise there is no financial backing. Always thrown in at the deep end part way through - rather than the fault of one person.*” [TM].

Interviewees stressed the contrast between the positive attitude and input of individuals with how the organisation as a whole contributed. Directorates were not felt to be able to speak with a single voice, and the Trust as a whole “*didn’t accept the importance of the project*” [TM]. The TWIS project’s best aspect was commonly described in terms of behaviour, such as it prompting communication with others within the Trust (6 Resps.), and other aspects of personal involvement, and individual action within the organisational context e.g. “*Goodwill. Pulling together in the face of adversity*” [TM].

The organisation’s capacity to carry out the project, demonstrated through various aspects of its culture (Table 3.19, row a) was questioned regardless of what system had been selected. This capacity related to trust-wide demands,

¹¹ The various TWIS project managers are referred to as PM1, PM2, PM3, PM4 and PM5. PM3 was in post at the time of TWIS interviews.

the complexity of technical and non-technical issues (and their relationship), the demand for all parts of the organisation and perspectives to play a role, and for the organisation to understand both detail and general implications.

3.3.7.3 The relationship between the organisational host and Trust IS

Over the long period from 1992 when the need for a Trust-wide comprehensive information system was documented, as an ideal it remained apparently very desirable. There seemed however a failure to develop preparedness for what the implementation would actually demand of the organisation, casting doubt as to how the objective could be achieved within the context of the Trust.

The involvement of limited perspectives and the domination of corporate/IS over clinical/operational staff from the outset however set a long-term trend for the relative lack of either decentralised skills or involvement by directorates in IS related issues. By the time the TWIS was implemented up to 2001 some directorates and services remained remote from the implementation. Progress was largely reliant on IS function leadership and personal commitment and enthusiasm of a small number of directorate staff. They and others confirmed through interview however that there was a struggle to allocate dedicated time.

Trust IS staff confirmed what they saw as an apparent IS/non-IS dichotomy within the organisation with a relative lack of integration between IS and the organisation, that IS staff did not have a detailed awareness of operational and clinical issues, and they believed there was a lack of awareness and understanding of IS issues throughout the Trust. Such limitations were described in contrast to the role that one member of IS staff felt that they, and only they, played within the Trust:

“...increased influence and role due to the fact that most of the Project Team knew technical issues but not operational, and operational people knew nothing about technical issues. Was in the middle as was the only person with a foot in both camps - slap bang in the middle.” [IS].

There were examples of strong criticism of Trust proposals over several years relating to the approach taken and assumptions made e.g. a fundamental flaw in Trust Information Strategy being not advocating a patient based system [DR008], and the 1993 IM&T Strategy being judged by a clinician as “*A farrago of half truths, banalities, advertising claims and technical misunderstandings*” [DR016]. Disassociation between IS and the organisation was also reflected in the 1994 Trust IS survey: “*Respondent employees ... have demonstrated a lack of understanding about the Trust's Information Management and Technology Strategy.*” [DR033]. This was apparently still the case after what was defined as the first phase of the project was completed and reviewed through audit. There was lack of confidence that the required clear understanding of user needs existed [DR174].

It was very difficult to bring the organisation together positively and to generate ownership of the project throughout the Trust. This was raised as early as 1995 by the IM&T Project Board when discussing slippage in the proposed plan and identifying lack of directorate ownership [DR047]. Interviews and Trust staff survey [DR182; DR183] confirmed that lack of both integration and association with the corporate body were general features of the Trust, which itself was subject of a series of significant changes. In general a lack of cohesiveness and integration presented a barrier to the project and to all “Trust-wide” developments.

From 1993 onwards the Trust developed a policy which favoured the purchase of an off the shelf IS product. This, it was argued could provide an adequate solution with lower cost and complexity than a bespoke system. The health authority emphasised that this should be regarded as a procure and develop option, and that substantial work would be required to fit the system to the organisational need. It is not evident that the work required for any, and specifically this system, to function well was understood, particularly amongst senior management and directorates. The reduction in scope of the project and the problems associated with this implementation created an impression of trying to shoe-horn an organisation into a product rather than an informed organisation adapting to the need to operate differently, to manage information better, and to

match its needs with a readily-customisable product. When parts of the TWIS went live, as reported by users, this was not physical installation of an IS which was fully-functioning and matched to organisational and clinical processes. Expectations, whether (un)realistic or (in)accurate were thus not met.

With neglect of issues such as clinical involvement and impact, problems were encountered by failure of organisational learning. This included much of what fell within the human and organisational field, and broadly the general approach within the Trust to information, its management, analysis and use for operational and clinical purposes in addition to financial and contractual purposes. A number of documents demonstrated this point in relation to, (1) operational information and input to the implementation [DR098, 1999], (2) the need to provide additional administrative support [DR011, 1993], (3) the danger of non-acceptance of the system due to "*Failure to involve all those with a legitimate interest at an early stage*" [DR012, 1993], (4) lack of skills as "*a serious failure of managerial competence*" [DR069, 1998], (5) failure to address problems creating "*a very real danger of perpetuating poor practices*" [DR069, 1998], and (6) need for senior operational staff involvement [DR160, 2000].

In this context the separation and contrast was clear between an IT project and the organisational development. Whilst the commitment was given to Year 2000 IT achievement, other non-IT priorities were not supported as clearly, and suffered as a result. Significant problems encountered with the software procured only increased concentration on the technical elements of the implementation and without alternative leadership and/or understanding non-technical implementation elements suffered further.

In the circumstances described, rather than benefiting from organisational learning, dangers existed of suffering the effects of what can be described as "organisational amnesia" or failure to learn from experience. By 2001 what became the second phase of implementation still did not feature clinical input or focus on clinical and administrative process [TM]. Whilst previously an IT specialist had taken on the project manager role, in contrast the second phase included appointment of a project manager (PM4) with little experience of IS and

implementation of IS. As elsewhere this raised questions of understanding and perspective - a concern expressed personally by PM4 - and the extent to which other perspectives were or were not included through and beyond the role of the PM. Lack of clarity remained a strong theme, defined as an implementation "weakness" by managers through questionnaire (12 Resps.), and demonstrated by the comment that:

"... at present the final outcome of the project is not predictable, and many questions remain unanswered at this late stage in the project e.g. confidentiality, admin. support, and compatibility with existing systems"
[TM].

The perceived lack of success of the TWIS was interpreted far more widely than technical failure and instead incorporated the organisation's failure to do what was needed. This was summed up by a senior manager when they stated that "*This is no way to run an organisation, no way to run a project.*" [TM].

Chapter Four

Discussion

Chapter 4: Discussion

4.1 Shifting the theoretical understanding of IS implementation

It was possible to identify an extensive range of problems by studying, through direct and indirect sources, an organisation's relationship with IS and IS implementation, over a period of approximately a decade. Here, as elsewhere, it is not a difficult task through available methods of analysis to point to large numbers of factors of failure. It would be an error however, to limit analysis to this at the expense of identifying the root cause(s) that lie behind these symptoms of failure. A more fundamental issue is to identify what it is that is failing that produces these symptoms.

Health and wider public sector performance of IS implementation continues to be a cause for concern. In November 2004 the National Audit Office reported in relation to "IT-enabled projects", that minimisation of risk of failure required that they do not avoid best practice, through the checks and balances outlined by the government's Gateway Review process. This avoidance of procedure appeared to be happening in some cases (NAO 2004a, 2004b). Potential progress is limited however with reliance on the existing theoretical concepts concerning IS and IS implementation. These influence beliefs of how to deal with or avoid problems and challenges, directing them towards the aim of incremental improvement or change based on more efficient project management and/or technology.

It is proposed as an alternative that it is weakness of thinking that can consistently be identified as the root cause of failure to achieve aims of IS implementation and must be confronted. Organisations and individuals misconceive what IS implementation is and demands. Misconception can be identified throughout implementation in terms of the approaches taken, practice employed, behaviour and attitude expressed. Failure to challenge this means that what is misconceived will not be affected by any technological or procedural changes, and will remain misconceived.

“Narrowly focussed” IS implementation is a product of a narrow concept of what is relevant to implementation and the problems it presents. This is consistent with a techno-centric or structural approach and interpretation of task as the introduction of technology, or a structured project in an organisational context. Although a change of emphasis towards human and organisational aspects of IS implementation has developed this does not necessarily imply that methods of analysis and evaluation have advanced. The “economic/structural” analysis of the problem will be in terms of benefits and costs, procedures and scheduled tasks, believing that changes within the organisation can be divided into benefits and costs.

Introduction of broad definitions of IS and IS implementation reflect that what actually happens when IS is implemented within an organisation - what is to count as implementation - cannot be comprehensively analysed and evaluated in this way. This is best seen when we consider the way in which “change” comes to be thought of.

The process of IS implementation generates knowledge about the organisation, IS, and necessary change. Whilst a *project* may be managed or controlled, in terms of being structured and pre-planned e.g. with fixed deadlines and required elements, IS implementation exists as more than a project structure. It is a learning process which inherently concerns the novelty of change, ambiguity and conflict which influences attitude and behaviour, and in turn creates new situations. The particular change represented by IS implementation challenges divergent forces within organisations (Clegg et al 1996)¹, demanding synthesis through the forging or modification of relationships, agreement upon definition, specification of process, application of common standards and so forth. The truces between opposing social forces that are necessary to allow the organisation to function are disturbed and so pre-existing variations of perspective, priority etc. are brought into focus. As a result prevailing

¹ OASIG conclude that organisational fragmentation is pervasive, resulting in dislocation of practice, for example between IS development and use (Clegg et al 1996, Summary, Section 8vi6).

assumptions of what IS implementation concerns, appropriate responsibility for and ownership of it are challenged.

This view of change recognises the influence of human and organisational issues, social activity, and the complexity of problem situations, and thus reaches beyond the assumption of systemic behaviour and practice that matches this theory. An alternative view of organisational activity and role of social process creates the opportunity to view the IS implementation process differently:

“Unstructured and conflicting situations in systems development are often discussed in terms of bad planning and lack of control. In terms of dialectics, however, such situations can be regarded as a source of insight and development.”

Bjerknes (1992, p1)

If “change” comes to be thought of as something which is contested within the organisation, then it ceases to be something which can be straightforwardly assigned to “cost” and “benefit” calculations. This does not detract from the usefulness of the economic/structural method of analysis and evaluation, and that may well be right if the rest of the “costs” and “benefits” from the implementation are clear. However, if the change that IS forces an organisation to undergo is something that will resist explanation by these methods what other methods are available?

In this case, the dialectic method has a number of distinctive advantages:

1. It allows “change” to be considered as the outcome of certain social forces, widely prevalent in social groups, but difficult to identify.
2. It explains the outcome of a process in terms of the social forces brought into play as change is encountered, rather than in terms of what the process is designed to achieve.

3. It questions the adequacy of the distinction between “context” and “process” as both are conceived as the outcome of the same social forces.

A problem which requires a detailed consideration of the context in which a process is created in order to account for confusion as to the boundaries between the two; where there is regularly difference between the change actually achieved and the outcome the process was intended to achieve; and where the intended change is both complex and contested, is a problem which is likely to be understood better by dialectical means.

In both Eastern and European philosophy change is described as a constant, to result through discourse, dialogue and the conflict between opposing forces. This is contrasted with the single unchallenged perspective or *myth* (Kojève 1934), a monologue which demonstrates nothing as it *discusses* nothing and thereby has not interacted with an opposing, contrary or merely different view.

Where everything is perceived to be made of opposites² the denial of multiple, competing or opposing views, and of contradiction - the relationship between opposites - is not a simplification, it is a misinterpretation, and one which is detrimental to an understanding of all situations, including IS implementation. The relationship between opposites and its impact is thus taken as a given rather than regarded as a danger or something to be denied. It is thus a false premise to approach the complex process of IS implementation as a monologue without alternatives and suppressing conflict. The struggle of opposites, or negation of negation need not necessarily be resolved therefore but through discourse it will reach another place i.e. a prevailing or existing argument, perspective, or *thesis* is faced by a contradiction, opposite, conflict, or *antithesis*. The discourse or confrontation that takes place is a *synthesis*, which results in reaching a new position i.e. a new thesis. This in turn must face fresh challenges or it will itself become monologue. The process of IS implementation can thus be thought of as synthesis of opposing attitudes, beliefs, professional priorities etc. This model of

² One of Engels' three laws of dialectics.

discourse can be used to interpret the organisational change which is represented by IS implementation as two ideologies of change.

4.1.1 The theory-practice model of organisational change

The theory and practice dialectic, the received view of organisational change, is predicated on the theory of organisations as systems of elements. Activity is directed rationally and systemically towards that common purpose, reflecting the shared self-image of the organisation.

Here IS implementation can be considered a technocratic or mechanistic, step-by-step process. It can be adequately governed and understood through a structured methodology and a technically dominated focus. If the IS implementation is concerned to manage or control change whilst reflecting and sustaining its self-image then dialogue, alternative perspectives and/or conflict are a distraction or threat. The incentive exists to avoid barriers to achievement that may exist, to aim for a distortion free project, a controlled environment, and to avoid perturbation. The change which is associated with the IS implementation is designed to reflect that self-image and can be characterised as quantitative, to do what we are doing but better, faster, or more efficiently. Its weakness is demonstrated where change is attempted without permitting the processes to take place that change requires and thereby the aim is disassociated from the means to attempt it.

Within this model of change, the organisation viewing itself as self-aware, the three elements thesis, antithesis and synthesis are:

- a) Thesis - the organisation is capable of self-awareness, to generate a theory of itself,
- b) Antithesis - change is novelty and inherently unspecifiable.
- c) Synthesis - the structures which promote self-awareness also promote management of novelty.

Within IS implementation this thesis equates to an assumption of there being a *mature* understanding of the implications of IS, and the means of achieving aims through implementation, and that practice by achieving results reflects and supports this. The antithesis presented challenges the assumption that change will fit into the existing - and what is presumed from the thesis to be - shared organisational self image.

Theory is defined in terms of its relationship with practice, being established through observation of practice, and in turn existing as a means to guide it. Descriptions of practice, or crucial descriptions (Vithal 2002), are an opportunity to examine this relationship between theory and practice. What is found in reality challenges this theory of the organisation rather than supports it, the dialectic contrasting these views:

"All senses of 'theory' are in part defined through contrast with practice.

The dialectic between theory and practice reflects a tension between life as lived and life as understood and construed"

Mason and Woodward (1996)

The adequacy of practice that is determined by the existing theory of the organisation is thereby challenged. Within the theory-practice model organisational self-awareness is seeming as it assumes to be true what is known to be not. There is shared delusion or dogmatism which demonstrates lack of understanding of how organisations change and failure to address how reality departs from the ideally self-aware. Within IS implementation, particularly within the complex and challenging context of UK public sector and mental health services, this relationship between theory and practice is not capable of explaining continuing and repeated failure to achieve aims. Retaining the beliefs associated with the thesis of self-awareness has the consequence of shifting the assumption of weakness to other areas. Faith is placed in the continuing search for a better structured methodology and better control of context.

Failure factor analysis and reporting demonstrating what is perceived to be technical or project failure can actually be re-assuring. It perpetuates the reason for failure, and areas of risk, as being the technology - often perceived as a specialist or managed as an external field - or the project manager and/or structured development/project methodology, rather than organisational and social issues. It is thereby possible to externalise the blame for failure and affirm the organisation.

The motivation to implement IS, within the context of belief in the theory-practice model of change can also be linked to the need for external risk reduction. Within the Trust whilst the case had been made over a number of years for potential benefits of IS, the decision to implement was instead reported to be external threat. This meant responding to the threat that after Y2K existing IS would be withdrawn or inoperable, rather than recognising the importance of responding to internal challenges or risks.

Systems theory and assumptions of the theory-practice dialectic therefore cannot account for what happens in reality - the management of conflict and the role of social processes - and cannot create a suitable way of coping. Its starting point is that the organisation is a system exhibiting systemic behaviour. If this is the case then IS implementation failure in the organisational system equates to failure of the management of the project, or technical malfunction. There cannot be another reason, hence narrow reports and audits about failure that explicitly or implicitly assume the organisation to be functioning.

Given this inadequacy to explain failure and to suggest ways to address it, an alternative view is required that describes organisational change and that is associated with complementary practice. This is one which perceives a different implementation milieu that concerns the resolution of conflicts, confusions and incompatibilities, and is affected by weaknesses and inadequacy of definition and clarity, understanding and interpretation, and of immaturity. This will situate the desire for IS within the organisation, and to address internal rather than external risk.

4.1.2 The ideology of dynamic change or social process

The alternative ideology of change relies upon assumptions of the inadequacy of the rational, systemic view of the organisation and activity, relying instead on the social nature of IS implementation. The dialectic model is:

- a) Thesis - the organisation's image of itself is dogmatic and incomplete.
- b) Antithesis - change is novelty and inherently unspecifiable.
- c) Synthesis - the change in the organisation's image of itself may be clarified through the achievement of lesser degrees of dogmatism

IS implementation reveals the incoherence between the theory of the assumed self-aware, unified organisation and the reality of what successful implementation demands. The practical reality is of projects having *characteristic distortions* and facing a variety of barriers, whether or not the choice is made to actively deal with them. An approach which asserts monologue and/or fails to address conflict and subjective alternative perspectives i.e. neglects its context, is thereby flawed. The alternative approach can thus be described as an issue-inclusive means of discovery. It relies on the capability not just to understand technology, but also the technical/non-technical or host-IS interface, and how to deal with social processes and their inherent irrationality.

The alternative dialectic, and the difference in ideologies, is that IS implementation seeks out, identifies and addresses these challenges in some way. IS implementation is regarded as a process of self-examination. It allows self-image to change with illumination and clarification. This dialectic is thus primarily linked to the need, and acknowledgement of that need, to better understand internal rather than external risks. The quantitative change described when considering the theory-practice dialectic is thereby superseded here by qualitative change whereby alternatives face each other and decisions are made which involve precedence being decided upon. This emphasises the view of change as a result of the relationship or conflict of opposites. Similarly it affirms the inadequacy of monologue, or in this case the danger of relying on either an

assumed existent shared image of self, or the possibility of a controlled environment.

With reliance on the received view of change there is inadequacy and incompleteness of associated assumptions, methodology and methods. The inert quantitative ideology of change does not produce the required change within IS implementation. IS in organisations, specifically in complex contexts such as the NHS, will continue to fail, and fail to achieve desired impact where they do not address the complexity of the organisation, the process of implementation, and nature of organisational change. Practice needs to reflect the complex and challenging reality of the organisation, and in turn inform the theory of the organisation.

The alternative ideology of change does not ensure success of IS implementation but creates the opportunity to understand what that involves. It does so by discovering the extent of the mismatch between image and reality, prompting the development of the skills and methods to do so, and addressing the question of whether the organisation is fit to implement - whether it has the capacity to do so.

4.2 Context appraisal - comparison pair study

The theoretical framework outlined provides a basis to consider what can be learnt from the comparison study in terms of the concept of change, and the thinking which determined how implementation was interpreted and conducted in the Trust. Within the range of opinions expressed, behaviour exhibited and other forms of evidence collected there was inner contradiction. This had an impact throughout the implementation but was not directly related to technology and neither was it confronted by the organisation. It relied upon their acceptance of the theory-practice ideology of change as the implementation was based around and performed according to particular assumptions of the organisation and how IS could be successfully implemented within it. It desired a Trust-wide IS that broke new ground by encompassing each directorate of the Trust. This aim was consistent with, and would support the concept of the relatively newly established

Trust, demonstrating both legitimacy and progress to internal and external audiences. Whilst it was argued that the external Y2K threat prompted project approval, acceptance that a Trust-wide project could be undertaken could only be made with belief in the concept and actuality of the unified organisation, or alternatively ignorance of the implications of IS. The project thereby reflected the desire of senior management to preserve or boost the organisation's self-image and thus avoided contrary indicators.

A tension was created as this desire did face incompatibility. It was of an existing organisation that was a unified Trust only in name, and instead operated as relatively independent directorates, and with distinct clinical cultures. A range of managers, administrative, IS, and clinical staff, and IS users predominantly reflected an alternative understanding, or theory of the organisation. This was based on their primary association with, and influence of individual directorates or specialisms/professions and their role within these rather than the Trust. Their opinions turned to reasons why the nature of the organisation, its culture and ways of behaving were felt not to be compatible with what was needed to achieve perceived aims. The study's research methods provided a means to examine the ways in which coping strategies were employed by those within the Trust to deal with ambiguous circumstances and feelings of frustration and disappointment. Rather than a single or multiple failure factors, from a variety of perspectives the project was seen to be influenced by issues of understanding, interpretation, attitude, behaviour and practice which were inconsistent with success of the endeavour.

The theory-practice ideology of change was demonstrated as the organisation attempted to implement Trust-wide IS on the basis of it being an organisation that could support it - the organisational self-image. Reliance on the organisational self-image and failure to respond to any contrary indicators can be termed pathologised implementation³. If the management of an organisation, as reported, fails in its primary task of directing activity within the organisation in accordance with stated goals e.g. to exist as a coherent Trust, it is unlikely to do

³ Pathologised behaviour is discussed in relation to the arms industry in "Addicted to arms: a Will Self investigation" (BBC 2002).

so in non-primary contexts such as the novel challenge of IS implementation. Instead it is likely to apply habitual assumptions, attitudes and patterns of behaviour. Pathologised implementation can be thought of as a consequence of the way in which organisations fail to contribute to promotion of communication across the *conceptual divide* (discussed at section 4.3) between IS and themselves as hosts of IS.

Beyond the numerous barriers which need to be addressed within IS implementation, and are identified by IS research, implementation will be constrained in its potential unless inner tension or incompatibility is recognised and taken account of. In the comparison study this would require transition from the Trust existing as a federation to becoming a unified organisation, change throughout the organisation being either desired or enforced and practice, attitude and behaviour consistent with this. This broader, fundamental organisational change, could be supported by IS but could not be reliant on it.

IS implementation is a process that, accepting the ideology of dynamic change, is influenced by social forces and requires greater individual, group and organisational self-awareness. The process of synthesis in the case of health services includes for example attention to administrative and clinical processes, definitions and the ability to codify or describe clinical activity, symptoms of illness etc. It was not evident that the Trust's prevailing divergent forces were taken account of or that there was a desire to attempt such change. The task of fundamental organisational change was not attempted, a point made by several TWIS managers who referred to performance of the implementation as being typical of the organisation. In the context of staff changes, and Trust merger and de-merger the change may have been beyond it.

Frustration was also felt by project managers not in a position to force required activity. This played a part in generating uncertainty about what the project was set up to achieve, how it expected to succeed through its IT bias, where decisions were made and upon what basis. There was insufficient understanding or influence amongst individual staff to challenge or remove this uncertainty. Whilst staff acting as implementation managers felt generally powerless within

the implementation the TWIS project managers also revealed similar feelings. They felt that decisions had already been made, directorates actually had more influence than they recognised, and the lack of clinical involvement continued to restrict implementation. In a variety of ways each respondent was able to externalise blame, argue their lack of control or influence and point to reasons for lack of progress.

The study directorate comparison indicated the similarity of challenges faced, and showed that IS implementation could be approached in a different way from an alternative theoretical standpoint. Within the same organisation, at the same time, with a comparable staff group a process was undertaken to develop and apply alternative thinking and theory to the interpretation of IS implementation. Strong similarities were found within the directorate context with a low level of experience and knowledge of IS, including a lack of appreciation of the implications of IS implementation beyond the installation of hardware and use of standard administrative applications. The same divergent forces were encountered of the existence of numerous sites and services, each with their own roles, working culture, sense of independence and so forth, and the varying and sometimes conflicting perspectives and priorities of medics, nurses and administrators, and IS staff.

Acceptance of the ideology of dynamic change or social process within implementation involved giving primacy to the desire to achieve change, face its uncertainty, and to assert the role of IS as the support to achieve, rather than determinant of it. Inadequacy of individual perspectives was accepted, for example through responsibility being shared for all decisions that directly related to the clinical service. It was clearly asserted that some issues and areas of responsibility could not fall to IS staff whether or not others felt the inclination to participate. Opposing views, conflicts and incompatibilities were accepted as inevitable organisational features and confronted, with attention drawn to problems as a means to seek agreement and consistency e.g. where the treatment of security and confidentiality issues was seen to vary between the new IS and existing access to medical records. The constancy and long-term nature of the process of relating and reconciling opposing views remained clear

through issues such as the integration of new parts of the directorate, and the attempt to increase levels of IS use, and change the nature of use towards routinisation.

In general, directorate IS implementation was managed according to the principle that procurement of technology was only one part of a much broader exercise, and where although there were clear aims these were not dominated by the technology itself. The purpose was to achieve development of the clinical service and to ways of working. The implementation process was associated with a formally-managed project but its role seen as limited and the nature of the change was seen to be something that would be discovered through the process itself.

There are comparisons which can usefully be drawn between the NPfIT and the Trust which rather than focus on the obviously contrasting scale and technical complexity, point to universal issues. Whilst there are also influential contextual similarities of staff characteristics, issues of IS use and experience, and clinical matters, the question of the ideology of change and associated practice can be considered in relation to, for example, the task of attempting to create organisation-wide IS within an organisation which is not a coherent whole.

Nationally, with areas of existing well-developed IS for example, as within the Trust there are opinions that the NPfIT or parts thereof provides the solution to a problem that they personally do not have e.g. Wirral NHS Trust is reported to be in advance of what the NPfIT may offer (Collins 2004c, 2004d). Similarities also extend to expressions of enthusiasm for aims i.e. attitude in concept, notably by clinicians (Royal College of Nursing 2004a, 2004b; Kelly 2003; Medix 2004) and the health informatics community (BCS Health Informatics Committee 2003, 2004). These attitudes sit alongside attitude in practice that is less positive. There are familiar complaints regarding data security and confidentiality, that clinicians are not sufficiently involved, and that ownership lies with those managing the project rather than the service which it is intended to be relevant to (Royal College of Nursing 2004a, 2004b; BMA IT Committee 2004). It was reported that in the latter part of 2004 levels of support and enthusiasm by

doctors was declining (Medix 2004). Whilst the BMA initially warned of dangers of transferring to new GP systems (BMA 2004), in June 2004 they went beyond this by voting to boycott the proposed Care Records Service (BJHC&IM 2004a). A former chairman of the BMA IT Committee unfavourably compared the potential impact with the technology involved:

“In IT terms, it is brilliant. In implementation terms, you couldn’t write a finer recipe for disaster.”

Kelly (2003, p56)

It may be that the most obvious risk of the NPfIT, as with the TWIS, is that it is, or is perceived to be IT led. Activity has thus far been dominated by IT procurement and the granting of exceptionally large contracts to private sector consortia⁴. In the context of arguing that IT domination should at least ensure that the IT works, an NHS Director of Computing commented upon this bias:

“The NPfIT is unashamedly an IT programme. The strategy started with an IT-investment programme totally ignoring the information, clinical and business needs of the Service.”

Anonymous (BJHC&IM 2004b)

This apparent or actual IT domination has contributed to difficult challenges concerning, (1) LSP association with past government and NHS failure⁵, (2) how the NPfIT can be made relevant to NHS staff, (3) whether or not it is seen to be associated with the desire to improve clinical services, (4) how the underlying change and associated standardisation may be achieved, (5) how human and organisational issues may be approached, and funded, particularly with allocation of local responsibility for non-IT costs, and (6) how there can either be confidence

⁴ An emphasis argued to exist made by BBC File on Four but rejected by Richard Granger, Director General of IT for the NHS (BBC Radio 4 2004).

⁵ Fujitsu (formally ICL) contract winners for the southern cluster LSP, covering a population of 13.05m (NPfIT 2004b), were criticised for their role in the Magistrates' Courts Libra project (Computer Weekly 2003, PAC 2003) and Accenture (formerly Anderson Consulting) contract winners for the Eastern and North East LSPs, covering populations of 9.46m and 7.5m respectively, were associated with the failed Wessex health development (Collins & Bicknell 1998).

in, or a clear understanding of how the implementation should progress where so many contracts have been awarded without an obvious understanding of, or resources to approach, the human and organisational process. In its current state therefore the NPfIT, and more widely the NHS and national government appear to have relied on the theory-practice model of organisational change.

With the actuality and/or perception of the NPfIT being IT and product dominated, and the general lack of understanding of what IS implementation involves, there is a high level of risk of problems of lack of clarity and misconception. This risk is particularly severe with the vast size and cost of NPfIT, making it also politically very sensitive, as was the case on a local scale within the Trust. On-going scepticism amongst clinicians, and the implications of continuing development and maintenance, and non-IT costs became high profile concerns by October 2004. Headlines indicated respectively that doctors had "*No confidence*" (BBC news 19.10.2004), and that in relation to "*extra costs*" the NHS faced a "*£15bn black hole*" (Carvel 2004, in The Guardian). The NPfIT argued that there was no cash shortfall (Collins 2004e) and bluntly denied that there were financial problems: "*any suggestion that vast unforeseen expenditure has been incurred, or that patient services will be robbed to meet this is complete nonsense*" (NPfIT 2004c).

Whether or not this is the case the publicity reflected problems found at the Trust case level, but on a much broader scale, where there is weakness of understanding what implementation implies, what allocated finance will be directed to and will deliver, and lack of clarity regarding aims and progress. The issue of the full financial implications beyond national funding remained unresolved: "... *there are no clear figures for the costs facing NHS organisations*" (Gary Fereday, NHS Confederation, quoted by Computer Weekly, 2004b).

Just as the TWIS became dominated by a product and the need to install it, with relatively less attention given to the nature of the change the above Guardian and BBC stories were described as concerning confidence in the physical entity of the "*new NHS computer*" and costs of "*The new computer system*" respectively. If understanding of IS and implementation remains fixed to the physical entity and

practice reinforces IT dominance and its power to create change, it is no surprise if there is a negative reaction to an apparent shift in the expected cost of that entity from £6bn to approximately £35-40bn (Collins 2004e). This figure was accepted by the head of NPfIT, but argued to relate to "*all information systems*" and to be already "*fully funded*" (Granger, interviewed on BBC 19.10.2004). Ambiguity arises where when human and organisational issues, the broader interpretation of IS and IS implementation and the nature of dynamic, social change fail to be understood or promoted.

4.3 Redefining & reinterpreting IS & IS implementation

Lack of successful, clear methods and established, agreed definition of implementation was found to reflect the limitations of implementation research and its narrow basis, both in terms of the consideration (or not) of social - human and organisation - issues, and in its relationship with practical experience. Weakness of research extends to evaluation of implementation and of IS, particularly within regard to the mental health context, the specificity of that context, the demands placed by it, the barriers which exist to achievement, and what benefits can result from IS.

Past and present widely varying definitions of IS and IS implementation point to the contrasting theoretical and implicit or explicit practical interpretation of the terms. Re-definition, and beyond this, clear statement of the basis of the reasoning lying behind definition, of assumptions and theoretical underpinning, was required to bring clarity to a field which has yet to establish it. The definitional aim of the thesis was broadened to take account of the need to consider the inter-dependent definitions of IS (section 1.5.1), IS implementation (section 1.5.2), the ideology of change (section 4.1), the process of IS implementation (section 4.3), human aspects of IS implementation (section 4.3), and practice compatible with each of the above (section 4.4).

By addressing each of these areas it was possible to create and propose a consistent and comprehensive perspective of IS and thereby indicate ways in

which it may be possible to maintain a link between theory and practice. In doing so emphasis is placed on those attempting to implement IS to apply the necessary rigour indicated within the approach described. Whilst IS implementation is not a simple task, neither are the means to address it. Failure to apply consistent principles will generate greater difficulty. The approach proposed demands difficult questions to be asked and conflicts and incompatibility to be addressed. Inability or unwillingness to face this is an indicator of the limits of what can be achieved, and rather than propose guaranteed success it is more likely to be applicable to demonstrate how effort should not be directed towards what is not achievable. In the case of the Trust, NPfIT or any other example, within the context of weakness and complexity no method or approach would allow an IS to be created or “dropped into” the organisation, and products do not exist which can be “dropped in”.

The framework proposed centres upon acceptance of the implementation process as a form of novel change which requires synthesis within a dialectical arena. It includes the interface between an organisation as *host* of a process of change, and the potential of change associated with technology. The ideology of dynamic change or social process is a means to explain human activity within IS implementation. To understand the complexity of the social process, however defined, it is necessary to accept and examine the existence of multiple and conflicting organisational perspectives, both between the host and IS and also within the host itself e.g. between clinicians and non-clinicians within the mental health context.

This principal relationship between the host (and its staff) and IS (and IS staff) can be described as a *conceptual divide* where the differences between perspectives are both deep-seated and enduring. An individual in the role of clinician for example has particular allegiance, with assumptions, attitudes, and an ethos related to their profession. With membership of that profession they are given a role within a health care organisation, and beyond (and in addition to) any personal perspective, bring to it particular priorities, skills, concerns etc. They have a specific relationship with the organisation, based upon their association with clinical practice and patients. The same can be said of all participants within

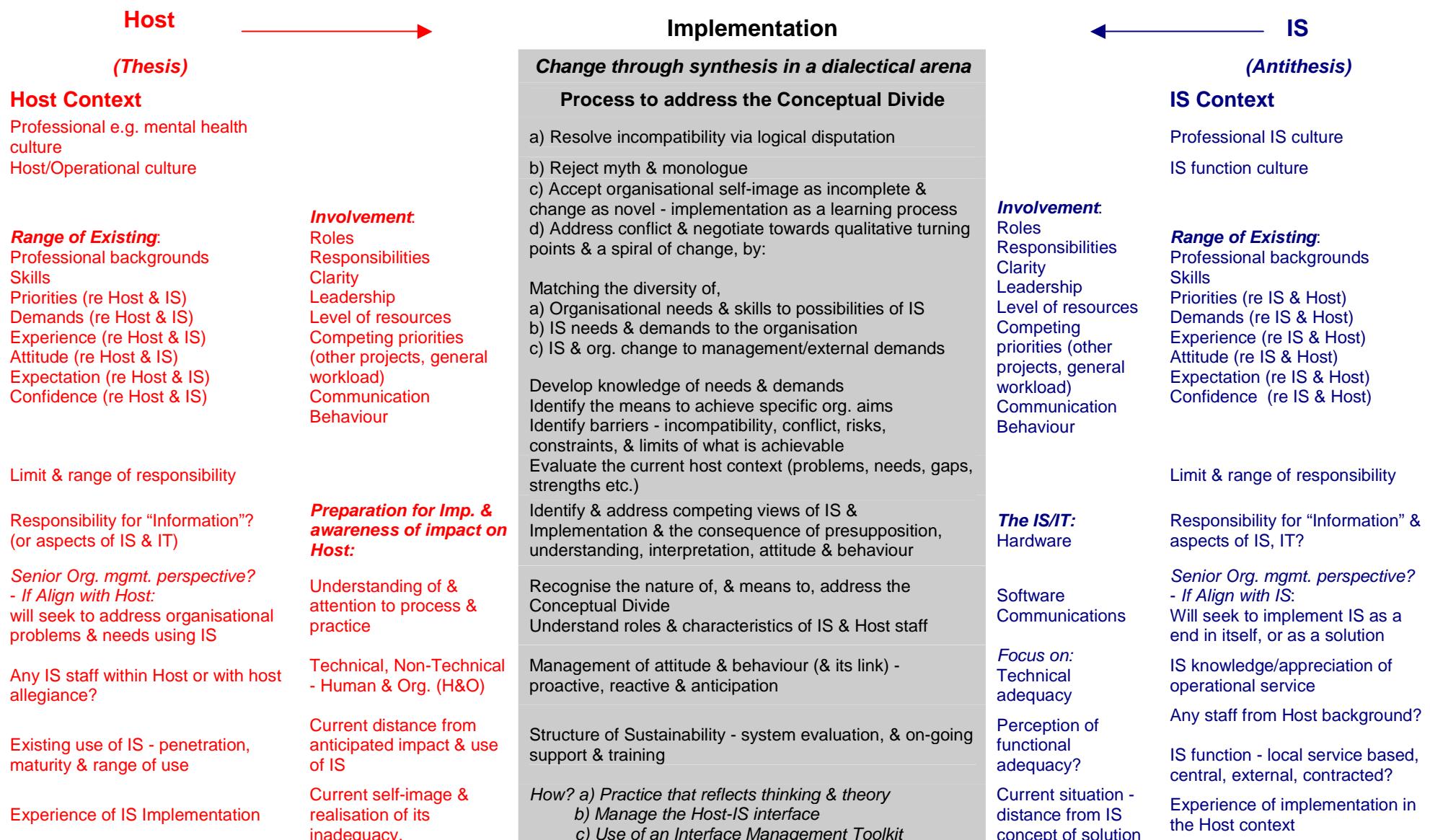
the implementation process, or all within the context within which implementation takes place, as each has a particular allegiance, whether it be to maintaining standards of clinical care, the application of technology, maintenance of IT networks, financial stability etc. This challenges the received view of the self-aware organisation being unified towards a common goal. If there is a shared goal it will inevitably be placed within the context, for example, of contrasting allegiance, assumption and attitude. In reality the attitude and behaviour of individuals and groups reflects their interpretation of personal, group, professional, organisational and customer, or in the case of health services the interests and priorities related to the patient.

Whilst a member of an organisation, such as a clinician, may have positive attitudes towards IS and/or appreciate the IS perspective, their primary allegiance is not based on the significance or use of IS. Similarly whilst an IS professional may be dedicated to supporting a clinical service and have knowledge of it, it would be wrong to think that this equates to either the desire or ability to place clinical matters at the forefront of their thinking. The link between theoretical and practically based attitude is not simple and relies on many issues to determine that link e.g. a clinicians positive thoughts towards IS in general versus a specific example and either understanding and interpretation of that IS, or how behaviour appears to be consistent or inconsistent with that attitude.

It is possible for all participants to appreciate other perspectives, to act in co-operation and agree with aims. Despite this it is essential that this should not be mistaken for commonality or consensus. Equally the desire to create commonality and the assumption that it is possible to create it is mistaken. As demonstrated by the study undertaken, in numerous ways problems result through misinterpretation in this area. Behaviour and practice were observed to relate to neglect or ignorance of the variety, and potentially the conflict and incompatibility between organisational perspectives and associated assumptions, expectations etc. This was based on a belief that it is possible to create shared positive attitude and behaviour in relation to IS, and assumption that attitude, in concept or in context, determines behaviour and practice consistent with this.

This divide should not be confused with the related but distinct issue of the organisational gap between IS and non-IS elements which may be narrowed or closed (Peppard 2001; Peppard and Ward 1998). Instead it is likely that in terms of the existence of a conceptual divide this is not something that IS implementation should attempt, or be focussed towards removing or closing.

As an alternative it is proposed that there is a demand for communication and understanding across this divide, that is, to establish a bridge. This is necessary as by accepting the re-definition of IS and implementation the existence of a substantial area of common interest, or interface, is recognised. Here the host and IS, and what can broadly be described as technical and non-technical issues cannot be properly considered in isolation from each other. The process of IS implementation therefore is one which should be interpreted as involving the task of bridging the existing conceptual divide, and is described as Figure 4.1.

Figure 4.1 The IS implementation process

As a result of this consideration IS Implementation can be considered a dialectic process of dynamic, qualitative, organisational change. The practice of IS implementation involves Host-IS interface management, and bridging the conceptual divide between the host and IS. Within the process or synthesis, the host organisation as thesis confronts and is confronted by IS as antithesis, within a dialectic arena where synthesis involves recognising and addressing conflicts and incompatibility. The organisation thus clarifies its image of itself.

This reflects the belief that success or failure of implementation cannot be attributed to the success or failure of a technical product, and that a technical product cannot be disassociated from the process which generated by it. To implement successfully is not to install technology successfully, though the former is inevitably linked to the success of the latter. It is potentially very misleading merely to associate success and failure of IS and its implementation by quoting statistics of whether products have been created or installed. The implementation process is not *the project*, or technical procurement, installation or development. Failure to appreciate the breadth of IS implementation and the complexity of the process affects evaluation of IS use and impact, an area regarded as particularly weak within health services.

The human or social element within implementation was further analysed through the wide-ranging research approach described via the conceptual map, involving study of both practical cases, and examination of theoretical issues thought to be relevant. As it was determined to be influential but not adequately recognised or managed within implementation the ability to propose a definition was interpreted as an essential part of understanding the challenge faced and forming the necessary response.

The human or social element of the process is based on a model of the relationship between thinking and acting, of individuals, groups and organisations, comprising:

- a) Presupposition,
- b) Understanding,
- c) Interpretation,
- d) Development of attitude and attitude in concept,
- e) Attitude in context,
- f) Behaviour, and
- g) Practice (of implementation).

From the initial model of implementation shown as Figure 2.1 - Essential aspects of IS implementation, this was thereby refined to the model described as Figure 4.2 - Human aspects of IS implementation.

This model provides an alternative to the assumptions of systemic behaviour which are inadequate to account for repeated and continuing failure to achieve the aims of IS implementation, or are restricted to the technical efficiency of IT, IS, methodology and organisations. It is based on the implications of the established complexity between thinking and behaving, taking account of sociological and psychological issues, and concerns the relationship between individuals and IS/IS implementation, not merely the likelihood of using IS, the focus for example of SCT.

It is thereby also possible to move beyond assumptions of progress and action that are founded only on the expression of attitude either within the context of implementation, or in concept. The implications of such expressions of attitude, the ISA for example, demonstrate potential. Care is needed to avoid oversimplification. The TWIS implementation did not contradict the ISA results but prompted questions of the foundation of attitude, its volatility, variation between individuals, means of maintaining positive attitudes towards IS, reasons for reduction of positive attitudes and/or increase in negative attitudes, and translation to behaviour and practice.

Figure 4.2 Human aspects of IS implementation**Relates To:**

Belief in meaning of IS & related concepts & entities - personal, group, professional & organisational.

Understanding of absolute & personal relevance of IS.

Representation of IS/Implementation & personal experience of it.

Relates To:

IS Impact/use/nature of/possibilities/interpretation:

- personal vs. general
- present vs. future
- actual vs. potential

Attitude complexity - not merely generally positive/negative.
 Shifting attitude – potential, volatility.
 Influenced by personal experience at home & work.
 What is proposed (theory) vs. practical experience.

Relates To:

Personal use & role in implementation.
 IS to host, & host to IS relationship.
 Reaction to IS itself.
 Balance of org., group, professional & personal motives.
 Relationship between professional allegiance & IS.
 Intrinsic & extrinsic to IS - gain/advantage, loss/disadvantage.
 Shifting - potentially volatile, influenced by personal experience & contextual issues.

*Substantive attitude can only develop
develop with Understanding and Interpretation*

Precursor to

**Determined By:**

Presupposition.
 Educational background.
 Organisational role.
 Referring Expressions.
 Impression Management - motive.
 (Non) Experience of IS - home, work, & professional.

IS & IS implementation:

- Awareness of its existence,
- Definition,
- Clarity.

Perception of IS as change.

Determined By:

Positive/neg. experience of IS use / Imp. process.
 Expectation.
 Belief in relevance of IS.
 Belief in utility of IS - personal & organisational.
 Belief in personal/org. ability to perform (confidence & anxiety).
 Belief in the potential of IS to +/- effect self, work, organisation, generally.
 Congruent with or vs. priorities & workload.
 Professional allegiance.
 Relationship with people associated - IS or Host.
 Changes in interpretation & understanding.
 If/if not required to be involved, are invited, or can avoid.

Determined By:

Organisational & personal factors.
 Availability of IS and access to it.
 Requirement of role, opportunities or encouragement.
 Personal control over role / action / compliance - optionality and enforcement.
 Impact on personal skills, performance, or career.
 Support & training offered (initial & on-going).
 If easier, less disruptive or advantageous to be involved, accept, tolerate, comply or avoid or criticise.
 Maturity & stage of perception of IS in org.
 Context of Imp. - extrinsic factors to influence reaction to that implementation.
 Personal skills & knowledge.
 Whether IS is congruent or conflicts with org., professional or personal ethos or priorities.
 Relationship between assumptions of IS & IS Imp., the organisation, & appropriate practice.

4.4 Developing practice from theory & redefinition

There has been (Hirschheim 1985), and continues to be (Baskerville and Myers 2004) recognition of the need to strengthen the relationship between research and theory, and practice within IS. Through this thesis the attempt has been made to achieve spiral or iterative progression - with discourse and the negation of negation - through the analysis of practice within comparison study being informed by and informing theory. To approach implementation appropriately, thereby maximising the potential to identify, understand and manage barriers to success, practice should reflect what has been found. This involves recognition of the elements which comprise the nature of change (section 4.1) and developed definition of IS implementation and so forth (section 4.3).

4.4.1 An Inclusive and Balanced approach to IS implementation

The approach to IS implementation which is proposed reflects the broad definitions of IS and IS implementation, and theoretical understanding of the process including its human element. It is also founded upon the practical experience of implementation, particularly within the challenging context of mental health. It is an *Inclusive and Balanced Approach* (I&B).

Specifically, this approach is an attempt to recognise and address the challenges and problems associated with, (1) redefinition of relevance within implementation and the inclusion or exclusion of issues and perspectives, (2) the nature and influence of human activity, and (3) determination of ownership and responsibility, and the general pursuit of clarity within what is defined as implementation.

Inclusivity requires the identification and integration into practice and process of the range of personal, professional, and service perspectives, attitudes, skills, issues - human/social, organisational and technical - conflicts, incompatibility or contradiction and the pursuit of clarity. It recognises that conflict and partiality are organisational facts which, rather than being avoided or merely accepted respectively, instead need to be understood and addressed. IS implementation as novel change stimulates these and brings them into the open. Equally this

implies recognition that implementation dominated by individual perspectives e.g. technical/IS or senior management, is not adequate to maximise the potential of IS. Using the example of study Trust IS it is open to question whether clinicians did not become involved because of one or a combination of the following reasons: (1) they were content to be detached, (2) there was no existing structure for them to become involved, (3) project managers would not know how or have the capacity/seniority to deal with their concerns, (4) they would not want to be diverted from what they would see as alternative core issues, (5) senior management either did not see the need for their involvement in “technical” issues, or (6) they wished to avoid anticipated complexity and conflict that would result from their involvement.

Whether or not it was possible to rectify the situation this significant omission and its consequences were not overtly addressed. This would have involved recognising it as representing, firstly, both a non-inclusive, and imbalanced implementation, and secondly, as demonstrated similarly within reported cases, an incompatibility. In this case the incompatibility was with the aim to implement an MHIS relevant to clinical service and process, and also the expectation that clinicians would enter data. With such an incompatibility relatively clear options were presented. These were to encourage, support or enforce clinical involvement or to modify implementation aims and to make this change known i.e. to re-specify the relationship of the IS to clinical information and clinical use. In effect this could involve re-categorisation of an MHIS as a less demanding and more feasible administratively focussed IS, or ISMH.

What is inevitably closely linked to inclusivity, and was demonstrated within the comparison study, is a lack of *balance* - of consideration, involvement and leadership/direction of/by different perspectives - within IS implementation. Within the TWIS nominal clinician inclusion or involvement e.g. through membership of a particular project group, attendance at system demonstrations or to be informed of progress, did not equate to the implementation being *balanced*.

Implementation balance requires maintenance of substantive dialogue, responding to the unpredictable nature of change, rather than practice and communication through unchallenged monologue, whichever perspective that represents. Balance can be formally established through project structure⁶ but it is a general concern and relates to the avoidance of domination of particular views, attitudes or issues. An example of the application of a balance project structure, from the SISD, is shown as Figure 4.3. Whilst within the SISD formal balanced structures were put in place, it was nonetheless often felt in practice by local IS staff that it would be less complicated or most convenient to rely on the local IS perspective to maintain effective leadership e.g. as others did not or found it difficult to prioritise the SISD. The dangers of resultant lack of balance if this happened were recognised and flagged up as a potentially limiting factor on impact, particularly as it would be likely to restrict routinisation of use within the clinical service. However much individuals, or any group or profession within an implementation may believe they have the organisation's best interests at heart failure to maintain balance has significant potential consequences. These include failure to establish or maintain broad ownership of, and responsibility for the success or failure of the implementation, and the inability to create long-term sustainability of either implementation or IS.

These issues reflect study findings such as the distinctions indicated through the ISA between opinions which relate to future or current IS, and alternatively what applies generally or personally e.g. regarding IS use or positive involvement. They also concern both the specificity of attitude and behaviour rather than it being generally positive or negative, and complexity of the relationship between attitude and behaviour e.g. the TWIS project manager stated they were not able to rely action consistent with positive attitude, and within the SISD there were clinicians who had concerns regarding confidentiality but as they were dealt with openly and involved the clinical service were also prepared to positively support agreed progress. Furthermore the instability of attitude and behaviour, and the distance between, for example, acceptance of IS, and positive commitment and

⁶ A balanced project structure is recommended within PRINCE2 (CCTA 1998).

involvement all place potential barriers in the way of achievement and sustained success.

With varying allegiance within the organisation it is necessary to recognise that positive attitudes towards its aims are not incompatible with contrary attitude and behaviour based on professional or personal allegiance, or priority. A corporate manager may have primary allegiance to organisational legitimacy and stability, translated as the ability to report the existence of an IS as a “success” and provide clinically-related statistics from it e.g. waiting lists. An operational manager may alternatively interpret their allegiance to a local directorate as meeting demands to use an IS with the minimum of disruption or change to their part of the organisation. Clinicians have allegiance to the provision of clinical care, and matters which they see as falling beyond this are judged accordingly. Within the Trust, IS staff, were primarily concerned with IT and Trust-wide infrastructure and the TWIS project reflected this.

These allegiances may be contrasted with, or considered to present potential barriers to allegiance to firstly, what is conventionally called an “IT project”, often deemed to be the responsibility of a project manager. Through redefinition however and the broader concept of implementation implicit within this is the need to address the interface between the organisational host and IS.

Associated with inclusivity and balance is thus a need for allegiance to the implementation itself. This should be distinguished from allegiance to whatever form of project structure or methodology is put into place. Whilst reference is conventionally made to project “sponsorship” this can be re-interpreted as the need for an *implementation conscience*. This means a role, not for technical knowledge, but for a general concern, to challenge assumptions, state and demand what the organisation needs to sacrifice in order to achieve implementation, and above all to ask everyone difficult questions.

In addition whilst an organisation may have skilled managers, clinicians, IS staff and even project managers, the nature of implementation as described also demands the particular skills necessary to understand, and to address the interface between the organisation and IS - how they effect each other, and the

way in which they need to be considered as integrated i.e. accepting the definition of IS as a blend of elements. Alongside allegiance to the implementation itself this requires establishment of the specific role, and development of skills of *interface management*.

A primary responsibility of interface management, and a common thread throughout implementation is *enforced realism*. Recognising the weaknesses of implementation found and the range of barriers to success, enforced realism is a general concern to tie aims, resources, methods, technology and thinking, to realistic potential and means to achieve. It also requires recognition of conflicts, and limitations and thus what cannot be achieved. This places a focus on achievability and the need for clarity e.g. converting any “vision” into specifics. It leads to challenge of assumptions, myths, identification of misconceptions and the recognition of conflict and incompatibility. The result of enforced realism is decisions within IS implementation concerning, (1) what precisely is desired, (2) what its consequences are (discovered through implementation rather than known at the start), (3) whether what is desired is possible, (4) what would be required to achieve it, (5) whether the organisation is capable or willing to do this, and (6) if not how either the organisation or aims should be modified.

Emphasis thereby changes from, but does not neglect, the question of whether the technology can work. Instead it is primarily focussed on the organisational change encountered, and the social process of implementation. Rather than be driven by the question of what IT and IS should be applied, the organisation must question what change it requires of itself and whether it is capable of undergoing this change. A concern within implementation and interface management, consistent with enforced realism, can thus be described as *organisational fitness to implement*.

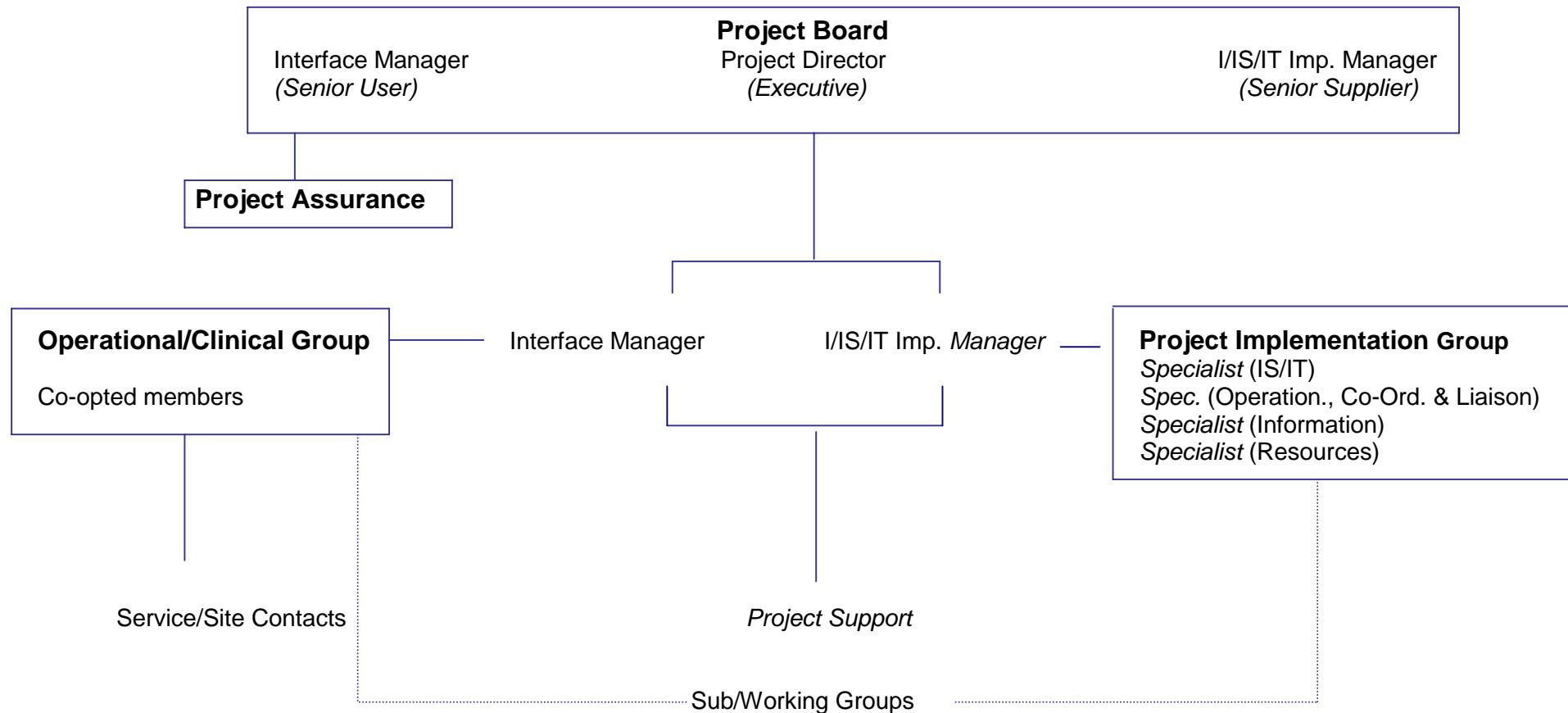
Constant attention is required to maintain I&B where organisational forces, behaviour of individuals and the ubiquitous concerns of time and budget represent pressure towards the bias of consideration of specific perspectives and the narrowing of focus. Within IS implementation this is seen most obviously by both the imbalance of narrowing of focus towards IT, and the most easily

understood physical aspects of technology, away from the challenges of social and organisational/clinical process and the essential invisibility of information. Project activity and effort, achieving some elements of implementation such as installation of technology, and the existence of software may not be perceived as failure in absolute terms, but be far from achieving less tangible scope and impact e.g. to provide information to support clinical decision-making. If an implementation does not address the means of achieving such impact its potential is limited and will be seen primarily in relation to those tangible elements. This pattern of progress can be described as *achievement plateauing*.

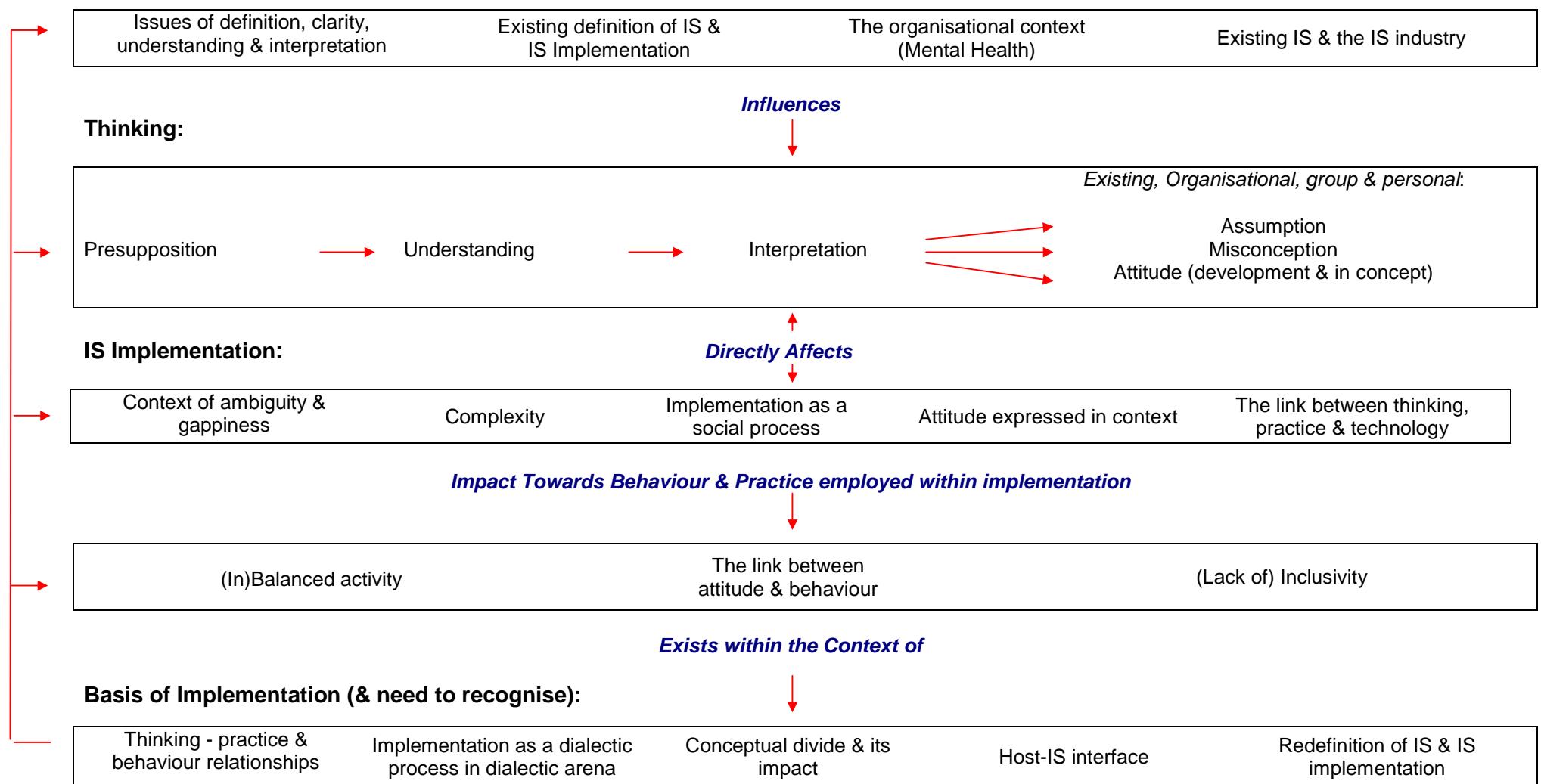
As a practical approach I&B does not represent an attempt to involve everyone and everything, to create an overblown project structure, or to attempt to homogenise attitudes. It rejects a belief that an approach or methodology can be employed which will ensure success. In contrast, recognising the evidence of lack of clarity as to what implementation entails, and failure to address relevant issues the I&B approach is an attempt to anticipate the many and wide-ranging barriers to progress, to recognise them, to make decisions, to allocate responsibility appropriately.

This approach involves avoidance of performance out of context with the task, resources, existing technology and organisation, and instead recognises difficulty, weakness and limitations. It is not a solution to be taken out of the context of the implementation milieu but is a development of the logical framework that has been developed through this thesis, described through Figure 4.4 - Summary of the implementation milieu. Within that assumed milieu I&B is a necessary means to support dialogue and synthesis. It is an attempt to avoid monologue, and to identify and navigate the many barriers that stand in the way of successful implementation.

Figure 4.3 Example balanced IS implementation management structure



Italic = PRINCE2 terminology

Figure 4.4 Summary of the implementation milieu**The Existing Environment:**

4.4.2 An Interface Management Toolkit

Although I&B and interface management can be described as general concerns or approaches in order to directly address areas of perceived weakness, the practical task of performing implementation involved interpreting these and the development and application of specific tools. Each was developed either reactively in response to problems found within the Trust or study directorate, or proactively to manage implementation within the study directorate. They are not therefore considered final, definitive tools but the basis for further modification as necessary. Together they comprise the *Interface Management Toolkit*.

Each tool concerns an area defined within the IS implementation process (Figure 4.1), and together they address the implementation as the complex social process defined. They act to bridge the conceptual divide, and are positive steps to move from the theory-practice model of change and the alternative ideology of dynamic, qualitative change. The tools vary between reference documents or thought/actions prompts, tables/forms to complete and others such as questionnaires to apply in either their original state or with justified amendments to a particular context.

Although predominantly aimed for use by the person or persons responsible for the implementation as a whole, or specific interface management (IM) these tools are designed to involve input from and communication with people across the host organisation, and from the IS function. The issues and processes discussed require this input.

There is no strict order in which to carry out the exercises, which the tools define. This is a matter for judgement within context. As various tools are designed to be revisited, revised, or repeated as required iterative development is assumed, prompted by the nature of the context, the status of the implementation and the results shown by each tool.

An approximate logical ordering of tools is shown below for guidance purposes and each is summarised as Table 4.1 - Interface Management Toolkit summary:

- a) ITQ - Information Technology Questionnaire
- b) Host - IS Typology
- c) Key Stages of Perception
- d) Communication Network Diagram
- e) Major Actor Analysis
- f) Conceptual Divide Analysis
- g) Conflict & Incompatibility Networks
- h) PID+
- i) 1 to 1 User Consultation
- j) Organisational Issues Tables
- k) Misconceptions
- l) Evaluation Structured Interview

Table 4.1 Interface Management Toolkit summary

| Tool Name | Issue Concerns | Related Case Findings |
|---|--|--|
| <i>ITQ - Information Technology Questionnaire</i> | The staff of the organisation and their experience, expectation and attitudes - the user, and use and attitude profiles. What do they think about IS in concept, and what is the potential for translation into attitudes and behaviour when encountered with implementation i.e. in practice. | <p>Lack of awareness of the staff of the organisation and their experience - at home and work - expectation and attitudes. Weak appreciation of the user, use and attitudinal context within which implementation takes place. How will this information influence what happens? How should the implementation be managed knowing this information? What is the impact of not being aware, acknowledging or taking account of this? Consider what the results for the study Trust told us that we did not know/expect.</p> <p>This is a demonstration that the organisation considers it important/a matter of relevance what its staff know and think - that this is of relevance to an implementation.</p> |
| <i>Host - IS Typology</i> | ITQ raises issue of attitude and its formation. This takes it further and addresses specifically how you can describe the varying experiences, attitudes and behaviour of all those within the Host and IS function spectrum (and specifically avoids addressing one at the expense of the other). This recognises the role and influence of all those involved within implementation. | <p>The importance of attitude and behaviour but the relative lack of awareness, understanding and management of it. There is a need to analyse the range of experiences, attitudes and behaviour, where they may be found, and how to understand them. Equally results demonstrate the variations in characteristics defined here as types, shifts that can take place, and the range of attitudes and characteristics that any individual may demonstrate i.e. they do not necessarily demonstrate static or singular characteristics.</p> |
| <i>Key Stages of Perception</i> | The nature of the gap that exists between learning that an IS, an implementation or a host organisation exists, and active participation in it or with it. | <p>There is a path, rather than a single step between obliviousness and active participation, and this requires nurturing and management. Positive involvement can be contrasted with apparent positive attitudes and requires further commitment. These stages relate to the path between interpretation and behaviour/practice, and in specific terms the host and IS types found.</p> |
| <i>Communication Network Diagram</i> | The major actors within the implementation process and the relationship between them, and also the existence and position of the Host-IS interface or barrier. | <p>There is a need to take into account the nature of the relationship (and responsibilities) between the major actors involved within implementation as this affects the process. The process and the relationships are however influenced by the Host-IS interface, where it exists and how it impacts upon implementation.</p> |

| Tool Name | Issue Concerns | Related Case Findings |
|--|---|--|
| <i>Major Actor Analysis</i> | Who is part of the implementation and what role they have. | IS implementation is not a routine event and organisations are not necessarily set up to cope with the challenge. A lack of clarity of role can exist. Those involved in implementation do not necessarily understand what their role is or agree about each others' roles. There needs to be identification of who is involved, what skills they have and what role they will play. This will raise issues concerning allocation of responsibility and identify gaps. |
| <i>Conceptual Divide Analysis</i> | Lack of understanding, lack of knowledge, issues that are not addressed or remain unanswered, and different perceptions of the nature of the organisation and the implementation. | Organisations fail to address both the lack of understanding between IS and host, and investigate the interface between them. There is a need to consider the implications for the implementation. |
| <i>Conflict & Incompatibility Networks</i> | The need to analyse the implementation milieu for the purposes of identifying barriers or inadequacies. To identify incompatibilities between elements of the implementation process, and to differentiate between general conflict and specific limits on what can be achieved. | <p>This provides a means to address complexity and specify what potentially or actually stands in the way of implementation - to frame the situation. It provides greater certainty and clarity - what should be or has to be addressed - by placing the IS within the context of its environment and the issues that are relevant to its implementation.</p> <p>It is a means to demonstrate to managers of the organisation, in non-technical terms, what stands in the way of progress as specific limits and what conflicts are likely to occur. This prompts communication at an early stage rather than allow "shocks" to affect progress at a later time.</p> |
| <i>PID Plus</i> | Providing a comprehensive document (or series of documents) describing not just technical issues but what is happening, how, why, & what the implementation does and does not concern or include. It is a means for all to understand the implementation & communicate about it. A resource kit/reference point for the implementation to be used throughout. | As a reference document this overtly states what the implementation will attempt to achieve, how and why. All will know and be in a position to judge progress, methods etc. It thereby attempts to increase clarity and support evaluation. |

| Tool Name | Issue Concerns | Related Case Findings |
|--|---|---|
| <i>1 to 1 User Consultation</i> | To support communication between users and those managing implementation, increasing their awareness and knowledge for each of the other. To raise any problems, queries and concerns that may exist. | Reflective of the ITQ questionnaire, there is inadequate understanding of the staff of the host organisation, their needs, expectations, skills and so forth. Consultation will help where there is need to establish this. |
| <i>Organisational Issues Tables</i> | Acts as the basis for any level of detailed consideration of or communication regarding the human & organisational issues – what they are, how & when they are dealt with, involving whom. Acts as a prompt for discussion and action as a catalogue of issues & action demanding attention & setting the agenda. | This tool supports inclusivity i.e. what is or is not included within the implementation, and balance i.e. emphasis across host and IS, technical & non-technical. It moves beyond outline project planning to a clearer, detailed, discussed & agreed framework to address issues & outline action involved. |
| <i>Misconceptions</i> | Isolated attitude, decisions, and behaviour can be considered in relation to common misconceptions felt to be a threat to achieving IS implementation. | Many individual actions and behaviour can be seen to be based on a limited number of misconceptions concerning the implementation process. |
| <i>Evaluation Structured Interview</i> | Establishment of implementation progress that has been made from the user's perspective as a formal means of communication & consultation. | With a host of often conflicting views of project and system progress those managing implementation need to know what people think and to apply a consistent and comprehensive means to seek opinion. It avoids relying on assumption, the views of a vocal or influential minority and should be carried out not as an afterthought but as part of monitoring of progress. |

4.4.2.1 ITQ - Information Technology Questionnaire

Utilised through the ISA study element (**Appendix E**), the ITQ aims to examine the host organisation's user and use profiles, and prevailing attitudes, notably when approaching implementation. This is the initial step to address the danger that implementation may be performed regardless, or be ignorant of the host organisation i.e. to include knowledge of the staff of the organisation, their experience of computers, and attitudes as users or potential users.

4.4.2.2 Host and IS staff Typology

The nature of IS implementation was defined as being a social process and focussing on the complex path from, and links between, understanding and interpretation, attitude, and behaviour and practice. A tool is thus required to prepare for and manage (though not control) this social process addressing the need to make sense of what can appear unpredictable behaviour and to understand its source. Through the IS Host User/Actor Typology (**Appendix T - Host User/Actor Typology⁷**) and IS Staff Typology (**Appendix U - IS Staff Role Typology⁸**) the wide range of attitude, behaviour and characteristic types of both users and IS professionals are defined and their consequences discussed. People can exhibit the behaviour/characteristics of one or more of the types and change between them. The variables discussed within the tool, in relation to each type is shown as Table 4.2, and the Host User/Actor and IS staff types defined as Table 4.3, and Table 4.4 respectively.

⁷ A full copy of the tool does not appear as an appendix, but can be provided by the author upon request.

⁸ As footnote ⁷.

Table 4.2 Typology category variable & description

| Type Variable | Description |
|-----------------------------------|---|
| Description | Description of type. |
| Who? | Who is thought to be an actual or potential member of this category? |
| Catchphrase | A typical indicative statement that could be made by a member of this category. |
| Experience | What work experience are they likely to have had. |
| Expectation | Their expectation of IS. |
| Role / Effect | The role of members of this group, and their effect. |
| Example of Action | Typical action(s) that a member of the group might make. |
| Management | How the group can be positively managed by the host organisation and/or management of implementation. |
| Stability & Transition | The relative stability of the group and its members, and how members may move into or out of the category. |
| Self-Efficacy | A person's belief regarding their personal capabilities to use IS. |
| Outcome Expectation – Performance | A person's belief regarding job performance i.e. efficiency & effectiveness, relative to the use of IS. |
| Outcome Expectation - Personal | A person's belief regarding the effect of IS use relative to their own role or career i.e. change, reward, and promotion. |
| Affect | Personal positive response to IS use. |
| Anxiety | Personal negative response to IS use. |
| Use | Degree of IS use. |

Table 4.3 IS Host User/Actor Typology categories

| IS host user/actor characteristics or behaviour | Type Description |
|---|---|
| Oblivious | Ignores the presence of IS. |
| The Uninitiated | New users. |
| Acceptor | Is prepared to accept IS without any necessary particular enthusiasm, fear or doubt. If they exist these feelings may be internalised rather than expressed. |
| Technophobe | Fearful of IS. |
| Technohater | Active, positive dislike of IS. |
| Gatekeeper | With the previous or present ability to grant or restrict access/use, or a sole user within a locality. |
| Inexperienced Enthusiast | Optimist who wants it to work, but without the benefit of experience or perhaps knowledge, or realistic expectations. |
| Grasper | Wishes to seize the opportunity presented by IS. |
| Convert | Someone who did not, but does now see the point and potential benefit of IS. |
| Underminer | Criticises beyond the formal implementation forums. |
| Old-hand Sceptic | Doubts success from the benefit of previous experience or knowledge of use. |
| Implementation Conduit / Operational Interface | Someone who is used within the implementation process. |
| Power User | Those playing a defined part within IS implementation or development. |
| Immunity & The Immune | Belief in the non-applicability of actual IS or its demands or implications to themselves. |
| Helpdesk Junky | A high level of dependence on the support of others to use and to deal with problems encountered. |
| Me, Me, Me | A preoccupation with the personal meaning and impact of an IS or implementation, to the exclusion of other group, professional or organisational meanings, demands or consequences. |

Table 4.4 IS Staff Typology categories

| IS Staff Role | Type Description |
|---------------------------------------|--|
| Oblivious | Unaware of, or ignore the presence of the host of IS. |
| Workhorse | Get on with what they are asked or told to do. Not interested in or paid to consider the context. Have a strict focus on technically implementing what the IT function requests them to do. |
| Mr. Practical | Focus on getting the job done, and not being sidetracked by either technical or contextual distractions. Likely to be aware of contextual complexities but wishes not let them impinge or perhaps even to face them, in which case someone else will have to. |
| The Two-Headed-Beast | Presents one face i.e. attitude, approach & priorities, within the IS or IT function and an alternative or contradictory one to the host. |
| The Balanced Practitioner / Interface | Attempts to implement or develop taking account of all perspectives, and both short and longer-term issues i.e. with an inclusive and balanced manner. |
| Strategic Thinker | Plans IS implementation, infrastructure, standards, and general direction of IS use. |
| Hostphobe | Wary of contact with, or demands placed by the host. |
| Hosthater | Active disregard for or dislike of host/user demands. |
| Gatekeeper / Protector | Ability to restrict or allow the purchase of, access to, and use of IS. The gatekeeper of knowledge and involvement. As Protector takes a specifically defensive attitude towards freeing or granting access to IS resources. |
| True Techie | Focussed on the achieving technical solutions - "the joy of IS" and its specific practical demands, and not primarily concerned with implementation, contextual issues or user needs. |
| Experimenter | Focussed on testing and experimenting with IT. The IT challenge in itself is the primary, and perhaps only priority. |
| Universal Pleaser / Task Sponge | Tries to please everyone all the time. Takes on everything, deals with all issues. Actively seeks involvement and does not turn down requests to help. |
| The Peoples' Friend | As a User's friend the primary focus is on their needs. |
| Educator / Evangelist | An approach based on, or reflecting the belief in the beneficial role of IS. Sees the benefit of hosts, or anyone, generally knowing more. |
| The Non-Technical Technician | Although they work with IS and have technical skills, the non-technical technician presents them self to the world as a "non-technical" person. Alternatively they may be regarded as such by the organisation that they work for. |

4.4.2.3 Key Stages of Perception

This tool was constructed in recognition of steps of attitude and behaviour in relation to their reaction and involvement within IS implementation. It is intended to act as a reference to differentiate between, to locate individuals and groups within the range shown, and describe the path between different states (**Appendix V - Key Stages of Perception**)

4.4.2.4 Communication Network Diagram

The communication network diagram is a means to identify and describe existing, and consider requirements of communication and relationships amongst major actors within implementation (**Appendix W - IS Communication Network**). In diagrammatic form it prompts specification of potential weaknesses, considering the position of the following actors and their communication relationships:

- a) Suppliers (IT)
- b) Project Team
- c) Project Manager
- d) The Host-IS Interface/Barrier
- e) Senior Managers
- f) Operational Managers
- g) Users (to include administrators and clinicians within mental health contexts)

4.4.2.5 Major Actor Analysis

Linked to the Communication Network Diagram above, Major Actor Analysis is a means to identify and describe existing, and consider requirements relationships amongst major actors within implementation (**Appendix X - Major Actor Analysis**). It specifies potential weaknesses and areas to give attention to.

4.4.2.6 Conceptual Divide Analysis

Conceptual Divide Analysis presents a range of questions to enable examination of the relationship between the organisation host and IS, and lists questions to ask by one of the other. It is thereby intended to support the bridging of the conceptual divide (**Appendix Y - Conceptual Divide Analysis**).

4.4.2.7 Conflict & Incompatibility Networks

Diagrams produced using this tool demonstrate awareness of the inherent conflicts and incompatibilities that exist as part of IS implementation (**Appendix Z - Conflict & Incompatibility Network**). Conflicts have the potential to have negative or positive impact, and exist as either potential barriers, or are issues that need to be addressed. Incompatibilities however by definition limit what is possible to achieve.

The simple, non-technical format of the tool supports discussion within the organisation and their clarity acts as a means to enforce realism. Choices are demanded as to how conflicts and incompatibilities are to be addressed. In the latter case the consequence of recognition of incompatibility requires that either features of the implementation context or wider environment, or the aims of IS implementation have to change. Resources should thus be appropriately directed.

Example network diagrams and related tables, created through the SISD are shown below as Figure 4.5 - SISD Conflict Network, Table 4.5 - SISD Conflict Table, Figure 4.6 - SISD Incompatibility Network, and Table 4.6 - SISD Incompatibility Table.

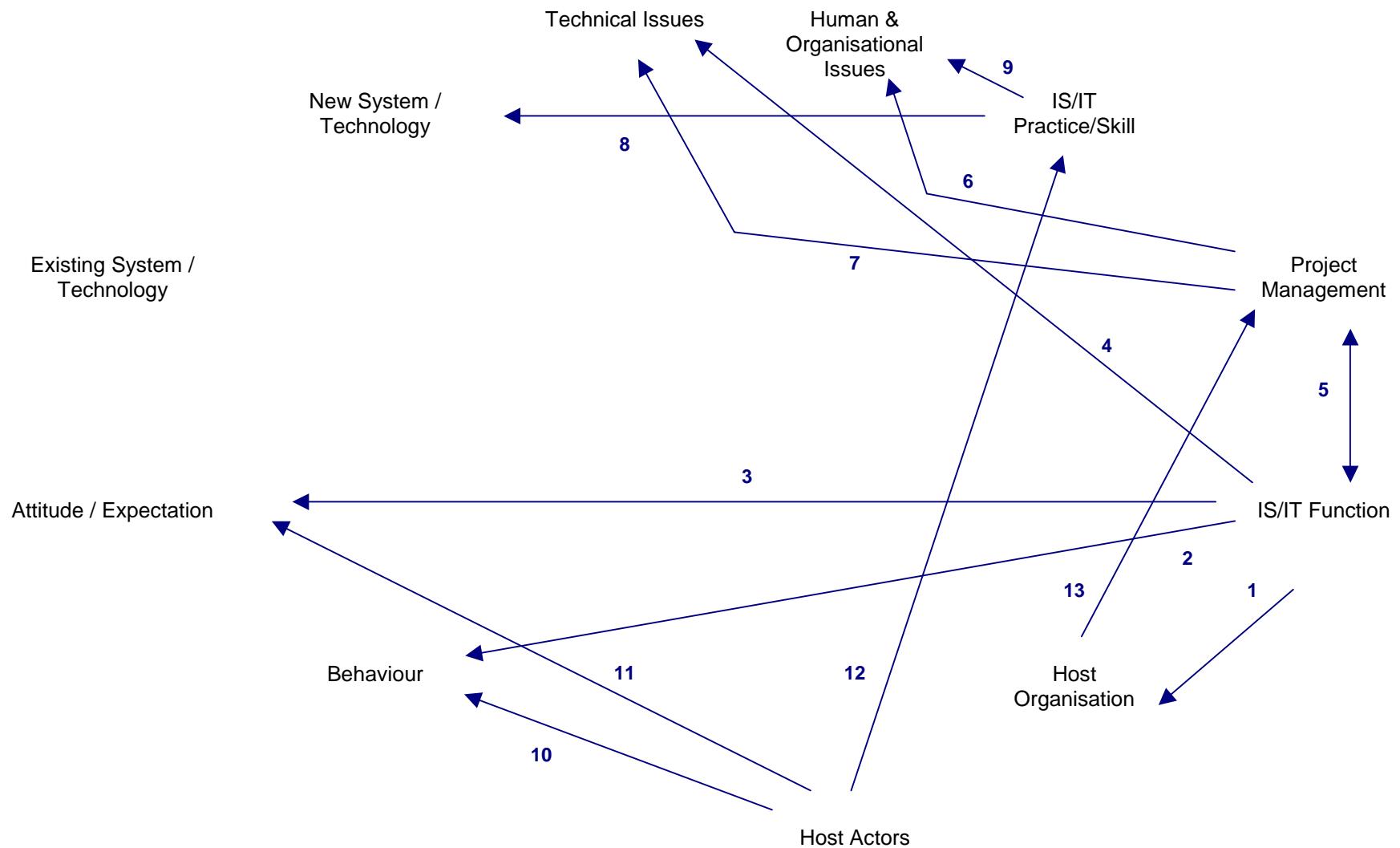
Figure 4.5 SISD Conflict Network

Table 4.5 SISD Conflict Table

| Conflict No. | From | Content | Relating To |
|---------------------|-------------------------------------|--|-------------------------------------|
| 1 | IS/IT Function | <i>Issues relating to previous relationship - Non-IS and IS specific.</i> | Host Organisation |
| 2 | IS/IT Function | <i>Specific non-adherence to requests and agreements.</i> | Behaviour |
| 3 | IS/IT Function | <i>IS/IT attitude to roles, who manages and leads. Also conflicting attitudes within IS/IT.</i> | Attitude / Expectation |
| 4 | IS/IT Function | <i>Conflicting IT advice from different sources.</i> | Technical Issues |
| 5 | IS/IT Function & Project Management | <i>Competing and conflicting perspectives and priorities.</i> | Project Management & IS/IT Function |
| 6 | Project Management | <i>Lack of control/influence over matters related to H&O issues.</i> | Human & Organisational Issues |
| 7 | Project Management | <i>Lack of control/influence over technical implementation.</i> | Technical Issues |
| 8 | IS/IT Practice/Skill | <i>Prolonged problems with technical matters.</i> | New System / Technology |
| 9 | IS/IT Practice/Skill | <i>Does not address H&O issues sufficiently, both absolutely and the interface between technical and non-technical. Requires Host/Project Management intervention.</i> | Human & Organisational Issues |
| 10 | Host Actors | <i>Potential non-adherence to required practice.</i> | Behaviour |
| 11 | Host Actors | <i>Expectation of ease. Little appreciation of difficulties.</i> | Behaviour |
| 12 | Host Actors | <i>Lack of skill, and training shortfall versus the demands being made of the staff by the new systems.</i> | IS/IT Practice/Skill |
| 13 | Host Organisation | <i>Organisational preparedness to accept the implications of an inclusive and balanced implementation.</i> | Project Management |

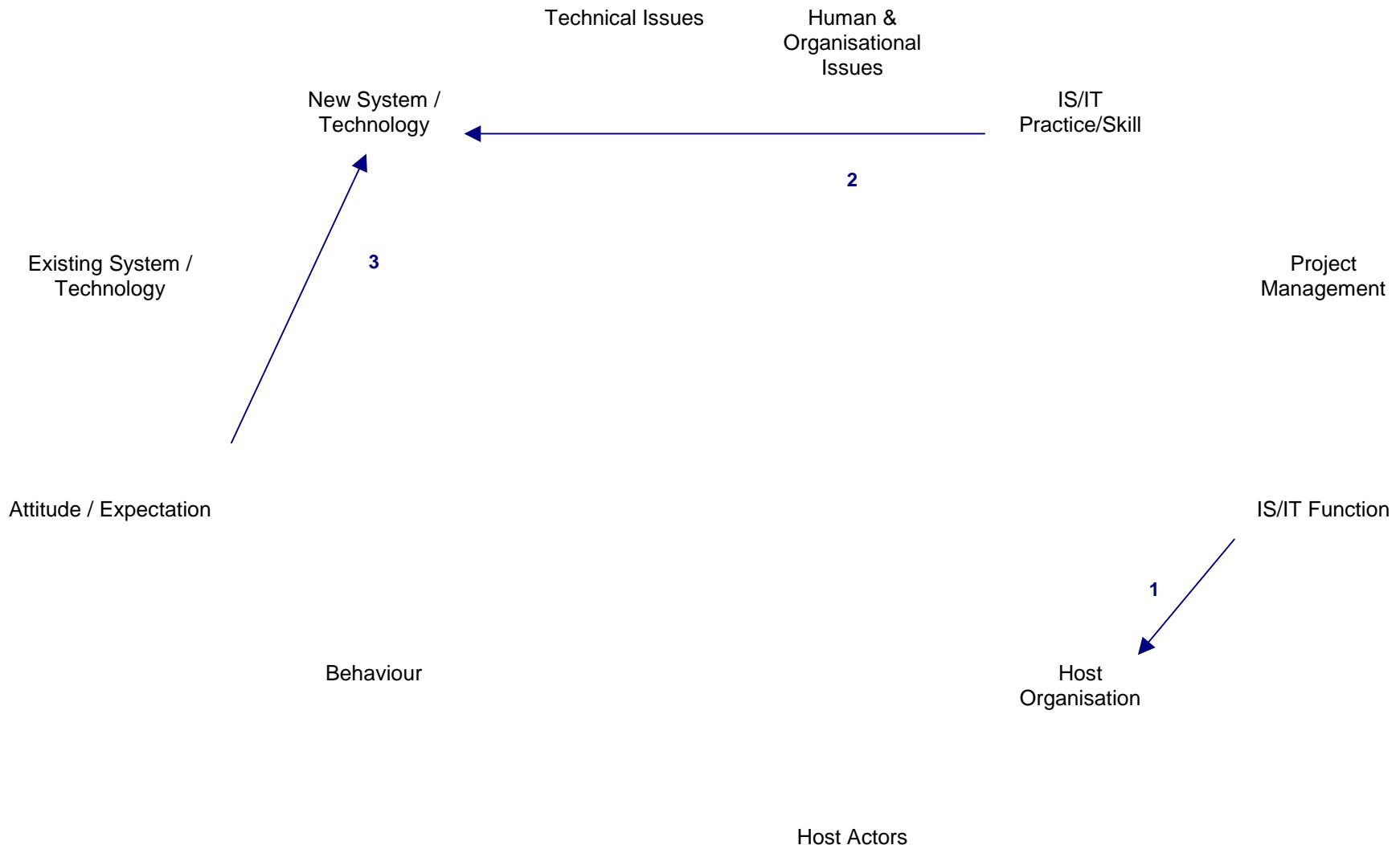
Figure 4.6 SISD Incompatibility Network

Table 4.6 SISD Incompatibility Table

| Incomp. No. | From | Content | Relating To |
|-------------|------------------------|---|-------------------------|
| 1 | IS/IT Function | <i>Incompatible IS/IT assumptions, methods, priorities versus the demands of, and the systems desired by, the Host Organisation.</i> | Host Organisation |
| 2 | IS/IT Practice/Skill | <i>Developing incompatibility - The skills of IS/IT and application of technology versus the desired systems and functionality, and reasonable schedules.</i> | New System / Technology |
| 3 | Attitude / Expectation | <i>Expectations of the systems to meet defined organisational needs not met. Becomes incompatibility between the actual implementation & what IS/IT is able to implement, versus what was needed.</i> | New System / Technology |

4.4.2.8 PID (Project Initiation Document) Plus

The standard Project Initiation Document used within PRINCE2 methodology was adapted to create a detailed reference document, written in non-technical language that could be understood by staff throughout the host organisation. This provided a basis for subsequent evaluation (**Appendix AA - PID+**⁹). An example of the content included, showing aims and objectives of the SISD is shown as Table 4.7.

⁹ A full copy of the tool does not appear as an appendix, but can be provided by the author upon request.

Table 4.7 SISD aims & objectives

| | Aim/Objective | Who is Responsible | Means to Achieve | How Measured / Reviewed / Assessed |
|----|--|--|---|---|
| 1 | General e.g. Agree and establish project structure, aims and objectives, roles and responsibilities | <i>Initiation Group (Project Authors)</i> | Project Initiation Document (PID) | Review of PID |
| 2 | Physical Implementation of new Information Technology e.g. PC access to all administrators, clinicians, managers, nurses, and PAMs, in appropriate locations, agreed through project, in 2001. | <i>Project Manager</i> | Details within Project Plan. Via PIG Using Project Asst. | Against Project Plan within the PB. |
| 3 | Setting Infrastructure e.g. Establish current position of cabling infrastructure and steps required to have entire service to required standard | Project Specialist (Resources) | Via Health IT & securing of funding. | Project Plan via Project Board. |
| 4 | Networks e.g. Establish a process for prompt setting-up, modification, and deletion of user accounts. | <i>Project Manager</i> <i>Operational Group (CEG)</i> | Establishment of internal notification system and PM/Health IT action | Establish procedure Review of performance |
| 5 | Communications Infrastructure e.g. Agree strategy for Implementation with Trust / Leics. Health. | <i>Project Director</i> | Meetings with Health IT | Progress Reports Establishment of Plan |
| 6 | Intranet e.g. Establish practice for writing and programming content – long-term, including favoured methods and how to achieve them. | <i>Project Manager</i> | Experience, training & external support | Progress against Development Plan |
| 7 | Clinical Impact and Use e.g. Identify the means of implementation conducive to the needs of the clinical service i.e. with minimal distraction from clinical priorities. | <i>Operational Group</i> | Operational Group meetings | Project Report |
| 8 | Organisational & Administrative Impact and Use e.g. The operational service to advise the project regarding implementation issues, and how administration is/will be affected. This should be through the project structure created. | <i>Project Co-ordinator</i> | Operational Group Local Contacts | Agendas & Reviews |
| 9 | Information e.g. Introduce an awareness of the “Information Impact” of action clinical & other operational practice e.g. with a new procedure – will this affect information collection or reporting? | <i>Specialist (Information)</i> | Project role responsibilities. Input to PIG | Specialist (Information) to report on issues & requirements |
| 10 | New User Community e.g. Identify all potential/expected users | <i>Operational Group</i> | OG & Contacts to action, with awareness of planned systems. | Project review |

4.4.2.9 1 to 1 User Consultation

Within both the SHQ and SISD study elements a substantial effort was made to consult with potential IS users, carry out system induction and support individual IS users. A user support role was created to take responsibility for this area alongside establishment of site contacts representing all services and physical sites, and regular meetings of these staff. A standard form was used to frame, and record details of consultation with individuals and the task of preparation prior to physical installation of technology (**Appendix BB - IS Implementation - 1 to 1 User Consultation**).

4.4.2.10 Organisational Issues Tables

Adapting categories of human and organisational issues defined by Doherty and King (1997 and 2001) a template was created to document the treatment of these issues¹⁰. This provided a framework for planning and review of progress within implementation cases (TWIS and SISD), and for comparison of approaches and understanding of human and organisational issues. The tool is also a communication device for staff across the organisation and means to support the identification of requirements and implications. Issue categories are shown as Table 4.8.

¹⁰ A copy of the tool does not appear as an appendix, but can be provided by the author upon request.

Table 4.8 Organisational Issues Table categories

| Category | Specific Issues |
|------------------------------------|---|
| Organizational Contribution | Cost-benefit analysis Information systems strategy Prioritisation Process re-engineering Future needs of organisation |
| Human-centred Issues | Training provision Health & safety / ergonomic factors User motivation / needs User working styles / IT skills Job redesign |
| Transitional Issues | Timing of implementation Organisational disruption |
| Organizational Alignment | Organisational structure Organisational culture Organisational power |

4.4.2.11 Misconceptions

During the study there was observation of a range of assumptions, expectation, attitudes, behaviour and IS implementation related practice. Relating this to the definitions of IS and implementation that were developed and of the nature of the social and dynamic change that has been described, there were a number of misconceptions that were identified. The many individual assumptions etc. witnessed during implementation and communicated through research tools were thereby identified as symptoms of what were more fundamental general misconceptions¹¹. Using this tool rather than consider attitudes and actions in isolation, it was possible to interpret them within the broader context of implementation and principles of implementation. This provided a basis to interpret attitude and behaviour, and to support communication within the host organisation. This was possible as the tool, in addition to detailing misconceptions, in each case also discussed the underlying assumptions leading

¹¹ A copy of the tool does not appear as an appendix, but can be provided by the author upon request.

to misconception, why these can be challenged, the attitudes and behaviour that demonstrate the misconception, and tactics to address the misconception. It was thereby possible to explain why assumptions are wrong whereas misconceptions may appear to be reasonable. The misconceptions are listed as Table 4.9 - IS Implementation Misconceptions.

Table 4.9 IS Implementation Misconceptions

| No. | Misconception |
|-----|---|
| 1 | There is a “gap” between the IS host and IS function that can be closed. |
| 2 | The problem or project is wholly known or defined before you address or start it. |
| 3 | A technical project or implementation can take place out of the social/political context of the organization which is to be its host. |
| 4 | It is possible to fully prepare for and plan in precise detail the conduct and action of an IS implementation. |
| 5 | A good project structure and better project organization or methodology can in itself provide a solution to project success. |
| 6 | The organisation should aim to create a “Controlled Environment”. |
| 7 | Technical input, or increased IS and resources can necessarily provide a solution. |
| 8 | Single or isolated factors tend to be the reason for failure or lack of success. |
| 9 | Implementation and use of IS are absolutes. |
| 10 | Awareness of IS and IS implementation equates to understanding, and leads to required involvement. |
| 11 | Attitude towards IS can be characterised as either positive, or negative. |
| 12 | A positive attitude towards IS will improve the likelihood of successful implementation (all things being equal). |
| 13 | People with a negative attitude will act negatively. |
| 14 | Those leading an Implementation have the understanding and expertise to achieve what is expected. |

4.4.2.12 Evaluation Structured Interview

A system and project evaluation structured interview involving the completion of a questionnaire was constructed as part of the SHQ study element. This provided a basis to perform further case evaluation exercises (Based on **Appendix P - Information Systems and the TWIS Project - Staff Questionnaire**).

4.5 Conclusions

Chapter One describes the problem of continuing and repeated failure associated with IS. From that point the dangers were avoided of attempting to provide a universal solution based on the evidence that is provided by that failure and its many symptoms. The alternative approach taken was to consider what it is about IS that presents such a difficult challenge, interpreted as the process of implementation, of getting IS to achieve its aims within an organisational, and thus, social context.

IS implementation demands synthesis between various technical, informational, organisational, and human elements. The essential challenges faced do not concern understanding of technology itself, but of the various elements that comprise IS, what it is to implement, what is required to maximise the potential of achievement of positive results, and the role, for example of IT within the greater whole. Understanding is required both of the place of technology within the organisation, and of its limitations as technology is not an end in itself. The change represented by IS implementation, like all change, must be understood in order to recognise the nature of the challenge it represents and the demands it makes of the organisation and individuals.

As the potential of IT rapidly advances, and by implication expectation of what is perceived to be IS also increases, the gap between potential, and actual positive and desired impact is not necessarily reduced. The "*myths and meanings*" (Checkland 1999, pA39) applied continue to influence this expectation, the process and outcomes. In order to understand outcomes there is need to recognise the consequences of thinking and practice that do not match this

potential. This involves considering the distinction between IT and IS, and the means of achieving maximum use and desired impact of IS, that being directly related to the particular organisational context.

Chapter Two describes the methods employed to examine the process of IS implementation as found within examples of UK mental health services, and Chapter Three the results of this. The quantitative and qualitative-based methods used were principally directed to a single organisation, over a number of years. This approach allowed consideration of the relationship of the organisation, and two parts thereof, with IS and how implementation was perceived and performed. In doing so it was possible to give attention to the influence of the human element within the implementation process - understanding and interpretation, attitude and behaviour - and as a result to demonstrate the difference between employing methodology, managing a project, and more broadly, performing implementation.

To present an answer that suggests that it is possible to ensure success is to miss the point. What is required is a better understanding of the process, and barriers to success, for example areas of conflict and incompatibility, to avoid diversion from these, and thus match organisational aims with the means of achieving them. This is to enforce realism. The process of IS implementation involves discovering the nature of the interface between an organisational host and technology, and what change is involved in the pursuit of specified aims. It is only through this understanding that the challenge of IS implementation can be addressed, not in terms of installing a technically proficient product, or carrying out an efficient project, but to manage change and generate impact through IS. This change is one which demands synthesis but is made complex as it highlights both, a) the host-IS interface and its interdependencies, and b) what distinguishes or separates us - priorities, allegiance, assumptions, attitudes, functional roles, behaviour and so forth.

A contribution is thereby made within the IS field, notably in terms of appreciation of the nature of the challenge faced when implementing IS within health and mental health services. This is at a time when the investment in IT - a question

being whether this applies equally to IS - and the expectation of change as a result, has never been greater. Further evidence regarding the potential of the interpretive approach and methods has been provided, in the context of desire within the IS field to make IS research more relevant to practice, specifically using action research (Baskerville and Myers 2004).

The attention given to mental health services demonstrates the peculiarities that exist within that area. The results of this research however are generally applicable as they concern the impact of the implementation process, which is complex and influenced by whatever contextual circumstances prevail. They point to general weakness within understanding of human and organisational issues and the role they play within implementation. These issues themselves are not situation-specific, whereas the organisation, the groups and individuals, and the situation at the point of, during, and created by implementation, is unique.

The study also facilitated, more broadly, consideration of understanding and interpretation of IS, IS implementation, the nature of that process and its human element. The Inclusive and Balanced Approach proposed is an initial attempt to put into practice the developing ideas discussed.

Appendices

- Appendix A - Mental Health Trust Comparison Study Timeline
- Appendix B - Comparison Study Method Summary
- Appendix C - SHQ IS implementation: Definition Exercise
- Appendix D - SISD Rich Picture
- Appendix E - Use of Computers at Work: Staff Questionnaire
- Appendix F - NHS Trust TWIS Interview Confirmation
- Appendix G - TWIS Managers Interview: Interview Subjects
- Appendix H - TWIS Manager Interview Guidance Notes
- Appendix I - TWIS Project - Manager Interview Acknowledgement
- Appendix J - SHQ Structured Interview/Questionnaire
- Appendix K - TWIS Project Managers Interview: Interview Questions
- Appendix L - LIS Implementers Interview Questions
- Appendix M - TWIS Project Interview: Project Manager Follow-Up
- Appendix N - TWIS Project Interview: Project Manager (2) Follow-Up
- Appendix O - TWIS Project: User Interview Question Schedule
- Appendix P - Information Systems and the TWIS Project: Staff Questionnaire

- Appendix Q - Research Project: TWIS Questionnaire covering letter
- Appendix R - SISD Research Themes
- Appendix S - Comparison Study Bibliography
- Appendix T - Host User/Actor Typology
- Appendix U - IS Staff Role Typology
- Appendix V - Key Stages of Perception
- Appendix W - IS Communication Network
- Appendix X - Major Actor Analysis
- Appendix Y - Conceptual Divide Analysis
- Appendix Z - Conflict & Incompatibility Network
- Appendix AA - PID+
- Appendix BB - IS Implementation: 1 to 1 User Consultation

Appendix A: Mental Health Trust Comparison Study Timeline

Table Key:

| | |
|------------------|----------------------------------|
| Research action | = Arial font |
| Contextual event | = Times New Roman font |
| Shaded area | = Period of research involvement |

| Date | Trust (or MHSU) Development | Trust-Wide Information System (TWIS) | Local Information System (LIS) | IS Questionnaire (ITQ) | Site Development (SHQ) | Directorate Development (SISD) |
|---------|---|--|--|------------------------|------------------------|--------------------------------|
| 1.1990 | | | Service Created. | | | |
| 2.1990 | | Report - Summary of Information Collected. | Definition of clinical data structure commenced. | | | |
| ?1990 | | Information Mgmt. Strategy (Not dated). | | | | |
| 4.1991 | | | System Specification | | | |
| 6.1991 | | | Development with 3 rd party commences. | | | |
| 8.1991 | | Service Director request for general use of LIS data structure within Trust. | Request for general Trust application of data structure. | | | |
| 2.1992 | | | Initial implementation. | | | |
| 5.1992 | | Joint HA/MHSU IS Work Plan. | | | | |
| 7.1992 | | HA/MHSU IM strategy. | MHSU Strategy to pilot LIS within Trust (didn't happen). | | | |
| 8.1993 | Chief Executive (CE) #1 leaves. | Bid for Funding. | | | | |
| 9.1993 | First Project Manager (PM #1) mentioned. | Info. Management Strategy. | | | | |
| 10.1993 | | Information Management & Technology – Implementation Issues Report. | MHSU Strategy - LIS noted as one of 3 current clinical systems. MHSU – Need to integrate IS or to develop e.g. LIS. | | | |
| 1.1994 | | HA Criticise MHSU IS. | | | | |
| 4.1994 | Trust status granted. Specific "Original PM" to be appointed. | IM&T Strategy. | | | | |
| 5.1994 | | PRINCE use stated. | | | | |
| 9.1994 | | Operational Requirement Report. IS Staff Survey. | MHSU Business Case – Inability to develop bespoke | | | |

Appendix A: Mental Health Trust Comparison Study Timeline

| | | | | | | |
|---------|------------------------------------|--|--|--|---|--|
| | | Business Case – the IS market is “mature” enough. | systems within the organisation as done through the LIS model. | | | |
| 11.1994 | | Project PID – Implement early 1996. | | | | |
| 1.1995 | | Detailed Statement of Need – 784 ideal / 236 minimum users, 468 ideal / 214 minimum terminals. | MHSU Statement of Need argues LIS “yet to go live”. | | | |
| 2.1995 | PM #2 appointed. | | | | | |
| 3.1995 | | Project Plan. Project Structure. PID v2. | | | | |
| 4.1995 | | IM&T Strategy. | | | | |
| 6.1995 | | PID v4. | | | | |
| 10.1995 | Original PM (#1) back in position. | Business Case. | | | | |
| 11.1995 | | | | | | |
| 12.1995 | | Business case – implementation 1997. | MHSU Business Case – Directorate “happy” with LIS. | | | |
| 2.1996 | | Business Case. | | | | |
| 4.1996 | | Medical Reps. Group ceases. | | | | |
| 5.1997 | CE #2 leaves. | | | | | |
| 1.1998 | | | | | | |
| 2.1998 | | Output Based Specification – 853 ideal / 90 minimum users, 256 ideal / 90 minimum terminals. | | | | |
| 3.1998 | | PID. | Director response to MHSU OBS – Challenges threat to “Valuable” local IS e.g. LIS. | | | |
| 4.1998 | | | | | | |
| 5.1998 | | System Presentations. | | | | |
| 6.1998 | | Shortlist recommendation. | | | Specification written. Queries Listed. | |
| 7.1998 | | | | | First meeting with Trust IT. | |
| 8.1998 | | | | | Organisational Issues documented. | |
| 9.1998 | | Full Business Case. | | | Issues for Trust produced. | |
| 10.1998 | | | | | Tenders reviewed. | |

Appendix A:

Mental Health Trust Comparison Study Timeline

| | | | | | | |
|---------|---|--|---|---|--|--|
| 11.1998 | | | | | Training Documents written. Tenders Examined. One-to-One user consultation proposed. Orders written. User Guidance Document. Site Presentation. | |
| 12.1998 | Research Registration - Formal Commencement. Permission from Chief Executive for research. New PM #3? | Trust Board approves purchase. | | | Project Plan. Hardware received. Hardware & software to inventory. Server/PC set-up. User demos. of new equipment. | |
| 1.1999 | | | | | User Consultation. | |
| 2.1999 | | Implementation Plan – live 11.99. Interview/Questionnaire Pilot. | | First Draft & Pilot. | Laptop installation. Software re-installed. Problem Review. | |
| 3.1999 | | Confidentiality Meeting. Interview Pilot | | Second draft & Pilot. First ITQ completion. Database created. | Technical review. Internet Access Policy. | |
| 4.1999 | Trust merger. Two IT depts. combined. | Newsletter to all staff re project. Decision - Community Trust also to purchase this system. Questionnaire Pilot. | | First Data Entry. | PC installation. User Induction. | |
| 5.1999 | | Need to be live by 9.1999. | | ITQ Distribution – All Rehab. Directorate. | User Induction. | |
| 6.1999 | | | | Elderly Directorate Contacted. | Site Update presentation. E-Mail Training Review of use. | |
| 7.1999 | | Elements of system live. Some elements of old systems switched off to manual replacement. Project Manager Contacted. | | Distribution #1 to Specialist Directorate. | Continued use to Present. | |
| 8.1999 | | Day Care Module not appropriate. Security Report. Plan for replacement of “manual systems” (not done by 11.2002). | MHSU – Details replacement of IS such as LIS. | | | |
| 9.1999 | | System problems push live dates from 9.1999 to 11.1999. | | | | |

Appendix A: Mental Health Trust Comparison Study Timeline

| | | | | | | |
|---------|---------------------------------|--|--|---|---|--|
| 10.1999 | | | | Elderly Directorate re-contact | | |
| 11.1999 | | System problems push live dates from 11.1999 to 12.1999. | | | User Interviews. Developer Focus Group. | |
| 12.1999 | | | | | | |
| 1.2000 | CE #3 leaves. | "Phase 1" Completion Report. Proposals for completion. PM Further Contact. Adult Directorate unstructured Interviews. | | Elderly Distribution. Adult Contacted. | | Intranet experiments, onwards. |
| 2.2000 | | | | Corporate contacted. Adult Distribution. Corporate Distribution #1. Specialist Distribution #2. | | |
| 3.2000 | | Interviews. | | Corporate Distribution #2. Specialist Distribution #3. | | |
| 4.2000 | New Phase 2 PM proposed – PM #4 | MHA, CPA not operational. Defined "Phase 2" Set up – New PM #4. Interviews | | Additional Elderly Distribution. Corporate Distribution #3. Specialist Distribution #4. | | |
| 5.2000 | | Community Trust implementation to be abandoned. | | | | |
| 6.2000 | | | | Corporate Distribution #4. | | |
| 7.2000 | | | | Final Receipt & Data Entry. | | |
| 8.2000 | | Interviews. | | | | |
| 9.2000 | New PM #4. | Clinical Phase 2 – New PM #4. Interviews. | | | | Site-by-site Funding Bid Written. |
| 10.2000 | TWIS PM #3 Leaves | TWIS PM #3 Leaves New PRINCE structure proposed. Interviews. | | Initial Analysis Commenced. | | |
| 11.2000 | | Critical Audit Report re "Phase 1" – not yet fully implemented or robust. User Interviews. | | | | Presentations to Stakeholders. |
| 12.2000 | | | | | Implement part 1 Clinical document storage (EDS) Intranet piloted | |
| 1.2001 | | | | | Review/Evaluation | Funding Approved. Informal discussion with Trust IT – Specification. HA IT Involved (IT merger). |
| 2.2001 | | | | | | Formal discussion with Trust IT. Specification drawn up. |

Appendix A:

Mental Health Trust Comparison Study Timeline

| | | | | | | |
|---------|---|--|--|--|--|---|
| | | | | | | Presentation to Clinicians. HA IT discussions. Equipment Ordered. Equipment Delivery. |
| 3.2001 | | Critical Audit Report – due to concerns “expressed by users”. | | | | Discussion Paper – Project Structure & Management. Equipment Delivery. Storage premises set up. Project Assistant employed. Risk analysis considered. Equipment Delivery. |
| 4.2001 | Trust/HA IS/IT merger (3 original depts. to one). | | | | | Presentation to Managers. Site Presentations. PC Installation/Self Training. |
| 5.2001 | | Phase 1 closure considered. | | | | Draft “PID”. Project Board Commences. |
| 6.2001 | | | | | | “PID” Presented, Discussed & Finalised. Formal Discussion with Trust IT. “Operational Group” Commences input. Project Implementation Group. Initial User Documentation Site Visits. |
| 7.2001 | | Clinical system PID. | | | | Site visits. Dummy PCs to all Sites. Site Contacts set up. Presentation to Trust. Site requirements to PIG. First User Lists Created. |
| 8.2001 | | | | | | EDS Working Group. Full Site Issue Schedules. Site Contact Workshop. Training Group. |
| 9.2001 | CE #4 leaves. | Security meeting – system remains open to all records by all users. | | | | Intranet Working Group. Internet/E-mail Policy. |
| 10.2001 | | Critical Audit Report. Legal action against system supplier considered. | | | | Site Contact Meeting 2. Computer Use Policy. Site Visits with IT. Risk Assessment/Lessons Learnt/Progress Report. |
| 11.2001 | | | | | | Continued liaison with IT. IT Plan Installation for 12.2001. Intranet Development Training. |

Appendix A: Mental Health Trust Comparison Study Timeline

| | | | | | | |
|---------|----------------------|---|--|--|-------------------------|---|
| | | | | | | Security & Conf. Group. Implementation Planning. Installation Planning. Network Structure Planning. |
| 12.2001 | | | | | | Site Contact Meeting 3. Security & Conf. Pack. Installation commences. "IS User Declaration". User Instructions. User Registration Process. IT Plan Installation for 1.2002. |
| 1.2002 | | | LIS re-written and transferred to W2000 | | | PM withdraws to research role. Tech. development & problems throughout 2002. Installation Issues Report. Installation re-planned by IT. Project Review. |
| 2.2002 | | Follow-up Project Manager Interview | Document Review | | | Installation continues. |
| 3.2002 | | | Developer Interviews | | | Support Officer appointed. Installation continues. |
| 4.2002 | Trust De-Merger | | | | | Installation continues. "Implementation Hand-over by IT". |
| 5.2002 | | | | | | Installation continues. Status Report – IT Problems. |
| 6.2002 | | | | | | Installation continues. |
| 7.2002 | | | | Detailed Statistical Analysis | | Installation continues. |
| 8.2002 | | | | Completion of Detailed Statistical Analysis | | Installation continues. Status Report – IT Problems. |
| 9.2002 | | | | | | Typology Focus Group Installation continues. |
| 10.2002 | | | | | | Implementation & development continues. |
| 11.2002 | | | | | | Implementation & development continues. |
| 12.2002 | CE #5 still in post. | Implementation & development continues with PM #5. | LIS continues to be used. | - | IT replaced under SISD. | Implementation & development continues. |

Appendix B: Comparison Study Method Summary

| | Trust-Wide Attitude to IS & its Use (ISA) | Trust-Wide Information System (TWIS) | Local Information System (LIS) | Site Development (SHQ) | Directorate Development (SISD) | External Case Studies (CTIS) |
|-------------------------------------|---|--|---|---|---|---|
| System Context & Breadth | Throughout an NHS Mental Health Trust. | Throughout a Mental Health Trust (Intentions stated at various times & actual implementation vary however). | A single Directorate of the Trust. Physical aspects located on one site, the system affecting the whole Directorate. | A single site of one Directorate of the Trust (as per LIS, & SHQ). | A single Directorate of the Trust (as per LIS, & SHQ). | Other Mental Health Trusts. Other mental health, health, government, & other IS, nationally & internationally. |
| System Type | General use of "computers" within the Trust i.e. ISMH. | Integrated single Trust-wide database supported by Infrastructure development – MHIS (This is not wholly clear – see Results). | Development & use of a local centralised clinical database - MHIS. | Network installation, software & hardware upgrade – ISMH. | Introduction of systems across service – new networks, servers, PCs, software, communications, Internet/Intranet. All sites linked & introduction of new users & functionality – ISMH, with effect on MHIS. | Various – MHIS, ISMH, & IS. |
| IS Focus | Generalised attitude towards, & experience of "computers" – not system or project specific. | Centred on the implementation of the database system – the project carried out. | Implementation & use of the MHIS within the context, over a prolonged period. | IS implementation – establishment of network infrastructure, server set-up, PC LAN, software, email etc. | The process of establishing a project & performing implementation, considering attitudes & behaviour therein. | System projects & implementation. Specific projects & general use. |
| Period Studied | General experience & attitudes of Trust staff – relates to the past, present & future. | 1990 – 2001: Focus on both a) 10 year period of development of the idea, & b) the period of physical implementation. | 1990 – 2002: The implementation of the LIS & subsequent period of continued use. | June 1998 – November 1999: During implementation, & immediately following physical implementation. | January 2000 – December 2002: Through the development of ideas & implementation. | Periods of development, use, & post project or system evaluation. |

| | ITQ | TWIS | LIS | SHQ | SISD | CTIS |
|---|---|---|--|--|---|---|
| Timing of research vs. system or project status | <p>Focus on the past, present & future use of IS across the organisation.</p> <p>Prior to physical implementation of TWIS & SISD systems.</p> | Following formation of plans, system selection & structuring of project - during period of physical implementation & systems development. | At a point 10 years following the initial system implementation, during current use. | During & subsequent to physical implementation, & during systems use. | Throughout period of project conception, & the physical & organisational implementation of systems. | Various – both post & during systems implementation & use. |
| Researcher Position & Approach | <p>Unknown to the majority of the Trust.</p> <p>All work presented as external research project, independent of the host organisation.</p> | <p>Some limited observation from within the Trust – had been given system specification & attended system presentations. Had commented on both.</p> <p>No other project involvement, or access to the product implemented.</p> <p>Prior knowledge of a minority of those contacted & interviewed. Unknown to most.</p> <p>Specifically detached from the project – no formal involvement.</p> <p>All work presented as external research project, independent of the host organisation.</p> | <p>Colleague of those involved with system development & use.</p> <p>Not involved in the system's implementation or use.</p> | <p>Project Manager for the implementation studied.</p> <p>Known by all affected by the project.</p> <p>Elements of participant observation & action research involved therefore.</p> | <p>Project Manager for the implementation studied.</p> <p>Project was an on-going service development regardless of research.</p> <p>Action Research approach taken – whole development had elements of practical research within it. Aim to analyse development & action as it progressed, using research tools, rather than retrospectively.</p> <p>General assumption that all activity & experiences as material for research purposes. No specific formal notification of research elements.</p> <p>General acknowledgement of all activity and experiences as material for research purposes. No specific formal notification of research elements.</p> | <p>Through access to literature.</p> <p>Discussions & Interviews undertaken as external researcher.</p> |
| Research Tools | <p>1. Questionnaire to non-ancillary members of staff within the organisation. Single exercise.</p> | <p>1. Document analysis.</p> <p>2. Interviews – Unstructured & semi-structured initial exploratory & pilot, with those involved in</p> | <p>1. Semi-Structured Interviews with those involved from systems introduction to present use.</p> | <p>1. Structured Interview / questionnaire of users & those involved in project management & development.</p> | <p>1. Action Research – examination of activity, behaviour & attitude i.e. the implementation process throughout the development, from position as</p> | <p>1. Visits to organisations implementing MHIS. Discussion with</p> |

| | ITQ | TWIS | LIS | SHQ | SISD | CTIS |
|--|--|--|--|--|--|--|
| | | <p>project management</p> <p>3. Interviews - Standard semi-structured, with those involved in project management & development.</p> <p>4. Interviews – Semi-structured follow-up, with project managers.</p> <p>5. Interviews – semi-structured, with system users.</p> <p>6. Questionnaires - those involved in project management & development (who were also interviewed).</p> <p>7. Definition exercise (Root Definition & CATWOE) - those involved in project management & development (who were also interviewed).</p> | <p>2. Document Analysis.</p> | <p>2. Definition exercise (Root Definition & CATWOE) - users & those involved in project management & development.</p> <p>3. Focus Group - those involved in project management & development. A single exercise.</p> <p>4. Elements of Action Research in position as project manager.</p> | <p>project manager.</p> <p>2. Action Research – development, application & testing of specific techniques & methods throughout the development, from position as project manager.</p> <p>3. Generation of “Social Process Notes” (as part of the above) – recording of on-site project activity & interaction with IT staff & users. Generated by author & project worker.</p> | <p>staff responsible.</p> <p>2. Available general literature including health & government reports & surveys.</p> |
| Period of Research – Detail¹ (Numbers refer to Research Tools above) | <p>1. Questionnaires distributed from original pilot, 26.3.1999, to 20.6.2000.¹</p> <p>2/3/4. Pilot 3.1999, then 1.2000-10.2000 (one additional interview 2.2002).</p> <p>5. User Interviews 11.2000.</p> <p>6/7. Carried out 1.2000 – 10.2000.</p> | <p>1. Collected documents 1998-2001. Research conducted 2.2002.</p> <p>2/3/4. Pilot 3.1999, then 1.2000-10.2000 (one additional interview 2.2002).</p> <p>5. User Interviews 11.2000.</p> <p>6/7. Carried out 1.2000 – 10.2000.</p> | <p>1. February 2002.</p> <p>2. March 2002.</p> | <p>1/2/3. November 1999.</p> <p>4. June 1998 – November 1999.</p> | <p>1/2/3. Initial pilot 1.2000, then general activity 9.2000 to 12.2002.</p> <p>4. September 2002.</p> | <p>1. November 2000 onwards.</p> <p>2. December 1998 onwards.</p> |

¹ Numbers 1., 2., 3. etc. relate to the specific tools employed within case study elements, & are referred to throughout the document.

| | ITQ | TWIS | LIS | SHQ | SISD | CTIS |
|---|---|---|--|--|--|--|
| Sample | <p>1. Potentially all non-ancillary staff of the Trust – Medical, PAMS, nursing, administrative, management.</p> <p>Questionnaire distributed to 1,523 staff. Actual sample limited by practical issues of access & distribution.</p> | <p>1. Document analysis covers the Trust generally, & related stakeholders – Health Authority, internal & external auditors, suppliers etc.</p> <p>2/3/4/6/7. Those involved in project management & development, from all operational directorates, corporate services & IS/IT. Targeted all those could access depending on availability, staff changes & period of involvement (25 staff in total, with 4 during exploratory & pilot, & 2 project managers).</p> <p>5. A small indicative sample of system users (4 users).</p> | <p>1. The 2 host Information function staff involved from systems introduction to present day use.</p> <p>2. Document analysis covered the Directorate/Trust generally & related stakeholders including Health Authority, suppliers etc.</p> | <p>1/2. 7 members of staff involved in project management, development & use (including the author as project manager).</p> <p>3. The 5 members of staff involved in project management, development & user contact.</p> <p>4. Study of the whole development & activity, behaviour & attitude of those within the site, & relationships with external suppliers & IT function.</p> | <p>1/2/3. All directorate staff were involved as they were affected by the development & were actual or potential users. Suppliers, Trust IT function & external stakeholders such as Health Authority & board members were considered.</p> <p>4. Host IS function – 5 staff.</p> | <p>1. Two Mental health Trusts sites introducing MHIS.</p> <p>2. Various.</p> |
| Access to the Study | <p>Formal approval by Trust Chief Executive in December 1998 to cover all elements (related to ITQ, TWIS, LIS, SHQ, SISD).</p> <p>Liaison with & distribution through local Directorate contact network.</p> | <p>Co-operation with Project Manager who provided a list of those involved.</p> <p>Additional Directorate contacts established.</p> | <p>Service Director approval.</p> | <p>Service Director approval.</p> <p>Through personal position as project manager.</p> | <p>Service Director approval.</p> <p>Through personal position as project manager.</p> | <p>1. By making contact with host organisations.</p> <p>2. Access to literature.</p> |
| Access to information / Distribution of research tools | <p>Distribution arrangements, timing, locations & sample size determined in association with Directorate contacts.</p> | <p>1. Via project manager, directorate staff, & external stakeholder.</p> <p>3/6/7. Distributed to staff as part of a single exercise with detailed explanation.</p> | <p>1. Staff approached directly.</p> <p>2. Same document sources as TWIS. Interviewees also provided relevant documents.</p> | <p>1/2. Interviews & definition exercise treated as single exercise.</p> <p>4. Project Manager status gave general access.</p> | <p>1/2/3/4. Project Manager status gave general access.</p> | <p>1. Through contacts within external host organisations.</p> <p>2. General availability of literature.</p> |

| | ITQ | TWIS | LIS | SHQ | SISD | CTIS |
|-----------------------|---|---|---|---|---|---|
| Data Collection | Respondents completed questionnaires. Questionnaires attached to pre-addressed envelopes for return. | <p>1. Documents reviewed by author.</p> <p>2. Notes made by author, with feedback on research tools by interviewees.</p> <p>3/4/5. Notes made by author during interview, with taped observations immediately afterwards.</p> <p>6. Questionnaires distributed prior to interview along with its covering information. Completed by interviewee & collected at interview.</p> <p>7. Explained, & exercise conducted at completion of interview or later. Interviewee completed form.</p> | <p>1. Notes made by author during interview.</p> <p>2. Documents reviewed by author.</p> | <p>1. Combined interview/questionnaire with author leading interviewee through completion.</p> <p>2. Explained & exercise conducted at completion of interview or later. Interviewee completed form.</p> <p>3. Focus Group facilitated by the author, who made notes & collected group notes made.</p> | <p>3. "Social Process Notes" routinely generated by author & project worker in response to observed activity, behaviour & attitude.</p> <p>4. Focus Group facilitated by the author, who made notes & collected group notes made.</p> | <p>1. Notes made by author during interview / discussion. Relevant documents collected.</p> |
| Ethical Consideration | Confidentiality & researcher independence from the host organisation were assured. Purpose of activity detailed. No other person had access to the results. | <p>Remained removed from project & knowledge of the system related.</p> <p>Purpose of activity detailed.</p> <p>Detailed assurance of confidentiality & researcher independence from the host organisation throughout documentation & verbally.</p> | <p>Purpose of activity detailed.</p> <p>Detailed assurance of confidentiality throughout documentation & verbally.</p> <p>Position of knowledge of the organisation acknowledged.</p> | <p>By definition action research method openly featured involvement of the author with the host context & implementation.</p> <p>Purpose & method approved by Service Director.</p> | <p>By definition action research method openly featured involvement of the author with the host context & implementation.</p> <p>Purpose & method approved by Service Director.</p> | <p>1. Trust contacts formally notified of purpose of activity & intended use of information.</p> |

Appendix C: SHQ IS Implementation - Definition Exercise

Please complete the following:

1. Describe in your own words the SHQ project i.e. the core purpose of the system being created - the “deliverable” of the project.

.....
.....
.....
.....
.....

2. For the system being created please describe:

Customer(s)/Client(s)
(The victims or beneficiaries
of the system)

.....

Actors
(Those who will perform
activities in the system)

.....

What the System Does
(The Transformation Process - the
conversion of input to output)

.....

**The Assumptions that make the
Transformation meaningful**
(The “World View”)

.....

Owner(s)
(The system owner)

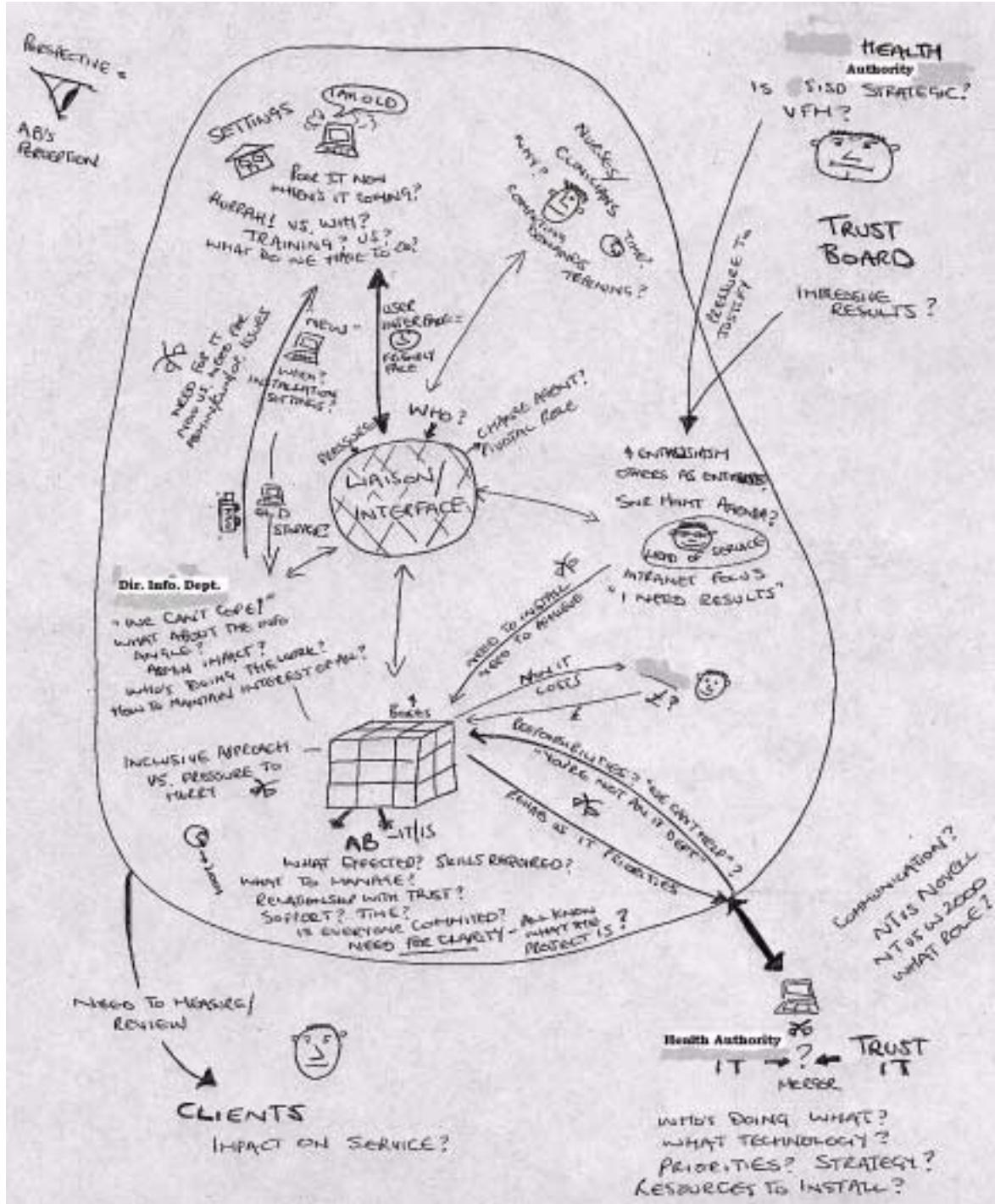
.....

.....

Environmental Constraints
(Elements outside the system which
it takes as given)

.....

Appendix D: SISD Rich Picture





Appendix E: Use of Computers at Work - Staff Questionnaire

Please ring the appropriate response:

Gender : Female / Male

Age Range : Up to 20 / 20 - 29 / 30 - 39 / 40 - 49 / 50 - 59 / 60+

Experience of Computers at Work : None / 0-6 Months / 6 Months - 2 Years / 2 - 5 Years / 5 - 10 Years / 10+ Years

Experience of Computers at Home : None / 0-6 Months / 6 Months - 2 Years / 2 - 5 Years / 5 - 10 Years / 10+ Years

Functional Area : Medical / Nursing / PAMS / Managerial / Administrative / Other -

Date Completed : / / 2000

| | | Agree Strongly | | Neither Agree or Disagree | | Disagree Strongly | |
|----|--|----------------|---|------------------------------|---|-------------------|--|
| | | 1 | 2 | 3 | 4 | 5 | |
| 1. | I expect computers to malfunction regularly | | | | | | |
| 2. | Generally computers do/ <i>could</i> help me to accomplish tasks with better quality | 1 | 2 | 3 | 4 | 5 | |
| 3. | I am willing to learn about computers | 1 | 2 | 3 | 4 | 5 | |
| 4. | I think that computers will be used more in health services in the future | 1 | 2 | 3 | 4 | 5 | |
| 5. | Some people encourage me to use computers | 1 | 2 | 3 | 4 | 5 | |
| 6. | I use computers routinely | 1 | 2 | 3 | 4 | 5 | |
| 7. | I could/ <i>can</i> do my job without computers | 1 | 2 | 3 | 4 | 5 | |
| 8. | I do/ <i>would</i> use computers only when I have/ <i>had</i> to | 1 | 2 | 3 | 4 | 5 | |
| 9. | If I had more training I would use computers more effectively | 1 | 2 | 3 | 4 | 5 | |
| | | 1 | 2 | 3 | 4 | 5 | |

| | <i>Agree Strongly</i> | | <i>Neither Agree or Disagree</i> | | <i>Disagree Strongly</i> | |
|--|-----------------------|----------|----------------------------------|----------|--------------------------|--|
| | 1 | 2 | 3 | 4 | 5 | |
| 10. I will use computers only when I have to in the future | | | | | | |
| 11. I know more about computers than I did a year ago | 1 | 2 | 3 | 4 | 5 | |
| 12. My job is/ <i>would be</i> made simpler using computers | 1 | 2 | 3 | 4 | 5 | |
| 13. I do/ <i>would</i> prefer having access to a computer than not | 1 | 2 | 3 | 4 | 5 | |
| 14. I am looking forward to using computers in the future | 1 | 2 | 3 | 4 | 5 | |
| 15. I am more confident about using computers than I was a year ago | 1 | 2 | 3 | 4 | 5 | |
| 16. I don't have enough time to learn about computers | 1 | 2 | 3 | 4 | 5 | |
| 17. I think computers are more trouble than they are worth | 1 | 2 | 3 | 4 | 5 | |
| 18. The introduction of computers worries me | 1 | 2 | 3 | 4 | 5 | |
| 19. I think I can/ <i>could</i> get adequate support if I have problems with computers | 1 | 2 | 3 | 4 | 5 | |
| 20. I think using computers will/ <i>would</i> help my career | 1 | 2 | 3 | 4 | 5 | |
| 21. If I had more training I would use computers more | 1 | 2 | 3 | 4 | 5 | |
| 22. Generally computers do/ <i>could</i> help to accomplish tasks more quickly | 1 | 2 | 3 | 4 | 5 | |
| 23. My manager encourages me to use computers | 1 | 2 | 3 | 4 | 5 | |
| 24. I think too much money is spent on computers | 1 | 2 | 3 | 4 | 5 | |
| 25. I do/ <i>would</i> know what to do if computers malfunction | 1 | 2 | 3 | 4 | 5 | |
| 26. I would rather not use computers in the future | 1 | 2 | 3 | 4 | 5 | |
| | 1 | 2 | 3 | 4 | 5 | |

| | <i>Agree Strongly</i> | | <i>Neither Agree or Disagree</i> | | <i>Disagree Strongly</i> | |
|--|-----------------------|----------|----------------------------------|----------|--------------------------|--|
| | 1 | 2 | 3 | 4 | 5 | |
| 27. I expect computers not to malfunction | 1 | 2 | 3 | 4 | 5 | |
| 28. I feel confident enough to help others if they have a problem with computers | 1 | 2 | 3 | 4 | 5 | |
| 29. I think that computers will become more important in my job in the future | 1 | 2 | 3 | 4 | 5 | |
| 30. I think the ability to use computers improves job status | 1 | 2 | 3 | 4 | 5 | |
| 31. If I have/ <i>had</i> a computer problem I don't/ <i>wouldn't</i> mind asking for help | 1 | 2 | 3 | 4 | 5 | |
| 32. I do/ <i>would</i> need more support to be able to use computers adequately | 1 | 2 | 3 | 4 | 5 | |
| 33. No one encourages me to use computers | 1 | 2 | 3 | 4 | 5 | |
| 34. I will use computers routinely in the future | 1 | 2 | 3 | 4 | 5 | |
| 35. I can/ <i>could</i> do my job better without computers | 1 | 2 | 3 | 4 | 5 | |
| 36. I expect computers to malfunction occasionally | 1 | 2 | 3 | 4 | 5 | |
| 37. Generally computers help to accomplish tasks more easily | 1 | 2 | 3 | 4 | 5 | |
| 38. The unavailability of computers would/ <i>does</i> cause me significant problems | 1 | 2 | 3 | 4 | 5 | |
| 39. I wish that I knew more about computers | 1 | 2 | 3 | 4 | 5 | |
| 40. Knowing more about computers would help me do my job better | 1 | 2 | 3 | 4 | 5 | |
| 41. I don't care about computers | 1 | 2 | 3 | 4 | 5 | |
| 42. I am worried that if I don't know something about computers I will look silly | 1 | 2 | 3 | 4 | 5 | |

Appendix F: NHS Trust TWIS Interview Confirmation

Interviewee Address

TWIS/twisintlet.doc/AB

21 November 2000

Dear ?,

Research Project NHS Trust –TWIS Interview

Further to our recent contact, thank you very much for agreeing to be interviewed in relation to my research concerning (mental health) information systems. I am carrying out this work as part of a personal research project concerning mental health information systems and focusing on particular case studies such as **TWIS**.

May I thank you in advance for your valuable contribution to this research in agreeing to the meeting - confirmed to be held at **??? a.m./p.m., on ?? Month 2000, at ?**. I look forward to seeing you then.

Broadly speaking I would like to discuss **from your perspective**, issues including:

1. The Trust information system - **TWIS**,
2. The information systems project of creating and implementing the system, and
3. Your own role, and the roles of others in the process.

I will take notes of the discussion that will take place, but I can confirm that confidentiality and anonymity will be assured, as I will anonymise responses and be the only person to analyse results of the exercise.

If you have any queries please contact me as follows:

Andrew Burnham
University of Leicester, Department. of Psychiatry

Yours sincerely

Andrew Burnham

Direct Line: ?

Email: Andrew.burnham@?

Appendix G: TWIS Managers Interview - Interview Subjects

TWIS Managers Interview Interview Subjects

The interview is intended to last no longer than a hour and cover the following issues *from your own perspective*:

1. The Trust information system - TWIS,
2. The information systems project of creating and implementing the system, and
3. Your own role, and the roles of others in the process.

If there are issues that you wish to expand upon beyond the scheduled hour, you wish to broaden the subject of discussion at this time, or to arrange another discussion, then this will be possible.

Discussion is likely to cover the following specific areas but others are not precluded, particularly if there is anything that you wish to bring up:

1. Your *formal* and *informal* roles in the project
2. *When, why* and *how* you became involved in the project.
3. The *aims* of the project.
4. Your *experience* and *knowledge* of the project.
5. The *impact* of the system being created and implemented.

Appendix H: TWIS Manager Interview Guidance Notes

TWIS Project ***Manager Interview Guidance Notes***

Firstly, thank you for agreeing to be interviewed.

This interview is intended to take no longer than an hour - those carried out thus far have been completed in about an hour - and will fairly closely follow a pre-defined set of questions. I will make notes during the discussion, and will write these up later.

If you wish to expand the content or subject of discussion then please do so, but note that this will extend the time needed.

As the introductory information confirmed, the subject of discussion *from your own perspective* is:

1. The Trust information system - TWIS,
2. The information systems project of creating and implementing the system, and
3. Your own role, and the roles of others in the process.

I am carrying out this work as part of a personal research project concerning mental health information systems and focusing on particular case studies such as TWIS.

This research is my sole responsibility and is not being run by or for the Trust. The University of Leicester and the Trust support the work however.

Finally I intend to complete the session (*by collecting the questionnaire I sent to you, if you have completed it and*) by carrying out a brief exercise where I will ask you to complete a form that asks you to describe your understanding of the project. It should take 5 minutes or less.

Have you any questions at this point?

OK, if everything is clear, I will now start to go through the questions I have prepared.

Appendix I: TWIS Project - Manager Interview Acknowledgement

Interviewee
Interviewee Address

/TWISmanintacklet.doc/AB

?? 2000

Dear *Interviewee*,

Research Project TWIS Interview

I write to thank you for undertaking the interview *when*, and for completing the additional material i.e. the questionnaire and definition form.

The information gleaned will be treated as confidential, and will be extremely useful as part of my information systems case study work.

With regard to our discussion concerning feedback to the Trust concerning findings please feel free to put a request or comment to me in writing. I can then bring this to the attention of my research supervisors at our next meeting, and I will inform you of the result.

As before I can be contacted as follows:

Andrew Burnham,
Address

Thank you once again for your contribution.

Yours sincerely

Andrew Burnham

Direct Line: No.

Email: *email*

Appendix J: SHQ Structured Interview/Questionnaire

SHQ Information Systems Implementation

Interviewee: Date Completed: / / 1999

How long has the interviewee been using computers : *Within Health Service : None / 0 - 6 Months / 6 Months - 2 Years / 2 - 5 Years / 5 -10 Years / 10+ Years*
In Total : None / 0 - 6 Months / 6 Months - 2 Years / 2 - 5 Years / 5 -10 Years / 10+ Years

The Interviewee

- | | | | | | | | | |
|----|--|--------------------|---|---|---|---|----------------|---|
| 1. | What proportion of your job involves using IT as a user | 0 - 20% | 1 | 2 | 3 | 4 | 80 - 100% | 5 |
| 2. | What proportion of your job involves IT with you as a non-user i.e. support, trainer, implementer. | 0 - 20% | 1 | 2 | 3 | 4 | 80 - 100% | 5 |
| 3. | Generally how confident are you of using Information Technology | No Confidence | 1 | 2 | 3 | 4 | Very Confident | 5 |
| 4. | What is your own perceived level of IT skill before the project started (in November 1998) | Inexperienced User | 1 | 2 | 3 | 4 | Professional | 5 |
| 5. | What is your own perceived level of IT skill now <i>Note any Change and prompt for the reason</i> | Inexperienced User | 1 | 2 | 3 | 4 | Professional | 5 |

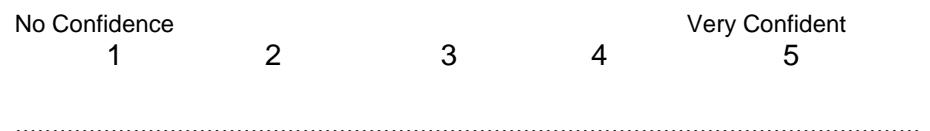
The Project

6. What was your role in the project

.....

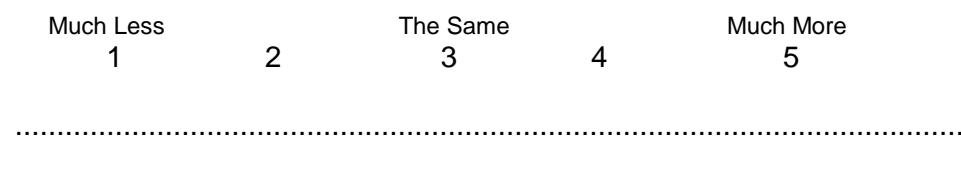
7. How confident were you in your ability to carry out your role in the project ...

and Why ?



8. Would you prefer to have been more or less involved in the project

Why & in what way ?



Attitudes (Anxiety, expectation etc.)

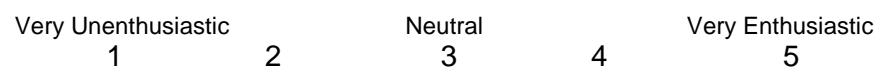
What was your attitude:

- ## 9. Towards the concept of the project i.e. creating an IS



What is your attitude :

- #### 10. Towards the project in its current status/progress

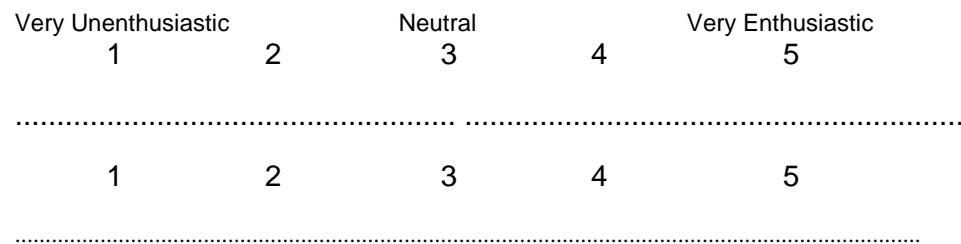


If there is a change between 9. and 10., why is this so ?

*On the whole what have you found to be the attitude towards the project :
Expand with any examples - nature, how expressed, consistency, variety of
attitude*

11. Those involved in project development

 12. Those who were not involved project development



| | | | | | | |
|-----|--|--------------------------|---|--------------|---|------------------------|
| 13. | Those that use computers daily | Very Unenthusiastic 1 | 2 | Neutral 3 | 4 | Very Enthusiastic 5 |
| 14. | Those who didn't/don't use computers daily | 1 | 2 | 3 | 4 | 5 |

Project Management & System Impact

How clear were you as to,

| | | | | | | |
|-------|--|-------------------|---|--------------|---|-----------------|
| 15. | Who had overall responsibility for the project | Very Unclear 1 | 2 | Neutral 3 | 4 | Very Clear 5 |
| 16. | How the system would affect your own working environment | 1 | 2 | 3 | 4 | 5 |
| 17. | How the system would affect the site in general | 1 | 2 | 3 | 4 | 5 |
| | | | | | | |
| | | | | | | |

How clear do you think others were as to,

| | | | | | | |
|---|---|-------------------|---|--------------|---|-----------------|
| 18. | Who had overall responsibility for the project | Very Unclear 1 | 2 | Neutral 3 | 4 | Very Clear 5 |
| 19. | How the system would affect their own working environment | 1 | 2 | 3 | 4 | 5 |
| 20. | How the system would affect the site in general | 1 | 2 | 3 | 4 | 5 |
| Examples, nature, how expressed, consistency, variety of attitude | | | | | | |
| | | | | | | |
| | | | | | | |

29. What have been the problems that you have seen

What do you think the clinical impact of the system has been,

21. Within your working environment

| None | 1 | 2 | 3 | 4 | Very Large 5 |
|------|---|---|---|---|-----------------|
|------|---|---|---|---|-----------------|

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

22. Within the site as a whole

.....

What do you think the non-clinical impact of the system has been,

23. Within your working environment

| None | 1 | 2 | 3 | 4 | Very Large 5 |
|------|---|---|---|---|-----------------|
|------|---|---|---|---|-----------------|

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

24. Within the site as a whole

.....

Is this impact of the system more or less than you expected,

25. Within your working environment

| Much Less | 1 | 2 | As Expected | 4 | Much More 5 |
|-----------|---|---|-------------|---|----------------|
|-----------|---|---|-------------|---|----------------|

| | | | | | |
|-----------|---|---|-------------|---|----------------|
| Much Less | 1 | 2 | As Expected | 4 | Much More 5 |
|-----------|---|---|-------------|---|----------------|

26. Within the site as a whole

| Very Negative | 1 | 2 | Neutral | 4 | Very Positive 5 |
|---------------|---|---|---------|---|--------------------|
|---------------|---|---|---------|---|--------------------|

27. On balance, do you think the impact of the system has been positive or negative

.....

In what areas, with what effect, how perceive positive/negative

.....

28. Have problems that you have seen been predominantly technical or non-technical e.g. user issues

| Technical | 1 | 2 | Equal | 3 | 4 | Non-Technical 5 |
|-----------|---|---|-------|---|---|--------------------|
|-----------|---|---|-------|---|---|--------------------|

.....

.....

Factor Approach to implementation

What is your experience of the Project in terms of the following - give reasons :

| | Very Negative 1 | 2 | Neutral 3 | 4 | Very Positive 5 |
|-------------------------------------|--------------------|---|--------------|---|--------------------|
| 30. Clarity of Project Mission | | | | | |
| 31. Senior Management Support | 1 | 2 | 3 | 4 | 5 |
| 32. Project Scheduling & Planning | 1 | 2 | 3 | 4 | 5 |
| 33. User Consultation | 1 | 2 | 3 | 4 | 5 |
| 34. Provision of Training | 1 | 2 | 3 | 4 | 5 |
| 35. Technical Aspects of the System | 1 | 2 | 3 | 4 | 5 |
| 36. Technical Support | 1 | 2 | 3 | 4 | 5 |

.....

37. User Opinion

1 2 3 4 5

.....

38. Communication

1 2 3 4 5

.....

39. Means of Providing Feedback & Monitoring Progress

1 2 3 4 5

.....

40. Information Provided to users regarding the system & its aims

1 2 3 4 5

.....

41. In your opinion what are the Strengths and Weaknesses of the Project
and its progress :

Strengths -

Weaknesses -

Technology Acceptance Factors & System Reliability

From personal experience rate the following elements of the new system, in terms of :

- a) its “**Usefulness**” to you, b) its “**Ease of Use**”, and c) “**Reliability**”.

| | Usefulness | | | | | Ease of Use | | | | | Reliability | | | | |
|------------------------|------------|---|-------------|---|---|-------------|---|------|---|---|-------------|---|----------|---|---|
| | Not Useful | | Very Useful | | | Difficult | | Easy | | | Unreliable | | Reliable | | |
| 42. The Network/System | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | | | | | | | | | | | | | | | |
| 43. PCs/laptops | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | | | | | | | | | | | | | | | |
| 44. Windows NT | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | | | | | | | | | | | | | | | |
| 45. Exchange/E-mail | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | | | | | | | | | | | | | | | |

| | Usefulness | | | | | Ease of Use | | | | | Reliability | | | | |
|--------------------------|------------|---|-------------|---|---|-------------|---|------|---|---|-------------|---|----------|---|---|
| | Not Useful | | Very Useful | | | Difficult | | Easy | | | Unreliable | | Reliable | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 46. Internet Explorer | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | |
| 47. Schedule+ | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | |
| 48. MS Office | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | |
| 49. Local Epson printers | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | |
| 50. Network printing | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | |

Examples ?

Appendix K: TWIS Project Managers Interview - Interview Questions

TWIS - Project Managers Interview - Interview Questions

(Note issue of tense - "now", "in the past" etc.)

1. What formal role have you played in the Project.
2. In practice what *actual* role do you think you play & what *influence* do you have within the project.
3. At what point, & when, were you approached to play a formal role.
4. How much work is involved.
5. Is this more or less than you anticipated, or would want.
6. What informal / ad hoc involvement have you had in the project.
7. What role have you had in decision-making i.e. the aims of the project, the selection of the system & so forth.
8. How have others within your Directorate been involved in the project.
9. In what ways do you think you and other users have a means of influencing the project (Groups & beyond).
10. Why was the successful system chosen.
11. Briefly, what, and how clear, are the aims of the project (in Definition exercise).
12. From whom or where do you think the direction and impetus for the project comes.
13. Who is responsible for the Implementation of the system.
14. What measures of project success are there that you are aware of.
15. What form of post implementation evaluation has/will take place.
16. What do you think the impact of the project will be.
17. What do you think the project will achieve, and why.
18. In your experience what has been the best aspect of the project.
19. In your experience what has been the least favourable aspect of the project.
20. If you had a query about the project who you would contact - formally and informally.
21. At what point will your involvement with the project end.
22. How does this project compare with any other IT projects that you have been involved in.

To conclude - Is there anything that you would like to add, or point out.

Appendix L: LIS Implementers Interview Questions

Interview 1 Staff Involved in System Implementation

- Q1 What role did you play in the systems development and implementation?
- Q2 What influence did you have within the project?
- Q3. At what point, & why, were you approached to play a role?
- Q4. How much work was involved?
- Q5. What role did you had in decision-making i.e. the aims of the project, the selection of the system & so forth?
- Q6. How were others within the Directorate involved in the project – did that include everyone who needed to be involved?
- Q7. Why was the successful system chosen, rather than an off-the shelf system for example?
- Q8. Briefly, what, and how clear, were the aims of the project.
- Q9. From whom or where do you think the direction and impetus for the project came?
- Q10. Who was responsible for the Implementation of the system, and for the system now?
- Q11. What measures of project and current system success have there been that you are aware of?
- Q12. Describe the part played by, and relationship with, the trust IT Department during and since the introduction of the system?
- Q13. Has involvement of Trust IT been requested or has interest been shown by them?
- Q14. To what extent does the system fit in with or deviate from Trust developments or thinking (would the Directorate and Trust agree upon this?)
- Q15. How has/have organisational culture(s) affected this development and system?
- Q16. What form of post implementation evaluation has taken place?
- Q17. What do you think the impact of the system has been?
- Q18. What do you think the system has achieved, and why?
- Q19. What are the strengths of the system and the way the system was implemented and developed?
- Q20. What are the shortcomings of the system and the way the system was implemented and developed?
- Q21. How did this system development compare with any other IT projects that you have been involved in?
- Q22. Would you describe this system as successful, and how would you define this?

Questions to Q10 concern the project of system implementation, subsequent questions relate to the system over time since implementation.

Appendix M: TWIS Project Interview: Project Manager Follow-Up

- Q1. What would you say is the current status of the project/system?
- Q2. What do you think of the system now? - Patient focused/stats. focused?
- Q3. What is your current role - how/when/why did that change?
- Q4. How did the expansion in project scope happen?
- Q5. What are your main reflections on the Project and how it went?
- Q6. Would you say it is a Clinically-based or admin. system now? - In future?
- Q7. Clinical development - How has actual and intended progress varied in terms of timescale, content & manner of development etc.
- Q8. Describe your Relationship with:
 - a) Software suppliers
 - b) Senior management
 - c) Users & User departments
- Q9. In what way did organisational culture reveal itself?
- Q10. Problems/difficulties - balance these between timescale/the system/the organisation
- Q11. When was the OBS written? - was this updated for this attempt at project?
- Q12. How was this changed to reflect input from Directorates? (who saw this document?)
- Q13. Who were the most influential people within the project? - why and with what roles?
- Q14. Things would do differently a second time? - would that make a difference?)

Appendix N: TWIS Project Interview - Project Manager (2) Follow-Up

- Q1 Describe your feelings about the TWIS – Phase 1 project now time has passed.
- Q2 How is Phase 2 different or better?
- Q3 Compare the experience of Phase 1 to Phase 2
- Q4 What have been the triggers for improvement?
- Q5 What was learnt from Phase 1? – You and the organization
- Q6 Is everyone involved that needs to be?
- Q7 Lack of involvement - How can you resolve this problem?
- Q8 Does there remain a distinction between this being an IS/IT rather than Clinical project?
- Q9 What is your actual title?
- Q10 What is most likely to hold back success of the Project?
- Q11 Describe your relationship with IT Department

Appendix O: TWIS Project - User Interview Question Schedule

Questions

1. Which Directorate/Department, and who do you work for?
2. What experience do you have of using computer systems - where, when, what systems?
3. What system, if any, did you use before TWIS? - please describe what use you made of it?
4. What involvement/role, if any, did you have in the development of this (pre-TWIS system)?

5. When and how did you first hear about TWIS/the system?
6. From where did information first come from, and where has it come subsequently?
7. What did you think of the idea when you first heard about it?
8. What do you think now? - and why?
9. As far as you know why has the system been introduced? - what explanation has been given, by whom?
10. Why was this particular system chosen?
11. What has your role been in the systems development and introduction? (developer/user/manager) - any input?
12. What form of communication and consultation has there been?
13. How clear has your and others roles been?
14. What contact have you had with the IT staff?
15. What was the timescale for its introduction?
16. Have you received new equipment? – Operating System/used before?
17. What training did you/have you received?
18. What has been the impact of the project and the system on your working environment / processes? (as anticipated / how managed / what planned & what just happened)
19. Has this differed from what you anticipated would happen?
20. What do you see as the problems/benefits, strengths/weaknesses etc. (technical/non-technical)
21. What attitudes towards the system/project have you seen in your or other Directorates?

Appendix P: Information Systems and the TWIS Project - Staff Questionnaire

Please State your Directorate : Date Questionnaire Completed : / / 2000

Are you formally Involved in the Project ? **Y / N**, if "Yes" in the role as :
 (i.e. as member of a Group, Board or dedicated member of staff) if "Yes" since : / /

How long have you been using computers : **Within Trust** : *None / 0 - 6 Months / 6 Months - 2 Years / 2 - 5 Years / 5 -10 Years / 10+ Years*
In Total : *None / 0 - 6 Months / 6 Months - 2 Years / 2 - 5 Years / 5 -10 Years / 10+ Years*

1. How important is Information Technology/Systems (IT/IS) to you in your job

| Not Important | 2 | 3 | 4 | Very Important |
|---------------|---|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 |

2. What proportion of your job involves IT/IS

| 0% - 20% | 40% - 60% | 80% - 100% |
|----------|-----------|------------|
| 1 | 3 | 4 |

3. Generally how confident are you of using Information Technology

| No Confidence | 3 | 4 | Very Confident |
|---------------|---|---|----------------|
| 1 | 2 | 3 | 5 |

What is **Your attitude**:

4. Towards the *concept of the project* i.e. creating an information System

| Very Unenthusiastic | Neutral | Very Enthusiastic |
|---------------------|---------|-------------------|
| 1 | 2 | 4 |

5. Towards the *actual system/project* in its current status/progress

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

On the whole what have you found to be the attitude of those you have contact with towards the project:

6. Those who are personally involved in the project

| Very Unenthusiastic | Neutral | Very Enthusiastic |
|---------------------|---------|-------------------|
| 1 | 2 | 4 |

7. Those who are not directly involved in the project

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

8. Those that you work with daily

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

| | | | | | |
|---|--------------------------|---|-------------------|---|------------------------|
| 9. Those who are beyond your immediate working environment | Very Unenthusiastic 1 | 2 | Neutral 3 | 4 | Very Enthusiastic 5 |
| 10. How much do you personally expect to use the new system | Not at All 1 | 2 | Occasionally 3 | 4 | Daily 5 |
| 11. How confident are you in your ability to carry out your role in the project | No Confidence 1 | 2 | 3 | 4 | Very Confident 5 |
| 12. Would you prefer to be more or less involved in the project | Much Less 1 | 2 | Neutral 3 | 4 | Much More 5 |

How clear are you as to,

| | | | | | |
|---|-------------------|---|--------------|---|-----------------|
| 13. How the system will affect your own working environment | Very Unclear 1 | 2 | Neutral 3 | 4 | Very Clear 5 |
| 14. How the system will affect the Trust in general | 1 | 2 | 3 | 4 | 5 |
| 15. Who is responsible for the implementation of the system | 1 | 2 | 3 | 4 | 5 |

What do you think the impact of the system will be,

| | | | | | | |
|---|------|---|---|---|---|------------|
| 16. Within your working environment | None | 1 | 2 | 3 | 4 | 5 |
| 17. Within the Trust as a whole | 1 | 2 | 3 | 4 | 5 | Very Large |
| 18. On the Clinical Service (rather than non-Clinical e.g. Admin. & management) | 1 | 2 | 3 | 4 | 5 | |

| | | | | | |
|--|--------------------|---|--------------|---|--------------------|
| 19. <i>On balance</i> , do you think the impact of the system will be positive or negative | Very Negative 1 | 2 | Neutral 3 | 4 | Very Positive 5 |
|--|--------------------|---|--------------|---|--------------------|

| | | | |
|--|--------------------------|-------------------|-------------------------|
| 20. In your experience project emphasis has focused towards technical (IT hardware and software) or non-technical (user issues, training, admin. impacts etc.) | Non-Technical 1 2 | Equal 3 4 | Technical 5 |
| 21. Problems experienced have been predominantly technical or non-technical | Non-Technical 1 2 | Equal 3 4 | Technical 5 |
| 22. More emphasis should have been placed on the technical or non-technical issues | More Technical 1 2 | Same 3 4 | More Non-Technical 5 |
| <i>What is your experience of the Project in terms of :</i> | | | |
| 23. Clarity of Project Mission | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 24. Senior Management Support | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 25. Project Scheduling & Planning | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 26. User Consultation | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 27. Organisation of Project groups/boards | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 28. Provision of Training | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 29. Technical Aspects of the System | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 30. User Opinion | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 31. Communication | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 32. Means of Providing Feedback & Monitoring Progress | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |
| 33. Information Provided regarding the system & its aims | Very Negative 1 2 | Neutral 3 4 | Very Positive 5 |

34. In your opinion what are the Strengths and Weaknesses of the Project and its progress (please attach an additional sheet if you wish) :

Strengths -

Weaknesses -

Any Additional Comments you wish to make :

Appendix Q: TWIS Questionnaire - covering letter

*Interviewee Name
Interviewee Address*

TWISmanquesletter.doc

?? 2000

Dear *Interviewee*

Research Project* *TWIS Questionnaire

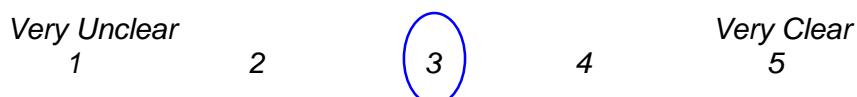
I write further to our recent communication and arrangements to carry out an interview regarding the Trust information system - TWIS.

To complement the interview exercise please find attached a questionnaire (reference staffq05.doc) regarding this system and your experience of information systems generally. I would be grateful if you could spare a few moments to complete the document. I will collect the completed questionnaire, if convenient at the time of the interview, or please feel free to forward it to me.

May I again thank you in advance for your contribution to this research.

Within the questionnaire responses to questions are generally requested in the form of selecting a position on a sliding scale between 1 and 5 to signify your opinion.

Please ring the number that corresponds to your response, demonstrated as follows:



You can contact me regarding the project and forward responses as follows:

Andrew Burnham
Address

Yours sincerely

Andrew Burnham

Direct Line:

Email:

Appendix R: SISD Research Themes

| Subject | Purpose of activity | AR Method - Means of Addressing |
|---|--|--|
| 1. Definition & establishment of need. | <ul style="list-style-type: none"> a) To direct attention to organisational need and potential organisational change. | <ul style="list-style-type: none"> b) Communication with key staff focussing on needs rather than technical solutions. c) Use of technical experimentation & demonstrations to inform debate & explore potential. |
| 2. Implementation initiation, initial communication & consultation | <ul style="list-style-type: none"> a) How do projects emerge, & what is the influence of this initiation throughout progress? b) Who should be involved, when & how, & with what intended effect? c) Who is considered relevant & what is the impact of involvement? d) The definition and clarity of the implementation, aims & system. e) To examine <i>engagement</i> and <i>ownership</i>. f) To examine forms & effects of communication. | <ul style="list-style-type: none"> a) Carrying out communication exercises e.g. demonstrations. b) Presentations & meetings with internal & external stakeholders. c) Use of SSM – Rich pictures, root definition & CATWOE. |
| 3. Ongoing communication & consultation | <ul style="list-style-type: none"> a) Consider how the initial communication & consultation is continued & people are involved throughout. b) The need for & demands of continuing communication & consultation rather than single initial measures. c) Maintaining involvement, support & enthusiasm – managers & potential users. | <ul style="list-style-type: none"> a) Implementation management as on-going activity. b) Inclusion within project structure. c) Project roles established. d) Implementation groups established. |

| Subject | Purpose of activity | AR Method - Means of Addressing |
|---|--|---|
| 4. Project structure & roles – Involvement | <ul style="list-style-type: none"> a) The appropriate structure & roles to manage implementation. b) Impact of the structure & roles that are defined or emerge ad hoc. c) The impact of decisions & selection of staff involvement. d) Ability for operational staff to have time, & their interest & motivation. | <ul style="list-style-type: none"> a) Establishing representation. b) Inclusion of perspectives. c) Groups & roles – Observing involvement & non-involvement. |
| 5. User support & induction | <ul style="list-style-type: none"> a) Examine specific/general or ad hoc approaches made, with what impact. b) Who is/should be given responsibility. c) What induction & support is needed, why & with what effect. | <ul style="list-style-type: none"> a) Development of a general approach, including techniques, role definition, specification of support roles, local contacts, & assumption of site uniqueness. b) Establishment of a specific User Support post & role. |
| 6. Clarity & definition | <ul style="list-style-type: none"> a) A general theme throughout – trying to establish, & the impact of clarity & definition. b) Does a lack of definition & clarity can have a detrimental effect on implementation? | <ul style="list-style-type: none"> a) A general approach to early & detailed documentation & clarification of all elements possible e.g. Specifications, Initiation Document, training/user documentation, role definition, risk analysis, issue logs etc. |

| Subject | Purpose of activity | AR Method - Means of Addressing |
|--|--|--|
| 7. The influence of IS, technical factors & the IS function | <ul style="list-style-type: none"> a) How specific IS issues & technical factors influence general progress & specifically the alternative H&O issues. b) The impact of the approaches taken & attitudes of the IS function. | <ul style="list-style-type: none"> a) General consideration, with inclusion within group/board meetings, & documents produced. |
| 8. Organisational culture, behaviour & activity | <ul style="list-style-type: none"> a) The impact and nature of the interaction between the host & the IS, & IS & the host. b) How the host, & groups & individuals within react & affect the success of the implementation. c) The predictability & impact of human reactions. d) The source of attitudes & behaviour. | <ul style="list-style-type: none"> a) Social Process Notes recording activity & attitudes encountered. b) Construction of tools to recognise & address these implementation issues. |
| 9. Interfaces & organisation relations (liaison) | <ul style="list-style-type: none"> a) Impact of (lack of) knowledge of other actors & perspectives. b) Impact of (not) addressing others perspectives. c) What perspectives & knowledge are required within the implementation. | <ul style="list-style-type: none"> a) Examination of significant interfaces that exist. b) Examination of the nature of these interfaces. c) Developments of tool(s) to address them. |
| 10. Security & Access to Systems | <ul style="list-style-type: none"> a) Clinical vs. non-clinical information, use & access. b) Knowledge of technology required to meet service needs. c) Technology implementation & service adaptation. d) Implementation according to service need & the adaptation of technology to it. e) Whether security & confidentiality is integrated into practice – theory vs. practice. | <ul style="list-style-type: none"> a) Consultation with, & involvement of clinicians & other staff groups. b) Working group involvement. c) Definition & application of security models & their implications. |

| Subject | Purpose of activity | AR Method - Means of Addressing |
|---|---|---|
| 11. Issue Inclusion | <ul style="list-style-type: none"> a) Who controls issue inclusion & exclusion. b) How issues are included & excluded. c) The impact of inclusion & exclusion decisions. | <ul style="list-style-type: none"> a) General consideration through practice. b) Examination of the actions of actors e.g. their involvement – who, when why, how. |
| 12. Management of problems. | <ul style="list-style-type: none"> a) How problems & conflicts are addressed. b) How an understanding of the impact of issues & decisions affects the implementation. c) Sharing & retention of decision-making. d) Who sees what as their concern or relevant to themselves. | <ul style="list-style-type: none"> a) Use of groups and reporting for management. b) Definition of risks, potential problems & conflicts at the outset – immediate awareness and monitoring. c) Development of implementation tools. |
| 13. Risk & Realism | <ul style="list-style-type: none"> a) How is risk identified & dealt with? b) Are limits of achievability identified, recognised or taken account? – with what result? | <ul style="list-style-type: none"> a) The means of including risk & realism within implementation. b) The means of taking account of limits within implementation. |
| 14. Evaluation of implementation | <ul style="list-style-type: none"> a) The need to elicit opinion, share & develop ideas, & feedback. | <ul style="list-style-type: none"> a) Implementation Focus Group. |
| 15. Sustainability, momentum, & achievement plateauing | <ul style="list-style-type: none"> a) How progress & involvement is maintained or declines over a period, & its impact on results. b) The role of implementation management. | <ul style="list-style-type: none"> a) Consultation, formal meetings & informal contact. b) Monitoring and reporting on progress. |

| Subject | Purpose of activity | AR Method - Means of Addressing |
|--|--|---|
| 16. Ownership – whose project & system is it? | <ul style="list-style-type: none"> a) The impact of the existing driving force. b) How & whether other perspectives are included. c) Is general ownership needed, or promoted? d) How does the organisation & its clinicians regard the results of implementation? | <ul style="list-style-type: none"> a) General analysis of involvement & ownership. b) Examination of how & whether general or specific ownership can be created. c) Monitoring of input & opinion. |
| 17. Attitudes of all actors | <ul style="list-style-type: none"> a) How attitudes affect what happens. b) Are attitudes predictable, or adaptable, & what conflicts do they cause? | <ul style="list-style-type: none"> a) General consideration of attitude & behaviour e.g. via diary of activity. b) Development of an analysis tool to address attitude & behaviour. |
| 18. Attitude & behaviour | <ul style="list-style-type: none"> a) Appreciation of the causes of behaviour. b) Understanding of management of behaviour. c) Appreciation of the links between attitude and behaviour. d) Understanding of the management of this relationship. | <ul style="list-style-type: none"> a) General consideration of attitude & behaviour e.g. via diary of activity. b) Development of an analysis tool to address attitude & behaviour. |

Appendix S: Comparison Study Bibliography

- DR001 *Health Authority – Mental Health Service Unit Summary of Information Presently Collected*, February 1990(?).
- DR002 *Health Authority Mental Health Service Unit Information Management Strategy*, 1990.
- DR003 *Letter from Service Director to Health Authority/Mental Health Service Unit*, 9 August 1991.
- DR004 *Information Systems for MHS – Joint Working Group Work Plan*, May 1992.
- DR005 *Health Authority Mental Health Service Unit Information Management Strategy*, July 1992.
- DR006 *Health Authority Mental Health Service Unit Information Management Strategy – Implementation*, July 1992.
- DR007 *Information for Mental Health*, 3.2.1993, meeting notes.
- DR008 *Information for Mental Health*, 7.3.1993, meeting notes.
- DR009 *MHSU Bid for Funding*, August 1993.
- DR010 *MHSU Information Management Strategy – Discussion Document*, September 1993.
- DR011 *MHSU Information Management & Technology Strategy*, October 1993.
- DR012 *MHSU Information Management & Technology Strategy – Process Review*, October 1993.
- DR013 *Health Authority MHSU Production of Contract Minimum Data Sets*, October 1993.
- DR014 *MHSU Information Management & Technology – Implementation Issues*, October 1993.
- DR015 *Information for Mental Health*, 21.12.1993, meeting notes.
- DR016 *Directorate Response to MHS IM&T Strategy*, 19 November 1993, letter.
- DR017 *Health Authority memo and report*, 14 January 1994.
- DR018 *Mental Health Strategy Group – Process Paper*, February 1994.

- DR019 *IM&T Strategy – Feedback*, 17 February 1994.
- DR020 *Health Authority Chief Executive letter to MHSU Chief Executive*, 15 March 1994.
- DR021 *MHS IM&T Strategy – Management Summary*, 5 April 1994.
- DR022 *Health Authority memo to Mental Health Service*, 10 May 1994.
- DR023 *Setting Up A PRINCE Project*, 10 May 1994.
- DR024 *IM&T Project Brief*, 12 May 1994.
- DR025 *IM&T Project Board (#1) meeting notes*, 16 May 1994.
- DR026 *Mental Health Strategy Meeting Notes*, 26 May 1994.
- DR027 *IM&T Project Brief*, June 1994.
- DR028 *Project Assurance Team meeting notes*, 20 June 1994.
- DR029 *IM&T Project Board meeting notes*, 25 July 1994.
- DR030 *Memo: Operational Requirement – Feedback from Directorate Service Director*, 15 August 1994.
- DR031 *First Draft Operational Requirement for an Integrated Patient Based Database*, 12 September 1994.
- DR032 *IM&T Project Board meeting notes*, 12 September 1994.
- DR033 *Patient Database Survey – Staff Survey*, 12 September 1994.
- DR034 *Outline Business Case for an Integrated Patient Based Database – First Draft*, 30 September 1994.
- DR035 *Briefing Paper - Information Strategy progress*, 17 October 1994.
- DR036 *IM&T Project Board meeting notes*, 7 November 1994.
- DR037 *Health Authority letter to MHSU Chief Executive*, 18 November 1994.
- DR038 *IM&T Project PID*, 30 November 1994.
- DR039 *IM&T Project Board meeting notes*, 19 December 1994.
- DR040 *Briefing to MHSU Directors*, 22 December 1994.
- DR041 *Detailed Statement of Need*, 25 January 1995.

- DR042 *IM&T Project – Status at Handover*, 3 March 1995.
- DR043 *IM&T Project Board meeting notes*, 6 March 1995.
- DR044 Memo: *Directorate Response to Detailed Statement of Need*, 15 March 1995.
- DR045 *IM&T Project Plan*, 23 March 1995.
- DR046 *IM&T Project Structure*, 27 March 1995.
- DR047 *IM&T Project Board meeting notes*, 27 March 1995.
- DR048 *Health Authority Memo*, 27 March 1995.
- DR049 *IM&T Project Structure*, 31 March 1995.
- DR050 *Project Initiation Document*, 18 April 1995.
- DR051 *Work Estimate*, 21 April 1995.
- DR052 *IM&T Project Board meeting notes*, 24 April 1995.
- DR053 *MHSU IM&T Strategy*, April 1995.
- DR054 *IM&T Project Board meeting notes*, 22 May 1995.
- DR055 *Project Initiation Document*, 6 June 1995.
- DR056 *IM&T Project Board meeting notes*, 26 June 1995.
- DR057 *Outline Business Case*, 10 October 1995.
- DR058 *Outline Business Case*, 5 December 1995.
- DR059 *Proposals for Project Team Structure*, 22 January 1996.
- DR060 *Purchasing Team Meeting notes*, 20 February 1996.
- DR061 *Outline Business Case*, 2 April 1996.
- DR062 *Meeting – Directorate Co-ordinators meeting notes*, 11 April 1996.
- DR063 *Database Project Board meeting notes*, 22 April 1996.
- DR064 *Output Based Specification*, February 1998.
- DR065 *Project Initiation Document (To Trust Management Board)*, 4 March 1998.

- DR066 *Health Authority Response to Output Based Specification*, 17 March 1998.
- DR067 *Long list Presentation Feedback (from Author)*, 20 May 1998.
- DR068 *Shortlist Recommendation to Trust Board*, 11 June 1998.
- DR069 *Health Authority Review of Mental Health Service Information Systems*, July 1998.
- DR070 *Trust-Wide Patient Database – Project Manager's Update*, 5 August 1998.
- DR071 *Full Business Case*, 20 November 1998.
- DR072 *Operational Sub-group meeting notes*, 3 December 1998.
- DR073 *Trust Board meeting notes*, 17 December 1998.
- DR074 *HR Sub-Group meeting notes*, 18 December 1998.
- DR075 *Implementation Group meeting notes*, 11 January 1999.
- DR076 *Operational Sub-group meeting notes*, 14 January 1999.
- DR077 *Data Dictionary – Draft 1*, 19 January 1999.
- DR078 *Numbering Sub-Group – Briefing Paper*, 20 January 1999.
- DR079 *Operational Sub-group meeting notes*, 28 January 1999.
- DR080 *HR (Training) Sub-Group – Training Report*, 29 January 1999.
- DR081 *Implementation Group meeting notes*, 11 February 1999.
- DR082 *Draft Implementation Plan*, 16 February 1999.
- DR083 *Implementation Group meeting notes*, 4 March 1999.
- DR084 *Training Issue meeting notes*, 10 March 1999.
- DR085 *Confidentiality meeting notes*, 10 March 1999.
- DR086 *Implementation Group meeting notes*, 18 March 1999.
- DR087 *HR (Training) Sub-Group Report*, 23 March 1999.
- DR088 *HR (Training) Sub-Group meeting notes*, 29 March 1999.
- DR089 *Memo from Trainer*, 30 March 1999.

- DR090 *System Newsletter – Issue 1, April 1999.*
- DR091 *Notes from HR Sub-group (Associate Director), 7 April 1999.*
- DR092 *Implementation Group meeting notes, 9 April 1999.*
- DR093 *User Guide and Training Manual Group meeting notes, 12 April 1999.*
- DR094 *Memo to Training Group from Director, 13 April 1999.*
- DR095 *Training Sub-Group meeting notes, 15 April 1999.*
- DR096 *Implementation Group meeting notes, 23 April 1999.*
- DR097 *Implementation Group meeting notes, 7 May 1999.*
- DR098 *Mental Health Steering Group meeting notes, 7 May 1999.*
- DR099 *Training Sub-Group meeting notes, 10 May 1999.*
- DR100 *Steering Group meeting notes, 17 May 1999.*
- DR101 *Mental Health Steering Group meeting notes, 21 May 1999.*
- DR102 *Training Sub Group meeting notes, May 1999.*
- DR103 *Adult Mental Health – Medical Secretary PC Audit, 27 May 1999.*
- DR104 *Current Working Practices Audit – Adult Directorate, June 1999.*
- DR105 *Mental Health Steering Group meeting notes, 4 June 1999.*
- DR106 *Project Structure, 17 June 1999.*
- DR107 *Mental Health Steering Group meeting notes, 20 June 1999.*
- DR108 *Local Implementation Group meeting notes, 22 June 1999.*
- DR109 *System Live Notification – In-Patient module, 5 July 1999.*
- DR110 *System Live Notification – some out-patient areas, 5 July 1999.*
- DR111 *Local Implementation Group meeting notes, 8 July 1999.*
- DR112 *Memo to staff, 13 July 1999.*
- DR113 *Local Implementation Group meeting notes, 15 July 1999.*
- DR114 *Mental Health Steering Group meeting notes, 16 July 1999.*

- DR115 *Local Implementation Group Chair – Letter to trainer*, 16 July 1999.
- DR116 *In Patient and Out Patients Implementation – Post Implementation Review*, 20 July 1999.
- DR117 *Local Implementation Group – User Guidelines for Entry of Data Items*, 21 July 1999.
- DR118 *Local Implementation Group meeting notes*, 22 July 1999.
- DR119 *Mental Health Steering Group meeting notes*, 22 July 1999.
- DR120 *Local Implementation Group report*, 23 July 1999.
- DR121 *Local Implementation Group meeting notes*, 29 July 1999.
- DR122 *Mental Health Steering Group meeting notes*, 30 July 1999.
- DR123 *Local Implementation Group meeting notes*, 5 August 1999.
- DR124 *Local Implementation Group meeting notes*, 9 August 1999.
- DR125 *Local Implementation Group - Day Care Report*, 11 August 1999.
- DR126 *Project Manager memo to Chair of Local Implementation Group*, 12 August 1999.
- DR127 *Mental Health Steering Group meeting notes*, 13 August 1999.
- DR128 *Mental Health Steering Group - Security Recommendation Document*, 13 August 1999.
- DR129 *Mental Health Steering Group – Further Implementation*, 13 August 1999.
- DR130 *Local Implementation Group meeting notes*, 19 August 1999.
- DR131 *Security Document Feedback memo*, 20 August 1999.
- DR132 *Local Implementation Group meeting notes*, 26 August 1999.
- DR133 *Mental Health Steering Group meeting notes*, 27 August 1999.
- DR134 *Adult Directorate DMT meeting notes*, 27 August 1999.
- DR135 *Local Implementation Group meeting notes*, 9 September 1999.
- DR136 *Mental Health Steering Group meeting notes*, 10 September 1999.

- DR137 *Local Expert re-designation* - notification of action, 13 September 1999.
- DR138 *Local Implementation Group meeting notes*, 16 September 1999.
- DR139 *Mental Health Steering Group meeting notes*, 24 September 1999.
- DR140 *Local Implementation Group meeting notes*, 30 September 1999.
- DR141 *Mental Health Steering Group meeting notes*, 8 October 1999.
- DR142 *Memo from Local managers*, 12 October 1999.
- DR143 *Memo from Local Expert*, 14 October 1999.
- DR144 *Memo to Senior Corporate Management from Local Implementation Group*, 14 October 1999.
- DR145 *Local Implementation Group meeting notes*, 14 October 1999.
- DR146 *Local Implementation Group meeting notes*, 21 October 1999.
- DR147 *Memo - Local Implementation Group Chair to own Directorate*, 5 November 1999.
- DR148 *User report – Issues/problems (Unknown author – Elderly Directorate)*, November 1999.
- DR149 *Mental Health Steering Group meeting notes*, 5 November 1999.
- DR150 *Local Implementation Group meeting notes*, 18 November 1999.
- DR151 *Local Implementation Group meeting notes*, 19 November 1999.
- DR152 *Duplicate Sub-Group Report*, November 1999.
- DR153 *Memo to Clinical Audit*, 29 November 1999.
- DR154 *Memo – Project Manager to Local Implementation Group member*, 30 November 1999.
- DR155 *Local Implementation Group meeting notes*, 2 December 1999.
- DR156 *Local Implementation Group meeting notes*, 9 December 1999.
- DR157 *Memo to Chair Local Implementation Group*, 14 December 1999.
- DR158 *Mental Health Steering Group*, 17 December 1999.
- DR159 *Phase 1 Completion Report – Feedback*, 6 January 2000.

- DR160 *Proposal to Complete Implementation of Phase 1*, January 2000.
- DR161 *Proposed Way Forward*, 14 January 2000.
- DR162 *Mental Health Steering Group meeting notes*, 14 January 2000.
- DR163 *Memo from Information Services*, 20 January 2000.
- DR164 *Letter from Project Director*, 28 January 2000.
- DR165 *Mental Health Steering Group meeting notes*, 11 April 2000.
- DR166 *Mental Health Board – Clinical (Phase 2) Implementation meeting notes*, 28 April 2000.
- DR167 *Letter from Trust Chief Executive to Staff*, 11 May 2000.
- DR168 *Mental Health Steering Group meeting notes*, 13 June 2000.
- DR169 *Project Management Role Change*, 12 September 2000 (notification of action).
- DR170 *Report to Mental Health Management Team*, 6 October 2000.
- DR171 *Report to PAS Reference Group – Project Board*, 26 October 2000.
- DR172 *District Audit Report – Project Management Risk Assessment*, 27 November 2000.
- DR173 *Project Team Managers Meeting notes*, 12 January 2001.
- DR174 *NHS Internal Audit Report – Review of Mental Health System*, March 2001.
- DR175 *IT Function Reorganisation*, April 2001 (notification of action).
- DR176 *Project Board meeting notes*, 2 May 2001.
- DR177 *Clinical System PID*, 9 July 2001.
- DR178 *System Security and Confidentiality Meeting Notes*, 19 September 2001.
- DR179 *Implementation Project Board meeting notes*, 25 September 2001.
- DR180 *District Audit Report – Project closure Phase 1, Follow Up Report*, 4 October 2001.
- DR181 *Review of Mental Health Service Contract*, Unknown Date.

DR182 *Staff Attitude & Opinion Survey*, July 2000

DR183 *Staff Attitude Survey*, June 2001

Notes:

- a) This bibliography was produced through the TWIS Document Review.
- b) Documents were included within this bibliography on the basis of having been the subject of notes having been made as to their content or taken extracts from them, within document review.
- c) MHSU = Mental Health Service Unit (name of the NHS organisation prior to Trust status)
- d) IM&T = Information Management & Technology

Appendix T: Host User/Actor Typology

The (Host – IS) Interface Management Toolkit IS Host User/Actor Typology

1. Purpose

Host User/Actor Typology is a means to analyse the staff within a host organisation from the perspective of their relationship to the general use of IS or participation within a specific implementation. It is a means to understand how staff may relate to IS, in terms for example of their experience of and attitudes towards it, actual or potential roles within IS use or implementation, and how attitudes and behaviour may change. The host should consider who may actually or potentially fit into these categories and with what effect.

2. Origin of the Tool

This tool developed through experience within organisations undergoing IS implementation and through support of IS use. The role of Project Manager within the SISD involved active consideration of such typology as a means to understand and predict positions and behaviour, and predict it. As Project Manager there was personal responsibility to deal with these attitudes and behaviour, and a stake in understanding them better.

3. Use of the Typology Tool

This tool is intended to be part of the process of organisational learning, alongside other suggested tools including Actor Analysis, and established tools such as the Soft Systems Methodology Rich Picture and CATWOE. When an implementation is being considered, and then subsequently through the process of implementation and continuing use, the tool is a reference point to understand the many user and non-user perspectives, and how they are or need to be considered and managed. At implementation inception the tool should be used to identify the existing perspectives and how they may affect or be included within the implementation.

This is intended to be an inclusive tool to be used by and meaningful to those with any level of IS knowledge.

The tool contains a number of variables against which host staff can be described. These include elements of social cognitive theory (SCT), which specifically addresses the link from experience to attitude and to behaviour.

The tool should be used in a bi-directional manner. It is a means to consider the suggested categories and what roles, attitudes and behaviour may exist at present and in the future i.e. match categories to the host. Secondly it is a means to clarify how the host organisation matches these categories i.e. who fits where, with what likely effect – to match the host with the categories.

As movement between the categories is assumed, it is important to understand the nature of the path between forming attitudes and actual behaviour, as described through Social Cognitive theory. An additional tool is therefore included at the end of this document :

Key Stages of Perception – Host Staff reaction to IS & IS staff reaction to the Host Organisation

The method of use of the **IS Host User/Actor Typology** will involve the following steps:

- a) Consider the typology and the descriptions contained against each variable.
- b) Relate this model to the host organisation identifying which categories may be seen to exist now or in the future.
- c) Identify which groups or individuals could be seen to match the categories.
- d) Add any other categories that may apply to the particular host (either entirely new, or adaptations of existing categories).
- e) Consider the possibility that individuals may take up one or more position at different times, or demonstrate characteristics from more than one.

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- f) Consider the implications of these definitions and typology - identify risks and opportunities existing - and the appropriate management response.
- g) Build these conclusions into host structure and process.
- h) Periodically revisit the exercise and identify changes.

Host User/Actor Typology

1. Oblivious

| | |
|-----------------------------------|---|
| Description | Ignores the presence of IS. |
| Who | <p>Someone who doesn't wish to acknowledge the relevance of IS, or doesn't want change. IS is a representation of change and personal lack of control over change.</p> <p>You are only able to be genuinely oblivious if sufficiently removed from the central focus of the project e.g. within mental health to be a lower grade nurse. If the member of staff is of any seniority they are unlikely to be credible if they profess obliviousness. The exception to this could be to parade obliviousness as a badge of honour e.g. a doctor who shows commitment to walk away from such "distractions".</p> |
| Catchphrase (To Whom) | "What computer?" (To anyone) |
| Experience | Those who have managed to avoid any experience, and any communication, or attempt to convince others that no communication has taken place i.e. to blame someone else for not including them. |
| Expectation | It will probably not add benefit to the service. Don't necessarily care however so they may not have given it much or any thought other than a wish not to face it. |
| Role/Effect | Non-senior more likely to "avoid" use and reduce impact, particularly if they then rely on others to do system-based jobs intended for them. Possible clinical obliviousness results from and emphasises dislocation from IS. |
| Example Action | Will not read any information circulated about an implementation and avoid attendance at presentations or training about it. Will always say "too busy" to have paid any attention and thus deny knowledge. |
| Management | Appropriate communications and training, both through the project and the local management. Local managers need to ensure compliance. Fully inclusive systems involve all and demonstrate relevance to all i.e. they are designed to aid all, including clinical staff. |
| Stability & Transition | It is difficult to remain oblivious if involvement or use is required. Within the mental health context there may be relatively high levels of staff within this category due to historic low levels of IS penetration and limited forms of use. This state may therefore be very long-standing and thus stable. |

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|--|--|
| | The implementation of IS however demands that there is transition to other categories and strategies for achieving this have to be put in place and residual Obliviousness challenged. Care is needed though as to the subsequent state after Obliviousness is challenged e.g. to avoid them becoming a Technophobe. |
| Self-Efficacy (Belief re capabilities to use) | Unlikely to be positive if have no experience. Lack of belief may be a reason for “averting gaze”. |
| Outcome Expectation – Performance (Job performance – efficiency/effective) | Unlikely to have any positive expectation from position of ignorance. |
| Outcome Expectation – Personal (Change, reward, promotion) | Unlikely to be aware, or have thought of, the relevance of use to personal expectations. |
| Affect (Use response – positive) | None. Has no experience. |
| Anxiety (Affect use response – negative) | None necessary as have no experience. They are not oblivious if they have developed anxiety – this will mean transference possibly to Technophobe, or another category. |
| Use (Degree of Use) | None. Reactions are not based on actual use – unable to deny existence if they have actually used. |

Appendix U: IS Staff Role Typology

The (Host – IS) Interface Management Toolkit IS Staff Role Typology

1. Purpose

IS Staff Role Typology is a means to analyse the staff within an IS function from the perspective, firstly, of their relationship with IS. Beyond this it questions their attitudes and behaviour towards, a) the use of IS within host organisations, b) the staff of host organisations, and c) how this may be reflected through participation within specific IS implementation.

As a matching tool to Host User/Actor Typology this is a means to understand how staff may relate to IS, in terms for example of their experience of and attitudes towards it, actual or potential roles within IS implementation or general use, and how attitudes and behaviour may change. The managers of an implementation should consider who may potentially or actually fit into these categories and with what effect. Views as to required IS input to an implementation may thus be informed initially, or though on-going appreciation of how staff appear to take up the roles identified. In turn the host organisation can become better informed, notably in terms of the appropriate relationships and roles that should exist, and how much or little the actual situation matches this.

This is a means to recognise, understand and challenge the perceived Conceptual Divide between host organisation and IS function.

2. Origin of the Tool

This tool developed through experience within organisations undergoing IS implementation and through support of IS use. IS implementation project management has involved active consideration of such typology as a means to understand and predict positions and behaviour. Inclusive IS project management involves personal responsibility to deal with these attitudes and behaviour. There is a personal stake in understanding them better.

3. Use of the Typology Tool

This tool is intended to be part of the process of organisational learning, alongside other suggested tools including Player/Actor Analysis, and established tools such as the Soft Systems Methodology Rich Picture and CATWOE. When an implementation is being considered, and then subsequently through the process of implementation and continuing use, the tool is a reference point to understand the many user and non-user perspectives, and how they are or need to be considered and managed. At implementation inception the tool should be used to identify the existing perspectives and how they may affect or be included within the implementation.

This is intended to be an inclusive tool to be used by and meaningful to those with any level of IS knowledge.

This tool should be used in a bi-directional manner. It is a means to consider the suggested categories and what roles, attitudes and behaviour may exist at present and in the future. Secondly it is a means to clarify how the IS function matches these categories i.e. who fits where, with what likely effect.

As movement between the categories is assumed, it is important to understand the nature of the path between forming attitudes and actual behaviour, as described through Social Cognitive theory. An additional tool is therefore included at the end of this document:

Key Stages of Perception – Host Staff reaction to IS & IS staff reaction to the Host Organisation

The method of use of the **IS Staff Role Typology** will involve the following steps:

- a) Consider the typology and the descriptions contained against each variable.

- b) Relate this model to the relevant IS function identifying which categories may exist now or in the future.
- c) Identify which groups or individuals could be seen to match the categories.
- d) Add any other categories that may apply to the particular IS function (either entirely new, or adaptations of existing categories).
- e) Consider the possibility that individuals may take up one or more position at different times, or demonstrate characteristics from more than one.
- f) Consider the implications of these definitions and typology - Identify risks and opportunities existing - and the appropriate management response.
- g) Build these conclusions into host structure and process.
- h) Periodically revisit the exercise and identify changes.

IS Staff Role Typology

| 1. Oblivious | |
|-----------------------|---|
| Description | Unaware of, or ignore the presence of the host of IS. |
| Who? | Has had no or little previous contact with this host or perhaps IS hosts generally and with no desire to communicate with or understand them. They may be a trainee, not aware of the contextual realities and pressures of the job i.e. uninitiated. |
| Catchphrase | <i>"Who is this for... who are the users?"</i> |
| Experience | No or little experience of this or other host organisations generally. May be new to IS and yet to have had a prompt to develop wider understanding or consideration of non-technical issues. |
| Expectation | Positive feelings about Users/hosts are not present as don't have awareness or knowledge of them. They don't necessarily care. Knowing about the host will probably not add benefit. It is pointless to know about the host, as the job required is to be concerned with IS rather than them. |
| Role/Effect | This position is more potentially damaging the more senior the person concerned is, particularly if they senior IS management. Such detachment from the host may not have a great impact if they are junior or are part of a large team e.g. as a temporary or contracted worker. They could however reflect or stimulate a general culture of detachment from the host environment. |
| Example Action | <p>Implement IT decisions without any consideration of current host practice and the impact of the action.</p> <p>To expect all users to be present at the moment when they install their PCs. This may be without any notice given that installation will take place. Arriving on site without notice is general practice. Unaware that clinical workloads will restrict the ability of users to be present at a desk at a given time. Will assume that should be able to access offices at all times and be frustrated by refusal to interrupt a clinicians contact with a client to access the office.</p> <p>Makes changes to systems that affect users e.g. directory permissions, neglects to tell anyone, and gives no consideration to their effect on users.</p> |

| | |
|-----------------------------------|--|
| Management | The IS host will have to face problems if there is a general prevalence of Oblivious rather than the limited example of a junior or contracted hardware installer working as part of a wider team, following instructions. They will need to work alongside or for a balanced IS. Generally, work with no appreciation of the host cannot go unmonitored or unchallenged. The IS function need to be made aware of needs in order that someone who is Oblivious will be asked to do appropriate tasks. From the host perspective it is not acceptable to generally agree needs with IS, and for them to then allow the Oblivious to wander in blindly and take the blame for a lack of appreciation or knowledge of host implementation needs. |
| Stability & Transition | New staff are likely, through experience to gain wider knowledge and move on to another category. This position is difficult to retain i.e. to remain oblivious. They are liable to, if they positively want to remain oblivious, have a motive to do so e.g. actually becoming Hostphobe, or with a desire to become a True Techie with a career path to a strict “technology only” focus. |

Appendix V: Key Stages of Perception

The Interface Management Toolkit

Key Stages of Perception - Host Staff reaction to IS, & IS Staff reaction to the Host Organisation

| Perception | Effect |
|----------------------------|---|
| 0. Oblivious | <ul style="list-style-type: none">• No appreciation of the work, purpose, existence, or of existing I/IS/IT use.• No prior or existing involvement with IS or Host. |
| 1. Aware | <ul style="list-style-type: none">• Knowledge of existence of IS or Host.• Precursor to any involvement.• Some appreciation of the work, purpose or existing I/IS/IT use – know it exists.• No assumption that they will understand IS or Host, or their needs.• May merely be aware of problematic history or individuals/individual experiences – surface level awareness.• Presence of a veneer – “Aren’t they the ones who...?” / “Isn’t that the system that...?” |
| 2. Understand | <ul style="list-style-type: none">• Beyond awareness there is understand of IS or Host, or their needs.• Understanding of the purpose of IS and IS implementation• Understanding of the impact and demands of IS and IS implementation• Does not assume that will have positive attitude towards it, accept or will actively participate. |
| 3. Recognise/Accept | <ul style="list-style-type: none">• Means to avoid basic negativity relying on ignorance/false perception.• Doesn’t imply a high level of understanding.• A possible veneer of support for what the host is doing / what IS is concerned – means nothing practically if not translated to action.• Accept existence of host / IS versus acceptance of what their aims. |

| Perception | Effect |
|--------------------------------|--|
| 4. Knowledgeable | <ul style="list-style-type: none"> • Understanding of project/system/implications in that context and vice versa. • Able to match user needs and IS and can participate constructively if understand context – understanding of the Host – IS interface. • Informed position to allow a contribution. • Doesn't necessarily mean that will participate. • IT centred perception – <i>"This is going in"</i> - shifted to wider focus – <i>"How will this work here?"</i>. • Host-centred perception – <i>"We want this"</i> – shifted to wider focus – <i>"What does this mean for IS?"</i> |
| 5. Enthusiastic | <ul style="list-style-type: none"> • A positive desire for the change to succeed and to play a part – positive motivation to do more than just do a checklist job i.e. where know exactly what to be done before start. • A push for maximum possible versus minimal implementation/use. • Eager to closely match IS to needs of the host and vice versa. • Prepared to promote host implementation wants/needs in front of usual IT imperatives. • Go beyond "Get it to work" to precisely how used, benefits and effects on host. • Not necessarily required for project participation but will change performance. • May involve communication of strengths, achievement etc. to others in IT – promote the host and their work. |
| 6. Actively Participate | <ul style="list-style-type: none"> • Able to put this enthusiasm into action i.e. need the means to do so in order that it may happen. • Appropriate structures and processes exist within the host and IST structures, and the specific implementation. • Participation defined through host, IS/IT or implementation structure and role. |

Appendix W: IS Communication Network

Suppliers

Project Team

Project Manager

The Host-IS Interface/Barrier

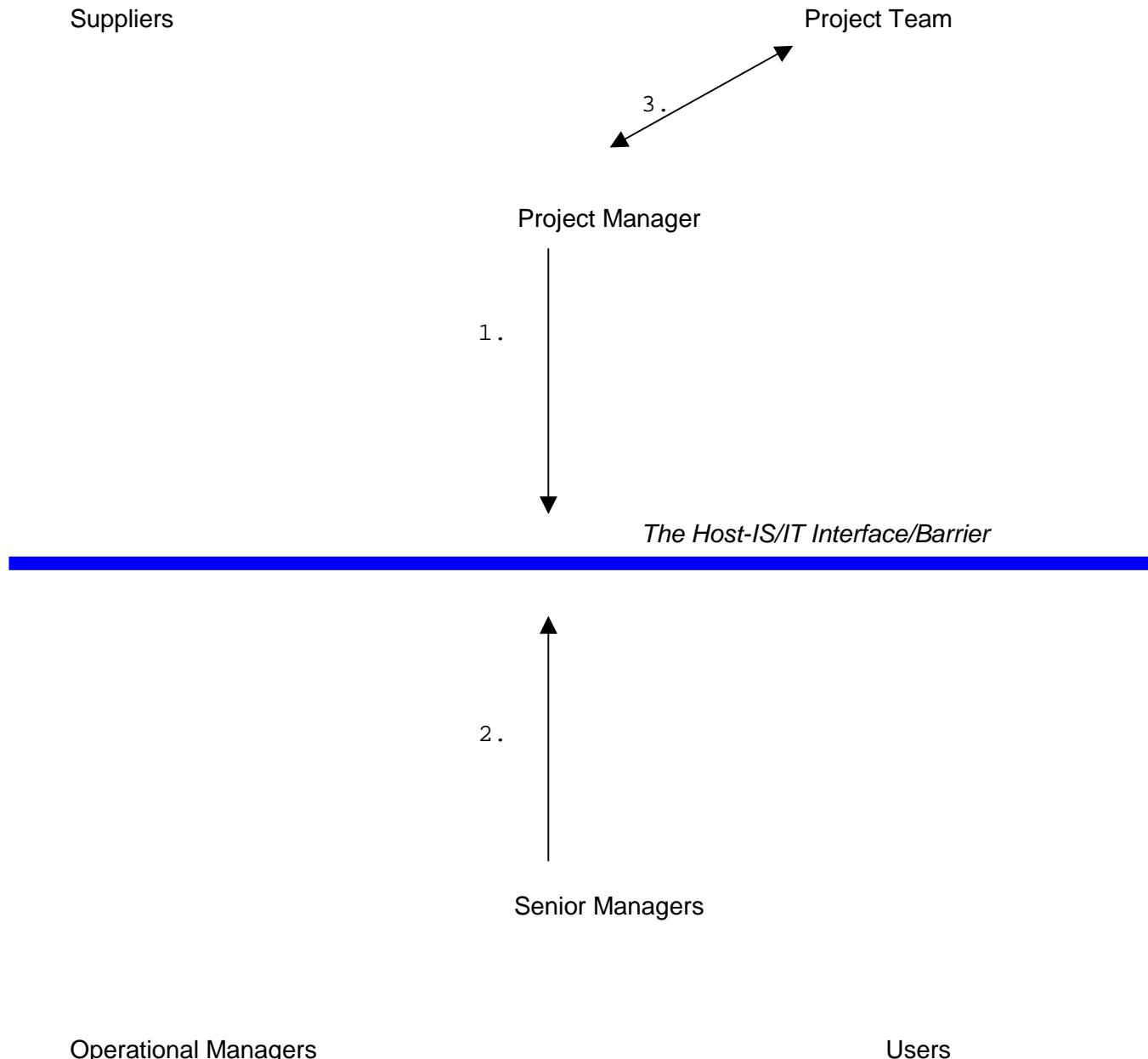


Senior Managers

Operational Managers

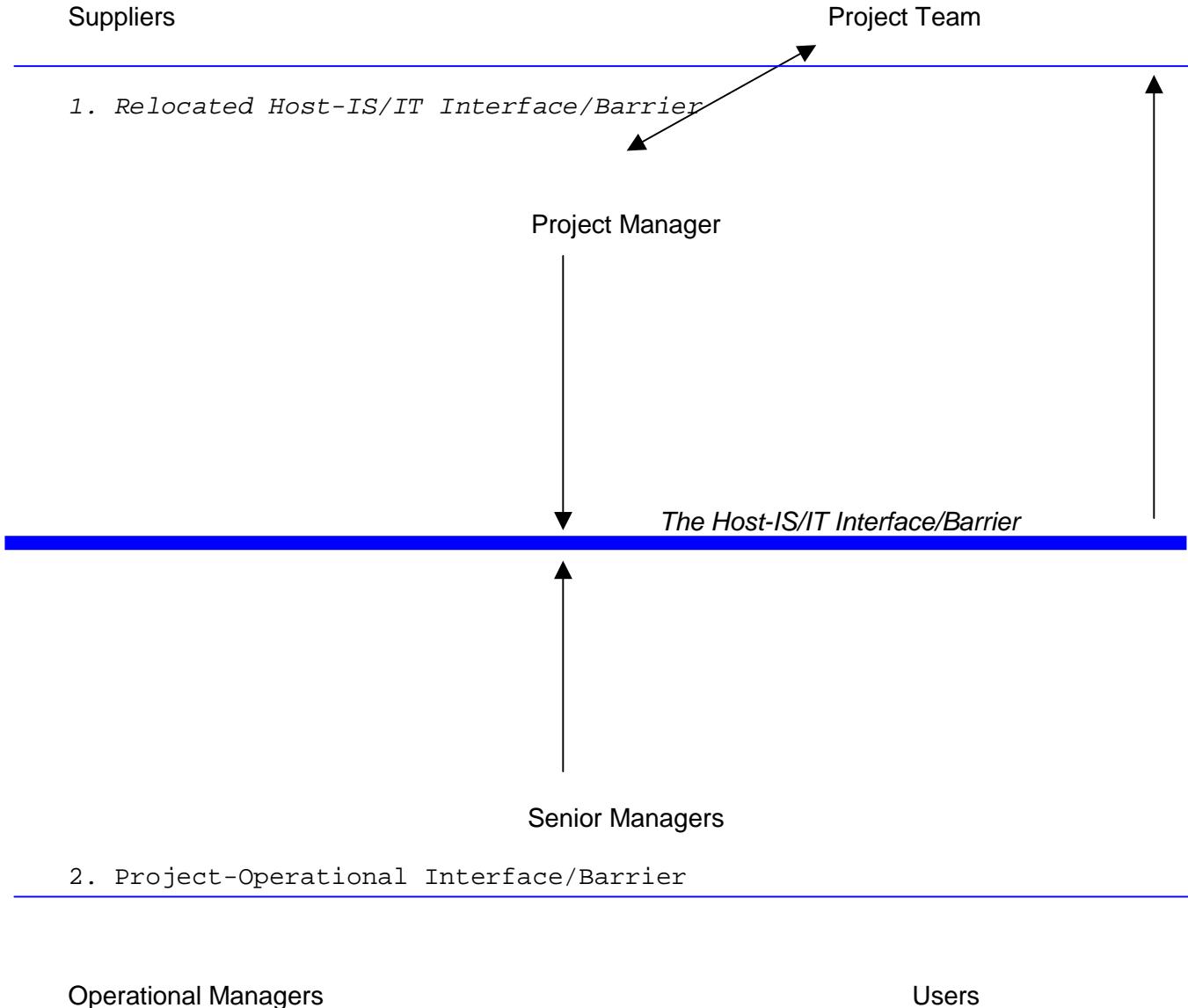
Users

IS Communication Network - SISD



-
1. Project Management is host based but with IS/IT background.
 2. Senior Manager has IS/IT experience – so not remote from the Interface/Barrier.
 3. Project Management attempt to get closer link with IS/IT function.

3. IS Communication Network - SISD



1. Attempt to reposition Interface/Barrier, and reduce barrier impact.

2. Revelation or emergence of a secondary Host-IS/IT Interface/Barrier – the Project-Operational Interface/Barrier. If primary Interface/Barrier had not been addressed or not aware of it then the secondary Barrier/Interface may have gone unnoticed or it may have assumed was O.K. In this project after physical implementation is completed this second Interface/Barrier is to be the focus of attention.

Appendix X: Major Actor Analysis

Major Actor Analysis

Purpose:

1. To identify the characteristics of the actors involved in an implementation, project, development or service.
2. Match existing vs. required features.
3. Identify strengths and inadequacies.
4. Identification of who and what exists, and how best to use these resources vs. the alternative approach of merely planting a project structure on the existing organisation i.e. to apply and comply with PRINCE2.

A table should be completed for each of the following actors:

- a) Suppliers (IT)
- b) Project Team
- c) Project Manager
- d) Senior Managers
- e) Operational Managers
- f) Users (to include administrators and clinicians within mental health contexts)

Actor Analysis - Suppliers

| Actor Information | Detail | Issues/Problems |
|--|---|-----------------|
| Consists of | | |
| Professional Background | | |
| Skills | | |
| Responsibilities | | |
| Involvement | | |
| Demands made of | | |
| Responsible To | | |
| Communication / Relationships (Suppliers to...) | 1) Project Team: 2) Project Manager: 3) Senior Managers: 4) Operational Managers: 5) Users: | |

Appendix Y: Conceptual Divide Analysis

The (Host – IS) Interface Management Toolkit **Conceptual Divide Analysis**

The results of the study point to the prominence of a lack of understanding between, on the one side, host organisations (and elements therein), and on the other IS (and the IS function therein). The lack of understanding may exist across a range of issues, from macro to micro levels. These two basic elements - the organisation and the IS - can be seen to suffer from a conceptual divide, that with its own specific contextual nature will impact upon the relative success of the use of IS generally and of projects or developments that include the application of IS.

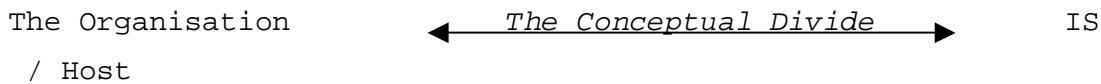
This divide relates to:

1. Lack of understanding,
2. Lack of knowledge,
3. Issues not addressed or unanswered, and
4. Different perceptions of reality.

In all cases these aspects of the divide reflect the experiences of hosts and IS staff, when referring to the other, by stating “*They just don’t understand*”. Throughout the study examples were found of contrasting perceptions, lack of clarity and confusion over a range of issues, from project aims, roles and staff involvement through to specific requirements and system impact.

The nature of this divide is that it is a two-way issue. Just as the organisation may have little understanding of IS, or interest in it, the IS function may have little understanding of, or interest in the host organization. Individuals may or may not express the attitude that IS or the organisation does not interest, or concern them. The existence of such individual attitudes (see IS and User categories) will not exist

as a surprising or necessarily damaging feature. What is potentially, and likely to be damaging however is a general or corporate failure to address the divide and a lack of leadership to bridge it.



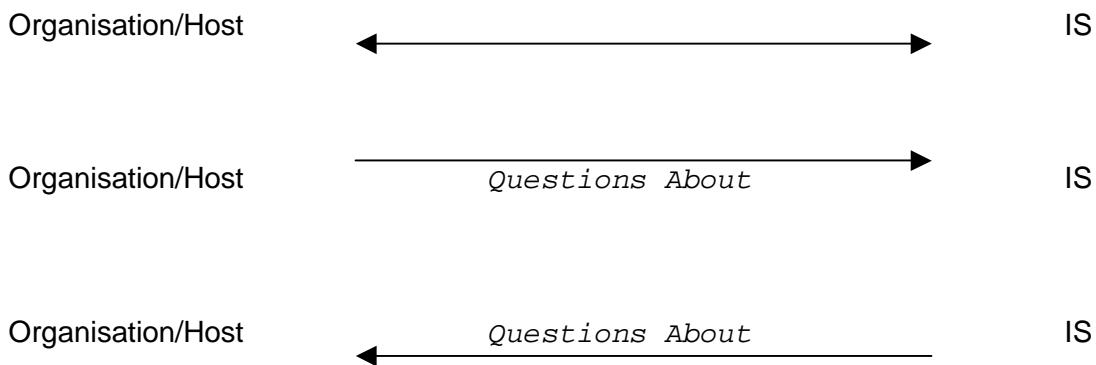
In the context of mental health, given that clinical staff are not required to be IS or IT experts, and IS and IT experts are not required to be clinicians the organisation needs to avoid the extremes of neglecting the divide and alternatively of trying to encourage all people to know everything, to be all things to all people. Growing knowledge of the organisation and IS will develop from interaction between the organisational elements, the technology and the individuals, through the development and use of IS systems. The scope, nature and impact of this knowledge however may be insufficient to support successful IS introduction and use. Also the passage of time and turnover of staff can reduce knowledge and overall levels of experience.

It is a necessary requirement therefore for an organisation using, changing the nature of use, or considering the use of IS to specifically, a) address the divide, and b) allocate responsibility and define a role to manage that divide. This specific role may be termed co-ordination, or interface management. The structural location and precise emphasis of this role will vary depending on the nature, structures and skills of the existing organisation e.g. whether the IS function is an internal body, a form of arms-length function, outsourced or contractual. This will influence the nature of the relationship between the host and IS, and therefore the "distance" between them. Also organisational structures and staffing will determine access to, and ownership of skills and roles such as systems analysis, data/information analysis, management

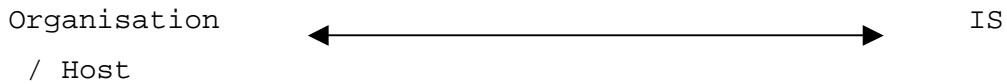
information, research, and data input. Do these roles exist, are they internal, and are they considered part of IS or not?

The Conceptual Divide can be bridged therefore through short-term action and longer-term development. In both cases responsibility and authority needs to be defined and allocated. However it is managed there are a series of issues that need to be raised and questions that need to be asked. The following describes the questions that need to be asked, and issues to be addressed, and stresses their bi-directional nature i.e. they apply equally relevantly in the case of both the host organization questioning the IS function and the reverse.

The 3 Perspectives included:



Questions and Issues to Bridge the Conceptual Divide



1. What do I understand about your role in the organisation?
2. What do you understand about my role in the organisation?
3. What are the priorities my/your role?
4. What are the challenges of my/your role?
5. What is the motivation for the my/your action?
6. What do you need me to do to help/support your role?
7. What do I need to know to be able to help/support your role?
8. What do I/you have to do to maximize potential for success?
9. What do I/you have to do to minimize risk of failure?
10. What does the systems success/use mean to me/you?
11. What are your attitudes to the use and role of IS generally?
12. What are your attitudes to the use and role of IS in this context?

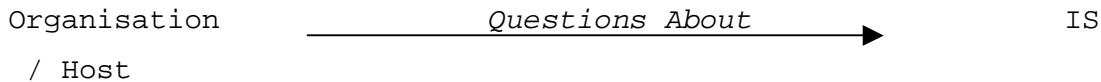
13. What is the aim of this system/project, and what does it need to achieve?
14. What is the impact of decisions that I may make? – on me/you.
15. What is the impact of actions that I may take? – on me/you.
16. What is the formal relationship between us?
17. What is the informal relationship between us, and is there one?
18. What issues do we need to raise and discuss?
19. What issues should not be a point of discussion?
20. Who is able to make a decision about the issues that we need to discuss?
21. Who is able to make a decision about the issues that are beyond our brief?
22. What decisions have to be made?
23. When do these decisions have to be made?
24. In what areas will you request my opinion?
25. In what areas will you listen to my opinion?
26. In what areas will my opinion have weight?
27. In what areas will my opinion be the deciding factor?

28. What forms of communication need to take place between us?
29. Who needs to be involved in this communication?
30. What responsibilities do/will I have with regard to the system itself – implementation, maintenance, support, development and use?
31. What skills are needed to ensure that these responsibilities can be carried out?
32. Do the required skills exist and if not how are they to be generated?
33. What is the impact of inaction by me/you?
34. Who has responsibility for the processes that the system affects?
35. Who is going to address the processes that the system affects?
36. How are we to address the processes that the system affects?
37. When are we to address the processes that the system affects?
38. Do you know what I do and why I am here?
39. Do you believe that my role is beneficial to the host organization?
40. What is needed to make a system/project work?
41. What is needed to make a system/project effective?

42. What time am I able commit to the system/project?
43. What do I/you think the system/project can achieve?
44. What do I/you think prevents greater use of IS?
45. What do I/you think prevents more effective use of IS?
46. What is relevant to the project/system?
47. Who needs to be involved?
48. When do people need to be involved?
49. Why do people need to be involved?
50. What do people need to do?
51. What is the scope of my responsibility, involvement and interest?
52. Can I blame “the other side” for failure?
53. What failures of “the other side” can I allege?
54. How were “their failures” managed?
55. What did we do about “their failures”?
56. Why couldn’t we prevent “their failures”?

57. Am I willing to openly blame “them” for failure?
58. How will I express my thoughts about “failure”? – to whom, when.
59. What skills are relevant to my job/role?
60. How far do we/they need to compromise to reach goals?
61. What issues cannot be compromised on?
62. What issues can be compromised on?
63. What impact is expected for the host?
64. What impact is reasonable/not reasonable for the host?
65. What needs to be communicated to them to enable understanding?
66. What questions will I ask to increase understanding?
67. What needs to be understood by them to enable progress?
68. What am I prepared to do about fears raised?
69. What am I prepared to do about hopes expressed?
70. Do I understand the impact of my action on them/the project/the system?
71. Do I understand the impact of my attitude on them/the project/the system?

Questions and Issues to Bridge the Conceptual Divide

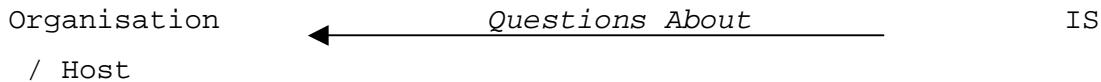


To be asked individually or across the host organization as a whole.

1. Who does/doesn't want (more or different) IS?
2. Who accepts, or sees the need for (more or different) IS?
3. Am I prepared to contribute to the process to achieve implementation?
4. Am I prepared to contribute to the process to achieve effective use?
5. Will I actually use the system when it is there?
6. Will I ignore its presence?
7. Will I encourage/force others to do what they should?
8. Will I get others to carry out functions that I should do myself?
9. Will I ignore the functions that are requested or required of me?
10. What is the limit of what I am prepared to offer the system/project?
11. Do I use systems that are already in existence?

12. Do I retain existing/previous/manual processes despite the existence of IS?
13. Am I prepared to raise problems?
14. Who will I discuss problems with?
15. Can I and will I blame IS for other or personal failings?
16. Am I prepared to change?
17. Do I understand this change?
18. Do I understand this change as part of wider changes?
19. Do I think that IS presents different challenges or a new slant on the existing?
20. Can I accept that IS presents a new slant on existing issues?
21. Am I prepared to address the problems/issues that IS prompts?
22. Am I prepared to blame IS for the address the problems/issues that IS prompts?

Questions and Issues to Bridge the Conceptual Divide



To be asked about individuals or about the host organization as a whole.

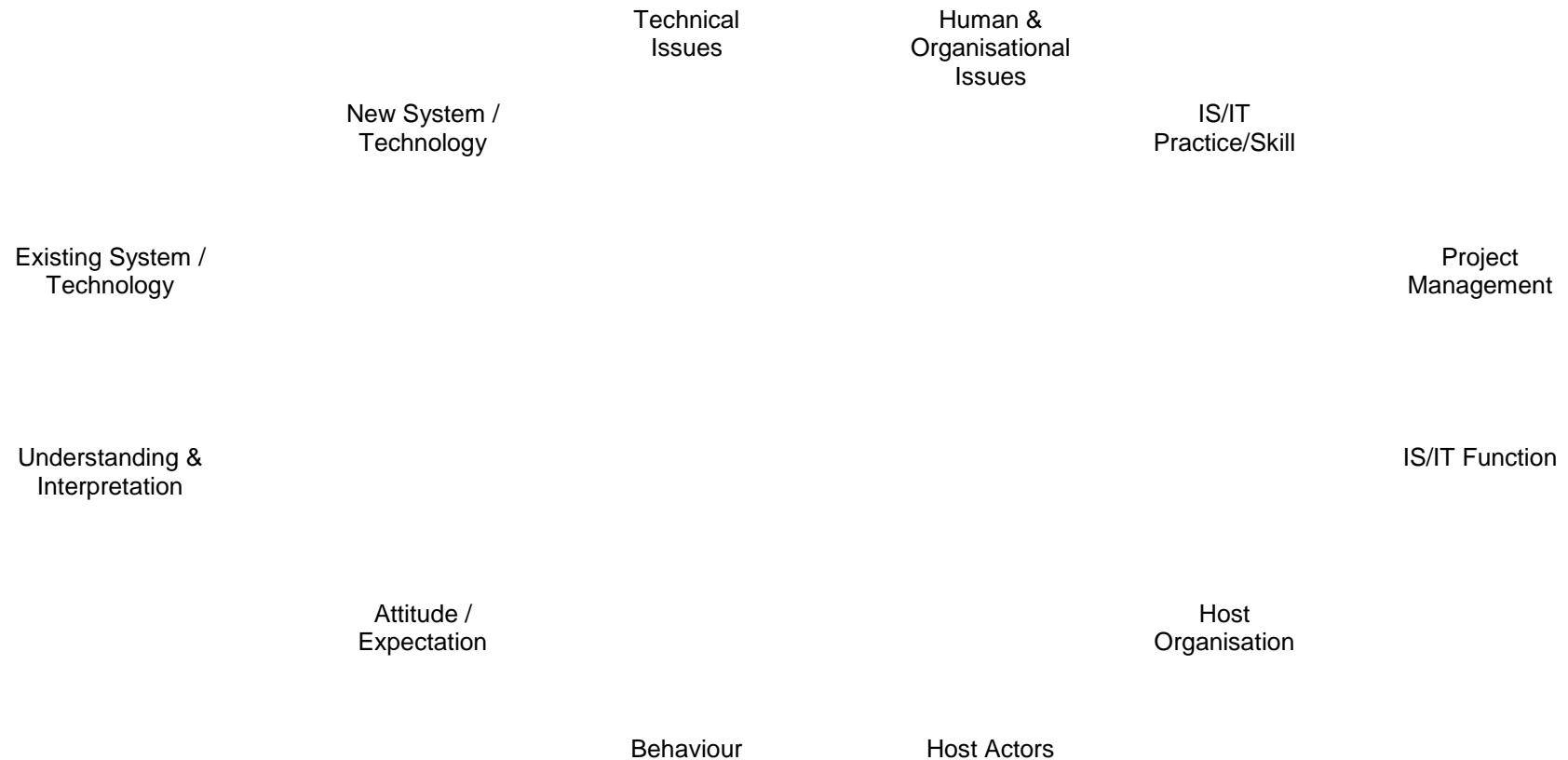
1. Do I really know what you do?
2. Do I really care what you do?
3. Do I see the need to know what you do?
4. How will I apply knowledge about the host organization?
5. Is understanding of the implementation context important?
6. Can I segment my role away from any host reality?
7. How much does host opinion have a role about IS issues?
8. Where does host opinion have a role about IS issues?
9. Will I listen to your opinion and do what I was going to anyway
10. Do you understand the host's range of backgrounds and professional groups?
11. Do you understand the host's range of experience?

12. Do you understand the host's range of motivation and perspective?
13. Do I know who is using/going to use the system?
14. What will be different if I know about you?
15. Where do I think consultation is necessary?
16. Where do I think communication of technical decisions and progress is needed?
17. Can I accept that IS can't solve problems on their own – in theory and in practice?
18. Can I accept that IS may not be applicable?
19. Am I prepared to advise that IS is not applicable?
20. Am I prepared to put users' needs before the imperative to technically implement?
21. Am I prepared to solve users' problems at the expense of technical implementation?
22. Do I know if you are using the system at all?
23. Do I know if you are using the system as intended?
24. Do I know which parts of the system you are using?

25. Am I asking you about system use and problems/benefits?
26. Am I, and how am I acting on feedback re system use?
27. Do I know what would make the system technically better?
28. Do I know what would make the system better for the user?
29. Can I differentiate between technically good systems and system elements and those, which are beneficial for the organization?

Appendix Z: Conflict & Incompatibility Network

Conflict & Incompatibility Network - 1. Conflict / 2. Incompatibility



Appendix Z: Conflict & Incompatibility Network - 1. Conflict / 2. Incompatibility

| Conflict/ Incomp. No. | From | Content | Relating To |
|--------------------------------------|-------------|----------------|--------------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

Appendix AA: PID+

| | |
|---|--|
| Implementation Name | <i>Produced By:</i> |
| Project Initiation Document - Template | <i>Reference: IMTPIDv1 Date: Version: Distrib. To:</i> |

Attached Documents:

Example Appendices

1. Funding/resources bids
2. IS/IT/Information Strategy
3. Background Policy/Procedure
4. Feasibility / Cost Benefit / Project Selection
5. Rich Picture
6. CATWOE – Project Definition
7. Prior Project Planning
8. Anything done prior to this point

Implementation Name
Project Initiation Document

Contents

| | Page |
|---|-------------|
| 1. The Purpose of this Document | |
| 2. Implementation Background | |
| 3. Introduction | |
| 4. What the Project Is and Includes | |
| 5. Project Aims and Objectives | |
| 6. Risks, Constraints and Dependencies - Barriers to Success | |
| 7. Project Structure | |
| 8. Project Roles & Responsibilities | |
| 9. Project Approach and Method(ology) | |
| 10. Project Progress & Planning | |
| 11. Sustainability & Evaluation | |
| 12. Summary, Conclusion & Recommendations | |

Appendix BB: IS Implementation - 1 to 1 User Consultation

Interviewee: **Interviewer :** Date :/...../.... Time :am/pm

| Issues to Address | Notes / Action Required |
|--|-------------------------|
| <p>1. What is going to happen</p> <ul style="list-style-type: none">.1 Installation of a network / PC / Server / other hardware / software..2 Who hardware will be installed by (& who they are accountable to)..3 Whether will continue to use old equipment whilst new IS tested & data transferred..4 We will inform everybody when things are happening and what each user needs to do, before it happens. | |
| <p>2. When it will happen</p> <ul style="list-style-type: none">.1 Anticipated delivery dates..2 Where is set up work to be done, for how long..3 Installation of new equipment..4 Removal of any old system elements..5 New system fully live date expected..6 Note if User will not be present during period & any issues for installation. | |

| Issues to Address | Notes / Action Required |
|--|--------------------------------|
| <p>3. What equipment will you get</p> <p>.1 User Dependent – consult location maps and equipment inventories.</p> | |
| <p>4. Where it will go – Physical location issues</p> <p>.1 User Dependent - Discuss physical location of new system, including peripherals.</p> <p>.2 Any issues if parallel running to take place.</p> <p>.3 Any additional IT requirements e.g. network sockets, electricity sockets.</p> <p>.4 Any additional associated requirements e.g. desk, chair, storage etc. (Confirm responsibility for work and financing).</p> <p>.5 Confirm if convenient or inconvenient times/days, and any required alternative access requirements if own equipment to be down.</p> | |
| <p>5. What applications will be immediately / potentially available</p> <p>.1 Operating system – documentation, training, manuals? Any change from present circumstances?</p> <p>.2 Office applications available, and versions.</p> <p>.3 E-Mail & Communications systems.</p> | |

| | |
|---|--|
| <p>5. What applications will be immediately / potentially available</p> <p>.4 Internet facilities.</p> <p>.5 Networks and links.</p> <p>.6 Intranet facilities.</p> <p>.7 Diary, scheduling, group work applications.</p> <p>.8 Anti-Virus software.</p> <p>.9 Specialist applications e.g. SPSS, Clinical, Drug prescribing.</p> <p>.10 Immediate versus future facilities.</p> <p>.11 Changes to current use involved.</p> | |
| <p>6. Confirm Training requirements</p> <p>.1 For basic computer literacy. (Existing user or new user).</p> <p>.2 For existing applications e.g. Office applications.</p> <p>.3 For new applications i.e. operating systems and others.</p> <p>.4 Discuss how training needs may be met – local, Trust, electronic (Intranet), external courses, ECDL etc.</p> <p>.5 Current opportunities and limitations for training.</p> | |

| Issues to Address | Notes / Action Required |
|--|--------------------------------|
| <p>7. Documentation - Confirm Receipt and Content of Documents</p> <p>.1 Systems Guide – a) Distribute, b) Confirm if read, c) Need to read, d) Discuss content.</p> <p>.2 Internet/Email Policy - a) Distribute, b) Confirm if read, c) Need to read, d) Discuss content.</p> <p>.3 Any Other (e.g. specific for Administrators) - a) Distribute, b) Confirm if read, c) Need to read, d) Discuss content.</p> <p>.4 Any queries or issues</p> <p>.5 Discuss security/anti-virus etc. - issues demanding attention</p> | |

| Issues to Address | Notes / Action Required |
|---|--------------------------------|
| <p>8. Completion of New User Forms (if appropriate)</p> <p>.1 New User Form – a) discuss, b) distribute, c) complete as required.</p> <p>.2 User Declaration - a) discuss, b) distribute, c) complete as required.</p> <p>.3 Note how well/poorly the forms work & are received.</p> <p>.4 Consider any changes necessary.</p> | |
| <p>9. Current Systems Use - Data & Applications</p> <p>.1 Any applications need to be transferred e.g. specialist, not covered by general installation?</p> <p>.2 What data needs to be transferred</p> <p>.3 How is user data currently stored - format & location</p> | |

| Issues to Address | Notes / Action Required |
|--|-------------------------|
| <p>10. Data Storage System & Network Structure</p> <p>.1 Confirm Objective</p> <p>.2 Confirm what the User will be able to access – local & network drives, personal directories, shared/workgroup drives/directories.</p> <p>.3 Are there any problems with this? – Confirm that the proposed setup is appropriate.</p> <p>.4 Confirm need to organise documents in preparation for transfer.</p> <p>.5 Confirm need to set up appropriate directories - User dependent.</p> <p>.6 Discuss how this will be achieved / give any advice – confirm user and IS role.</p> | |
| <p>11. User Queries</p> <p>.1 Confirm where queries should be directed to and availability to assist.</p> <p>.2 Any agreed future action or requirements</p> <p>.3 Any concerns, fears, expectation, or requests.</p> | |

References

- Arndt, M and Bigelow, B. 2000a: ***Presenting Structural Innovation in an Institutional Environment: Hospitals' Use of Impression Management.*** [Internet] *Administrative Science Quarterly*, September 2000. Available from: http://www.findarticles.com/cf_0/m4035/3_45/68217154/print.jhtml [Accessed 27.08.2002].
- Arndt, M and Bigelow, B. 2000b: ***The potential of chaos theory and complexity theory for health services.*** [Internet] *Health Care Management Review*, (25:1), Winter 2000, Gaithersburg, Holland, Aspen Publishers Inc. Available from: <http://web.inter.nl.net/users/kennismanagement/chaos/Arndt%20Commentary%20Health%20Care%20Mgt%20Review.doc> [Accessed 27.08.2002].
- Arnott, S. 2002a: ***NHS budgets for IT "must be doubled".*** *Computing*, VNU Business Publications, 25.04.2002, p. 4.
- Arnott, S. 2002b: ***Major IT investment is critical to NHS reforms.*** *Computing*, VNU Business Publications, 25.04.2002, p. 1.
- Association for Information Systems: ***ISWorld Net*** [Internet resource for information systems academics and practitioners]. Available from: <http://www.isworld.org>.
- Bandura, A. 1969: ***Principles of Behaviour Modification.*** New York, Holt, Rinehart and Winston.
- Bandura, A. 1977: ***Social Learning Theory.*** Englewood Cliffs, New Jersey, Prentice-Hall.
- Bandura, A. 1986: ***Social Foundations of Thought and Action: A Social Cognitive Theory.*** New Jersey, Englewood Cliffs, Prentice-Hall.

Bandura, A. 1997: ***Self-Efficacy: The Exercise of Control.*** New York, W.H. Freeman and Company.

Barki, H., & Hartwick, J. 1994: ***Measuring user participation, user involvement, and user attitude.*** *MIS Quarterly* (18:1) March 1994, pp. 59-82.

Baroudi, J.J. and Orlikowski, W.J. 1988: ***A Short Form Measure of User Information Satisfaction.*** [Internet] *Journal of Management Information Systems* (4:4) Spring 1988, pp. 44-59. Available from:
<http://wings.buffalo.edu/mgmt/courses/mgtsand/success/baroudi.html> [Accessed 19.11.1998].

Baskerville, R. and Myers, M. 2004: ***Making IS Research Relevant to Practice.*** *MIS Quarterly*, Forward to (28:3) September 2004, pp. 329-335.

Baskerville, R. and Wood-Harper, A.T. 1996: ***A critical perspective on action research as a method for information systems research.*** *Journal of Information Technology* (11) pp. 235-246.

BBC 2000a: ***UK relief over bug.*** [Internet] news.bbc.co.uk, 04.01.2000. Available from: <http://news.bbc.co.uk/1/hi/uk/590045.stm> [Accessed 01.11.2002].

BBC 2000b: ***Y2K: Overhyped and oversold?*** [Internet]. news.bbc.co.uk, 06.01.2000. Available from: http://news.bbc.co.uk/1/hi/talking_point/586938.stm [Accessed 01.11.2002].

BBC 2002: ***Addicted to arms: a Will Self investigation.*** [Internet] BBC article with content from BBC Correspondent, broadcast 28.04.2002. Available from: http://news.bbc.co.uk/hi/english/audiovideo/programmes/correspondent_europe/newsid_1939000/1939250.stm [Accessed 09.05.2002].

BBC News 2004: '**No confidence**' in new NHS computer. [Internet] BBC File on 4, 19.10.2004. Available from:
http://www.bbc.co.uk/1/hi/programmes/file_on_4/3754064.stm [Accessed 25.10.2004].

BBC Radio 4 2004: File on 4, Interview transcript, **Interview with Richard Granger, Director General NHS IT**. [Internet] Broadcast 19.10.2004 at 20:00 BST. Available from:
http://news.bbc.co.uk/1/shared/spl/hi/programmes/file_on_4/transcripts/transcript_richard_granger.txt [Accessed 25.10.2004].

BCS Health Informatics Committee 2003: **More Radical Steps**. [Internet] BCS Health Informatics Committee, *Report that followed the meeting on More Radical Steps held on 1st July 2003*. Available from:
<http://www.bcshic.org/radical/MRS2003-positionstatement.pdf> [Accessed 29.06.2004].

BCS Health Informatics Committee 2004: **Radical Steps**. [Internet] BCS Health Informatics Committee, *Report that followed the meeting on More Radical Steps held on 26th February 2004 - The 3rd Think Tank of Health Informatics*. Available from:
<http://www.bcshic.org/radical/RSPaper04.pdf> [Accessed 29.06.2004].

Benbasat, I. and Zmud, R. 2003: **The Identity Crisis Within the IS Discipline: Defining And Communicating The Discipline's Core Properties**. *MIS Quarterly* (27:2) June 2003, pp. 183-194.

Benbunan-Fich, R. 2002: **Information Technology In Organizations: Paradigms And Metaphors**. [Internet] New York, Baruch College, Zicklin School of Business, Department of Statistics & Computer Information Systems, Abstracts And Papers -

#CIS-2002-01. Available from: <http://cisnet.baruch.cuny.edu/papers/cis200201.htm> [Accessed 31.10.2002].

Bend, J. 2004: ***Public Value and e-Health.*** [Internet] London, Institute for Public Policy Research. Available from:
http://www.ippr.org/research/files/team34/project143/bend_publicvalueandehealth_ippr.pdf [Accessed 27.07.2004].

Bennett, E.M., Trute, B. (Eds.) 1983: ***Introduction.*** In *Mental Health Information Systems: Problems and Prospects.* New York, The Edwin Mellen Press, Studies In Health And Human Services, pp. 1-10.

Bentley, C. 2000: ***Managing Projects the PRINCE2 Way.*** Waterlooville, Hampshire Training Consultants.

Berners-Lee, T. 1998: ***The World Wide Web: A very short personal history.*** [Internet] USA, W3C - World Wide Web Consortium. Available from:
<http://www.w3.org/People/Berners-Lee/ShortHistory> [Accessed 15.10.2002].

Bjerknes, G. 1992: ***Dialectical Reflection in Information Systems Development.*** [Internet] Göteborg, Scandinavian Journal of Information Systems (4), The IRIS (Information Systems Research in Scandinavia) Association. Available from:
<http://iris.informatik.gu.se/sjis/vol4/bjerknes.shtml> [Accessed 02.02.1999].

British Journal of Healthcare Computing and Information Management 2004a: ***GPs boycott Care Records Service.*** BJHC&IM (21:7) September 2004, p. 7.

British Journal of Healthcare Computing and Information Management 2004b: ***Will England's National Programme for IT in the NHS succeed? The 'jury is out'.*** BJHC&IM (21:7) September 2004, pp. 18-19, Anonymous.

- Bland, C. 2004. Quoted in Collins, T.: *BT 'frightened by the enormity' of NHS's £2,3bn IT programme*, *Computer Weekly*, 23.03.2004, p1.
- Bloomfield, B.P. and Vurdubakis, T. 1994: ***Boundary Disputes: Negotiating the Boundary between the Technical and the Social in the Development of IT Systems***. *Information Technology and People* (7:1), MCB University Press, pp. 9-24.
- British Medical Association 2004: ***Guidance for GP practices in relation to the NHS National Programme for IT (NPfIT)***. BMA, April 2004 [Internet]. Available from: <http://www.bma.org.uk/ap.nsf/content/npf0404> [Accessed 12.11.2004].
- Boar, B. 1984: ***Application Prototyping***. Reading, Massachusetts, Addison-Wesley.
- Boehm, B. 1981: ***Software Engineering Economics***. New Jersey, Englewood Cliffs, Prentice-Hall.
- Boland, R.J. 1985: ***Phenomenology: A Preferred Approach to Research on Information Systems***. In Mumford, E., Hirschheim, R., Fitzgerald, G. and Woodharper, T. (Eds.) 1991, *Research Methods in Information Systems*, Northholland, Amsterdam, pp. 439-464.
- Bryant, J. 1998: ***The importance of human and organisational factors in the implementation of computerised information systems: an emerging theme in European healthcare***. The British Journal of Healthcare Computing & Information Management, BJHC (15:4) May 1998, pp. 27-30.
- Bryman, A. 1988: ***Quantity and Quality in Social Research***. London, Routledge.

Bryman, A. 1989: ***Research Methods and Organization Studies***. London, Routledge.

Bryman, A, and Burgess, R.G. 1994: ***Reflections on Qualitative Data Analysis***. In Bryman, A, and Burgess, R.G. (eds.): *Analyzing Qualitative Data*. UK, Oxford, Routledge, pp. 217-226.

Burnham, A. and Horan P. 1998: ***SIR, Information and a UK mental health service, or 'No news is good news'***. Presentation to SIR Users International Conference, Orlando, Florida, 20-22.04.1998.

Burns, F. 1998: ***Information for Health - An Information Strategy for the Modern NHS 1998-2005***. [Internet] NHS Information Authority. Available from: <http://www.nhsia.nhs.uk/def/pages/info4health/contents.asp> [Accessed 23.10.2002].

Cabinet Office 2001: ***Review of Major Government IT Projects - Successful IT: Modernising Government in Action***. [Internet] London, Cabinet Office, 04.04.2001. Available from: <http://www.citu.gov.uk/itprojectsreview.htm> [Accessed 04.05.2001].

Cambridge International Dictionary of English, 2002. [Internet] Available from: <http://www.dictionary.cambridge.org/>.

Carvel, J. 2004: ***NHS faces £15bn black hole***. [Internet] *The Guardian*, 12.10.2004. Available from: <http://society.guardian.co.uk/internet/story/0,8150,1325211,00.html> [Accessed 26.10.2004].

Central Computer and Telecommunications Agency 1997: ***PRINCE2: An Outline***. London, The Stationery Office.

- Chau, P. 1996: ***An Empirical Assessment of a Modified Technology Acceptance Model.*** [Internet] *Journal of Management Information Systems* (13:2) pp. 185-204. Available from: http://rmm-java.stern.nyu.edu/jmis/articles/v13_n2_p185/index.html [Accessed 04.11.2002].
- Checkland, P. 1999: ***Systems Thinking, Systems Practice.*** Chichester, John Wiley & Sons.
- Checkland, P. and Holwell, S. 1998: ***Information, Systems and Information Systems: making sense of the field.*** Chichester, John Wiley & Sons.
- Checkland, P. and Scholes, J. 1999: ***Soft Systems Methodology in Action.*** Chichester, John Wiley & Sons.
- Ciborra, C. 1999: ***Hospitality and IT.*** [Internet] PrimaVera Working Paper Series, Amsterdam, Universiteit van Amsterdam, Department of Accountancy & Information Management [Internet]. Available from: <http://primavera.fee.uva.nl/PDFdocs/99-02.pdf> [Accessed 22.09.2003].
- Ciborra, C. 2002: ***The Labyrinths of Information: Challenging the Wisdom of Systems.*** Oxford, Oxford University Press.
- Clegg, C. 2002: e-mail to author, 4.2.2002
- Clegg, C. et al 1996: ***The performance of Information Technology and the role of human and organizational factors.*** [Internet] University of Sheffield, Institute of Work Psychology. Available from: <http://www.shef.ac.uk/~iwp/publications/reports/itperf.html> [Accessed 30.01.2002].
- Coghlan, D. and Brannick, T. 2001: ***Doing Action Research in Your Own Organisation.*** London, Sage Publications Ltd.

Collins, T. 2004a: ***BT 'frightened by the enormity' of NHS's £2.3bn IT programme.*** *Computer Weekly*, 23.04.2004, pp. 1-4.

Collins, T. 2004b: ***Is the national programme for NHS IT set to be 'the biggest gamble in the world'?*** *Computer Weekly*, 23.04.2004, p. 4.

Collins, T. 2004c: ***Wirral lights the way to electronic records.*** *Computer Weekly*, 05.10.2004, pp. 14, 16.

Collins, T. 2004d: ***Wirral hospital is 'years ahead' on patient records.*** *Computer Weekly*, 05.10.2004, p 4.

Collins, T. 2004e: ***There is no cash shortfall, IT chief tells NHS trusts.*** *Computer Weekly*, 19.10.2004, pp. 1-4.

Collins, T. and Bicknell, D. 1998: ***Crash: Learning from the World's Worst Computer Disasters.*** London, Simon & Schuster.

Compeau, D., Higgins, C., and Huff, S. 1998: ***Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study.*** [Internet] University of Calgary. Available from:
<http://www.acs.ucalgary.ca/~compeau/rn2560/rn2560.html> [Accessed 19.11.1998].
Also published as *MIS Quarterly* (23) June 1999.

Computer 50, 2001: ***The University of Manchester Celebrates the Birth of the Modern Computer.*** [Internet] University of Manchester. Available from:
<http://www.computer50.org> [Accessed 01.10.2001].

Computer Weekly 1998: ***New Jobs, Old Crisis.*** *Computer Weekly*, 27.08.1998, p. 6.

Computer Weekly 2003: **NHS courts £5bn IT disaster by following the Libra route.** [Internet] Computer Weekly, 06.02.2003. Available from: <http://www.computerweekly.com/articles> [Accessed 10.02.2003].

Computer Weekly 2004a: **Doctors call for input in UK NHS IT project.** [Internet] Computer Weekly, 03.11.2004. Available from: <http://www.computerweekly.com/article134757.htm> [Accessed 14.11.2004].

Computer Weekly 2004b: **NHS finance directors want answers.** Computer Weekly, 19.10.2004, p.1.

Cornford, T. 2003: **Information Systems and New Technologies: Taking Shape in Use.** London School of Economics, Department of Information Systems, LSE Working Paper 122, January 2003.

CSSA 2001: **Getting IT Right for Government.** [Internet] CSSA, 03.09.2001. Available from: <http://www.cssa.co.uk/home/industry/itforgov.asp> [Accessed 04.02.2002].

Dahlbom, B. 1997: **The New Informatics.** [Internet] Scandinavian Journal of Information Systems (8:2), Göteborg, Sweden. Available from: <http://iris.informatik.gu.se/sjis/magazine/vol8no2/Dahlbom.htm> [Accessed 03.12.2002].

Davis, F.D. 1989: **Measurement Scales for Perceived Usefulness and Perceived Ease of Use.** [Internet] University of Buffalo. Available from: <http://wings.buffalo.edu/mgmt/courses/mgtsand/success/davis.html> [Accessed 19.11.1998]. Reproduced from *Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology*, MIS Quarterly (13:3) September 1989, pp. 319-340.

Davis, G. and Olson, M. 1984: ***Management Information Systems: Conceptual Foundations, Structure and Development.*** Second edition. Singapore, McGraw-Hill.

Deckmyn, D. 1998: ***Gartner predicts massive Y2K failures.*** [Internet] *Computing*, 06.08.1998. Available from: <http://wwwcomputing.co.uk/Print/60461> [Accessed 04.02.2002].

Denzin, N.K., and Lincoln, Y.S. (Eds.) 1998a: ***Introduction: Entering the Field of Qualitative Research.*** In *Strategies of Qualitative Inquiry*, Thousand Oaks, California, Sage Publications, pp. 1-34.

Denzin, N.K., and Lincoln, Y.S. (Eds.) 1998b: ***Collecting and Interpreting Qualitative Materials.*** USA, Thousand Oaks, California Sage Publications.

Department of Health 1983: ***Summary of the Mental Health Act 1983.*** [Internet] Department of Health. Available from: <http://www.dh.gov.uk/publicationsandstatistics/legislation/actsandbills> [Accessed 20.01.2002].

Department of Health 1990: ***The care Programme Approach for People with a mental illness referred to the Specialist psychiatric services.*** HC(90)23/LASSL/(90)11DH.

Department of Health 1999: ***National Service Framework for Mental Health: modern standards and service models.*** [Internet] Department of Health. Available from: <http://www.doh.gov.uk/nsf/mentalhealth.htm> [Accessed 23.10.2002].

Department of Health 2000a: ***Draft Mental Health Information Strategy Prepared for the NHS Executive - Consultation Document.*** NHS Executive.

Department of Health 2000b: ***Findings of Regional Consultation on the draft Mental Health Information Strategy - Feedback*** [Internet] London, Department of Health [Internet]. Available from:
<http://www.doh.gov.uk/ipu/strategy/nsf/mhfeedba.pdf> [Accessed 25.04.2002].

Department of Health 2000c: ***Findings of Regional Consultation on the draft Mental Health Information Strategy - Annex*** [Internet] London, Department of Health [Internet]. Available from:
<http://www.doh.gov.uk/ipu/whatnew/mhis/mhannex.pdf> [Accessed 25.04.2002].

Department of Health 2001a: ***Mental Health Information Strategy***. [Internet] London, March 2001. Available from:
<http://www.doh.gov.uk/ipu/whatnew/mhis/mhisdoc.pdf> [Accessed 06.03.2002].

Department of Health 2004: ***Press release - Professor Aidan Halligan appointed as head of Irish Health Service Executive***. [Internet] Department of Health. Available from: <http://www.dh.gov.uk/publicationsandstatistics/pressreleases> [Accessed 30.09.2004].

Department of Health Information Policy Unit 2002a: ***Delivering 21st century IT Support for the NHS***. [Internet] Department of Health, 11.06.2002. Available from:
<http://www.doh.gov.uk/ipu/whatnew/deliveringit/nhsitimpplan.pdf> [Accessed 15.09.2002].

Department of Health Information Policy Unit 2002b: ***Delivering IT in the NHS - A Summary of the national programme for IT***. [Internet] Department of Health, 11.06.2002. Available from:
<http://www.doh.gov.uk/ipu/whatnew/deliveringit/deliveringit.htm> [Accessed 13.09.2002].

Doherty, N.F. and King, M. 1997: ***The Consideration of Organisational Issues during the Systems Development Process: A Research Agenda.*** UK, Loughborough University Business School Working Paper No. 1997:1.

Doherty, N.F. and King, M. 2001: ***The Treatment of Organisational Issues in Systems Development Projects: The Implications for the Evaluation of Information Technology Investments.*** [Internet] Holland, Delft University of Technology, *Electronic Journal of Information Systems Evaluation*, Issue 1. Available from: http://is.twi.tudelft.nl/ejise/fr_ind.html [Accessed 10.05.2002].

Doll, W.J. and Torzadeh, G. 1998: ***The Measure of End-User Computing Satisfaction.*** [Internet]. Available from:
<http://wings.buffalo.edu/mgmt/courses/mgtsand/success/doll.html> [Accessed 19.11.1998]. Reproduced from: *The Measure of End-User Computing Satisfaction, MIS Quarterly* (12:2) June 1988, pp. 259-274.

Donaldson, A.J.M and Jenkins, J.O. 2001: ***System Failures: An approach to building a coping strategy.*** [Internet] *Proceedings of the 14th IEEE Conference on Software Engineering Education & Training*, February 19-21 2001, Charlotte, NC, USA. Available from:
http://www.cs.mdx.ac.uk/research/SFC/Papers/AJMD_CSEET01.pdf [Accessed 11.09.2002].

Dorsey, P. and Koletze, P. 1997: ***CASE Application Development Method (CADM) Using Designer/2000.*** [Internet] Dulcian Inc. Available from:
<http://www.dulcian.com/papers/CADM%20Using%20Designer2000.htm> [Accessed 01.03.1999].

Easterby-Smith, M., Thorpe, R., and Lowe, A. 2002: ***Management Research: An Introduction.*** Second edition. London, Sage.

Easton, G. 1992: **Learning From Case Studies**. Second edition. Hemel Hempstead, Prentice Hall International.

Ewusi-Mensah, K. and Przasnyski, Z. 1991: **On Information Systems Project Abandonment: An Exploratory Study of Organizational Practices**. *MIS Quarterly* (15:1) March 1991, pp. 67-86.

Farbey, B., Land, F. and Targett D. 1993: **How to Assess Your IT Investment: A study of Methods and Practice**. UK, Butterworth Heinemann.

Finlay, P.N. and Marples, C.G. 1996: **A Research Instrument for the Measurement of Information Management and Technology Maturity in the UK National Health Service**. UK, Loughborough University Business School, Working Paper No. 1996:25.

Flores, F., Graves, M., Hartfield, B. and Winograd, T. 1988: **Computer systems and the design of organizational interaction**. *ACM Transactions on Office Information Systems* (6:2) April 1988, pp. 153-172.

Forbes.com 1999: **Microsoft on Forbes 500**. [Internet] USA, Forbes.com. Available from: <http://www.forbes.com/finance/lists/38/1999/> [Accessed 15.10.2002].

Forrester, J. 1968: **Principles of Systems**. Cambridge, Wright-Allen Press.

Franz, C. and Robey, D. 1987: **Strategies for research on information systems in organisations: A critical analysis of research purpose and time frame**. In Boland, R.J. and Hirschheim, R.A., *Critical Issues in Information Systems Research*, Chichester, John Wiley & Sons, pp. 205-225.

Franz, C.R. and Robey, D. 1986: **Perceived Usefulness of MIS**. [Internet] University of Buffalo. Available from:

<http://wings.buffalo.edu/mgmt/courses/mgtsand/success/franz.html> [Accessed 19.11.1998]. Reproduced from *Organizational Context, User Involvement, and Usefulness of Information Systems*, Decision Science (17:3) Summer 1986, pp. 329-356.

Glover, G.R. 1996: ***Mental Health Care and the Big IT.*** [Internet] Computers in Mental Health. Available from: <http://www.ex.ac.uk/cimh/arts/cism.htm> [Accessed 13.09.2002]. An edited version of this paper appeared in the *Psychiatric Bulletin*, 1996 (20) pp. 195-7.

Goffman, E. 1959: ***The Presentation of Self in Everyday Life.*** London, Penguin.

Goodhue, D.L. 1995: ***Measure of Task-System Fit.*** MIS Quarterly (19:2) June 1995, pp. 213-236.

Goodstein, L, and Warner Burke, W. 1993: ***Creating Successful Organization Change.*** In Mabey, C, Mayon-White, B. (Eds.): *Managing Change*, Second edition, London, Paul Chapman Publishing, pp. 164-172.

Greenwood, D.J., and Levin, M. 1998: ***Introduction to Action Research: Social Research for Social Change.*** Thousand Oaks, California, Sage Publications Inc.

Guenier, R. 1998: ***Foreword: 2000 and Counting.*** In Collins, T. and Bicknell, D. 1998: *Crash: Learning from the World's Worst Computer Disasters.* London, Simon & Schuster, pp. 7-10.

Hare, E.H., and Wing, J.K. (Eds.) 1970: ***Psychiatric Epidemiology: Proceedings of the International Symposium held at Aberdeen University 22-5 July 1969.*** World Psychiatric Association, Royal Medico-Psychological Association. London, Oxford University Press.

- Hayward, R., and Shuff, C. 2002: **Somerset's development of an integrated information system for mental health services.** *The British Journal of Healthcare Computing & Information Management*, Weybridge, April 2002, pp. 18-19.
- Heeks, R. 1999: **The Tyranny of Participation in Information Systems: Learning from Development Projects.** [Internet] USA, Institute for Development Policy and Management. Available from: http://www.man.ac.uk/idpm/idpm_dp.htm#devinf_wp, hosted by University of Manchester [Accessed 01.03.2000].
- Heeks, R., Mundy, D. and Salazar, A. 1999: **Why Health Care Information Systems Succeed or Fail.** Information Systems for Public Sector Management Working Paper Series, Working Paper No. 9, June 1999. Manchester Institute for Development Policy and Management, University of Manchester.
- Herbst, K., Littlejohns, P., Rawlinson, J., Collinson, M., and Wyatt, J.C. 1999: **Evaluating computerized health information systems: hardware, software and human ware: experiences from the Northern Province, South Africa.** *Journal of Public Health Medicine* (21:3), pp. 305-310.
- Hirschheim, R. 1985: **Office Automation: A Social and Organizational Perspective.** Chichester, John Wiley & Sons.
- Hirschheim, R., Klein, H. and Lyytinen, K. 1995: **Information Systems Development and Data Modelling: Conceptual and Philosophical Foundations.** Cambridge, Cambridge University Press.
- Huber, N. 2002: **Government does not learn from IT failures.** *Computer Weekly*, 16.05.2002, p. 3.
- Hunt, J. 2002: **The M: drive project.** *The British Journal of Healthcare Computing & Information Management*, Weybridge, April 2002, pp. 20-22.

IDC 2002: **PC sales estimates revised.** [Internet] In *Computer Weekly*, 13.06.2002.
Available from: www.computerweekly.com/articles [Accessed 14.06.2003].

Iles, V, and Sutherland, K. 2001: ***Organisational Change: A Review for Health Care Managers, Professionals And Researchers.*** [Internet] National Coordinating Centre for NHS Service Delivery and Organisation, London School of Hygiene and Tropical Medicine, May 2001. Available from:
<http://www.sdo.lshtm.ac.uk/PDF/ChangeManagementReview.pdf> [Accessed 22.05.2002].

Jenkins, G. 1987: ***The Systems Approach.*** In Jenkins, G. (ed.), *Systems Behaviour*. Third edition, The Open University.

Johanessen, J-A., Olaisen, J. and Olsen B. 1999: ***Systemic thinking as the philosophical foundation for knowledge management and organizational learning.*** *Kybernetes*, MCB University Press (28:1), pp. 24-46.

Jones, S. et al 1989: ***The use of psychiatric services by the elderly: a study based on the case registers of Nottingham, Salford, Southampton and Worcester.*** In Wing, J.K. (Ed.) 1989: *Health Services Planning and Research: Contributions from Psychiatric Case Registers*. London, The Royal College of Psychiatrists, pp. 81-93.

Kaplan, B. and Maxwell, J.A. 1994: ***Qualitative Research Methods for Evaluating Computer Information Systems.*** In Anderson, J.G., Aydin, C.E., and Jay, S.J. (Eds.) 1994: *Evaluating Health Care Information Systems: Methods and Applications*. Thousand Oaks, California, pp. 45-68.

Karahanna, E., Straub, D.W., and Chervany, N.L. 1999: ***Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs.*** *MIS Quarterly* (23:2) June 1999, pp. 183-213.

Keen, J. (Ed.) 1994: ***Information Management in Health Services.*** Buckingham, Open University Press.

Keil, M. 1995: ***Pulling the Plug: Software Project Management and the Problem of Project Escalation.*** *MIS Quarterly* (19:4) December 1995, pp. 421-446.

Kelly, G. 2003: ***Programme presents more problems than solutions.*** *Computer Weekly*, 25.09.2003. p. 56.

King, J. and Lyytinen, K. 2003: ***When grasp exceeds reach: Failures of Foresight and Fortitude in the Information Systems (IS) Field.*** [Internet, PowerPoint presentation], Lyytinen, K., LSE I-Studio 5 Seminar, March 2003, Department of Information Systems. Available from:
http://is.lse.ac.uk/events/lyytinen/default_files/slide0225.htm [Accessed 24.03.2003].

Klein, H. and Hirschheim, R. 1987: ***Social change and the future of information systems development.*** In Boland, R.J. and Hirschheim, R.A., *Critical Issues in Information Systems Research*, Chichester, John Wiley & Sons, pp. 275-305.

Klein, H. and Myers M. 1999: ***A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems.*** *MIS Quarterly* (23:1) March 1999, pp. 67-94.

Kojeve, A. 1934: ***Introduction to the Reading of Hegel.*** [Internet] Marxists.org Internet Archive, reproduced from *Introduction to the Reading of Hegel*, Basic Books, 1969, Chapter One. Available from:

<http://www.marxists.org/reference/subject/philosophy/works/fr/kojeve.htm> [Accessed 10.04.2004].

Kwon, T. and Zmud, W. 1987: Unifying the fragmented models of information systems implementation. In Boland, R.J. and Hirschheim, R.A., *Critical Issues in Information Systems Research*, Chichester, John Wiley & Sons, pp. 227-251. Chichester, John Wiley & Sons.

Lamb, R. and Kling, R. 2003: **Reconceptualizing Users as Social Actors In Information Systems Research.** *MIS Quarterly* (27:2) June 2003, pp. 197-235.

Land, F. 1999a: **The Management of Change: Guidelines for the Successful Implementation of Information Systems.** [Internet] London School of Economics and Political Science, Department of Information Systems Working Paper Series - 83, November 1999. Available from: <http://is.lse.ac.uk/wp/pdf/WP83.PDF> [Accessed 31.10.2002].

Land, F. 1999b: **Re-inventing Management Information Systems: MIS – Beginnings.** [Internet] London School of Economics and Political Science, Department of Information Systems Working Paper Series - 78, November 1999 [Internet]. Available from: <http://is.lse.ac.uk/wp/pdf/WP78.PDF> [Accessed 31.10.2002].

Leavitt, H. and Whisler, L. 1958: **Management in the 1980's.** [Internet] *Harvard Business Review* XXXVI (41:1), November 1958, Harvard Business School [Internet]. Available from:
http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item_detail.jhtml?id=58605 [Accessed 31.10.2002].

Lee, S., Kim, Y., & Lee, J. 1995: *An empirical study of the relationships among end-user information systems acceptance, training, and effectiveness*. *Journal of Management Information Systems* (12:2) Fall 1995, pp. 189-202.

Legare, J. and Douzou, S. 1995: *Who needs information systems in the health care sector and who will use them? An experiment*. *Information Technology and People* (8:3), MCB University Press, pp. 28-42.

Leginski, W. A. et al 1989: *Data Standards for Mental Health Decision Support Systems : A Report of the Task Force to Revise the Data Content and System Guidelines of the Mental Health Statistics Improvement Program*. Rockville, Maryland, Department of Health & Human Sciences, DHHS Publications No.(ADM)89-1589.

Lelliott, P., Flannigan, C., and Shanks, S. 1993: *A Review of Seven Mental Health Information Systems: A Functional Perspective*. London, Royal College of Psychiatrists.

Lewin, K. 1947: *Frontiers in Group Dynamics*. *Human Relations* (1:2), pp.143-153.

Liebowitz, J. 1999: *A look at why information systems fail*. *Kybernetes* (28:1) MCB University Press, pp. 61-67.

Lin, A. 2001: *Managing Perception of Technology*. [Internet] Leeds Metropolitan University, School of Information Management, Working Paper 2001-7, January 2001. Available from: <http://www.lmu.ac.uk/ies/im/Research/2001-7.pdf> [Accessed 31.10.2002].

Lin, A., and Cornford, T. 2001: *Framing Implementation Management*. [Internet] Leeds Metropolitan University, School of Information Management, Working Paper

2001-3 January 2001. Available from:

<http://www.lmu.ac.uk/ies/im/Research/00CRP19.pdf> [Accessed 31.10.2002].

Lindner, N. and Le Bas, J. 1997: ***The Evolution of a Clinical Information System in Mental Health.*** [Internet] Computers in Mental Health, [Internet]. Available from: <http://www.ex.ac.uk/cimh/arts/cism.htm> [Accessed 13.09.2002], reprinted from *Informatics in Health Care Australia* (6:5) November/December 1997, pp. 175-181.

Lock, C. 1996: ***What value do computers provide to NHS hospitals? The British Medical Journal*** (312), pp. 1407-1410.

Lucas, H.C. 1981: ***Implementation: The Key to Successful Information Systems.*** New York, Columbia University Press.

Lyytinen, K., King, J., and Bergman, M. 2000: ***Large Scale Requirements Analysis as Heterogeneous Engineering.*** [Internet] University of Jyväskylä, Department of Computer Science and Information Systems. Hosted by UK, Manchester Information Systems Seminars (MISS), Joint Meeting of BCS-Requirements Engineering Specialist Group (RESG), BCS Socio-Technical Group, 2000: [Internet]. Available from: http://www.co.umist.ac.uk/~djflynn/MISS/lyytinen_talk2000.pdf [Accessed 23.10.2002].

Lyytinen, K. and Hirschheim, R. 1987: ***Information systems failures: a survey and classification of the empirical literature.*** *Oxford Surveys in Information Technology* Vol. 4, pp. 257-309.

Mason and Woodward 1996: ***The role of theory in mathematics education and research.*** In Vithal, R. 2002: *Crucial Descriptions: Talking back to theory and practice in mathematics education through research*, p3. [Internet] Congress Consultants, Helsingør, Denmark, Published paper from 3rd International

Conference on Mathematics Education and Society, 2-7.4.2002. Available from:
<http://www.congress-consult.com/mes3/papers/vithal.doc> [Accessed 10.04.2004].

Masters, S. 1998: **Government admits 'patchy' IT record.** [Internet] *Computing* 23.06.1998. Available from: <http://wwwcomputing.co.uk/News/57120> [Accessed 30.01.2002].

McNiff, J. 1988: **Action Research: Principles And Practice.** London, Routledge.

Medix 2004: **Medix UK plc survey (Q558) of doctor's views about the National Programme for IT (NPfIT).** [Internet] UK. Available from:
<http://www.medix.to/Q558.pdf> [Accessed 14.11.2004].

Microsoft 1998: **A Brief History of the Windows NT Operating System.** [Internet] USA, Microsoft Corporation. Available from:
<http://www.microsoft.com/presspass/features/1998/winntfs.asp> [Accessed 29.10.2002].

Microsoft 1999: **Windows Version History.** [Internet] USA, Microsoft Corporation, Microsoft Knowledge Base Article - Q32905. Available from:
<http://support.microsoft.com/default.aspx?scid=kb;en-us;Q32905> [Accessed 29.10.2002].

Microsoft, 2001: **Windows XP Home Edition System Requirements.** [Internet] USA, Microsoft Corporation. Available from:
<http://www.microsoft.com/windowsxp/home/evaluation/sysreqs.asp> [Accessed 29.10.2002].

Microsoft 2002a: **Presspass - Information for Journalists.** [Internet] USA, Microsoft. Available from: http://www.microsoft.com/presspass/inside_ms.asp [Accessed 15.10.2002].

Microsoft 2002b: ***Windows Operating Systems Family History.*** [Internet] USA, Microsoft Corporation. Available from:
<http://www.microsoft.com/windows/WinHistoryIntro.mspx> [Accessed 29.10.2002].

Microsoft 2002c: ***Windows Desktop Operating Systems.*** [Internet] USA, Microsoft Corporation. Available from:
<http://www.microsoft.com/windows/winhistorydesktop.mspx> [Accessed 29.10.2002].

Microsoft 2002d: ***Windows Server Operating Systems.*** [Internet] USA, Microsoft Corporation. Available from:
<http://www.microsoft.com/windows/winhistoryserver.mspx> [Accessed 29.10.2002].

Microsoft 2002e: ***Why Service Packs are Better Than Patches.*** [Internet] USA, Microsoft Corporation. Available from:
<http://www.microsoft.com/technet/treeview/default.asp?url=/technet/columns/security/Default.asp> [Accessed 29.10.2002].

MIT Green Computing 2002: ***Computer Waste is Rising Fast.*** [Internet] MIT Green Computing, Massachusetts Institute of Technology. Available from:
<http://web.mit.edu/11.122/www/11.122-Projects-F01/Eco-computers/PROCES~1.HTM> [Accessed 01.11.2002].

Myers, M.D., and Young, L.W. 1997: ***Hidden agendas, power and managerial assumptions in information systems development: An ethnographic study.*** *Information Technology and People* (10:3), MCB University Press, pp. 224-240.

National Audit Office 2003a: ***New IT systems for Magistrates' Courts: the Libra project.*** [Internet] Report by the Comptroller and Auditor General 29.01.2003, HC 327 Session 2002-2003, London, The Stationery Office. Available from:

http://www.nao.gov.uk/publications/nao_reports/02-03/0203327.pdf [Accessed 01.07.2003].

National Audit Office 2003b: ***Executive Summary - New IT systems for Magistrates' Courts: the Libra project.*** [Internet] Report by the Comptroller and Auditor General 29.01.2003, HC 327 Session 2002-2003, London, The Stationery Office. Available from: http://www.nao.gov.uk/publications/nao_reports/02-03/0203327es.pdf [Accessed 01.07.2003].

National Audit Office 2004a: ***NAO Press Notice - Improving IT procurement: The impact of the Office of Government Commerce's initiatives on departments and suppliers in the delivery of major IT-enabled projects.*** [Internet] NAO, Report by the Comptroller and Auditor General, 05.11.2004. Available from: <http://nao.org.uk/pn/03-04/0304877.htm> [Accessed 15/11/2004].

National Audit Office 2004b: ***Improving IT procurement: The impact of the Office of Government Commerce's initiatives on departments and suppliers in the delivery of major IT-enabled projects.*** [Internet] NAO, Report by the Comptroller and Auditor General HC 877 Session 2003-2004, 05.11.2004. Available from: http://nao.org.uk/publications/nao_reports/03-04/0304877.pdf [Accessed 15.11.2004].

National Programme for Information Technology 2004a: ***making IT work.*** NHS Information Authority, Issue 1, March 2004.

National Programme for Information Technology 2004b: ***Regional clusters.*** [Internet] NPfIT. Available from: <http://www.nhs.uk/regions> [Accessed 14.11.2004].

The National Programme for IT 2004c: ***NPfIT Says Vast Unforeseen Expenditure Claims Are 'Complete Nonsense'.*** [Internet] NPfIT, NHS Information Authority,

13.10.2004. Available from: <http://www.informatics.nhs.uk/item/922/2d3A31/125> [Accessed 26.10.2004].

Network News 2003: **Comment: NHS National Programme minefield.** [Internet] vnunet.com, 27.03.2003. Available from: <http://www.networknews.co.uk/1139784> [Accessed 29.06.2003].

Newsfactor Network 2002: **Microsoft's Next Must-Have Operating System.** [Internet] USA, Triad Commerce Group, LLC. Available from: <http://www.newsfactor.com/perl/story/19338.html> [Accessed 29.10.2002].

Newstead, P., Huff, S., Munro, M. and Schwarz, A. 1998: **Survey Instruments in IS.** [Internet Research Tool Resource]. Available from: <http://www.isworld.org/surveyinstruments/> [Accessed 08.11.2000]. Originally published in *MISQ Discovery*, December 1998

NHS Executive 1998: **Purchase of Read Codes and Management of the NHS Centre for Coding and Classification.** Health Service Circular, HSC 1998/169. Wetherby, Department of Health.

NHS Information Authority 2001: **IM&T Skills Issues in the NHS.** [Internet] NHSIA, 31.07.2001. Available from: http://www.nhsia.nhs.uk/def/pages/features/f_310701.asp [Accessed 09.09.2002].

NHS Information Authority 2002a: **Basic IT skills training for all NHS staff.** [Internet] NHSIA, 08.07.2002. Available from: <http://www.nhsia.nhs.uk/def/pages/inform/informish8/informp2.asp#2> [Accessed 15.09.2002].

NHS Information Authority 2002b: **Pathways to Professionalism in Health Informatics: A Discussion Document.** [Internet] NHSIA, Discussion Paper for

meeting: *Pathways to Professionalism in Health Informatics*, 31.07.2002, Commonwealth Conference Centre, London. Available from:
http://www.nhsia.nhs.uk/pdf/pphi_0702_prep.pdf [Accessed 15.09.2002].

Nygaard, K. 2002: **Foreword: An Emergency Toolkit.** In Ciborra, C. 2002: *The Labyrinths of Information: Challenging the Wisdom of Systems*. Oxford, Oxford University Press, pp. v-x.

Ofcom 2004: **The Ofcom Internet and Broadband Update January 2004.** [Internet] UK, Ofcom, January 2004. Available from:
http://www.ofcom.org.uk/research/consumer_audience_research/139330/InternetandBroadband.pdf [Accessed 26.04.2004].

Office for National Statistics 2001: **Census 2001.** [Internet] National Statistics. Available from: <http://www.statistics.gov.uk/census2001/pop2001/> [Accessed 14.10.2003].

Oftel 2002a: **OFTEL Publishes Results of Dial-Up Internet Access Review.** [Internet] UK, Oftel, Press release. Available from:
http://www.oftel.gov.uk/press/releases/2002/pr07_02.htm [Accessed 29.01.2002].

Oftel 2002b: **Consumers' use of Internet: Oftel residential survey Q7 November 2001.** [Internet] UK, Oftel. Available from:
http://www.oftel.gov.uk/publications/research/2002/q7_internet_res.htm [Accessed 29.01.2002].

Orlikowski, W. 1991: **Ownership Interaction: A Key Ingredient of Information Technology Performance.** [Internet] In Avital, M., and Vandebosch, B. 2002: *Sprouts: Working Papers on Information Environments, Systems and Organizations*, Vol. 2, Winter 2002, USA, Ohio, Weatherhead School of Management, Case

Western Reserve University. Available from:
<http://www.weatherhead.cwru.edu/sprouts/2002/020102.pdf> [Accessed 30.10.2002].

Orlikowski, W.J, and Baroudi, J.J. 1991: ***Studying Information Technology in Organizations: Research Approaches and Assumptions.*** *Information Systems Research* (2) 1991, pp. 1-28.

Oxford English Dictionary 2003. [Internet] OED Online. Available from:
<http://athens.oed.com/>.

Oxford Reference 1991: ***Dictionary of Computing.*** Third edition. Oxford, Oxford University Press.

Oxford University Press 1995: ***The Oxford Companion to Philosophy.*** Oxford.

Patton, M.Q. 1987: ***How to Use Qualitative Methods in Evaluation.*** Newbury Park, California, SAGE Publications.

Peppard, J. 2001: ***Bridging the gap between the IS organization and the rest of the business: plotting a route.*** *Information Systems Journal* (11:3) UK, Blackwell Science Ltd., pp. 249-270.

Peppard, J. and Ward, J. 1998: **"Mind The Gap": Diagnosing the relationship between the IT organisation and the rest of the business.** Submission for *Journal of Strategic Information Systems*, Version 2.0, UK, Cranfield School of Management, Cranfield University, 28.04.1998.

Pettigrew, A. 1985: ***The Awakening Giant: Continuity and Change in Imperial Chemical Industries.*** Oxford, Basil Blackwell.

Pettigrew, A. 1990. In Walsham, G. 1993a: ***Interpreting Information Systems in Organizations***. London, Paul Chapman Publishing, p. 14.

Pettigrew, A., Whipp, R. 1993: ***Understanding the Environment***. In Mabey, C, Mayon-White, B. (Eds.): *Managing Change*, Second edition, London, Paul Chapman Publishing, pp. 5-19.

Procter, P. 2004: ***Circles... The British Journal of Healthcare Computing & Information Management***, Weybridge, April 2004 (21:3), p. 16.

Quicke, S. 2003: ***Optimism returning as PC sales figures show upturn***. [Internet] Computer Weekly, 27.05.2003. Available from:
<http://www.computerweekly.com/articles> [Accessed 14.06.2003].

Reuters 1999: ***Compaq: We're No. 2***. [Internet] 25.10.1999. Available from: Wired News, <http://www.wired.com/news/business/0,1294,32083,00.html> [Accessed 14.06.2003].

Riley, J. 2003: ***Can IT tsar deliver?*** Computer Weekly, 20.03.2003, p. 32.

Robey, 1996. In King, J. and Lyytinen, K. 2003: ***When grasp exceeds reach: Failures of Foresight and Fortitude in the Information Systems (IS) Field***. [Internet, PowerPoint presentation], Lyytinen, K., LSE I-Studio 5 Seminar, March 2003, Department of Information Systems. Available from:
http://is.lse.ac.uk/events/lyytinen/default_files/slide0225.htm [Accessed 24.03.2003].

Robinson, R. and Prior, M. 1995: ***Systems Analysis Techniques***. London, International Thomson Publishing Inc.

Rogerson, S. 1989: ***Project Skills Handbook***. Bromley, Chartwell-Bratt.

Royal College of Nursing 2004a: **Nurses and NHS IT developments.** [Internet]

RCN, October 2004. Available from:

<http://www.rcn.org.uk/downloads/research/nurses-it-devs-survey.doc> [Accessed 10.11.2004].

Royal College of Nursing 2004b: **Speaking Up: Nurses and NHS IT**

developments. [Internet] RCN, October 2004. Available from:

http://www.rcn.org.uk/publications/pdf/nurses_and_nhs_it_dev.pdf, [Accessed 10.11.2004].

Sanders, G.L. 1984: **MIS/DSS Success Measure.** [Internet] University of Buffalo

[Internet]. Available from:

<http://wings.buffalo.edu/mgmt/courses/mgtsand/success/sanders.html> [Accessed 19.11.1998]. Reproduced from: *Systems Objectives & Solutions*, 1984 (4), pp. 29-34.

Sarris and Sawyer 1989. In Lindner, N. and Le Bas, J. 1997: *The Evolution of a Clinical Information System in Mental Health.* [Internet] Computers in Mental Health, [Internet]. Available from: <http://www.ex.ac.uk/cimh/arts/cism.htm> [Accessed 13.09.2002], reprinted from *Informatics in Health Care Australia* (6:5), November/December 1997, pp. 175-181.

Sauer, C. 1993: **Why Information Systems Fail: A Case Study Approach.**

Henley-on-Thames, Alfred Waller Ltd.

Schar, M. 1998: **What is "Technical" ?: A Contribution to the Concept of**

"Technicity" in the Light of the European Patent Convention. [Internet]

Germany, Foundation for a Free Information Infrastructure, FFII Software Patent Work Group. Available from: <http://swpat.ffii.org/papers/jwip-schar98/jwip-schar98.en.pdf> [Accessed 01.11.2002].

Science Museum 2002: ***Millennium Bug: All or Nothing?*** [Internet] Science Museum. Available from: <http://www.sciencemuseum.org.uk/on-line/y2k/time.asp> [Accessed 01.11.2002].

Select Committee on Public Accounts 2000: ***Improving the Delivery of Government IT Projects (First Report)***. [Internet] London, The Stationery Office, 05.01.2000. Available from:
<http://www.publications.parliament.uk/pa/cm199900/cmselect/cmpubacc/65/6503.htm> [Accessed 05.01.2000].

Select Committee on Public Accounts 2003: ***Forty-Fourth Report***. [Internet] PAC, 20.10.2004 [Internet]. Available from:
<http://www.publications.parliament.uk/pa/cm200203/cmselect/cmpubacc/434/43402.htm> [Accessed 12.11.2004].

Sharpe, R. 2002a: ***Farrago, debacle or fiasco?*** [Internet] *Computing*, 23.05.2002 [Internet]. Available from: <http://www.computing.co.uk/Analysis/1132019> [Accessed 23.05.2002].

Sharpe, R. 2002b: ***Why public sector IT is so important.*** *Computing*, 02.05.2002, p. 31.

Shrimley, R. 1998: ***Millennium bug "could kill NHS patients".*** [Internet] *Electronic Telegraph*, 20.08.1998. Available from:
<http://www.telegraph.co.uk:...mo=99999999&pg=/et/98/8/20/ecnnhs20.html> [Accessed 20.08.1998].

Skidmore, S. and Wroe, B. 1994: ***Introducing Systems Analysis***. Manchester, NCC Blackwell.

silicom.com 2001: **Top IT gaffes... take two.** [Internet] UK, silicon.com, 22.6.2001.
Available from: <http://www.silicon.com> [Accessed 28.01.2002].

Smit, J., and Bryant, A. 2000: **Grounded Theory Method In IS Research: Glaser vs Strauss.** [Internet] Leeds, Leeds Metropolitan University, School of Information Management Working Paper IMRIP 2000-7. Available from:
<http://www.lmu.ac.uk/ies/im/Research/2000-7.pdf> [Accessed 31.10.2002]

Smith, L.M. 1978: **An evolving logic of participant observation, educational ethnography and other case studies.** In Shuman, L. (Ed.), *Review of research in education* (6), pp. 316-377.

Stake, R.E. 1998: **Case Studies.** In Denzin, N.K., and Lincoln, Y.S. (Eds.) 1998a: *Strategies of Qualitative Inquiry*. Thousand Oaks, California, Sage Publications, pp. 86-109.

Stalnaker, R. 1974, 1978: In Arko, J. 2001: **Presupposition and the processing of literary texts.** [Internet] The University of Edinburgh, Department of Theoretical & Applied Linguistics, Proceedings of Postgraduate Conference, May 2001. Available from: <http://www.ling.ed.ac.uk/~pgc/2001/jarko01.pdf> [Accessed 29.10.2002].

Straub, D., Keil, M., and Brenner, W. 1997: **Testing the Technology Acceptance Model Across Cultures.** *Information & Management* (33:1), pp. 1-11.

Strauss, A. and Corbin, J. 1998: **Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.** Second edition. Thousand Oaks, California, SAGE Publications.

Tedeschi, J.T., and Riess, M.: **Identities, the phenomenal self, and laboratory research.** In Tedeshci (Ed.), *Impression Management Theory and Social Psychological Research*, New York, Academic Press, pp. 3-22.

Tefft, B.M. 1983: ***An Administrative Perspective***. In Bennett, E.M., Trute, B. (Eds.): *Mental Health Information Systems: Problems and Prospects*. New York, The Edwin Mellen Press, Studies In Health And Human Services, pp. 35-58.

ten Horn, G. et al (Eds.) 1986: ***Psychiatric Case Registers in Public Health: A worldwide inventory 1960-1985***. Amsterdam, Elsevier.

The Information Technology Association of America 2001: ***The U.S. Information Technology Industry: A Brief Overview***. [Internet] Information Technology Association Of America. Available from: <http://www.itaa.org/news/itinddesc.pdf> [Accessed 25.10.2002].

The Standish Group 1995: ***The CHAOS Report***. [Internet] The Standish Group International Inc. Available from:
http://www.standishgroup.com/sample_research/chaos_1994_1.php [Accessed 18.04.2002].

Truex, D. 1996: ***Text-based Analysis: a brief introduction***. [Internet] Georgia State University. Available from: <http://www.ISWorldnet/> [Accessed 19.11.1998].

UK Academy for Information Systems 2003: [Internet page] Available from: www.ukais.org [Accessed 01.10.2003]

University of Edinburgh 2003: ***What is Informatics?*** [Internet] University of Edinburgh, School of Informatics [Internet]. Available from:
<http://www.informatics.ed.ac.uk/about/vision.html> [Accessed 09.09.2003].

Venkatesh, V. 1999: ***Creation of Favourable User Perceptions: Exploring the role of Intrinsic motivation***. *MIS Quarterly* (23:2) June 1999, pp. 239-260.

Venkatesh, V., and Morris, M.G. and Ackerman, P.L. 2000: **A Longitudinal Field Investigation of Gender Differences in Individual Technology Adoption Decision Making Processes.** *Organizational Behaviour and Human Decision Processes* (83), pp. 33-60.

Von Bertalanffy, L. 1968: **General Systems Theory.** UK, Allen Lane - The Penguin Press.

Vithal, R. 2002: **Crucial Descriptions: Talking back to theory and practice in mathematics education through research.** [Internet] Congress Consultants, Helsingør, Denmark, Published paper from 3rd International Conference on Mathematics Education and Society, 2-7.4.2002. Available from: <http://www.congress-consult.com/mes3/papers/vithal.doc> [Accessed 10.04.2004].

Wakefield, J. 1999: **Taskforce 2000: Stay at home for a month.** *Computer Weekly*, 15.9.1999.

Walsham, G. 1993: **Interpreting Information Systems in Organizations.** London, Paul Chapman Publishing.

Wanless, D. 2002: **Securing our Future Health: Taking a Long-Term View (Final Report).** [Internet] HM Treasury, April 2002. Available from: http://www.hm-treasury.gov.uk/Consultations_and_Legislation/wanless/consult_wanless_final.cfm [Accessed 15.05.2002].

Weber, R. 2003: **Editor's Comments - Still Desperately Seeking the IT Artifact.** *MIS Quarterly* (27:2) June 2003, pp. iii-xi.

Westrup, C. 1996: **The play of information systems development: drama and ritual in the development of a nursing information system.** *Information Technology and People* (9:2), MCB University Press, pp. 24-42.

Wing, J.K. (Ed.) 1989: ***Health Services Planning and Research: Contributions from Psychiatric Case Registers.*** London, The Royal College of Psychiatrists.

www.news.com.au 2003: ***XP sales top 17 million.*** [Internet] Australia. Available from: <http://www.news.com.au> [Accessed 14.06.2003].

Yin, R.K. 1994: ***Case Study Research: Design and Methods.*** Second edition. Thousand Oaks, California, Sage, Applied Social Research Methods Series.

Yourdon, E. 1989: ***Modern Structured Analysis.*** USA, Prentice-Hall.

Zuboff, S. 1988: ***In The Age of the Smart Machine: The Future of Work and Power.*** New York, Heinemann Professional Publishing.