



Why Healthcare Professionals Resist Change When Work Changing Technologies Such as PACs and VR are Implemented?

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degree of Master of Science in Health Informatics.

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Declaration

I declare that the work described in this thesis is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other university.

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Abstract

The role of Information Technology (IT) as an enabler of strategic organisational change is not only recognised but continuously escalating in its importance. Nevertheless, IT projects such as Picture Archive and Communication systems (PACs) still suffer from high failure rates and research in this area indicates that failure is rooted in the predominant 'hard' technical approach to IT projects with inadequate considerations of the human element of Information Service (IS) triggered change.

This thesis provides an insight into this topic through an in-depth study on resistance to change. While this research lies within the context of Information Systems (IS) projects, it is not of a technical nature, but focuses on the wider and generally obscured aspects of change. To address this complex topic, the research is tackled from the following 3 angles:

1. Identify the underlying factors influencing individuals to resist change by considering Organisational, Political and IT/business relationship issues.
2. Understand how individuals interpret the influence of these determinants by considering the role of perceptions, cognitions and emotions in human nature.
3. Identify the influence of participation and involvement activities on attitudes to change.

Following a literature review on these areas, qualitative research is carried out through interviews to understand how individuals experience change in the industry. The fieldwork findings are discussed and evaluated against the literature and a 'spiral model of resistance' is proposed. In this model's perspective of resistance, users experience levels of perceptions, relations and equity evaluations with specific determinants influencing their evaluation and attitudes at each stage.

In considering the findings on the influence of participation activities, there is evidence that whereas the underlying determinants have a stronger influence on attitudes with each level of the spiral, the influence of participation decreases.



Although the literature abounds with research on resistance, the findings of this research offer an alternative perspective and additional insight into this challenging subject adding value to IS project teams and change managers with a particular reference to the implementation of PACS.



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1.0 Introduction

Quality healthcare has depended on the “systematic creation, sharing, operationalisation and translation of knowledge to improve the quality of patient care” (Abidi, 2008). The importance of knowledge in the diagnosis and treatment of various health problems has been a driving force behind the implementation of different information management systems (Latham, 2008). The need for Information Technology (IT) approaches to collect, store, and manage data has been progressively more demanding in the last three decades.

In the 1970s, the basic components of Picture, Archive and Communication Systems (PACS) initiated the trend toward digital technology. In the 1980s, hospital radiology departments began implementing PACS. Since then, several papers have been presented and published to further examine the theoretical and technological developments in radiology departments. Besides other digital medical technologies such as Magnetic Resonance Imaging (MRI), Computed Tomography (CT) and X-Rays, the implementation of PACS have improved the efficiency of image storing, processing, and conversion of medical data into forms, which are useful in day-to-day medical practice (Hecht, 2008).

In June 2006, the Irish PACS Users Group was involved in a movement to secure funds from the government for a national PACS that would enable information to be centralised and be able to be sent between hospitals, specialists, and referring physicians (Corrigan; et al., 2009). The first PACS that was installed in Ireland was in Adelaide and Meath Hospital, Dublin Incorporating the National Children's Hospital (AMNCH), Tallaght in 1998 and to date, PACS have been installed in only 17 hospitals (O'Hare, 2008b). The other hospitals have a variety of technologies implemented. During this time, many hospitals have upgraded much of their radiology equipment to digital/computed versions. This is a preliminary compatibility step for all hospitals when moving towards a PACS environment.

1.1 IT Enabled Transformation

The use of IT as a major enabler of organisational change (Benjamin and Levison, 1993; Scott-Morton, 1991) has continuously escalated through a trend towards more highly integrated information systems, which have the ability to distribute information within and across



organisations (Doherty and King, 1998). These systems impact organisations' business processes, structure, and enterprise performance. However, they also influence individuals' performance, job specifications, and motivation with a variety of outcomes and secondary side effects that may be of positive or negative nature (Doherty and King, 2002). The strategic importance of this transformational phenomenon (Applegate et al., 1996) is not only an ongoing part of everyday organisational dynamics, and the rate of change fuelled by technology is set to increase (Kotter, 1996).

1.2 IT Industry Standards and Limitations

Of all the theoretical approaches, IT design and research has most clearly been shaped by positivism (Livari et al., 1998) and today positivism remains in the forefront (Vickers, 1999). The contribution of the positivist theory is most apparent in the 'hard methods' or 'structured methods' of a systems design. This method self-identifies as objective and scientific rather than humanist, and characterises successful design in instrumental terms of measurable effectiveness and efficiency (Earl, 1992).

While IT professionals have preferred more technically-orientated methods such as Structured Systems Analysis and Design Method (SSADM) (Eason, 1988; Hornby et al., 1992; Mumford, 1985), this traditional structured approach has been associated with a singular lack of success, not just in humanist terms, but also in terms of failure in delivering increased efficiencies, productivity and return to stakeholders (Landauer, 1995). Pefkaros (2008) cited that SSADM had its set of advantages and disadvantages; SSADM has been visual, makes good use of it graphical analysis and tools such as data-flow diagrams, which have made it easier for programmers to understand. It is a well known and established methodology in the industry, which entailed that it has been a mature technique. This method has allowed a means of requirements validation and has been relatively simple and easy to understand for programmers (Pefkaros, 2008).

However, Pefkaros (2008) also sited that the SSADM has been process-oriented, which is why it has ignored nonfunctional requirements. There also has been less direct management involvement and little interaction opportunities for programmers in SSADM. This approach has followed a non-iterative like waterfall model; hence changes in the design have required restarting the whole procedure. The model only offered logical design and data-flow diagrams as its tools for the



programmers, and this has provided a challenge for them to monitor the progress of the design. Using this approach, it is more difficult to decide when to stop functional decomposition and to start building the system which does not always address the programmers' requirements.

Pefkaros (2008) cited that there has been an increase in the use of object-oriented languages and object-oriented analysis and design (OOAD) in organisations and in academic institutions. The traditional SSADM approach was originally designed for structured programming languages and not object-oriented ones, which is why it has not been a good fit for the increasingly utilised object-oriented programming languages. Pefkaros (2008) cited that the OOAD has been time and cost efficient compared to SSADM due to its program reusability, it has increased understanding and improved the outcomes because of unrestrained implementation of designs that could conform to varying design environments.

However, Pefkaros (2008) cautioned that the shift from SSADM to OOAD may need massive training efforts for the programmers for the new method of object-oriented designing. The shift of method also implied accompanying cost of these trainings and a gradual integration to the systems of organisations. Based on the advantages and increasing patronage to OOAD, Pefkaros (2008) asserted that OOAD may provide organisations with competitive advantages than SSADM. This lack of success in SSADM also led to the development of methods that has focused the systems development process on social and organisational issues. An alternative constructed method included the agile development methodology (Admin, October 23, 2008), which has been iterative, incremental, and evolutionary in nature (Larson and Basili, 2003). Agile methods have been capable of being completed through collaborative manner and executed in less time. This method has given stakeholders recurring opportunities to calibrate releases for success in the real world. In essence, it could be said that the agile development methodology helps companies build the right product (Admin, October 23, 2008) because of its evolutionary capabilities (Larman & Basili, 2003).

The single most important factor in the domain of organisation success is that a lack of attention to the people dimension of change is a key reason for project failure (Hammer, 1990; Kotter, 1996; Prosci, 2002). Recent researchers (Roberts & Stephenson, 2008; Hughes & Kaplan, 2009; Iveroth, 2010) supported the importance of investing in IT decision makers and involved actors for the success of an organisation, aside from investing in IT infrastructures. Iveroth (2010) explained that



implemented innovations in the organisations have only been instruments for transformation; these instruments may only come to full potential when involved actors carry out these mechanisms into realisation. In this context, there has been much evidence to suggest that the handling of social and organisational issues has been now perceived primarily significant than technical issues in shaping the successful outcome of systems development projects (Christensen, 1997; Doherty and King, 2002; Hornby et al., 1992).

Despite the benefits of PACS, its implementation has not been without obstacles. To fully appreciate the benefits of PACS and to utilise PACS effectively, it is imperative that the technology be supported by the medical professionals in order to be successful (Bramson and Bramson, 2005). With the implementation of PACS, managements' attention has typically focused on the financial aspects and dealing with vendors for the technical aspects of the equipment and software (Bramson and Bramson, 2005). Although these are important components of implementing PACS in hospital environments, obtaining human "buy in" is necessary for a more successful implementation of new technology (Cohen et al., 2005; Ward and Peppard, 2002).

1.3 Resistance to change

"Resistance" is synonymous with change and "resistance to change" is a widespread phrase in the IT industry. Indeed, throughout the author's 12 year career in Radiography, several waves of new IT technologies have been implemented; with new acronyms and jargon used for a few years until the next wave took over, but this is not the case with "resistance to change". This ever-present term is acknowledged as a given barrier that must be overcome for project success. However, in the author's experience few people go beyond a superficial consideration and attempt to understand the driving forces to resistance and how they can be addressed in a practical manner.

Several authors (Ansoff and McDonnell, 1990; Leishman et al., 2006; Prosci, 2002) have highlighted user resistance as the critical determinant of IT implementation success which, at the very least, introduced considerable costs and delays into the change process. Others (Ansoff and McDonnell, 1990; Gilmore and Barnett, 1992; Herr, 2004; Prosci, 2002; Trader-Leigh, 2002a) have taken this theory further by identifying resistance to change as the principal failure and have also associated resistance directly with the development of negative attitudes to change. More specifically in the IT scenario, researchers have studied system implementation and concluded that



user resistance can undermine its success (Joshia and Lauer, 1998; Marakas and Hornik, 1996; Schultz and Slevin, 1975). Indeed, implementation of even the most robust IT package will not be effective if employees do not accept and adapt to the changes it necessitates (Kimberling, 2002). Thus, from a broader perspective, the attitudes and behaviours of employees impact on strategic implementation and ultimately the organisation's performance (Becker et al., 2001).

1.4 Dissertation Objectives

When implementing PACS and other IT systems in radiology, system implementer's attention is often focused on justifying the system financially, reviewing what potential vendors have to offer, laying out timeframes for hardware delivery, installing the software, developing interfaces and tracking and measuring results. These are critical components in implementing PACS and other IT but not sufficient for success. (Bramson and Bramson, 2005)

To successfully implement a new system/change Markus (1983a) and Davis and Songer (2008) argued that system implementers must find out the users' reasons for resisting, also a way to reconcile users with the system. In this context, user participation in the process of developing information systems has been posited to enhance the attitudes and behaviour of users (Ives and Olson, 1984). This dissertation aims to provide insight on this complex subject by understanding the far reaching impact of information technology systems, with particular reference to PACS, on the everyday lives of end users.

These resistance factors will be viewed through the following categories (Markus, 1983a):

- Organisational Focused
- Politically Focused
- People Focused
- System Focused

Once these determinants of resistance are identified, this research will investigate how Kotter and Schlesingers' (1996) theory regarding the concept of addressing resistance to change through participation and involvement activities could be related to the resistance factors and the broader influence of resistance to change on individuals' attitudes.



While there is a plethora of research on patient satisfaction with the service, little research has been directed to staff. There is a paucity of information on user satisfaction with PACS. Only 17 public hospitals have PACS in Ireland, which implied that it has been a relatively new technology. To successfully implement PACS with minimum resistance and maximum “buy in”, the findings of this research will be instrumental in identifying the areas of discontent/problem and appropriate solutions could eventually be administered. The knowledge gained from this research will formulate guidelines that could be useful to stakeholders involved in implementing PACS.

1.5 Personal Objectives

The researcher aims to learn from the findings from this study in terms of academic and social aspects. Upon the completion of the study, the author aims to disseminate the findings of the study in order to help fellow professionals in the Radiology department concerning the improvements that could be created in the implementation of PACS, as well as to other health providers with regards to their endeavours in incorporating information technology innovations to health care.

1.6 Research Methodology

This research will be undertaken using a qualitative interview study. In order to meet the objectives of this research, it is necessary to understand the perspectives of the involved individuals in the implementation of PACS. The proposed study will also examine how they these individuals have interpreted and handled the changes in the process, as well as their and participation in the necessary activities in their lived experiences. This qualitative approach provides scope for probing deeply into this complex subject and reveals issues that would be difficult to reveal through surveys.

This qualitative research approach offers a balance between deduction and inductive reasoning with literature used to identify tentative key concepts, in advance of the fieldwork. These advances could potentially be revised or even rejected as the analysis proceeds. This interview study will be carried out through interviews within three hospitals and other projects which have undergone many major IT projects, including an implementation of PACS. To strengthen the validity of data on such a small sample, a triangulation of sources of data will be used by interviewing both end-users and



project managers. The questions for the interviews will be devised by extracting the main themes on the subject as derived from the literature review. These themes will be subsequently grouped as a series of topics to discuss.

1.7 Dissertation Structure

The researcher conducted interviews within hospitals, wherein PACS has been implemented, as well as in organisations that have undergone a major IT project. The draft IT and user schedule were initially tested with a project manager and an end user respectively by conducting pilot interviews. The pilot study has provided the researcher with information for appropriate minor amendments to streamline the manner in which questions were presented. The researcher then conducted interviews with the project managers to gather a background regarding the project setting, and in preparation for the interview of the end-users of the implemented technology.

1.8 Scope Boundary

This research focused on the implementation of PACS and major IT changes in Ireland. The non probabilistic sample will be formed by approaching various project managers to create a core sample of industry experts. The results of this study will be applicable to the participating establishments during the duration of the investigation. Hence, the researcher will be careful from making generalisations.

1.9 Summary

This chapter has discussed the existence of IT transformations and the implications towards the success of these implementations within establishments. The critical contribution of actors involved in organisational transformation towards the realisation of the innovations has been also discussed. However, the resistance to change among these actors, specifically changes related to IT innovations have been observed to cause delays and negative impact to the outcomes of the organisations. Therefore, it has been essential to identify the reason of resistance for the successful implementation of IT transformations and how this could be resolved. The relatively new implementation of PACS in Ireland could also utilise the full support of medical professionals. This research aims to conduct a qualitative study by interviewing program managers in hospitals and



organisations, which have undergone a major IT project, as well as end-users of the respective technologies. Through this method, the author aims to formulate guidelines that could be useful to stakeholders involved in implementing of PACS. These guidelines may be used to better implement PACS in the hospitals and other IT projects in the organisations. The next chapter will contain information about the history of PACS and its implementation status in Ireland.



2.0 Picture Archive and Communication Systems (PACS)

2.1 Introduction

The provision of quality healthcare depends on the “systematic creation, sharing, operationalisation and translation of knowledge to improve the quality of patient care” (Abidi, 2008). The importance of knowledge in healthcare provision has been the main driving force behind the implementation of different information management systems (Latham, 2008). These information systems characteristically possess different levels of interoperability. Picture archive communications systems (PACS) have been intended to improve the efficiency and utility of diagnostic imaging with the intention of improving patient care (Choo, 2005).

2.2 The History of PACS

The initial phases in the evolution of digital radiology began with the development of the basic operational structural components of PACS in the 1970s. In the 1980s, hospital radiology departments began implementing PACS. It was also during this time that the concepts of radiological imaging became more popular. Shortly before the first ever International Conference and Workshop on Picture Archiving and Communications Systems in California, Duerinckx coined the term PACS (Duerinckx, 2003; Hecht, 2009). Since then several papers and publications have been written on PACS and numerous conferences have been convened in an attempt at furthering the theoretical exposition as well as practical technological developments. These developments have fuelled the integration of digital sensors in medical diagnosis. Besides other digital medical technologies such as Medical Resonance Imaging (MRI), Computer Tomography (CT) and X-Rays, the implementation of PACS improves the efficiency of image storage, processing and conversion of medical data into forms which are used in day-to-day medical practice (Hecht, 2009).

In the hospital radiology department, the inability of the film-based systems to meet the increasing demand for storage space prompted the development of PACS (Lederman, 2002). PACS provides an economical storage space, facilitates the rapid retrieval of diagnostic images, promotes the accessibility of images that have been acquired with different modalities and makes it possible to access the same images at multiple sites (Lederman, 2002).



Input to PACS may be through digital sources or analogue sources, but the latter have to be digitised before they can become compatible to the system (Ratib, 1997). Structural PACS are composed of an image acquisition device, data management system, image storage devices, transmission network, display stations and printers (Choplin et al., 1992). Overall, the integration of PACS into radiological operations has been targeted towards the improvement of operational efficiency, while at the same time enabling superior diagnostic ability.

A basic PACS system can support multiple modalities to allow digital capture of images from numerous imaging systems, which through the use of Integrated Healthcare Enterprise (IHE) standards, are handled in a uniform way from a PACS point of view. At its most basic mode, a PACS system must support the digital acquisition, storage, distribution, manipulation and display of radiological images with a view to eliminating the use of film based images and manual storage. The images are available for radiologists to view on high definition (3-5 megapixel) workstations for formal diagnostic interpretation, review, annotation and reporting, and on lower resolution workstations (1-2 megapixel) for clinical reference.

To facilitate archiving of image data, PACS requires both short-term and long-term storage. Redundant arrays of hard disks are typically used for storage of “live” images which can be accessed on demand. Older images are archived to digital tape for safe keeping in storage rooms in case they will be subsequently required for retrieval for comparison with current “live” images.

2.2 Current Situation in Ireland

In Ireland, PACS have been installed in only 17 hospitals. PACS was first installed in Ireland in AMNCH, Tallaght in 1998 (O'Hare, 2008b). In the intervening 10 years, 17 out of the 50 acute hospitals within the HSE/Voluntary sectors have implemented either PACS or an integrated PACS/Radiology Information Systems (RIS).

The other hospitals have had a variety of implemented technology. During this time, many local hospitals successfully upgraded much of their radiology equipment to digital/computed versions. This is a preliminary step for all hospitals when moving towards a PACS environment.

2.3 Future plans for Ireland: NIMIS

The National Integrated Medical Imaging System (NIMIS) project was established by the HSE in



2007 (HSE, 2007a) to deliver a National PACS solution. The project aims to deliver (O'Hare, 2008a; O'Hare, 2008b) an integrated PACS incorporating electronic order communications and voice recognition to the 33 HSE-funded hospitals that currently do not have such a facility and to replace the older PACS in three of the existing PACS sites. In each of the hospitals, the new PACS/RIS will interface to the existing hospital IT systems such as patient administration system (PAS), electronic patient records (EPR), and Order Communications, if present. Within two years, the individual hospitals will have a local storage facility for images taken. Each hospital will also send images and reports to a Central Data Repository (CDR) which will hold them in accordance with the National Hospital's Office (NHO) Code of Practice for health care records (HSE, 2007b).

Images from non-traditional PACS sources such as cardiology, angiography, and ultrasound, have been also included as part of the project. A key aim of the project has been for the hospitals to become paperless and filmless within radiology sector. The provision of general practice (GP) reports electronically via the National GP messaging project Healthlink was planned as well. For the hospitals with existing PACS, there has been a requirement to have their images and reports sent to the CDR to allow for more complete data sharing across all public hospitals.

While most existing PACS installations in Ireland have been single sited, this project will allow for cross-site look-up and reporting of images. These elements support many of the priorities of the HSE's Transformation Program (HSE, 2006) and will provide for improved sharing of radiologist services, particularly in the hospitals with current reporting relationships. Post-NIMIS it will be possible for images from any individual hospital to be reported from another hospital.

As the NIMIS project progresses, the urgent need for a National Client Identifier (NCI) has become even more apparent. While the new Health Information Act, which has been expected towards the end of 2010 to address this issue, a project has been established to provide a NCI that will allow for the matching of client identities across multiple systems (Beaton, 2008). The NIMIS project has become a driving force for the early adoption of a NCI and has engaged with the project group working on same to co-ordinate roll out to sites in advance of, or in conjunction with, NIMIS go-live. The national index project will also facilitate a consent register to provide for patient data protection rights, allowing patients to opt in or out of having their images and reports shared outside of the existing hospital group networks.



The central data repository will also provide rapid access to images, allowing for consultation with specialists and, therefore, permitting optimal care decisions to be made in a timely manner.

For instance, if a patient has been imaged in hospital A and an urgent consult is required from hospital B, then as soon as the image is written to the CDR, it can be readily viewed by hospital B and an opinion could given to the patient (O'Hare, 2008).

After presenting a relatively concise exposition on the basic understanding of PACS, there are some main questions that should be detailed henceforth. What benefits do PACS bring to the radiobiology department? What are the demerits of implementing PACS? In a technologically conscious hospital environment, why have some hospitals decided to maintain film based storage and transfer systems even though PACS are more technologically advanced? An analysis of these questions will not only give an insight into the future of PACS, but also expose the issues behind the resistance in the implementation of PACS and the solutions to these issues.

2.4 Advantages of PACS

The transition of hospital radiology departments to PACS has some proven advantages. Most of these benefits are directly derivable. For instance, the implementation of PACS reduces costs by eliminating the process of making films. Due to its small structural attribute, it reduces the need for big rooms for imaging or film based archives. PACS also increase the speed at which images can be accessed after acquisition hence reducing the duration of turnaround time. This efficiency accelerates image workflow (Furukawa et al., 2004). Given the ease of accessing these images, the time used for searching for a specific patient's images has been reduced; hence, reduction in queues and increase in customer satisfaction (Hecht, 2009; Reiner et al., 2000; Hangiandreou et al., 2009). Furthermore, remote interpretation of image softcopy significantly decreased the turnaround time for urgent and routine examinations. Given the probability of accessing the images in multiple points, the implementation of PACS has created room for subspecialty interpretation of the diagnostic data (Hangiandreou 2009). All these benefits significantly improve radiology and general medical practice.

In a research by Stockman and Krishnan (2006), the acceptance of PACS in a participating radiology department has promoted positive culture change, which provided positive influences in



teamwork and staff morale, improvement in the workflow, as well as the quality of patient care. Duck et al. (2008) conducted a study among radiologist and technologist to identify their insights in their acceptance of PACS in Ghent University Hospital. It was found that radiologist and technicians has positive responses regarding PACS, these entities also have indicated the intention of using the technology. Further findings suggested the respondents in this study indicated independent technology acceptance decisions from their superiors; hence the stress on the usefulness of PACS, rather than on ease of use. These professionals have also indicated their appreciation towards the support given to them in using the PACS technology (Dyuck et al., 2008). These studies have reflected the positive effects and responses of medical professionals towards PACS.

2.5 Obstacles to PACS Implementation

It can be argued that these benefits have existed since the implementation of PACS. However, it is interesting to note that even though these advantages are plenty, not all managers have implemented PACS. There are several reasons for this resistance to change. First, implementation of picture archive and communication systems has remained an expensive undertaking, despite the fact that the prices of hardware and associated technical instruments have been on the decline (Hecht, 2009). This exorbitant initial investment implied that PACS cannot guarantee immediate profitability. Return on investment has been observed to come after several years; this realisation has fueled scepticism (Hecht, 2009). Strickland (2003) reported that the costs of implementation of PACS in a 500-bed hospital ranged from \$1.5 million to \$3.0 million. With the approximated maintenance costs at 6% annually, this cost is prohibitive to many hospitals. Moreover, returns on investment can only be realised after five years (Strickland, 2003; Van, 1996).

Conservative physicians and radiologists have been frightened by the fact that implementation of the technology may alter workflow (Hecht, 2009). On the other hand, most radiologists and physicians may feel that the shift from a predominantly analogue system of operation to an exclusively digital interface will require extra training and work before they become experts in PACS software (Hecht, 2009).

With insufficient computer literacy, medical staff may resist any attempt at implementing PACS (Strickland, 2003). While this may not be a big issue in the 21st century workplace environment, it



is important to note that the manufacturers and vendors of PACS software and hardware have developed and continued to improve the graphic user interface (GUI) of PACS to make it more user intuitive and user friendly (Hori, 1996). However, this does not eliminate the need and the costs involved in training clinicians and other healthcare professionals on the operations of PACS (Protopapas et al., 1996).

Additional training tools that could be useful adjuncts may involve a pocket-sized instruction card, workplace computer training program, PACS workstations and online help (Strickland, 2003; Gamsu et al., 2003). Somerville et al. (2005) reiterated that usability concerns in terms of problems in retrieving images can be eliminated by improving communication between radiology, hospital management, information technology, and non-radiology clinicians during the implementation time.

The conversion of films into digital images has reduced the size of images, which may not appeal to the radiologists, surgeons or physician. This reduction minimises the notion of substantiality that had earlier on been associated with films. This conversion also entailed that the images can either be deleted or lost because of the existence of multiple access points (Hecht, 2008; Strickland, 2000). This fear was further heightened by the belief that even if an archive was to be developed, the archive cannot guarantee a complete fault tolerance.

After the implementation and complete shift to a digital PACS imaging platform, the hospital has to consistently and actively guard against any form of total system failure, an event which could be potentially disastrous to the health and survival of patients. This occurrence of system failure is frightening because total failure implied that when the whole hospital department system breaks down, there may be no fallback position. Complete destruction of the system implied that all data stored in the system may be lost. Thus, any implementation of PACS must be fully supported by an automatic backup architecture (Strickland, 2003; Strickland, 1996; Langer, 1996). This system backup approach will add more costs, which brings up the obstacle about the costs of implementing such technology and concern for returns of investment (Hecht, 2009; Strickland, 2003; Van, 1996).

These drawbacks remain the key obstacles to the complete transition to PACS (Strickland, 2000; Pilling, 2003). According to Yallop & Makin (2007), changing to PACS will make the comparison



between new and old films much more difficult. Considering that the failure to compare films has constituted cases of malpractice in radiology, this impossibility cannot be easily disregarded.

2.5 Summary

This chapter has presented an overview of the history of PACS and the current situation of PACS implementation in Ireland. Even though PACS possess significant benefits, the implementation of PACS has not been without considerable resistance. (Hagland, 2008) Despite the presence or implementation of sophisticated medical technologies such as PACS, the benefits of their operational efficiency can only be enjoyed when the technology is supported by the medical professionals. (Bramson and Bramson, 2005). This research will review why health care professionals resist the implementation of PACS and other IT projects. The next chapter will continue the literature review by considering organisational change.



3.0 Organisational Change

3.1 Introduction

This chapter sets the context of the research by reviewing the perspectives adapted by the principal schools on information technology related change.

3.2 Context, Process and Content of Change

Pettigrew (1987) suggested that any useful research on organisational change should involve the continuous interplay between ideas about the context of change, the process of change and the content of change.

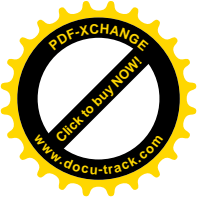
The theoretical insights that have been used for understanding change within an organisation are described in Appendix B and include planned (deliberate), contingent and emergent change, while content has the dimensions of maximisation and pluralism.

Maximisation has referred to utilising IT to achieve a single or small set of objectives (Peppard, 1998). Pluralism has been the recognition that there were probably many stakeholders, who will be impacted by the introduction of an IT-based system and any outcome will be determined through negotiation and consensus among all stakeholders. Examining the literature on IT related change; four broad schools can be discerned. These four perspectives are reviewed in the following section. (Peppard, 1998)

3.3. The Dominant Schools of IT-Related Change

3.3.1. Technological Deterministic School

The technological deterministic school holds that technology is an exogenous force, which strongly constrains the behaviour of individuals and organisations. The fundamental belief of this approach is that benefits will be derived by right technology itself. This perspective has captured the early views of researchers of technology in organisations (Leavitt and Whisler, 1958; Woodward, 1958), and laid the foundation for the traditional information systems development techniques. Indeed, most investments in IT are still technology-led and reflect too technical an emphasis (Clegg, 2000).



3.3.2. Organisational Choice School

The Deliberate-Maximisation is where a deliberate process of change is instigated to achieve a small set of objectives. Outcomes are a result of deliberate action with IT implemented in support of these objectives. This is the perspective of later research which ground itself in the organisational choice model that assumes that organisational structures have been largely under the control of managers and shaped by their decisions and actions (Galbraith, 1979).

Supporting this view, Child (1972) stressed that it has been people, who created structures and IT impacts have been determined by those, who control computing and have had the ability to use IT to achieve organisational, professional and even personal interests. Thus, this perspective recognises the political nature of organisations where IT can be implemented to change the balance of power.

3.3.3. Systematic School

The Systemic school articulates impacts as being more pluralistic than mere maximisation of a desired outcome and recognises that there are opportunities created by IT, which can be both positive and negative, depending on how technology is put to use. This school has viewed IT implementations as inescapably linked to the culture and power of the local social system in which it takes place and recognises that if a technical system is created at the expense of a social system the result will be sub-optimal (Peppard, 1998).

Hence, the systematic school has been concerned with the development of criteria for social and technological acceptance, which is addressed through a core ethical principle of end-user participation in decision-making in order for individuals to achieve a degree of control over their immediate work environment (Mumford, 1984; Mumford, 1987).

The underlying belief has been that compromise and social negotiation are crucial for success. Indeed while user involvement and participation has been important in any methodology, it is of absolute importance in systematic methodologies such as agile methodology (Admin, 2008).

3.3.4 Interactionist School

The Interactionist perspective contended that the use and consequence of IT emerged unpredictably from complex interactions of the IT and social network of the organisation. Change has been

observed to be arising due to changing social interaction patterns brought about through the implementation and use of IT.

In this perspective, the organisation has been portrayed as a network of nodes held together by the exchange of information. IT not only changes the nature of these exchanges, particularly formal arrangements, but also redefines the organisations information network. The impacts of IT emerge out of these changing social interaction patterns (Barley, 1990; Burhardt, 1994; Burhardt and Brass, 1990)

3.4 Summary

This chapter has provided an overview of the four dominant schools in IT related change. Each school adapts a different view on the technological and social aspects of IT driven change as in Figure 1.

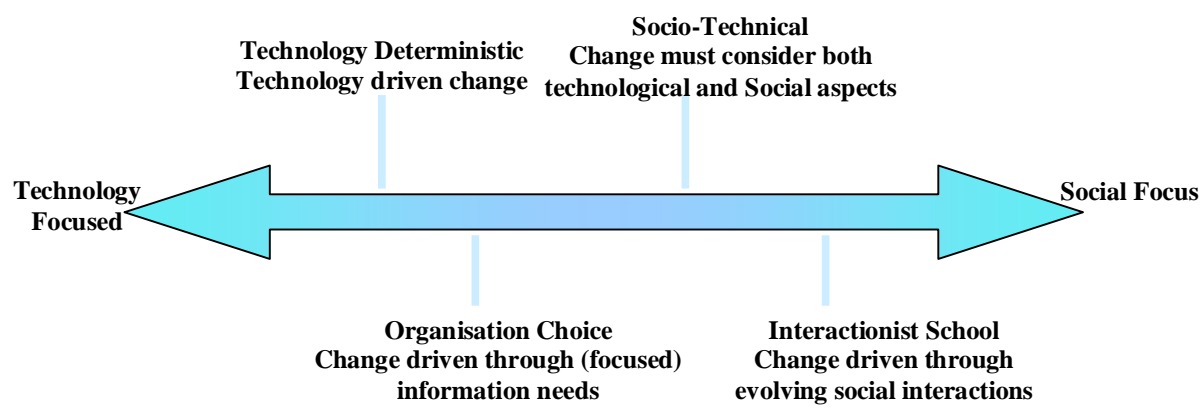


Figure 1. Perspectives on Change: Technology/Social Focus

Given the multi-dimensional and temporal nature of change, each of these perspectives has strengths and limitations and offers a valid but limited view of reality. This research adapted a socio-technical perspective on the subject of resistance; however, understanding the different view points is essential to develop the contextual foundations for this research and a better understanding



of the topic. The next chapter will probe further into this subject by considering the different views on resistance within this context.



4.0 Resistance to Change

4.1 Introduction

This chapter will define resistance and consider the different views and theories adapted by successive waves of research on the subject.

4.2 Definition

The verb *resist* is transitive, which means that it takes a direct object. Being aware of and knowing this object is crucial as resistance is formed in part by the “content of what is being resisted” (Jermier et al., 1994).

Markus (1996) defines resistance as “behaviour intended to prevent the implementation or use of a system or to prevent system designers from achieving their objectives”. Kotter and Schlesinger (1979a) added other elements: (a) fear of losing something important, and (b) misunderstanding the change.

Other definitions referred to employees adverse behaviours as a reaction to management-imposed changes (Coch and French, 1948), and as a limiting force by employees seeking to conserve the status quo (Lewin, 1947). Furthermore, resistance has involved deliberate acts of non-cooperation or omission (Ashforth and Mael, 1998), and a negative reaction to change associated with emotion, cognition and behaviour (Piderit, 2000).

These conceptualisations have a degree of overlaps and have generally viewed resistance as a behaviour that needed to be overcome by therapists (Cowen and Presbury, 2000). Still, these definitions diverge in important ways and definition focusing on one view at the expense of the others seems incomplete (Piderit, 2000).

4.3 Perspectives for Dealing with IS Resistance

Scholars have tried to address the problem of resistance during information systems (IS) implementations in different ways; thus, obtaining different insights and remedies for successful



implementations. Details on these perspectives can be found in Appendix C and a summary is provided in Table 1.

Table 1. Information Systems Perspectives to Address Resistance

Theory	Approach to address resistance	Research
Scientist-manager Philosophical view	Establish a mutual understanding between Analyst and User	Churchman & Schainblatt, 1965.
Factor view	Identify the Individual, Organisational, Situational and Technological factors that affect implementations outcome.	Lucas, 1975; Ginsberg, Schuits & Lucas, 1984; Leonard-Barton, 1988.
Process view	Implementation viewed as a process arbitrated by circumstances such as project management and managerial support.	Ginsberg, 1978; Gailbraith, 1979.
Socio-technical	Organisation is “conceptualised as consisting of interacting components; people, tasks, technology, and structure. Introduction of an IS involves changing the technology component which automatically triggers changes in the other components of the organisations.”	Markus, 1983.

This research adapted the socio-technical framework and investigated the underlying determinants in each category of this framework in parallel with the factor view of resistance.



4.4 IS Resistance Theories

With these high level perspectives in the background, the following section considers the key models found in the literature for IS resistance interpretation:

4.4.1. Technology Acceptance Model (TAM)

TAM (Davis et al., 1989) is a positivist approach that has been utilised in determining whether or not users will accept a new IS. It explains acceptance in terms of user's perception of the usefulness and ease of use of the IS. If a user perceives an IS to be useful and easy to use, the user will form a behavioural intention to use the system.

Critiques of TAM have suggested that the model has strong limitations through the focus on cognitions about the target technology. Issues related to organisational culture are not present in the theory. Likewise there has been an absence in the consideration of individual's perception of usefulness with respect to career goals and orientation within the organisation (Legris and Collette, 2003).

4.4.2 Equity Theory

Joshi (1991) explained resistance in terms of Equity Theory. He posited that users have assessed changes in their equity before and after implementation. These users then compare their personal change of equity to that of the organisation and members of their peer group. Resistance will occur if inequity has been perceived by the user.

Thus, Joshi (1991) stressed that in order to ensure the successful implementation of systems it is critical to create positive equity and advises. Extreme inequities should be avoided, as highly inequitable treatment of some users will be likely to influence the equity perception of others.

Equity can be used to explain a wide range of implementation situations; however, it has shortcomings too. In stating that people have made judgements based on equity, there has been an assumption that humans behave rationally; however, humans often behave irrationally (Markus 1983a).



4.4.3 Interaction Theory

Interaction theory has risen from interaction of the system with division of labour and/or with distribution of intra-organisational power. The political variant of the interaction theory has argued that neither of these changes will have much effects on the intensity of resistance if the resistance was generated by patterned interactions among competing groups (Markus, 1983a). This concept has been developed later in this document in reviewing Group Theory.

4.4.4 Attributional Model

The Attributional Model of Reactions of Information Technology (AMRIT) (Martinko, 2004), has posited that each individual user makes a causal attribution of an IS based on internal and external influences, past successes, and failure with similar systems. The attribution then leads to expectancies for future outcomes and eventually, the outcomes form the user's affective and behavioural reactions to the IS. The behavioural reactions results in outcomes, the nature of which influences the nature of future attributions.

4.4.5 Multilevel Model

Lapointe and Rivard, (2005) have proposed a multilevel model of resistance to IS implementation. Their model posited that resistance behaviours have been dynamic; therefore resistance behaviour will vary during the implementation process. Initially, users assess an IS in terms of how it relates to their current individual and organisational status. As the implementation process progresses, users will continuously re-evaluate and this may give rise to change both the level and focus of their resistance.

This explanation of resistance should be considered in parallel with the dynamic theories of individual behaviour during change as presented in Appendix-D. These theories consider sequential stages that individuals must pass through during change. This approach allows temporal analysis of what precedes and follows a current position enabling the prediction and anticipation of behaviours and attitudes of the individuals affected.

4.4.6 Passive Resistance Misuse

Marakas and Homik (1996) used the passive resistance misuse theory to explain a form of covert resistance to the IT implementation process that was neither couched in criminal intent nor



motivated by personal gain. Passive resistance misuses a recalcitrant, covert behaviour that have resulted from the user being afraid and stressed by the introduction of the technology into their previously constant world. Such behaviour takes the form of overt cooperation and acceptance of the proposed system combined with covert resistance and likely sabotage of the implementation effort. Appendix E-provides additional details' on individuals' manifested behaviours.

4.5 Summary

This chapter further focuses on the technological and social aspects of change. This chapter has reviewed the literature on managing resistance in IS implementation and the principal theories for interpreting IS resistance as summarised in the table 2.

Theory	Theme	Author
TAM	Users assess perceived usefulness and ease of use of system	Davis et al, 1989
Equity Theory	Users assess changes in their equity before and after implementation	Joshi, 1991
Interaction Theory	Considers interaction of system with division of labour and distribution of power	Markus, 1983
Attributional Model	Expectations based on internal and external influences and experience	Martinko et al, 1996
Multilevel Model	Focus and level of resistance changes during implementation	Lapointe & Rivard, 2005
Passive Misuse	Non intentional resistance driven by stress and anxiety	Marakas & Hornik, 1996

Table 2. Information Systems Resistance Theories and Themes



The usefulness of these different factors and perspectives when addressing IS resistance has been very much dependent on the situation; therefore, the reasons for resistance has been difficult to be captured in a single model (Marakas and Hornik, 1996).

Following this conceptual viewpoint of resistance, the next chapter will review the underlying factors of resistance.



5.0 Antecedents of Resistance

5.1 Introduction

This chapter identifies the underlying causes of resistance using a framework that looks at the interaction between people and technology in the workplace (Markus, 1983a). In this study, the factors related to the resistance of PACS users to PACS were identified by examining the relations between PACS users and technology such as the PACS. Individual category of factors in Markus's framework will be discussed separately in the next chapter.

5.2 Organisational Focused Factors

5.2.1 Structural Inertia

Structural inertia has been the extent to which employees have been selected and trained to perform certain jobs and reward for doing them well. When this is the case, the jobs have structural inertia and result in powerful forces on the individual to perform in these stable ways and resist changes to this stability (Greenberg and Baron, 2000).

5.2.2 Previously unsuccessful change efforts

In tune with the Attributional model (Martinko, 2004), the track record of implementing major organisational changes is recognised as influencing resistance to change (Schneider et al., 1996b). If employees have experienced past failures, they will be reluctant towards new change initiatives.

5.2.3 Cultural and Structural fit

New information systems may prescribe a division of roles and responsibilities that may lead to patterns of interaction that are at odds with the prevailing organisational culture. These changes may also conflict with bureaucratic structures and can be met with hostility. In these situations, workers will demand compensation for any extras they perceive, the change will bring about issues that upsets the existing culture (Trader-Leigh, 2002b).

This cultural aspect has been developed by Schein (1992), who argued that planned change cannot be understood without considering organisational culture. Schein (1992) considered organisational



culture to be primary source of resistance to change. This view was supported by Beer (2000), who examined past failures in organisational development efforts and found the role of culture a critical force to be considered in effecting change.

These cultural issues particularly emerged when there has been incongruence between the organisation's present norms and values, and the ones on which the organisation will be based in the future (Metselaar, 1997).

5.3 Politically Focused Factors

Researching under the broad implications of the Equity theory, MIS researchers have viewed the dynamics of implementation as a political process, where the sequence and the direction of the implementation can be explained in terms of the conflicting interests of the different user groups. Traits of this category include: (a) Changes in Power versus Structure Information, (b) Control and Task allocation, and (c) Individual Interest.

5.3.1 Changes in Power versus Structure

Markus (1983b) viewed resistance as a product of the interaction of system design features with the intra-organisational distribution of power, which has been defined objectively in terms of symbolism. Potential users would resist information systems if they cause a re-distribution of power that will be in conflict with the organisational structure (Pliskin and Romm, 1999).

The strength of resistance is also likely to be affected by the organisational position of the person or sub-unit to whom one loses power. If the "winner" is located in a vertically superior position in the hierarchy, resistance is much less likely than if the "winner" is a peer (Greenberg and Baron, 2000).

5.3.2 Information Control and Task allocation

These interests include users seeking to control information and obtain a greater share of computing resources (Danziger et al., 1982; Kling and Iacono 1984; Pfeffer, 1994) and to achieve preferred task allocation as referred to in the interaction theory (Markus, 1983b; Mumford, 1987).



5.3.3 Individual Interest

If the change that is going to be made is to the people in charge, it is probable that the balance of power may be altered between individuals and different units within an organisation. The resistance from the units or persons who are afraid of losing their advantageous position which can have a variety of forms (Greenberg and Baron, 2000).

Conversely, when the distribution of power implied in the design of an information system represents a gain to participants, they are likely to engage in behaviours that signify acceptance.

5.4 System Focused

This section will consider the user/system interface from a social perspective between the users and the IS professionals.

5.4.1 IT/Business Cultural divide

Rather than achieving a “mutual understanding” that was aimed for in the Science/Manager philosophical view of the IT implementation, many organisations have reported a troubled relationship between business and IT professionals since the introduction of computers in the 1960’s. After 40 years, organisations have become highly dependent on information technology; yet, tensions still exist between the two entities (Clarke et al., 2003).

These tensions have been attributed to the cultural differences between business users and IT people. According to Schein (1992), IS has been a part of the “Engineering Culture”, while many of the issues in leadership have been associated with “Executive Culture”. Schein (1992) explained that when these cultures become out-of-alignment, change in either of the two parties becomes difficult to achieve; hence failure rates may rise. Other explanations for this discontent have included business management inexperience with IT, changing role of IT, failure of IT to understand business implications of technology, and lack of management appreciation of the potential for IT to improve business performance (Grindley, 1992; Keen, 1991).



5.4.2 Communication

A strong factor prising these cultures out of alignment has been poor communication (Vecchio et al., 1996). Indeed, problems with communication may retard collaboration and stimulate misunderstanding, resulting in conflict (Robbins, 1998).

Indeed, like other professions, IT people have their own specialised jargon, which is often meaningless to others (Ward and Peppard, 1996). The use of jargon may not only result to poor communication and frustration between business and IT, but may restrict shared knowledge and organisational linkages (Nelson and Coopriider, 1996).

5.4.3 Trust in the Skills of IT Professionals

Typically, the management and execution of information systems projects has been delegated to technical specialists, these professionals have generally not undergone sufficient training, nor the skills or motivation to treat organisational issues (Clegg, 2000; Hornby et al., 1992). Consequently, IT professionals often developed ambivalent or even hostile attitude towards the treatment of organisational issues (Clegg, 2000; Hornby et al., 1992).

As IT professionals have continuously experienced problems with respect to the treatment of organisational issues, in which possible approaches to resolve the issues have also provided contributions to the ineffective treatment of organisational issues. This outcome may fuel the attributional theory of resistance (Martinko et al., 1996), which may lead to disappointment and resistance due to unrealistic promises and frequent problems with IT systems and support (Selig, 1991).

Rockart et al. (1996), elaborated on this by discussing how poor IT performance affected the credibility of the IT group and how this have deteriorated the trust of the business in IT. As a consequence, the thriving business organisations have become less and less dependent on IT (Avison & Torksadeh, 2009). For instance, organisations may perceive IT as a support function to their business processes, which is not a heavily critical component to the success of the organisations (Avison and Torkzadeh, 2009). Moreover, if IT will not be viewed as being critical to organisational success, the business may not involve the IT sector in main business activities. This



phenomenon will even provide deterioration to the relationship and widening the cultural gap between the IT and business organisations.

5.5. Summary

The underlying organisational, political and system focused factors that influence a resistance attitude are summarised below:



Figure 2. Organisational, Political and System-Focused Factors to Change Resistance

These findings provide a theoretical foundation that could be applied to the organisational changes in the radiology department during the implementation of PACS. The next Chapter will move from the external issues to address the influences on an individual on a more intimate level.



6.0 Understanding the Individual

6.1 Introduction

Elisur and Guttman (1976) stated that attitudes towards organisational change have been consisted of a person's thought process about change, emotional reactions to change, and behavioural tendency toward change. Bovey and Hede (2001) also acknowledged the affective reactions to change, also known as the perceived impact of on organisational change. Similarly, Ellis and Harper (1975) viewed the complex factors leading to individuals attitude under four basic processed or act. This view is also supported by Schlesinger (1982), who viewed resistance as a sequence of interpretation, cognition, affect, and action. Researchers such as George and Jones (2001) agreed that the attitudes towards organisational change may be influenced by the negative emotional reaction of involved entities. Moreover, Vakola and Nikolau (2005) explained that organisational change has been considered as a major issue that influences the organisational life individuals.

This chapter will follow a similar structure to present the literature review by considering perceptions, cognition, and emotional aspects of resistance.

6.2 Perception and Interpretation

6.2.1 Perceived Threat of Loss

Scott and Jaffe (1990) explained resistance through a sense of loss associated with giving up something that has been acquired and is satisfactory. This included loss of security, power, usefulness, competence, social relations, and of a sense of direction. This notion of loss was also sited by Kotter and Schleisinger (1979b), who stated that people have resisted change because they are frightened of losing something of worth and refer to security, money, pride and satisfaction, friends, freedom, responsibility, authority and good working conditions.

This is summarised by Dent and Goldberg (1999) who stated that “if we had to choose one term for what the literature suggests as to why people do resist, it would be loss...loss of the known...loss of the status”.



6.2.2 Distorted Perceptions and Constructed Realities

The post-modernist perspective of resistance to change has stated that realities have been socially constructed and there have been virtually no precise, objective, and standardised reality as to how similar changes result to varying outcomes to different individuals within an organisation. For the constructivist, reality has been interpreted, created, or performed through social connections (Berger and Luckmann, 1966; Watzlawick, 1984; Weick, 2009). Ford et al. (2002) argued that resistance has been found in this constructed reality, in which individuals operated as influence through the following three generic backgrounds:

a) The Complacent Background

This was formed on the foundation of past successes and current success, which has led individuals to believe that success, will continue if we “just leave things as they are”. This resistance to change has been thought of as the most difficult to overcome (Johnson, 1988; Nichols, 1993).

b) The Resigned Background

In stark contrast to the current and historic success of the complacent background, the resigned background was based on the Attributional model of resistance. Constructed realities developed through historical failure fuel resistance to change characterised by, lack of motivation, and an noticeable reluctance to contribute.

c) The Cynical Background

This constructed reality was also derived from the Attributional model; however, the cause of failure in this trait has been attributed to a peripheral reality or to other individuals and groups. When a change programme fails, it conveniently serves as a confirmation, further intensifying the belief of this background. Introduction of change in this situation would be met by an open hostility on the incapability or refusal to recognise that “nothing can write the wrongs” (Ford et al., 2002)



6.2.3 Cognitive Distortion

Beck (1983), suggested that individuals have had the tendency to develop a negative self-schema about themselves. This practice may result in an attitude, which has been consistently pessimistic (Beck, 1983). Coghlan and Rashford (2006) argued that this maladaptive thinking has been a creation of the human mind. Furthermore, because these maladaptive thoughts have been internalised and not tested, they have been perceived as being true, which may give rise to distortion of reality (Coghlan and Rashford, 2006).

These systematic errors in reasoning are described as “cognitive distortions” (Matlin, 2005) and these distortions have included tunnel vision, selective abstraction, arbitrary inference, overgeneralisations, polarised thinking, magnification, biased explanations, negative labelling, and subjective reasoning (Beck, 1983). If these dysfunctional cognitive processed or distortions will not be corrected, resistance to change will increase. (Coghlan and Rashford, 2006; Wayne H. and Bovey, 2001)

6.2.4 Group Theory

The readiness among individuals to change have depended on their beliefs about how proximal others will respond (Edmondson, 1999). This peer influence has been widely recognised (Lee, 1997) and is included in early studies by Coch and French (1948), who defined resistance to change as a combination of an individual reaction to frustration with strong group-induced forces.

Lee and Nemeth (1997) argued that the widely held view dictates even when mistaken because of two reasons: truth is found in numbers, and people are afraid of disapproval for being different. This view is supported in social psychology (Collinson, 1994), which showed that debate between individuals with similar mind sets have increased both in extremeness of their attitudes and the self-belief in them.

Thus, strong social norms within groups can develop, which can lead to demands to carry out jobs in a definite way. When change is introduced, the established normal ways of getting tasks done



have been disrupted and resistance forms during the course of social relations when groups norms and values are unsettled. (Greenberg and Baron, 2000).

In contrast to these dominant views without empirical backing, O'Connor (1993b) suggested that those who have resisted change will refuse more forcefully when they see others around them supporting it enthusiastically.

6.3 Cognition

The cognition dimension has been relevant to the Equity theory and has referred to a person's assessment and subsequent thinking about the change and the effects of change. Their evaluation may be positive or negative, mild or extreme, or indeed middle-of-the-road. This cognitive aspect of psychology has not only influenced perceptions, but has also been a strong factor in resistance or acceptance of IT systems, as users need to comprehend the system and view its usability qualities as necessary (Herzberg, 1966; Zhang et al., 2002)

Indeed, as discussed in the TAM model, no matter how easy or how attractive an IT may appear to the potential users, few people will use it if its functions are not perceived to be useful to help fulfill some needs or goals. Unlike the "Technology Deterministic" perspective of change, business users consider an IT system as a means and not as an end itself.

6.4 Emotions

6.4.1 Definition

Greenberg and Baron (2000) defined emotions as unconcealed reactions that articulate feelings about events such as organisational upheavals, which can lead to feelings of anger, sadness, anxiety, denial, loss, and frustration. Emotions; thus, provide a indication that there has been something that is personally pertinent, in need for attention, and can inspire cognitive activity and behaviour in order to address a reactive situation (Frijda, 1993). Therefore, emotions play a central role in perceptions, decision and behaviour (Damasio, 1994).



6.4.2 Personality Theories

Personality may be described as a persons characteristic totality of emotional and behavioural traits apparent in ordinary life, a totality that is usually stable and predictable (Kaplan and Sadock, 1998). It takes account of what has been significant to an individual person, how an individual evaluates a situation and determines behaviour and reaction to organisational change (Armenakis and Bedeian, 1999; Lazarus, 1994). The following are three key theories on this aspect

- (a) The **Psychoanalytical approach** (1921) described personality in terms of the id, ego and superego. For Freud, a threat symbolises the idea of an “internal enemy”, implying that what the individual is afraid of is not the danger itself but rather the thought of being overcome by emotion leading to collapse of the ego.
- (b) The **5 factor Model** (John and McCrae, 1992) described personality in terms of five dimensions: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness.
- (c) The **Personality and Environment Type fit** (Holland, 1985) defined six personalities and corresponding six environment types and argued that when these are not matched, the individual becomes stressed and resistance is more likely. Further details are available in Appendix-F

6.4.3 Personal Characteristics

a) Rigidity

Rigidity is the extent to which an individual clings on to customs or habits in their day to day life. Rigid individuals have found change ambiguous and by and large have more trouble with accepting changes in their organisation than individuals that are flexible (Kotter and Schlesinger, 1979a).

b) Locus of Control and Change Impact

Kyle (1993) claimed that resistance has been dependent upon two related factors; the degree of control the individual has over change and the degree of impact the change has on individuals. As control of change increases, resistance decreases and the higher the impact of change the greater the resistance.



This theory is supported and developed by Rotter (1966), who argued that the Locus of control is perceived as one of the most influential personal characteristics affecting innovative behaviour. Here, locus control has been defined as the perception by the individual of their ability to exercise control over the environment.

Individuals with an internal locus of control see themselves as active agents and believe they have control over their environment and their personal successes. Individuals with an external locus of control see themselves as relatively passive agents and believe that the events in their lives are controlled by external forces, such as change and others in a more powerful position

6.4.4 The Psychological Contract and Organisational Justice

In the employer-employee relationship, common duties are to a certain extent put on record in the written formal contract of employment, but for mostly they are implied, covertly held and rarely talked about. (Anderson and Schalk, 1998; Levinson, 1962)

Schein (1992) cautioned that abuse of this psychological contract is expected to have weighty consequences. Mclean Parks and Kidder (1984) were certain that employees' work behaviour would shift from a rational side to transactional side as employees remove their work commitment and reassess and define the terms of their broken psychological contract. This supposed violation would be thought of as a negative experience that creates psychic costs for the employee and may make him feel that he has been betrayed. (Rousseau, 1998).

6.4.5 Commitment

Many authors specify that organisational commitment has played a critical role in employees' acceptance of change (Cordery et al., 1993; Darwish, 2000). Employees with high organisational commitment have been observed to want to make more of an effort in a change project; therefore, these employees has been more likely to develop positive attitudes (Iverson, 1996).



Similarly, Guest (2000) suggested that commitment mediates the fundamental effects of positive affectivity, security, satisfaction, and motivation of the job, and environmental opportunity on organisational change.

Thus, commitment can be considered as a moderator that could affect how individuals' cope with the change, with sources and outcomes of stress, and the individual's awareness of the change event (Mack et al., 1998; Sullivan and Bhagat, 1992).

6.4.6 Anxiety / Capability Uncertainty

Wolman (1993) defined anxiety as an endogenous feeling of helplessness and inadequacy, while Rowan and Eayrs (1987) stated that anxiety has been an unpleasant feeling. From such descriptions it is not surprising that anxiety has promoted negative connotations and people would prefer to avoid it. O'Connor (1993b) suggested that in the context of organisational change, an individual may feel anxious due to high management expectations of the change process, uncertainty in their capability of making the transition, and also specialist technology and jargon.

Symptoms of anxiety will manifest themselves in the domains of mood, cognition, and bodily disturbances (Sims and Snaith, 1988). According to Kaplan and Sadock (1998), anxiety has also affected thinking, learning, and produces distortions of perception relating to time and space, people, and the meanings of events.

6.5 Summary

This chapter has reviewed the factors that shape the individual's attitude and behaviour towards change as summarised in the model below;

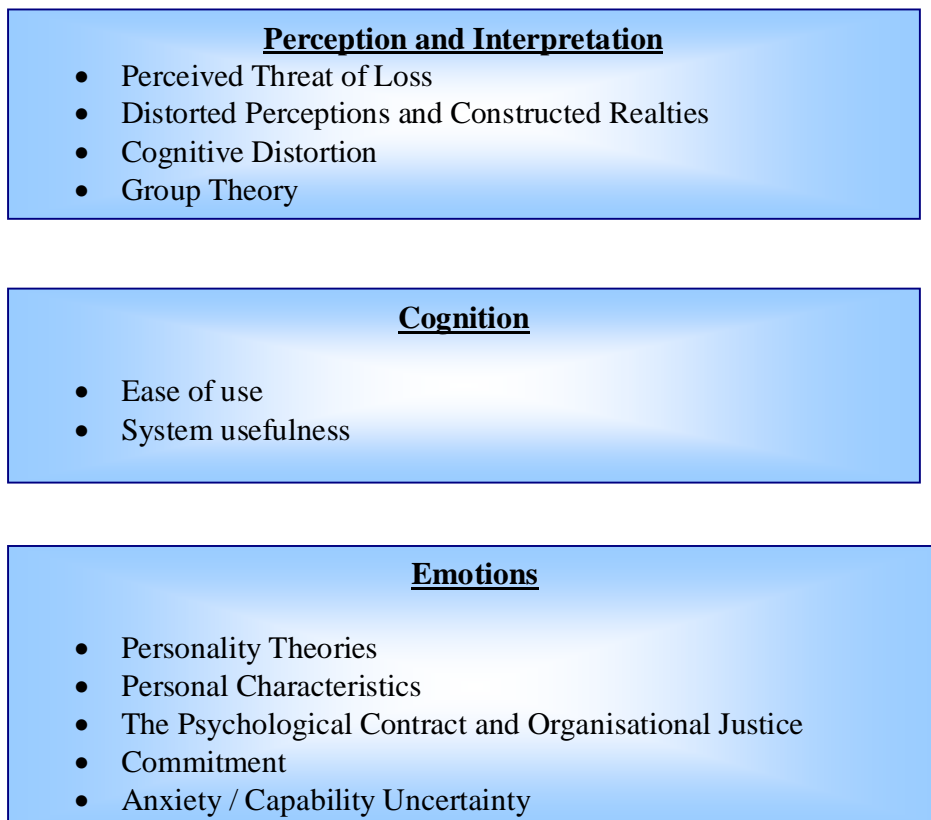


Figure 3. Individuals' Determinants of Resistance

This chapter complements the previous chapter to conclude the literature review on the underlying organisational, political, system and individual focused determinants of IS resistance. The following chapter will proceed to consider the influence of participation and involvement activities on these factors.

7.0 Participation and Involvement

7.1 Introduction

Early researchers (Blumberg and Golembiewski, 1976; Coch and French, 1948; Lewin, 1947) have suggested that employees' participation in decision-making process will be positively related to their acceptance of change. Kotter and Schlesinger (1979b) proposed strategies for reducing resistance based on involvement, education and participation. This chapter will investigate the influence of involvement and participation activities on the user.

7.2 Forms of Involvement

Most of the system design methodologies agreed that without effective user involvement in all stages of planning and design, the organisation is simply storing up problems for the future. However, while the various methodologies share this common denominator, they differ in the degree to which users are able to influence the system design. The potential forms of involvement with the respective degree of influence can be broadly classified along the continuum represented below:



Figure 4. Forms of Involvement (Damodaran, 1996)

In the predominant structured methodologies, users make a substantial contribution through their involvement in providing information to the project to the project team but often do not influence key decisions. This inevitably leads to systems that do not reflect adequately human and organisational needs.



At the high end of the influential scale found in the socio-technical world, the boundary between software system developers and users is blurred, highly permeable or non-existent. Participation in system design, assertion of systems requirements, or design decision-making is determined by effort, willingness and prior experience in similar situations rather than by assignment by management or some other administrative authority. Muller and Kuhn (1993) defined this as effective worker participation as opposed to mere involvement in design activities and decisions. Similarly, Hirschheim (1983) stressed the need for effective participation, where the users have been able to influence design not merely “rubber stamp” it.

7.3 Benefits and Influence of Participation

The broad topics of user involvement and participation incorporated a variety of factors that can be categorised into three groups; cognitive, motivational, and situational (Lorenzi, 1997).

7.3.1 Cognitive Benefits

Cognitive benefits have been rational and the easiest to understand and measure. A variety of studies (Ives and Olson, 1984; Robey and Farrow, 1982) suggested effective involvement in system design, which yielded the following cognitive benefits:

- Improved system quality through more accurate user requirements.
- Avoiding costly system features that the user did not want or cannot use.
- Avoid expensive changes after design “hardens”.
- Improved levels of acceptance of the systems.
- Greater understanding of the system resulting in more effective use.

7.3.2 Motivational Benefits

Participation influences the user’s psychological state of involvement through the following factors:

a) Increased Support and Commitment

If users have been actively involved, they will be motivated toward making the end effort a success as people support what they help to create (Qin, 2007). This was supported by Armenakis and



Bedeian (1999) and Strauss (1998), who stated that when people have been invited to participate and when their ideas were taken seriously, their commitment to change process will increase.

b) Addressed Organisational Inertia

While in pursuit of self-discipline and self responsibility, it may be necessary for an individual to overcome inertia and inaction. People who lead a somewhat lazy and passive existence often have viewed failure with horror and have a tendency to being involved in activities (Ellis and Harper, 1975). To overcome this inertia, the individual will benefit by participating and becoming absorbed in activities that provide a challenge and present an element of risk.(Ellis and Harper, 1975)

c) Increased Acceptance and Satisfaction

Participation have led to increased user acceptance and use by encouraging realistic expectations, facilitating the perceived usefulness, user's system ownership, and committing users to the system (Ives and Olson, 1984). O'Brien (2002) supported this through case study research and reports that employee's participation in change positively influenced their acceptance of change.

Ives and Olson (1984) also found a strong relationship between user participation and user satisfaction, while similar research on participative decision making by Locke and Schweiger (1979) revealed equivocal support for improved decision quality but strongly support for participant satisfaction.

7.3.3 Situational Benefits

This category refers to factors that describe the individual's social system or environment and includes:

a) Facilitates Trust Creation

Trust has been essential for people to feel that change is required and to secure their commitment to that change (Cartzon, 1989; Schermerhorn, 1989; Zand, 1997). Participation facilitated trust creation through the sharing and discussion of issues, which in turn ensured that the negative aspects of power are not displayed. The more genuine and deeply seated are these attributes, the longer the benefits of change will last the better it will be for an organisation (Mabin et al., 2001).



b) Mitigates Risk of Perceived Lack of Organisational Justice

The extent to which the top management's decision process is judged to be fair can be defined as "procedural justice" (Kim et al., 1993; Thibaut and Walker, 1975). As seen in the previous chapter, this affective feeling on fairness was believed to exert significant influence on individual attitudes.

A widely accepted and well validated phenomenon in procedural justice research was that perceptions of justice has been enhanced when affected parties were allowed to express their opinions and values regarding a pending decision (Lind and Tyler, 1988). This phenomenon has been labelled "Process Control" (Houlden et al., 1978; Thibaut and Walker, 1975).

Similarly, Folgar (1977) referred to the "Voice Effect" as a form of process control when participants believed that expression of an opinion will be instrumental in influencing a favourable outcome. This aspect directly addressed the determinant termed as "locus of control" in the previous chapter.

Thus, limited opportunities in participating in decision-making processes may result in a perceived lack of procedural justice in the decision-making process (Thibaut and Walker, 1975). Perceived unfairness of the outcomes, and perceived low organisation support, which may induce employees to resist the change (Thibaut and Walker, 1975).

c) Facilitates Communication

Kotter (1979b) has stressed the importance of credible and timely information to capture the hearts and minds of employees, and alleviate their preoccupations. Change agents must prevent employees from getting their information through the grape vine, as lack of information and rumours would make it easier to conclude whether the change effort has been failing, as well as if there have been decreases in the commitment of employees to the change process. (Reichers et al., 1997)

Indeed, employees who do not have information about change and may appear afraid of the unknown and may tend to have negative responses to the change. Thus, participation activities can provide the stage for effective information dissemination and communication on the change process. (Reichers et al., 1997)



7.4 Summary

While some authors highlight the limitations and potential pitfalls of participation (Appendix-G), the literature strongly recommended that participation is a valuable tool to address salient organisational and human issues. (Hornby et al., 1992) These beneficial findings are summarised through the following figure:

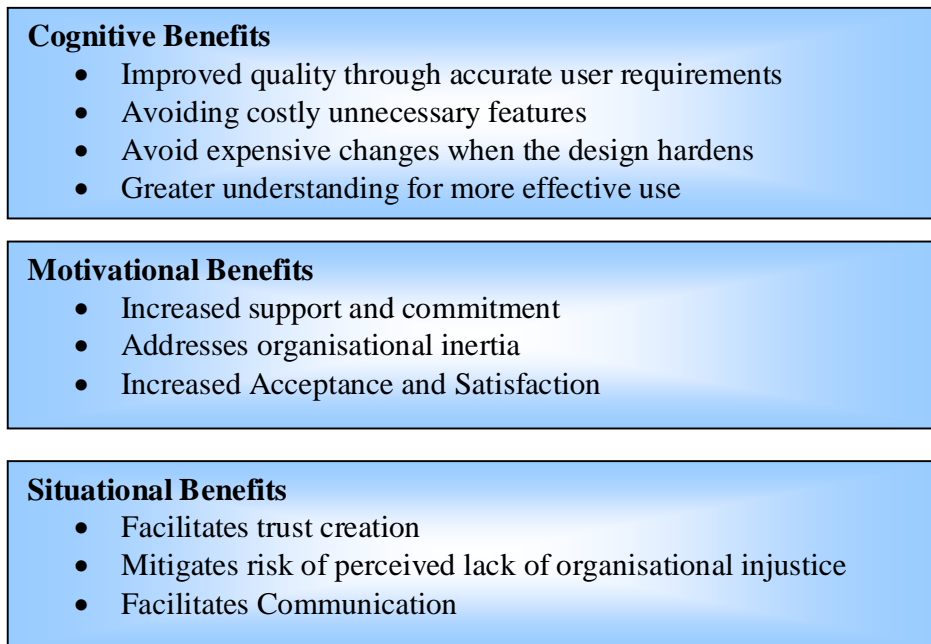


Figure 5. Benefits of Participation and Involvement

8.0 Research Methodology

8.1 Introduction

This chapter revisits the research objectives in relation to the literature review and describes the fieldwork approach.

8.2 Research Objectives

The factors influencing a resistance attitude as revealed in the literature are synthesised in the following theoretical model:

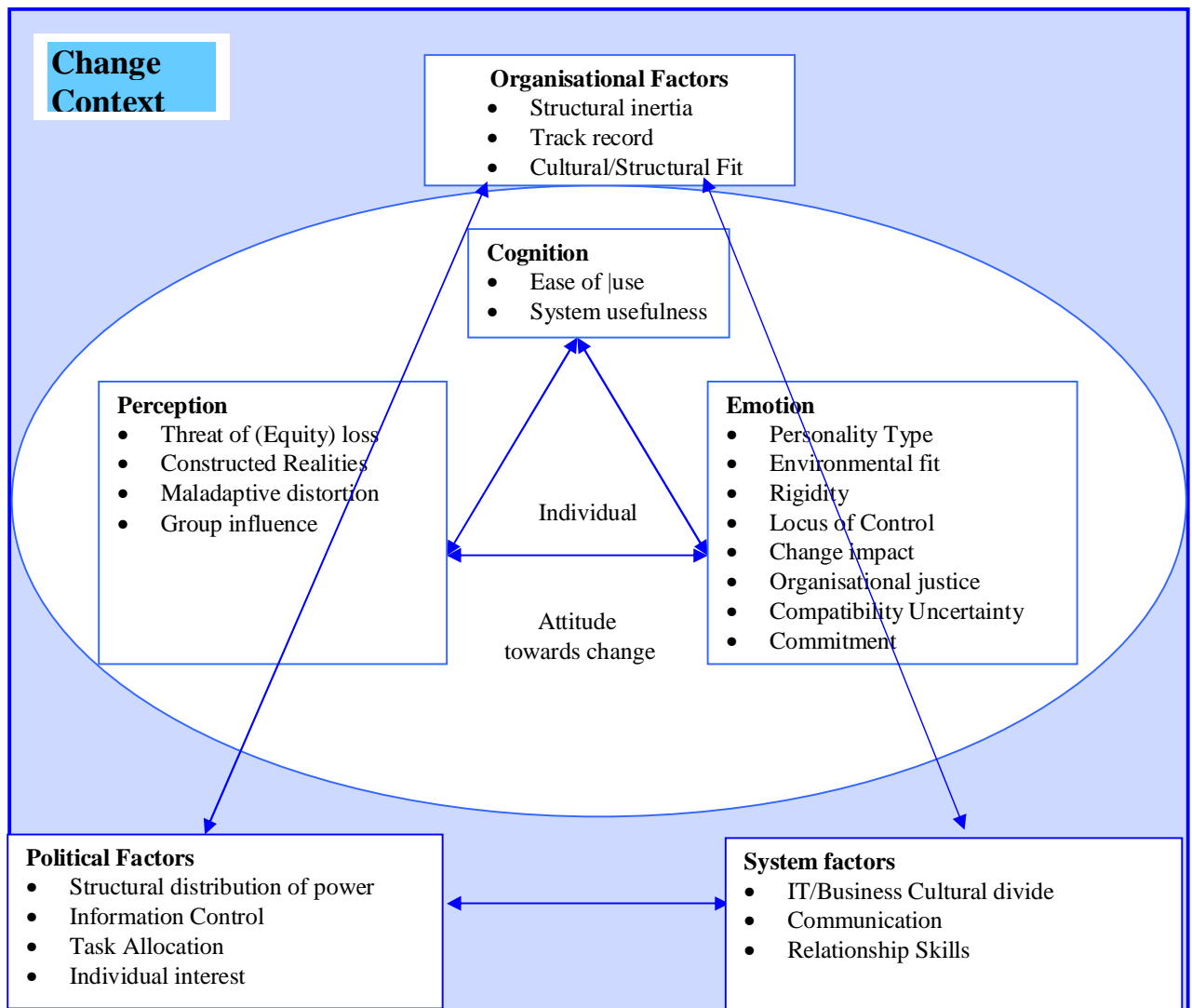
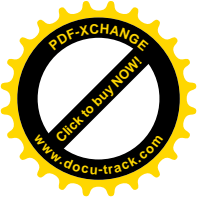


Figure 6. Factors Influencing a Resistance Attitude



The fieldwork will aim to validate the resistance determinants highlighted in this model to address the secondary questions. Subsequently, the influence of participation activities identified in the previous chapter will be analysed to understand the influence on individuals in line with the primary question

8.3 Research Approach

In order to meet the objectives of this research, it was necessary to adapt a micro-level unit of analysis to understand the individuals' perspectives and how they interpret and handle the change process and participation activities in their lived experience.

To satisfy this requirement following the principle of parsimony, the research was designed around in-depth semi structured interviews. This qualitative approach provided scope for probing deeply into this complex subject and revealed issues that would have been difficult to reveal through surveys.

In alignment with the post-positivism school, this research approach offers a balance between deduction and inductive reasoning with literature used to identify tentative key concepts in advance of the fieldwork that could potentially be revised or even rejected as the analysis proceeds.

8.4 Research Sample

This interview study was carried out through 17 interviews within three hospitals that have undergone an implementation of PACS and two organisations that have undergone a major IT project.

To strengthen the reliability of data on such a small sample, a triangulation of sources of data was used by interviewing both end-users and project managers. This non probabilistic sample was formed by approaching various project managers to create a core sample of experts. This elite data source (Marshall Rossman, 1999) offered a rich and wide perspective on users manifested resistance and their perceived influence of participation activities.



These sessions with project managers were the first to be conducted in order to gather a background of the project setting in preparation for interviewing the end users. A sample overview of interviews is available in Appendix J.

Subsequently, each project manager then snowballed (Henry, 1990) the sample by recommending a few users for a typical “resistant” user sample of the relevant project as opposed to a random sample from the user population. Although this approach limits the extent of generalisation offered by research, it was considered to provide more relevant information for this research

8.5 Interview Schedule

8.5.1 Devising the Questions

The questions for the interviews were devised by extracting the main themes on the subject as derived from the literature review. These themes or codes (listed later in this chapter) were subsequently grouped under topics to discuss. Thus, themes such as poor communication, doubts in IT capability and IT/business cultural issues were incorporated under the following generic question: “Could you tell me a bit about your relationship with IT (or supplier)?” If during the ensuing discussion, some of the specific themes were not touched upon, the interviewer raised them explicitly to ensure that all aspects of the research were covered.

8.5.2 Pilot Study

The draft IT and user schedule were initially tested with a project manager and an end user respectively by conducting pilot interviews. The objective of this exercise was to assess communicative style, and the practicality and usefulness of the set questions in capturing quality data. The pilot study was held during February in preparation for the full set of interviews carried out during March and April. Although the pilot study led to minor amendments to streamline the manner in which questions were presented, the data collected in these interviews still proved to be of sufficient quality to include with the main results and subsequent analysis. The set of questions/topics discussed with end users is available in Appendix H. While those for project managers in Appendix I.



8.6 Data Capture

On starting the interview, the topic areas and format of the session was explained to participants. The extent of confidentiality was described and permission to tape the discussion was sought. Although the interview schedule offered a useful guide the order of questions had to be adapted for each interview in order to maintain a flowing discussion and ask additional questions to the specific situation being discussed. Once it was ensured that all topics in the schedule were covered participants were invited to air any further comments or views about their experiences.

Each interview lasted approximately 1 hour and data captured through full interview recordings were transcribed to facilitate subsequent analysis. A ample of these transcripts are available in Appendix J as a representative sample.

8.7 Data Analysis

8.7.1 Techniques

The data was analysed through a series of iterations of listening to the interview recordings and in-depth analysis of the transcriptions. In this exercise, the following techniques suggested by Ryan and Bernard (2003) were considered:

Table 3. Analysis Techniques for Qualitative Data Gathered through Interview

1	Word Repetitions	Identify commonly used words and words whose repetition may indicate emotions
2	Indigenous Categories	Terms used by respondents with a particular meaning and significance in their setting
3	Key word In-Context	Identify the range of uses of key terms in the phrases and sentences in which they occur
4	Constant Comparison	Strauss and Corbin (1990) advise exploring different dimensions through systematic comparison is concerned with analysing the ways in which a phenomenon can vary and be treated and seen differently by people. This can lead to new ways of coding the respondent experiences.



		Far out comparisons, compare cases and situations that are similar in some respects but quite different in others
5	Missing Information	Reveal what is not being done or talked out, but which you would have expected to find
6	Metaphors and analogies	People often use metaphors to indicate something about their key, central beliefs and these may indicate the way they feel about things too.
7	Pawing	Marking the text and eyeballing or scanning the text. Circle words, underline, use highlighters, run coloured markings down the margins to indicate different meaning or coding. Then look at patterns and significance of marker and unmarked text
8	Cutting and Sorting	This refers to the traditional technique of cutting up transcripts and sorting common codes. Grouping these scraps and re-reading them, together. It is an essential part of the process of analysis.
9	Repetition	Look constantly for settings and events that are out of line with the main or expected findings. This will lead to a richer and more complex theory and explanation (Seale, 2000).

These techniques were considered to analyse the unstructured data from multiple viewpoints in order to promote the discovery of obscured themes and map them into codes.

This interview study was carried out through three hospitals that have undergone a major IT project or an implementation of PACS. To strengthen the reliability of data on such a small sample a triangulation of sources of data was used by interviewing both end-users and project managers. The non probabilistic sample was formed by approaching various project managers to create a core sample of industry experts. It has been hoped that this elite data source will offer a rich and wide perspective on users manifested resistance and their perceived influence of participation activities. Subsequently, it was hoped that each project manager will recommend a few users for a typical “resistant” user sample of the relevant project with particular emphasis on PACS projects, as opposed to a random sample from the user population. Although this approach may limit the extent of generalisation offered by the research, it was considered to provide more relevant information for this research.



8.7.2 Coding

During the literature review, a code book was created to document the initial list of research variables (a-priori codes) together with a brief explanation of what they stand for. These codes were documented in a hierarchical structure to categorise codes with a common theme.

Each time a passage of text was coded, it was checked against the code definition to ensure that the coding is appropriate and that the definition still applies. When the existing code did not explicitly and accurately cover the theme it was represented through a new code. The complete codebook as derived from the literature reviews and fieldwork analysis is included in Appendix-L.

This structured data reduction technique provided a fundamental structured framework to analyse the data. Thus, as each section of the transcripts was read several times and analysed using Ryan and Bernard's (2003) analytical techniques, the emerging themes were mapped against the code book framework.

The result of this lengthy exercise was a spreadsheet that sorted all the fieldwork data by code enabling an understanding of the extent each of the codes applies in the industry and degree of influence on the individual. This data provided the basis for the results presented in the next chapter.

8.8. Summary

The process used for data gathering and subsequent analysis is depicted in the flowchart overleaf, which includes supporting tools and deliverables of the process. Most deliverables are available in the respective Appendices except for the interview timetable, which is included in the main text and the 'Results sorted by theme'. This was not included due to the impracticality of presenting a massive spreadsheet. The key results of the analysis process described in this chapter are presented in the next chapter.

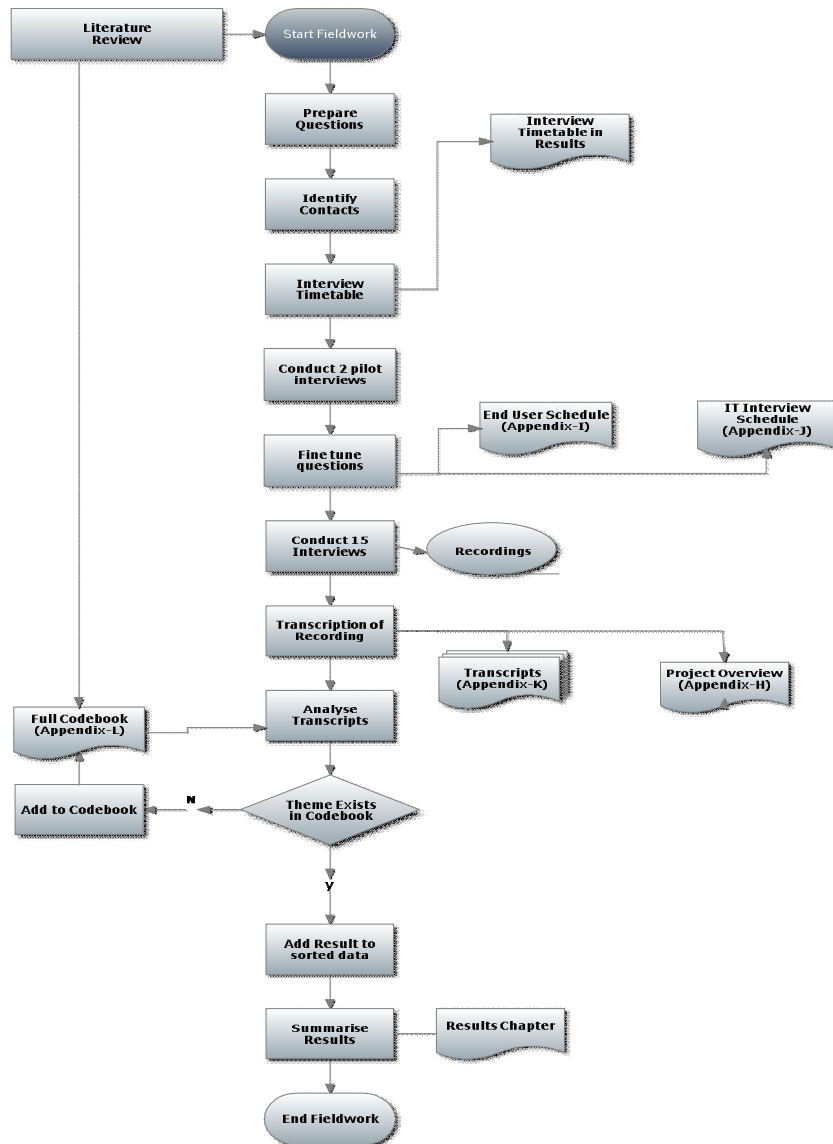


Figure 7. Fieldwork Research Process
Source: Author

9.0 Research Results

9.1 Introduction

This chapter will present the results of the fieldwork on the determinants on resistance and the benefits of participation categorised by the code-book themes (Appendix-K). For each theme the results will include:

- Number of respondents who found the topic relevant to their situation
- The relevant projects indicated using the following colour scheme:
Project A ■ , Project B ■ , Project C ■ , Project D ■ , Project E ■
- Brief description of typical responses and/or direct illustrative quotations.
- An indication of the relative degree of influence the theme was found to have on the individual's attitudes shown as follows:
Low ■ , Medium ■ , High ■

9.2 Project Context

The following radar chart shows how the fieldwork projects compare in the contextual factors identified in the literature that can influence attitudes. These characteristics provide a backdrop on which to interpret user responses.

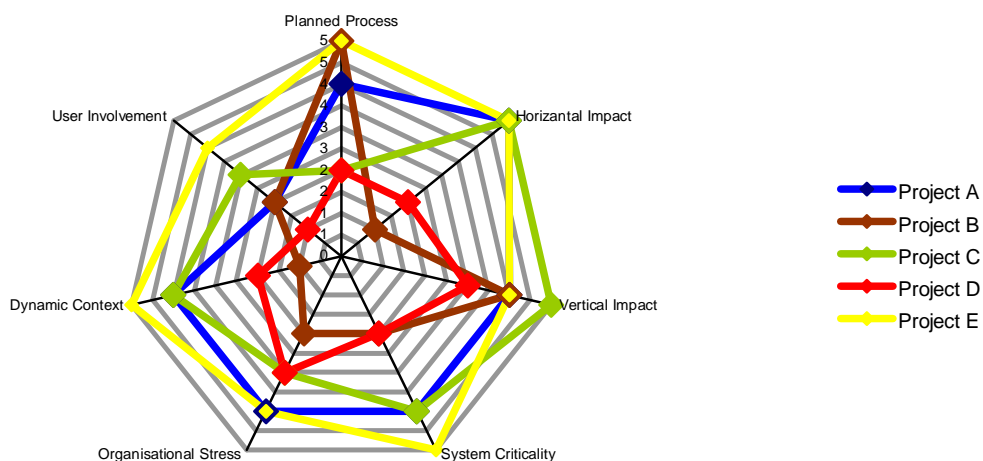


Figure 8. Project Profiles



9.3 Respondents profile / Interview Timetable

The full list of interviews carried out including respondent details is provided in the tables below:

Organisation: Waterford Transport

Project: Project was aimed at replacing the existing operational system with a new bespoke development which interfaced with a new ERP package for the back office processes

Venue: Waterford

Ref	Date	Age	Gender	Role
PA01 (Pilot)	08-03-10	54	M	Project Manager
PA02 (Pilot)	08-03-10	25	F	User
PA03	22-03-10	37	M	User
PA04	22-03-10	29	M	User
PA05	22-03-10	33	M	User
PA06	22-03-10	41	F	User
PA07	22-03-10	45	F	User

Organisation: Galway Regional Hospital

Project: B- Induction of a PACS, Electronic ordering and Voice Recognition

Venue: Galway

Ref	Date	Age	Gender	Role
PB01	25.03.10	48	M	Project Manager
PB02	25.03.10	36	M	User
PB03	25.03.10	27	F	User
PB04	25.03.10	40	F	User

Organisation: Waterford Regional Hospital

Project: C- DR/CR System

Venue: Waterford

Ref	Date	Age	Gender	Role
PC01	19.03.10	44	M	Project Manager
PC02	19.03.10	32	M	User
PC03	19.03.10	29	F	User
PC04	19.03.10	28	F	User
PC05	19.03.10	37	F	User
PC06	19.03.10	50	F	User
PC07	19.03.10	21	F	User

Organisation: Naas General Hospital



Project: D-Introduction of PACS and VR to a new Imaging department

Venue: Naas

Ref	Date	Age	Gender	Role
P101	13.04.10	35	M	Project Manager
P102	13.04.10	33	F	User
P103	13.04.10	27	M	User
P104	13.04.10	31	M	User
P105	13.04.10	25	M	User
P106	13.04.10	29	F	User
P107	13.04.10	38	F	User

Organisation: An Garda Siochana

Project: E- Introduction of PULSE-Police Using Leading Systems Effectively

Venue: Garda Headquarters, Dublin

Ref	Date	Age	Gender	Role
P101	31.03.10	45	M	Project Manager
P102	31.03.10	43	F	User
P103	31.03.10	50	M	User
P104	31.03.10	29	M	User
P105	31.03.10	34	M	User
P106	31.03.10	36	F	User
P107	31.03.10	24	F	User

9.4 Organisational, Political, and System-Focused Determinants

9.4.1 Organisational Focused

Responses related to organisational focused resistance are shown in Figure 9:

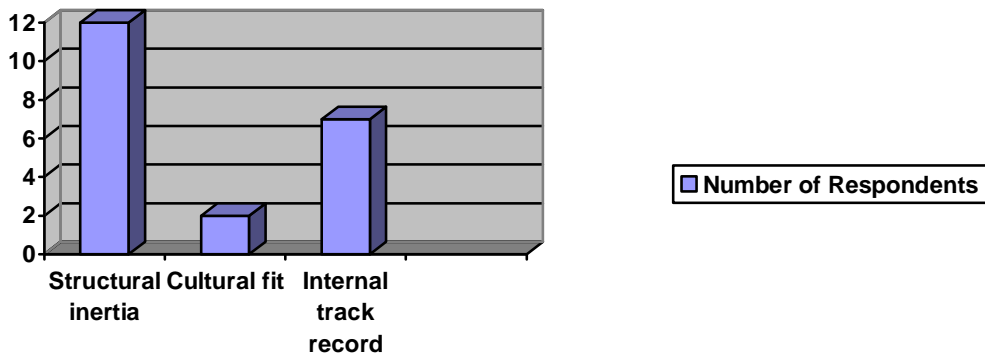


Figure 9. Organisational-Focused Determinants

Structural Inertia	Projects		Influence	
<p>Twelve respondents related resistance to structural inertia mostly in terms of expertise in the old systems. The degree of resistance increased when users had been trained and used the old system extensively. This was the case even when users were aware of problems with the existing system. Supporting this view but from the opposing perspective, in the new Computer Radiography (CR system) system (Project C).....</p> <p><i>...was a situation where there was nothing. A new system and new roles were setup to run the new process. There was acceptance of the system and we did not encounter and resistance whatsoever</i></p>				
Cultural Fit	Project		Influence	
<p>Incongruence between the proposed system and the existing system organisational culture was not a predominant factor in the discussions and was only raised by two interviewees. Users of the new health system faced major challenges as entire departments had to make the cultural leap from paper-based system to computer-based systems, while a respondent on project A discussed how....</p> <p><i>.....before the system no one was working the same, everyone had his own way of working, and the old system catered for that, flexible lack of control tailored functions for specific users. The new system tried to standardise the workflows, put very stringent control which did not go down well with users.</i></p>				
Internal track record	Projects		Influence	

Seven interviewees recalled how experience of previous IT projects influenced peoples' attitude towards the change. As expected successful projects helped build trust in IT, however experience of problematic projects was also found to have the beneficial effect of enabling users to set more realistic expectations on the challenges ahead and be more tolerant of the issues being encountered:

We had experienced a change in IT systems, so we had known about change. We knew that it's a game of compromises. We knew that it is unlikely that any one piece of software will have, absolutely everything, absolutely perfect just the way you want it....the response was that we've been through it before so we will do it again.

9.4.2 Politically Focused

Politically focused causes of resistance are summarised in Figure 10:

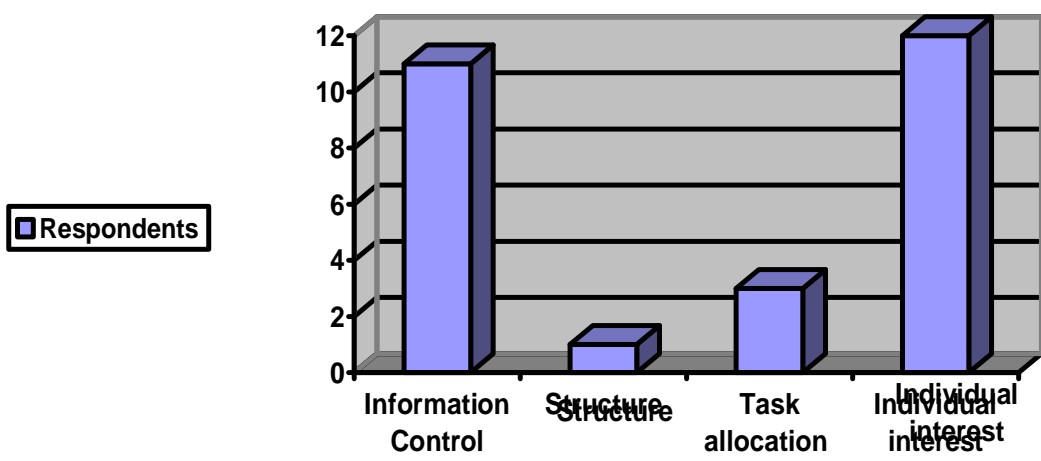








Figure 10. Political-Focused Determinants

Information Control	Projects		Influence	
<p>11 respondents discussed the influence of perceived information control. While most users alleviated their concerns as they realised they had sufficient information to do their job, other users consciously did not share their knowledge of the system and even used the new sources of information for their personal gain outside the organisation.</p>				

Raising this theme from a different angle, other users....

...in the finance department were scared that people outside of the department could now manipulate information that was previously under absolute control of finance



Interestingly, in some cases users were willing to accept additional workload as long as they had access to new reports which helped satisfy customer queries.			
Structure	Project		Influence 
In line with the interaction theory, one of the interviewees had a negative attitude as he felt the system was not designed to improve his front line job but to empower the financial department.			
Task Allocation	Project		Influence 
Three respondents confirmed that when users are asked to perform tasks they do not want to do, such as when senior doctors had to start using a PC, resistance increases. This was supported from the other point of view: <i>When we told secretaries that they will be doing more administrative work rather than just typing, they handled it very well as it was something they had been aspiring for.</i>			
Individual Interest	Project		Influence 
12 respondents experienced resistance attitudes associated with individual's gain or loss of power as perceived by the individual. Users who saw this opportunity were more proactive and pushed the project forward and in a number of cases these users managed to fulfil their interest. However when users realised that their expectation were unachieved their attitude changed: <i>The whole idea was that some people felt they would be better thought of by the company possibly even promoted purely and simply because they were termed super-users...As the project got delayed they found that being a super-user was not going to amount to anything to write home about and they lost all the initiative they had.</i> Unsurprising this influence revealed rife politics including users not using the system simply to place a colleague aspiring for promotion in a bad light and users complaining excessively on trivial matters to extend their temporary overseas contracts or to increase their income through overtime. <i>There were also concerns from people who were frightened that through the system we would know exactly what they are doing and start measuring their productivity</i>			

9.4.3 System Focused

Responses related to system focused determinants are summarised in Figure 11:

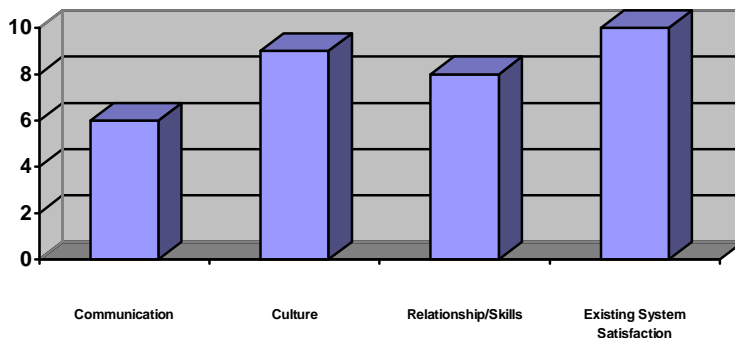


Figure 11. System-Focused Determinants

Communication	Project		Influence	
<p>5 respondents lamented about communication issues due to jargon and difficulties with the supplier being off-site while on other cases a stark lack of communication frustrated users. The positive influence of this factor was also identified:</p> <p><i>The trainers could use the business language and explain how the system will fit in the business. I think this was very useful in the implementation process as users felt at ease to raise concerns and issues without hesitating.</i></p>				
Culture	Project		Influence	
<p>10 users felt that some issues were rooted in the friction that existed between IT and the business. Users felt IT did not understand the business aspect of the system sufficiently, while IT complained that users just want problems fixed immediately without appreciating the underlying complexities. This cultural rift was evident even through the repeated use of “us – them” language throughout the interviews</p>				
Relationship	Project		Influence	
<p>Eight respondents found that a poor relationship between the supplier and the business influenced users’ attitude towards the system through ongoing difficulties and poor system support. On the positive side:</p> <p><i>We supported users on a 1-2-1 basis. Each user has his own “buddy” to support him from our office. In fact, we established a personal relationship with most users, and they would call and ask for their buddy.</i></p>				

Existing System Satisfaction	Project		Influence	
<p>A factor which was not distinctly identified in the literature review but was mentioned directly by 10 respondents was the degree of satisfaction with the existing system. Users who were using what was</p>				

perceived to be an efficient system manifested high resistance when the new system did not perform as well, Contrarily...
...other people recognised that a lot of things that were wrong with the old system, which was causing them problems in doing their work, and therefore they wanted to change.
 However, in these cases, users initially showed little resistance to change, but any system problems caused very determined resistance with statements of “absolute horror” when users saw the system as they had expected it to be a lot better.

9.5. Individual-Focused Determinants

9.5.1. Perception and Interpretation

Responses related to system focused determinants are summarised in Figure 12:

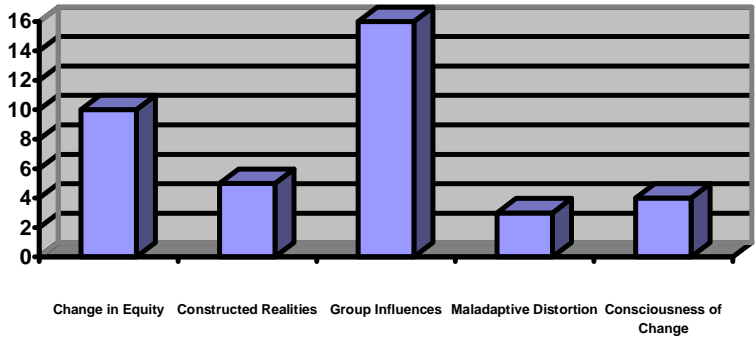


Figure 12. Individual-Focused Determinants

Change in Equity	Project		Influence	
Users’ perception of a change in equity was one of the strongest factors that came out of 10 interviews. These included perceptions that the system would make their job more complex through longer processed and an increase in workload which was the most cited factor, although a slight reduction in workload helped users adapt a more receptive attitude, when this was of an extent that it bordered with a perceived risk of redundancies it led to strong resistance.				

Constructed Realities	Project		Influence	
Six interviewees talked about attitudes influence by constructed realities mostly formed through past experience in line with the attributional theory, users who had experienced difficult projects formed realities with lowered expectations which helped them to be more tolerant of issues. However experience of projects with strong negative impact nurtured a resigned or even cynical attitude:				

People feel frightened, because they have seen that the software that we put in has actually knocked jobs out of the company so the people who are left are cautious, nervous, possibly reluctant, to take on board any new announcements.

Other users manifested a complacent attitude and resisted change in order to maintain current success.

Group Influence	Project		Influence	
------------------------	---------	--	-----------	--

Responses related to group influence came in the 3 flavours shown in figure 13:

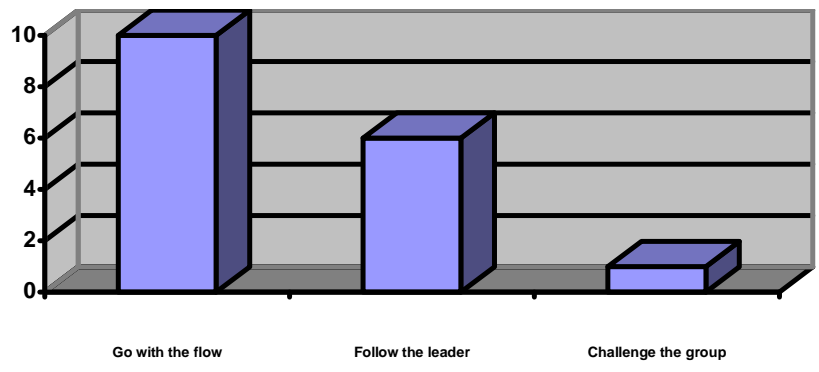


Figure 13. Group Influence

Peer pressure was evident and very effective in converting some of the most resistant users. Others were heavily influenced by the positive or even the negative attitudes of perceived leaders and respected colleagues. One interviewee stressed that he went against the flow and challenge strongly resistant colleagues. Interestingly, this particular individual got promoted during the project suggesting that perceived power factors overcome group influence.

Maladaptive Distortion	Project		Influence	
-------------------------------	---------	--	-----------	--

Three respondents confirmed the theory that people can be negative about themselves. *They were literally afraid of using the computer because they would do something wrong. They had this mentality.*

Consciousness of Change	Project		Influence	
--------------------------------	---------	--	-----------	--

A factor which was not identified in the literature but clearly has an influence on user's attitude was the degree of consciousness of the driving forces of the change. Discussions on this topic during four of the interviews suggest that when users understand that change is necessary and cannot be avoided such as because of EU legislation they manifest lower resistance.

9.5. 2 Cognition

Results on logical evaluation of the impact of change based on ease of use and system usability factors as follows:

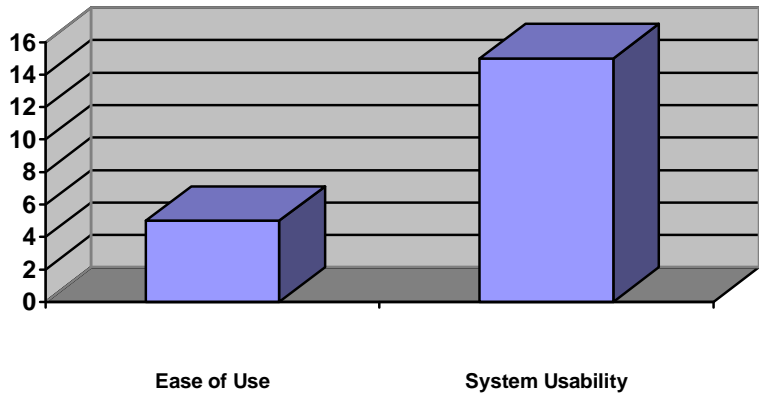


Figure 14. Cognitive Factors

Ease of use	Project		Influence	
<p>Five users confirmed that a system that is perceived to be easy to use will facilitate adaption and will face lower resistance and vice versa</p> <p><i>Initially users were not apprehensive, they were looking forward to the system as they expected it to make their life of inputting data and processing jobs a lot easier. The staff's reaction when they saw the system they were shocked...the process was much longer and complex that with the old system.</i></p> <p><i>Some users were not comfortable with the voice recognition software...when we added the option of dictating their report into a digital audio file, which is typed in by the secretaries, the usage of the system increased overnight.</i></p>				
System Usability	Project		Influence	
<p>The logical evaluation of the benefits derived by the system emerged as a strong determinant of user's attitude towards the system as evidenced in 15 interviews</p>				

Responses supporting this view included:

As we started using the system the attitude sort of changed because the system was not performing up to what they expected, speed wise and bugs and errors which hadn't been captured in testing.

The system was holding them up and causing problems. It was then seen as a hindrance and it affected them as they became more frustrated just because of the failed usability of the system....the system that had promised to automate everything and make life easier, had suddenly just tore everything into pieces.

On the other hand, perceived benefits helped user's embrace the system:

This particular system was very well received; users liked it immediately and were full of praise rather than complaints. This is because the system is very good and is of full help to healthcare professionals. Users saw a very high benefit in the system which helped them accept the system and be enthusiastic about it.

9.5.3 Emotions / Personal Characteristics

Results on individual's emotions and characteristics are summarised in Figure 15:

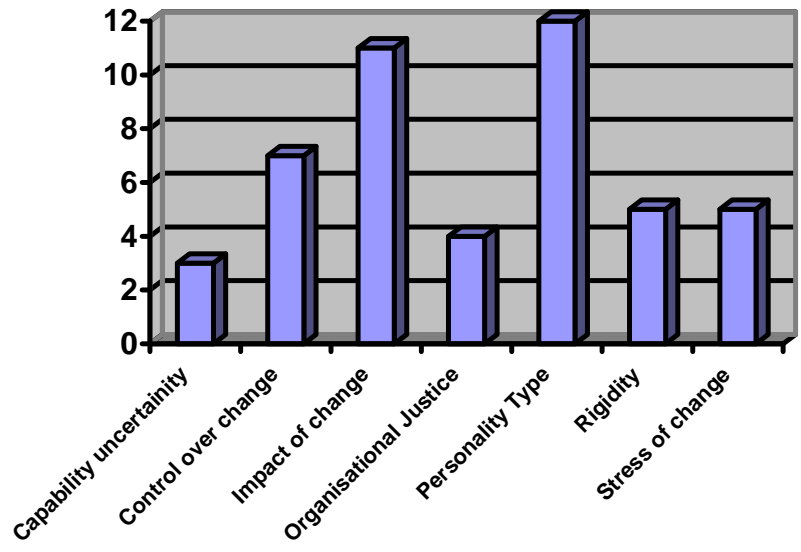


Figure 15. Emotional/Personal Characteristics

Capability Uncertainty	Project		Influence	
Three responses suggested users' resistance due to the individual's uncertainty in their capability to change and learn new skills such as learning to use computers				
Control Over Change	Project		Influence	
Four respondents raised concerns on the degree of control they had over change: <i>Users get disappointed and frustrated when they ask for changes and they are not accepted...because they feel that they do not have a say on the design of the system, they feel it is being imposed on them</i>				
Impact of Change	Project		Influence	
10 respondents talked about resistance related to the perceived change impact. When impact was perceived to be low, users were not too concerned about the change while perceived high impact (in different forms) led to strong resistance. <i>We were heading towards integrating the operating software with the financial software. Certain people said "oh the reason they must be doing that is because they must only be handling information once, therefore, do</i>				



<i>they need me?" So we had personnel issues there.</i>			
Organisational Justice	Project		Influence
<p>Four users were resistant because of strong perceptions of unfairness in the change bordering on violations of psychological contract:</p> <p><i>It is very frustrating, it is okay for management, but it is awkward for the people out there, to get aggravation from the customer and when they try to use the software it can't get the job right. It is not fair that staff have to put up with the complaints because they are not given the tools</i></p>			
Personality Types	Project		Influence
<p>12 interviewees confirmed how attitudes vary amongst different individuals within the same context due to their personality characteristics in appraising the situation. The responses covered a broad spectrum from natural complainers to others who were more open to new experience and..</p> <p><i>...saw the project as a way to do something new, something challenging, something exciting that they could apply some thinking to it</i></p>			
Rigidity	Project		Influence
<p>5 interviewees referred to resistance arising from a general fear of change. The more rigid individuals are less adaptable to change and thus more resistant. An extreme case was:</p> <p><i>This person was a one man job. Assign him one task and he would perform it well. But if you ask him to change his method, he would get lost or go out on sick leave. He couldn't cope with change and was eventually boarded out.</i></p>			

Stress of Change	Project		Influence
<p>Discussions with 5 interviewees suggested resistance attitudes being influenced by the degree of stress suffered by the individual throughout the change. This pressure made some users more nervous and led to strong negative reactions even when minor issues were encountered.</p>			

9.6 Participation Benefits

The following section categories the results related to the benefits of participation in Cognitive, Motivational and Situational benefits.

9.6.1 Cognition Benefits

A number of responses found tangible and evident benefits of participation in terms of improved system quality and effective use as summarised in Figure 16:

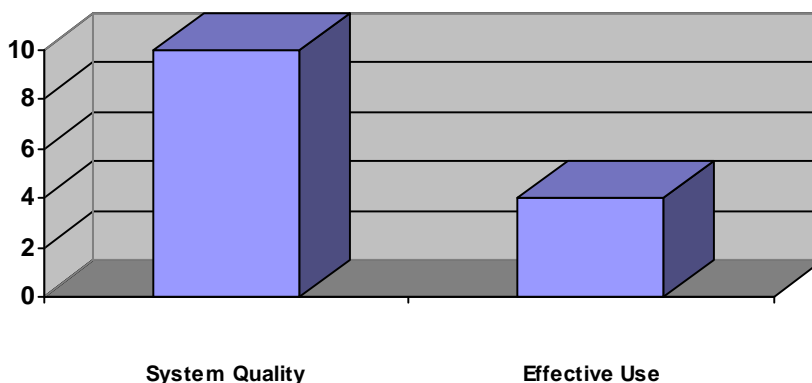


Figure 16. Cognitive Benefits of Participation

System Quality	Project	
<p>10 respondents strongly believed that additional participation would have resulted in a better quality system that accurately satisfies user requirements:</p> <p><i>If we had been asked we would have said it would not work, but nobody asked us. We would have said that this process can't work. But we were at the end of the line and just being dumped upon. You need involvement to communicate and get feedback from the users. You can't assume that you know all the requirements by talking to the manager, you must involve all the end users as issues are often revealed which not even his manager is aware of.</i></p>		

Effective Use	Project	
<p>4 Respondents saw participation as enabling greater understanding of the system resulting in more effective use:</p> <p><i>....the system was totally different from our working practices. Then by sitting down with the key users we managed to set the system parameters to minimise the impact, showed them some workarounds, and they are all now very happy with the system.</i></p>		

9.6.2 Motivational Benefits

Several interviews were adamant on the motivational benefits of participation. The responses in this category are summarised in Figure 17:

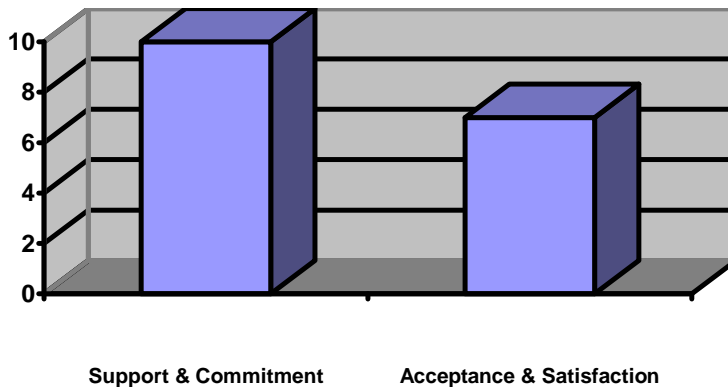


Figure 17. Motivational Benefits of Participation

System Quality	Project	
<p>10 respondents strongly believed that participation activities lead to a sense of commitment and ownership.</p> <p><i>I am a firm believer that we should have involved more people than we did. Just to make them feel part of the process. I had a different opinion because I was involved from the start and I was asked what we can do to improve this and that. That helped with my attitude towards what we were trying to achieve.</i></p> <p><i>With this increased involvement, we are seeing increased commitment from users and increased ownership. Even when things start to go wrong, they realise and come up with recommendations instead of pointing to IT. They are pulling the same rope as they are involved in the project.</i></p>		
<p>There were cases where lack of ownership led to users increasing complaints about the design of the system and avoid using it.</p> <p><i>So people then started to get detached from it, and that caused problemsbecause I don't think they felt they had true ownership of it, it was almost somebody else's software.</i></p>		
Acceptance and Satisfaction	Projects	
<p>7 Respondents found that participation increases users acceptance and satisfaction by encouraging realistic expectations and facilitating the perceived usefulness</p> <p><i>Because I was involved I knew exactly how the new system would work and what it would allow us to do, it wasn't a black box for me as it might have been for other users who were not involved</i></p>		

9.6.3 Situational Benefits

Feedback related to the situational benefit of participation is summarised in the figure:

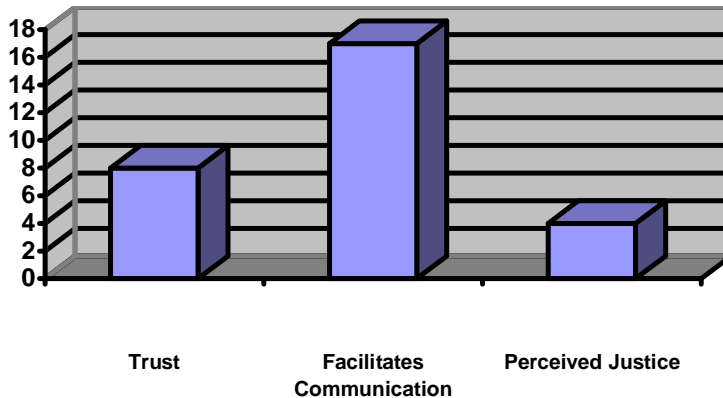



Figure 18. Situational Benefits of Participation

Trust	Project	
<p>10 Respondents found participation essential to understand people’s concerns and build a relationship of trust between the business and IT. This personal relationship led to a smoother implementation as users show more commitment when they are requested something by someone they know. <i>It was almost a change for users to experience someone to actually sit there with them, they certainly appreciated it. It helped relieve their frustration because they actually felt that they were telling somebody what was their problem, they were being listened to and they were getting their message across. With this increased involvement we are seeing increased commitment from users and increased ownership. Even when things start to go wrong, they realise and come up with recommendations instead of pointing to IT. They are pulling the same rope as they are involved in the project.</i></p>		

Facilitates Communication	Project	
<p>All 17 respondents found benefits of participation in setting a stage to communicate system benefits and impact while allowing users to raise concerns and discuss solutions.</p> <p><i>Increased participation would have helped to share the benefits of the system, rather than leaving people on their own to try and figure them out for themselves..... we actually had to tell users that when someone finds something new, stand up and tell the team</i></p> <p><i>My first experience of an IT project was a user, IT people used to come down from the 4th floor as if coming from Mars to deploy our system. They didn’t know what they were doing, we left them at it as they did a</i></p>		



<i>mess, and only after they started talking to us did things improve.</i>		
Perceived Justice	Project	
Four respondents explained how participation provides a sense of control to the individual and the associated organisational justice: <i>We are trying to have a full consultation with the key users of the various departments, to understand how they use it and how we can actually improve, and scoping through with them...This should help people feel in control of the change rather than feeling change pushed on them</i>		

9.7 Summary

The results on the determinants of resistance as presented in this chapter are summarised in the chart overleaf:

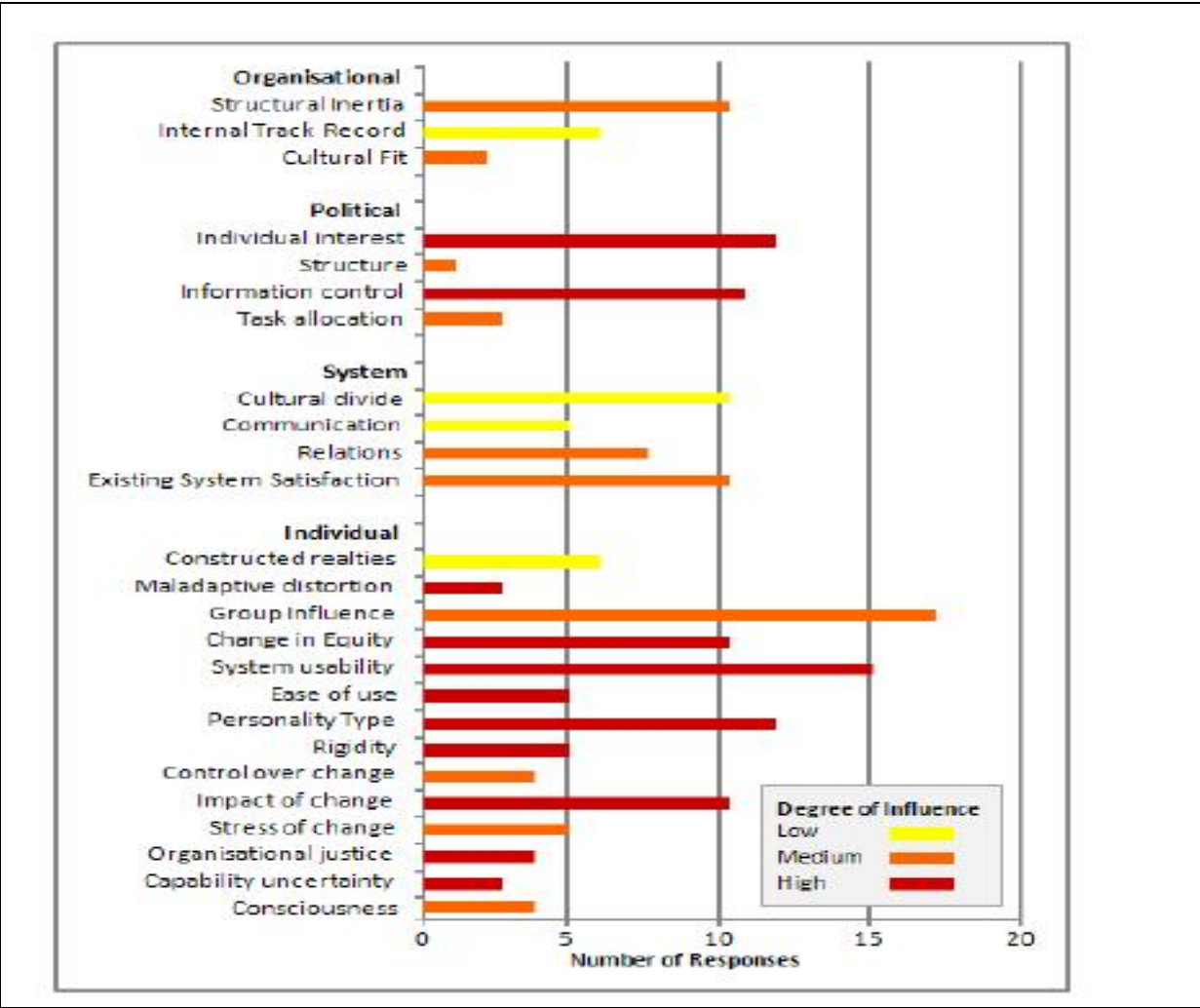


Figure 19. Determinants of Resistance

This data, together with the responses on the influence of participation will be analysed and discussed in the following chapter.

10.0 Discussion

10.1 Introduction

This chapter will analyse the field work results and draw on the available literature in order to answer the questions laid out in this research. This discussion will aim to develop an improved understanding of what leads individual to resist change and how it can be mitigated through participation activities.

10.2 A ‘Dartboard’ Perspective

Understanding users’ experiences as presented in the results chapter is necessary to develop a strong understanding of the root causes of resistance. However in analysing this low-level perspective a substantial degree of overlap between determinants was encountered making it desirable to view the low-level components from a higher-level perspective.

Drawing upon the “Perceptions, Cognition and Emotional” framework (Elisur & Guttman, 1976; Ellis & Harper 1975; Schleisinger, 1982) utilised for presenting the literature review on individual focused resistance and adapting it for the current results context, the following model was developed:

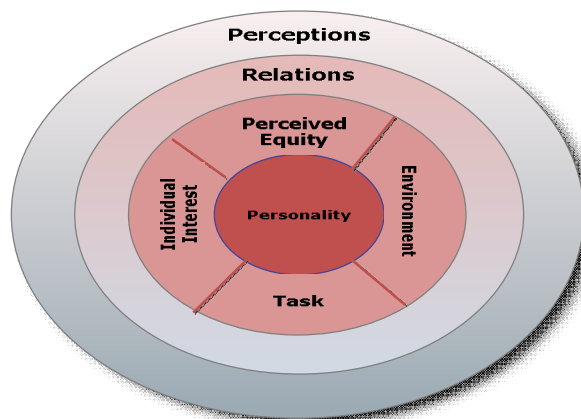
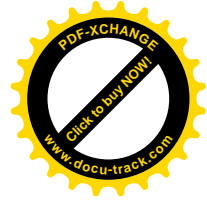


Figure 20. Perceptions, Cognition, and Emotional (Source Author)



This alternative view provides a logical and practical viewpoint on the results as experienced by the individual whilst avoiding conceptual overlaps. The layers of this viewpoint are discussed as follows.

10.2.1 Perceptions

The results sustain the attribution model of resistance (Martinko, 2004), with individuals approaching change with ingrained perceptions on what the change will bring about. It was found that determinants leading to the initial change perceptions are not directly influenced by the existing change programme but through past initiatives and experiences as predicted by Schneider et al. (1996a).

Constructed realities were also proven with users manifesting resigned and cynical attitudes as described by Ford et al. (2002). These sources influencing perceptions are summarised in Table 4, together with the degree of influence they exert on attitudes as presented in the results:

Table 4. Sources Influencing Perceptions

Factor	Literature	Influence
Internal Track record	Schneider et al., 1996	Low
Constructed Realities	Berger & Luckmann, 1966 Watslawick, 1984; Weick, 1979	Low

10.2.2 Relations

As maintained by the interactionist perspective on IT related change (Barley, 1990; Burkhardt, 1994; Burkhardt & Brass, 1990), it was found that during the change programme, individuals initial perceptions are directly influenced through relations with work colleagues, IT staff, trainers, and change drivers. Cultural issues between IT and the business were also raised frequently during the interviews. These complex interactions of the system with the social fabric of the organisation had an influence on user attitudes and were rooted in the following determinants:

Table 5. Sources Influencing Perceived Relations

Factor	Literature	Influence
Cultural Divide	Schein, 1996	low
IT Relations	Hornby et al., 1992, Clegg 2000, Rochart et al., 1996	medium
Communication	Vecchio, Hearn, & Southey, 1996	low
Group Influence	Edmondson, 1999; Lee 1997	medium

10.2.3 Equity

Subsequently, relations influence individual’s perceptions on lost or gained equity. To facilitate a better understanding on the board range of determinants that relate to equity theory (Joshi, 1991), the dartboard perspective considers three categories of equity, namely: “Environmental”, “Task”, and “Individual Interest”.

Environment-The fieldwork confirmed that IT systems have a strong influence on the environment in which the individual works. Although this impact is not targeted directly at the individual, the results show that a perceived negative impact on what’s going around users will promote a resistance attitude. The factors from the fieldwork that pertain to this category support the socio-technical perspective and include.

Table 6. Sources Influencing Perceived Equity

Factor	Literature	Influence
Stress of Change	Marakas & Hornik, 1996	Medium
Organisationnel Justice	Schein, 1988 ; Rousseau,1989	High
Cultural Fit	Schein, 1992	Medium
Structural Fit	Trader-Leigh, 2002	Medium
Existing System Satisfaction		Medium
Change Consciousness		Medium

The literature on the Individual/Environment fit (Holland, 1985) also pertained to this layer of the dartboard model, however this element was not specifically raised in the interviews, suggesting it is not that wide spread or easily recognisable.



Task- The results confirm that one of the primary evaluations carried out by individuals when accepting or rejecting a system is on the impact it will have on their tasks. Perceived benefits help users accept a system in supporting their task are a strong motive for resistance.

Factors which influence this evaluation on task impact are rooted on the Interaction theory of resistance (Markus, 1983) and the TAM model (Davies et al., 1989).

Table 7. Factors of Influences on Task

Factor	Literature	Influence
	Markus, 1983, Mumford & Pettigrew, 1975	Medium
Information Control	Danisanger et al., 1982; Pfeffer, 1981; King & Iacono 1984	High
Structural Inertia	Greenberg & Baron, 2002	Medium
System Usability	Davies et al, 1989	High
Ease of Use	Davies et al, 1989	High

Individual Interest – The interview discussions suggest that following an evaluation on the environmental and task related changes in equity, a deeper evaluation of equity change is assessed at a more personal level by considering the findings in Table 8:

Table 8. Factors of Influences on Individual Interest

Factor	Literature	Influence
Individual Interest	Greenberg & Baron, 2002	High
Change in Equity	Joshi, 1991	High
Control over Change	Kyle, 1993 ; Rotter, 1966	Medium
Impact of Change	Kyle, 1993 ; Rotter, 1966	High

10.2.4 Personality

All the interviews support the fact that ultimately, acceptance or resistance to change is very strongly dependant on the individual's personality. Elements in this category include:

Table 9. Factors of Influences on Personality

Factor	Literature	Influence
Maladaptive distortion	Coghlan & Rashford, 2006	High
Personality Type	McCrae & John, 1992	High
Rigidity	Kotter & Schleisinger, 1979	High
Capability uncertainty	Kaplan & Sadock, 1998	High

The perspective on the determinants of resistance indicate that the fieldwork results are very much in line with the theory discussed in the literature review and there were no stack conflicts (See Table 9).

10.3 The Spiral Model of Resistance

Analysing the determinants intensity of the research results from this ‘dartboard’ perspective reveals a relationship between the model categories and influence on resistance. Quantifying the influence intensity to a 1, 2, and 3 rating (Low, Medium and High) and plotting the average influence within each category against the categories within the dartboard result in the following graph.

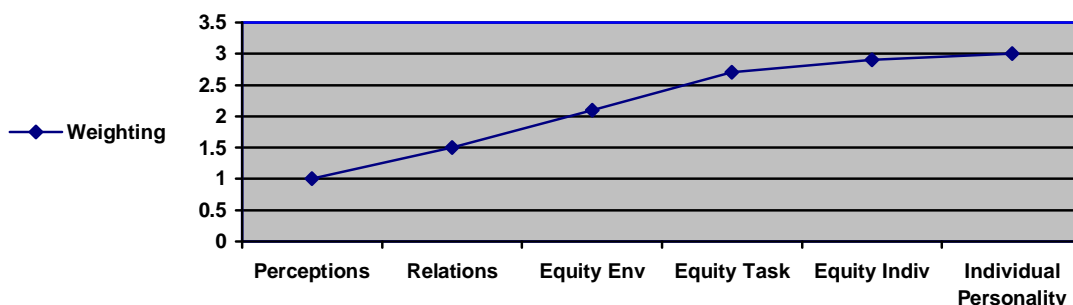


Figure 21. Average Intensity of Determinants in Category

This relationship suggests that the influence of factors on attitudes increases along the layers of the ‘Dartboard’ model.

By applying this ‘intensity’ dimension to the ‘dartboard’ model, the determinants of resistance can be conceptualised as a three dimensional spiral with the spirals widening to reflect the greater impact. At each turn of the spiral, the individual will face attitude-influencing determinants related to that respective category. As the individual goes down the layers of the spiral, the determinants

exert a greater impact on the individual and will increasing influence his attitude towards the acceptance or resistance of the IT system. This concept is shown in the ‘spiral-model’ (See Figure 22).

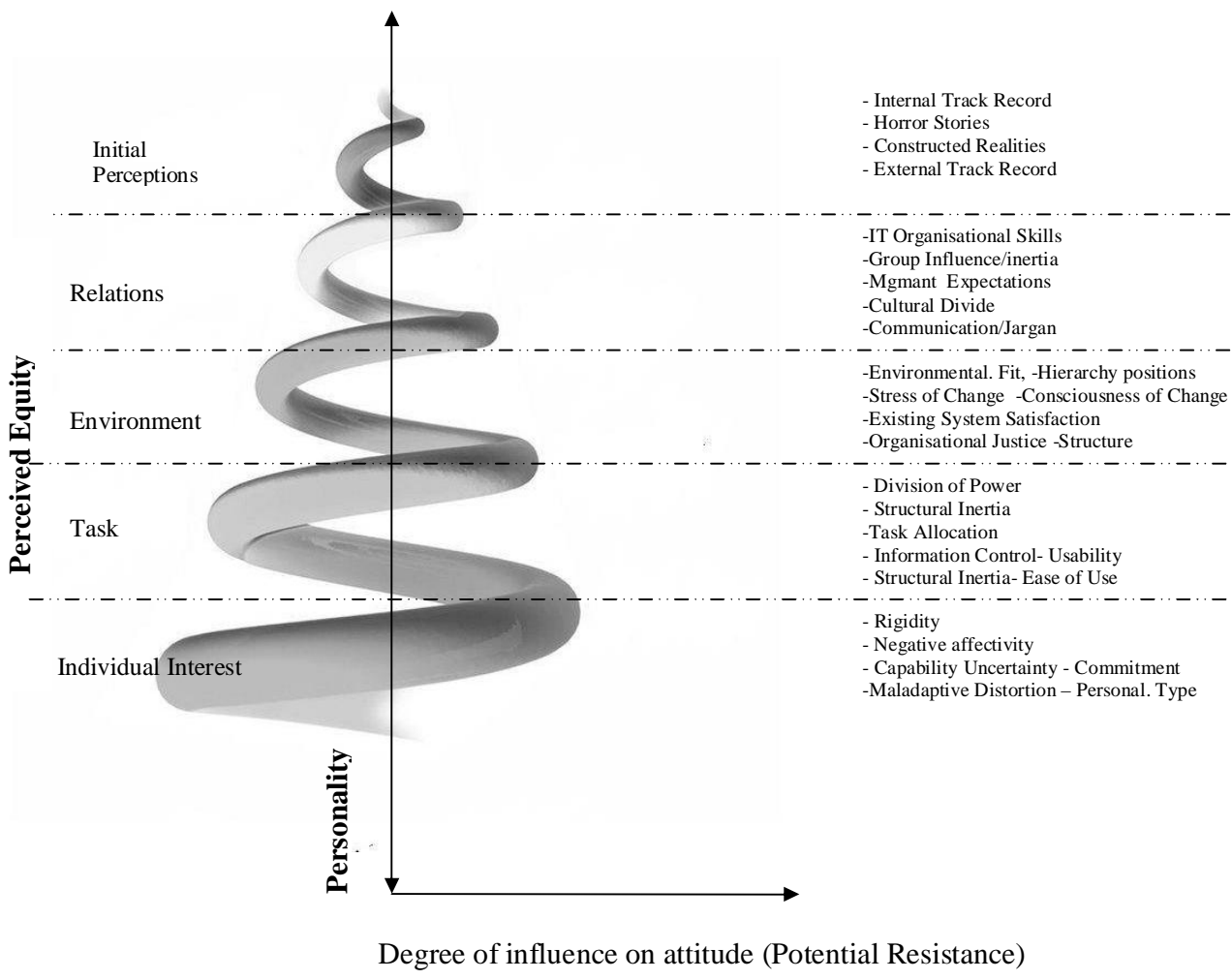


Figure 22. Spiral Model of Influences on Attitude

As evidenced in the research results, although individuals may be placed in similar circumstances, they experience the change differently and manifest dissimilar behaviour. The results indicate that the core reason for this lies in different personalities and individual characteristics. The spiral model considers this fundamental aspect by including personality as an axis around which the individual’s experience materialises.



Indeed, different individuals may encounter exactly the same factors on the same layer of the spiral because of their different personalities they may not be influenced in the same manner. Thus, personality can be prepared to a lens through which the individual evaluates how the change will impact him. Individuals with negative attitude will view a magnified negative impact, while positive forward looking personalities will view the same challenges as opportunities.

In tune with the multilevel theory of resistance (Lapointe and Rivard, 2005), this spiralling process is iterative. With every passing through this spiral, an individual experiences relations with his peers and IT, which lead him to reconsider his perceptions and reevaluate equity accordingly.

As individuals assess new information to refine their perceptions of the situation, they may change their focus and degree of resistance. This process may result in both improving and deteriorating attitudes such as evidenced in interviews with users who had to use a system which did not meet their expectations. This concept is expanded further as follows:

10.4 Perceptions and Expectations

It is evident that perceptions are a powerful source of influence on individuals attitude throughout the change. The initial perceptions on the objects of resistance (Jermier et al., 1994) and perceived threats to their ego (Freud, 1921) during the initial stages of change gradually evolve towards the new sense of reality for the individual. Although each individual will follow a unique path, the results suggest two predominant contrasting scenarios as follows:

10.4.1 Initial negative perceptions

When users had initial negative perceptions on the change, either because they were satisfied with the current system or they had constructed negative realities based on previous track records, they tended to manifest high initial resistance, supporting literature findings that users who want to mention current success are the most difficult to displace (Johnson and Dye, 1995; Johnson, 1988; Nichols, 1993)

This attitude led to poor expectations on the benefits of the change, and difficulties in acknowledging the benefits. However when they overcome the change factor and started using the system, in most cases they found that the system exceeded their expectations and they accepted with low resistance.

10.4.2. Initial positive perceptions

Contrastingly, other users were looking forward to change as they were more sensitive to the existing system flaws, or identified opportunities for increased equity. In these cases, users had high expectations and understood the benefits leading to a low resistance attitude. In these cases, there was a high risk of the system not being up to the perceived expectations and indeed the users manifested very low tolerance to any issues or flaws presented by the system leading to very high resistance. These two contrasting scenarios in attitude change were evident in several interviews.

10.4.3 Understanding the gaps

A further insight into this relationship between the expected impact and resulting attitude can be derived by adapting the SERVQUAL model typically used in marketing to understand gaps between customer's expectations and perceived service. This adapted model is shown in figure 23:

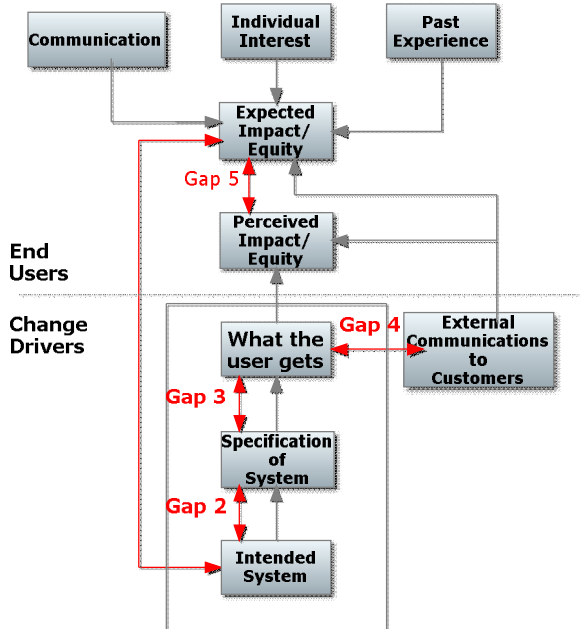


Figure 23. Adapted SERVQUAL (Parasuraman et al., 1988)



This model identifies the gaps between perceived and expected impact of change through a function of 5 potential gaps ($G5 = f(G1-4)$) at various stages of the process leading to overall user dissatisfaction (resistance).

These gaps will be described in the next section which will consider how participation and involvement activities can help close these gaps thus shedding light on the influence of these activities on the individual.

10.5 Closing the Gaps Through Participation and Involvement

Gap 1: What change drivers consider important vs. what is important for the end user

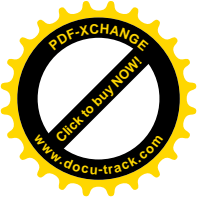
As highlighted in the literature (Armenakis et al., 1993; Strauss, 1998; Winslow, 1998) and supported by the results, participation activities are necessary for users to be committed and take ownership of the change programme. Through these activities, users can raise their needs and ensure that what is really important to them is set as an objective within the programme. This aspect could have addressed instances such as those evidenced in the results when users did not have the opportunity to raise their requirement for high system performance as the change drivers were focused on accuracy of data.

Gap2: Intentions vs. Design of the Change Programme

The results of this study supported the concept under the theory of cognitive benefits of participation in that, benefits of participation can be used to ensure that the system will be designed to meet the users' requirements. Furthermore, the results also indicated that benefits of participation can help in foreseeing what the system will look like from an early stage. This is necessary to help them set their equity expectations accordingly, highlight flaws and missing gaps for increased cognitive benefits and keep them part of the process.

Gap 3: Design vs. Delivery

Participation also assists the development team in verifying with users that the system is being developed according to the agreed designs. This aspect was supported by the results which found



participation crucial for high system quality and effective use (Ives and Olson, 1984; Robey and Farrow, 1982).

Gap 4: What is Delivered vs. The Promise of What Would be Delivered

As discussed in the previous section, initial expectations are crucial towards the attitude of the users throughout the process and when users start off with high expectations, it will strain the process and widen the gaps. In this aspect participation is essential to understand users' expectations and make them aware not only of the system benefits but also of its limitations. Setting realistic expectations not only makes it easier to satisfy users and thus reduce a resistance attitude, but also provides a sense of organisational justice.

Gap 5: Users Expectations vs. Perceived Delivery

Thus, by setting realistic expectations and involving users throughout the process to deliver a high quality system the various gaps described above will be reduced leading to closer match between what the users expect and what they get with the result of a higher user satisfaction.

10.6 The Influence of Participation on the Spiral Model

Following the discussions on what leads users to resist change as summarised in the spiral model and the insight on perceptions and expectations as described above, this section will close the discussion by considering the influence of participation and involvement activities on users' attitudes following the spiral model layers:

10.6.1 Perceptions

By explaining the details of the change and addressing concerns, participation, and involvement activities can help users overcome their perceptions and constructed realities based on track records and horror stories to a more realistic view.

However, as evidenced in the results, the strongest influence of participation activities will be enabling more success stories that create a virtuous circle of positive track records enabling users to approach future change initiatives with an increasingly positive attitude.



10.6.2 Relations

The results strongly support the literature in that participation activities are essential in building a relationship of trust between the users, change drivers, and the IT suppliers leading to diminished cultural barriers between parties. This relates to the early concepts of ‘mutual relationships’ between the scientist and manager as discussed in the scientist/manager philosophical view on IS resistance (Churchman and Schainblatt, 1965).

10.6.3 Equity (Environment, task, individual interest)

a) Environment

The research results support the literature theory that participation offers an opportunity for a degree of control over the change which leads to an increased perception of organisational justice.

Although improved cultural, structural and environmental fit were not highlighted as benefits of participation during the interviews, it is plausible to assume that participation can offer the change driver a deeper insight into the users way of doing things and thus tune the system and change design to align with the existing culture and environment.

While the results indicate that overloaded stressed users were more resistant towards change, participation was not found to improve the aspect. This situation could only be achieved by accepting that resources have to dedicate time for the change, which will reduce their production levels. When this is not acknowledged, the interview discussions suggest that it would lead to perceptions of injustice.

It has been found that the degree of existing system satisfaction has a strong influence on users’ attitudes and in setting the perceived expectations. On this aspect participation can help users be satisfied with the status quo to understand the drivers for change and highlight the system benefits without raising unrealistic expectations.



On the other hand users who are strongly dissatisfied and are willing to change should be made aware of the risks and limitations of the new system. What must be achieved is a consciousness for change and realistic expectations in all cases.

b) Task

It has been shown that specialisation influences users' initial perceptions to change related to division of labour and task allocations. Through participation activities, users can gain a realistic view of the changes to their task and any opportunities this may bring about such as the new administrative duties of secretaries quoted in the results. By participating in design, users are provided with an opportunity to raise any concerns they might have at an early stage of the process and ensure they have the degree of information control they require.

A vivid example of this was shown with the Project A where the system was not supporting users to do their job. The results also strongly support the literature in that benefits derived from participation activities results in improvements in the quality of the system leading to increased system usability and ease to use to the benefit of not only end users but also IT.

c) Individual Interest

The interviews show varies examples of changes in equity related to individual interest ranging from financial aspects and working hours to personal achievements of learning how to use computers. Participation can help users overcome their difficulties, and provide them with a sense of control over their destiny in the change process and mitigate the impact of change.

10.6.4 Personality

As expected, the interview results confirmed that personality has a strong influence on users' attitudes towards change; however, this aspect cannot be directly addressed through participation. What participation can provide is a healthy relationship and an environment of clarity and fairness in the process to motivate individuals to show their best side of their personality.



10.7 Summary

This chapter has taken a different perspective on the research results as introduced in the dashboard model. By adding a dimension of influence a deeper insight into what leads individuals to resist change has been achieved and presented as a spiral model of resistance.

Following consideration of expectations and perceptions, assisted by drawing parallels with SERVQUAL model, the discussion proceeded to understand how participation and involvement activities influence the SERVQUAL gaps and Spiral model; thereby answering the primary question of this research.



11.0 Guidelines for Implementing PACS

11.1 Issues to Consider during PACS Implementation

Users tend to have varying personality types, which may implicate varying attitudes toward changes. Some may be appropriate for the challenge, while some may display rigidity towards changes. The degree of stress that some type of users may experience has been also found to contribute to the pressure of coping with changes, further adding to the nervousness or even negative reactions toward changes. The increase in resistance was evident when the impact of change was perceived to be drastic, as compared to when the perceived impact was minimal. This resistance to change may be also attributed to an individual's uncertainty in their capability to change and learn new skills, which may involve the use of computers. Some users may experience maladaptive distortion symptoms, wherein they might feel negative about themselves; such distortion have included instances where users were to afraid of using the computer in fear of committing mistakes.

When users are asked to perform tasks they do not want to do, such as when senior doctors had to start using a PC, resistance increases. However, secretaries looked forward to doing more administrative work. Users were observed to initially show little resistance during implementation of PACS, this resistance among users were observed to increase dramatically when the system experienced difficulties. However, this change of system made users realise what was wrong with the system before, and even promoted initiatives to change.

11.2 Provide Training and Support to Users

It was revealed that users may have felt that the IT did not understand the business aspect of the PACS system sufficiently, while IT complained that users demanded that problems should fixed immediately without appreciating the underlying complexities. However, users may have experiences from previous IT projects, which may influence their attitude towards the change. As expected, successful projects helped build trust in IT; however, experience of problematic projects was also found to have the beneficial effect of enabling users to set more realistic expectations on the challenges ahead. These experiences may have resulted to the development of tolerance among



users towards the issues that may be encountered in future IT projects such as the implementation of PACS.

In the context of culture divide, there have been also issues of communications between jargons and difficulties with suppliers being off-site, lack of communication frustrated users. Hence, the implementation of 1-2-1 strategy is suggested; wherein a PACS user could be partnered to an IT supplier buddy in order to promote good rapport and improve system support for the PACS system. In an effort to address the resistance users, it is suggested that provision of an ongoing training and support system should be also implemented; especially to less adaptable users as adjustment may take more time for them. Participation was observed to be essential in building a sense of trust between the organisations and the IT suppliers. The collaboration between PACS users and IT supplier buddies was observed capable of producing a smoother implementation as users illustrated commitment.

11.3 Participation and Involvement

It is suggested that in order to address the resistance to change, participation and involvement among users should be promoted. Concerns such as information control may be addressed by participating in design, wherein users can be provided with an opportunity to raise any concerns they might have at an early stage of the process and ensure they have the degree of information control they require. Participation to the process also encouraged a sense of commitment and ownership. It was revealed by one user that when he was asked about what can be done to improve the PACS system, his attitude towards resistance was changed and redirected toward the goal of PACS. Participation among users reduced the cases of culture divide, wherein the users may blame IT alone for any technical difficulties that may arise. Instead of pushing the problem to the IT suppliers, users were able to commit and contribute to the suggestions that may be incorporated in the PACS, such as issues forums.

Participation increased the acceptance and satisfaction of users by encouraging realistic expectations and facilitating the perceived usefulness of PACS since they are well-knowledgeable of how it works. This highlights the importance of providing training and support for PACS users



as participation enabled users to further understand the system; hence resulting to effective use of PACS. Participation sets a stage for users and IT suppliers within a communicate system, which may allow users to raise concerns and discuss solutions to improve PACS. This method encourages commitment and ownership in users, as well as a sense becoming a part of the team. Hence, the participation in the improvement of PACS also encourages the exchange of feedback since the users are the ones who primarily use the system.

There was also a concern for task allocation, wherein resistance increases when users are asked to perform tasks they do not want to do. Through participation activities, users can gain a realistic view of the changes to their task and any opportunities a certain change may bring about. Furthermore, there were strong perceptions of unfairness, which was described by users as “unfairness in change bordering on violations of psychological contract”. The users reported that when PACS experienced problems, they have had to put up with clients’ complains; hence the unfairness to their positions, since they are not responsible for the occurrence of these technical problems. With the participation of users with IT suppliers, users may gain further knowledge about PACS that can help them feel in control and capable of addressing the problem or suggest solutions to IT suppliers, which may promote commitment and ownership among users. This process of having the option to participate in the improvement of PACS system may reduce feelings of changes being upon them and eventually address the perceptions on organisational injustice.

Varying examples of changes in equity were discussed earlier, which were related to individual interest ranging from financial aspects and working hours, to personal achievements, and of learning how to use computers. Participation can help users overcome their difficulties by providing them with a sense of control over their position in the change process, which may mitigate the perceived impact of change to them.

11.4 Campaign for Using PACS

Users who saw the change as an opportunity were more proactive and pushed the project forward in pursuit of individual gains. An example of this was when super-users of PACS did not see any incentive or gain in being one; hence, they lose interest. However, there were instances such as



when a user challenged and went against the strong resistance of colleagues. This individual was promoted for overcoming group influence and for being supportive of innovation. Peer pressure was also observed to be an effective approach in converting resistance users, while it was also observed that the influences of perceived leaders of respected colleagues were also instrumental to promote the adaption of changes.

A system that is perceived to be easy to use will facilitate adaption and will face lower resistance and vice versa. The ease of use will also increase the intentions of users to use the PACS system. When users become confronted with technical problems in PACS than the old system, this became a hindrance to the usability of the system. However, perceived benefits helped user's embrace the system. It has been discussed earlier that despite degrees of resistances from the perceived impact of change, users also recognised the matters that were wrong in the old system, which previously caused problems in their work, which triggered their initiatives to change. Therefore, managers should emphasise the problems in the old systems and how PACS could alleviate them, if not totally eradicated.

Managers should also promote opportunities towards becoming super-users. It was discussed earlier that super-users lose interest when they realised that there is no gain or sense of achievement of becoming one. Hence, it is essential to provide forms of incentives that could encourage super-users to retain interest and persuade non-super-users to enhance their abilities.

11.5 PACS and the Future

Aside from the promotion of opportunities towards the progression of capabilities in using PACS, it is also critical to uphold continuous efforts to acceptance of organisational changes. Changes are inevitable; specifically, with the ever evolution in IT field. Noting that changes should endorse improvements, involving the participation of PACS can be used to ensure that the system will be designed to meet the users' requirements. It has also been discussed that the initial expectations of the users influenced their attitudes throughout the change process. Therefore, it should be noted that participation could help in setting realistic expectations. In this context, realistic expectations could



strongly contribute in ensuring satisfaction of users, reduce attitudes of resistance, and provision of organisational justice.

Managers may continuously collaborate with the staff to identify progress and rooms for improvement. It is imperative for managers and users to move towards success, and foreseen barriers should not limit organisations from growth and success.

Issues to Consider during PACS Implementation

- PACS users tend to have different personality types, which entails varying attitudes towards PACS
- Increased resistance to change was observed when impact of change was perceived to be drastic
- PACS users' uncertainty in their capability to change and learn new skills may influence to their resistance
- Resistance to PACS may increase when users are asked to perform tasks they do not want to do
- Resistance to PACS increased when users encounter difficulties
- IT suppliers may be in the impression that PACS users do not understand the business aspects of PACS
- PACS users may blame IT alone for any technical difficulties that may arise in the PACS system
- Previous successful projects may help build trust between IT and users
- Previous problematic projects may help users to develop a realistic expectations and tolerance for succeeding projects such as PACS

Provide Training and Support to Users

- Implement 1-2-1 strategy to promote good working rapport between PACS user and IT supplier buddy
- Provision of trainings and support to users; specifically to users, who are less adaptable to changes and need more allowance for adjustment.
- Collaboration between IT supplier buddies and PACS users will produce smoother PACS implementation



Participation and Involvement

- Participation to the process of system development encouraged a sense of commitment and ownership among PACS users
- PACS users should be involved in the design of the PACS to provide their insights and concerns.
- Participation reduced the cases of culture divide among IT suppliers and PACS users
- Participation will increase the acceptance and satisfaction of PACS users by encouraging realistic expectations and facilitating the perceived usefulness of PACS through training and support.
- Participation sets a stage for users and IT suppliers with a communicate system, which may allow users to raise concerns and discuss solutions to improve PACS systems
- Participation can help users overcome their difficulties by providing them with a sense of control over their position in the change process, which may mitigate the perceived impact of change to them

Campaign for using PACS

- Focus on improving the ease of use to improve intentions of PACS users to utilise the system
- Emphasise the necessity of using PACS in order to trigger the users' initiatives to change and adapt PACS
- Managers should also promote opportunities towards becoming super-users
- Provision of incentives to PACS super-users

PACS and the Future

- Uphold continuous efforts to acceptance of organisational change
- Promote users' participation in ensuring system changes will be aimed to meet the their requirements
- Promote system satisfaction, reduce attitudes of resistance, and organisational justice by encouraging user participation, which may help in setting realistic expectations among PACS users

Figure 24. Summary of Guidelines



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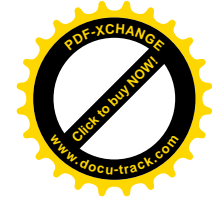
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Appendices



Appendix A- Failure Statistics

Statistic	Author
70% of change programs fail due to. <ul style="list-style-type: none">• Resistance to change• lack of strategy and vision• lack of communication and trust• lack of top management commitment• lack of resources, lack of change management skills	Beer and Nohria (2000)
A 1998 survey showed only 10% failures due to technical issues, with 90% attributed to social and organisational factors	Doherty & King (1998).
Only 10 per cent of failures in administrative applications are due to technical problems, 90 per cent can be accredited to organisational and managerial issues.	Long (1987)
60% of senior IT practitioners perceive human and organisational issues to be more important than technical issues in determining the success of systems development projects.	Doherty & King (1998)
A meta-analysis of large-scale change efforts suggests that positive outcomes occur less than 40 percent of the time.	Porras and Robertson, (1983)
Senior executives in Fortune 500 companies reported that less than 50% of the changes in their organisations were successful and suggest that resistance to change was the main reason for failure.	Maurer (1996).
50 to 70 % of all reengineering projects fall short of objectives	Hammer and Champy (1993)
Overall project failure rate of 72%. The Standish Group study (2000) concluded that the primary reason for declining project success rates between 1997 and 2000 was insufficiently collaborative working relationships	Standish Group survey (2000)



Appendix B- Planned, Emergent & Contingent Change

The numerous theoretical insights that have been used for understanding changes within organisations can be broadly categorised into planned, emergent and contingency models of change as outlined below:

Planned Change

Kurt Lewin's (1951) ubiquitous 3-phase model of change (unfreeze, change, and refreeze) provides the framework for much of the literature that deals with change management models and techniques today (Goodstein et al., 1995; Kotter and Langer, 1998).

Information systems draw heavily on this view of change and even the most modern models for managing IT-enabled change are also based on the Lewinian model (Benjamin and Levison, 1993). In practice the emphasis of practitioners has been to provide data to unfreeze the system by reducing the resisting forces (Dawson, 1994 ; Dawson. P., 1994). Once these negative forces are reduced the organisation is moved towards the desired state through the implementation of the new system and refreezing occurs through a programme of positive reinforcement of the new attitudes and behaviour.

Emergent Approach

The emergent approach is a popular contemporary alternative to the planned approach as it includes a contextual perspective (Burnes, 1996; Dawson, 1994). For the emergent approach, change cannot and should not be 'frozen' nor should it be viewed as a linear sequence of events within a given time period as with a planned approach.

In contrast, change is viewed as a continuous process of aligning an organisation with its environment and is best achieved through small-scale incremental changes which over time can amount to major transformation. (Dawson, 1994 ; Pettigrew and Whipp, 1993)



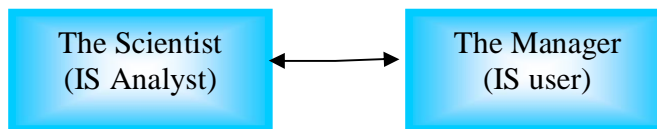
Contingency Approach

Another perspective arises from the contingent relationship between an organisation and its environment and the need to adapt to that environment (Burns and Stalker, 1961). In contrast to the planned and emergent approaches, the basic tenet of the contingency approach is that there is no 'one best way' to change. Thus an organisation facing constant and significant environmental changes may find an emergent approach to change management more appropriate than a planned approach.

Appendix C - Perspectives on Resistance

Scientist/Manager Philosophical View

Early research on IS implementation by Churchman and Schainblatt (1965), viewed implementation as the problem that in order to solve one must find out what actions of the scientist and the manager are most suitable to form an effective relationship between both. They advise that the relationship should be of ‘mutual understanding’ between that scientist (IS professional) and the manager (user) wherein both parties would begin to understand the other through a verbal communication process.

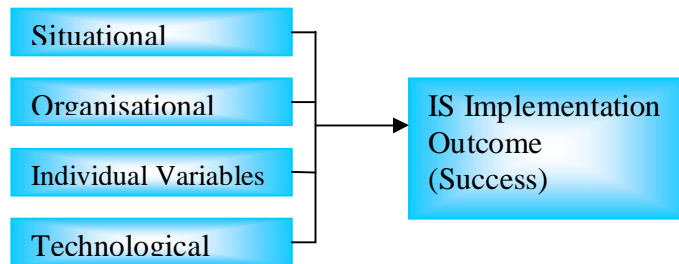


Philosophical View

Factor View

The next wave of research (Ginzberg et al., 1984; Leonard-Barton, 1988; Lucas, 1975) focused on identifying the factors that affect implementation outcome. These were classified as follows:

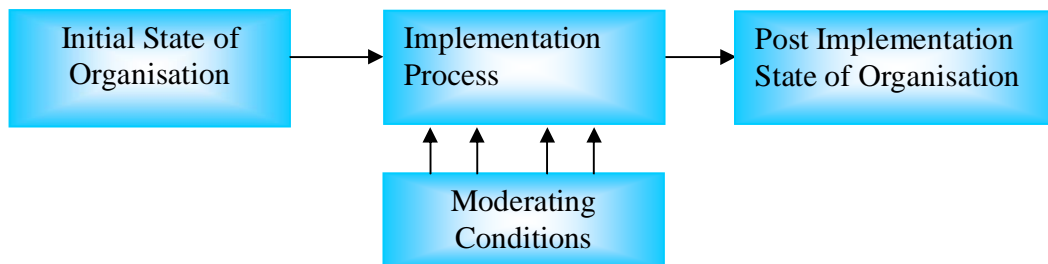
Individual	Cognitive style, personality, demographics, decision-style
Organisational	Level of centralisation, autonomy of unit, culture, group norms, reward systems, and power distributions
Situational	User involvement, nature of analyst-user communication, organisational validity, and the existence of critical mass
Technological	Type of technology and characteristics of technology such as transferability, implementation complexity, divisibility, and cultural content



Factor View

Process View

As scholars started understanding the role of different factors, they recognised that implementation would be better understood as a process mediated by certain conditions such as project management, sponsors and top management support. While some scholars adopting the ‘process view’ saw implementation as diffusion of innovation, most viewed it as a process of changing the institutionalised way of doing things within an organisation (Galbraith, 1979; Ginzberg, 1978).



Process View

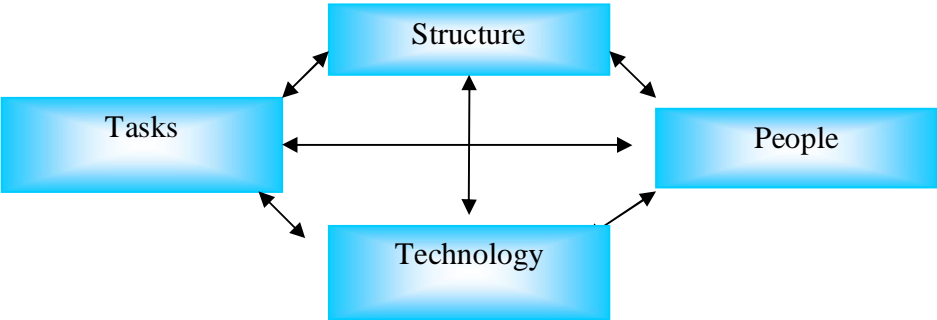
Socio-Technical View

The process view of implementation was further developed by scholars influenced by the socio-technical school discussed in the previous chapter. Within this perspective, the organisation is conceptualised as a diamond consisting of interacting components: people, tasks, technology, and structure (Markus, 1983b).

Introduction of an IS means altering the organisation’s technology component which by design triggers changes in the other components of the organisation. Implementation fundamentally refers



to expect ing and tactically managing the repercussions of the change of the technology component in order that IS becomes 'organisationally valid' (Markus and Robey, 1983; Schultz and Slevin, 1975).



Socio-Technical View



Appendix D- Dynamic Models of Resistance

Overview

Dynamic models have been proposed to provide a better understanding of the reactions of those affected during a change. Most of these models propose that transition, from one state to another, sometimes including oscillation between stages, concludes, more often than not, on a positive note, culminating in psychologically beneficial outcomes.

Morgan (1997) suggests that an understanding of the theory of transitional phenomena would provide valuable insight into organisational change, and why it might be met with employee resistance. A few of the principal models are described below:

Grief Related Model

'The Cycle of Negative Response' Conner (1998) adapted Kubler-Ross cycle of grief (1969) to describe people's negative response to change. According to Conner, the emotional highs and lows in question are less intense when compared with the ones involved in grief, but the sequence of the stages is just as relevant in understanding any negative change that individuals face but cannot control. There are eight distinctive stages through which people pass whenever they feel trapped in a change that they do not want but cannot control.

These stages are in the following sequence:

- a. **Stability:** This refers to the state prior to any announcement of change,
- b. **Immobilisation:** Shock is considered the initial reaction which varies from temporary confusion to complete disorientation.
- c. **Denial:** inability to assimilate new information into the current frame of reference, and the reaction is one of rejection or ignorance.
- d. **Anger:** Frustration and feelings of being hurt come in at this phase, and these are often manifested through irrational, indiscriminate lashing out.



- e. **Bargaining:** People begin to try bargaining to avoid the negative impact of change. This indicates that people can no longer avoid confronting with the reality. All earlier phases involve different forms of denial; this phase signals the beginning of acceptance.
- f. **Depression:** People go through another phase of emotion now, usually expressed in the form of resignation to failure, feeling victimised, a lack of emotional and physical energy, and disengagement from one's work. It represents a positive step in the acceptance process as the full weight of the negative change is finally acknowledged.
- g. **Testing:** This refers to the finding of new ways to adapt to the new situation and to get on with the new framework.
- h. **Acceptance:** At last people respond realistically, being more grounded and productive relative to the previous phases within the new context.

Seven Preoccupation Stages

Bareil's theory (1998) maintains that to capture the experience of employees affected by a transformation, which is often imposed on them, one must grasp their preoccupations, which arise during the implantation of an organisational change. The seven phases of preoccupations describe all of the preoccupations that individuals may experience when they are in the position of actors and targets of the implementation of an organisational change.

These preoccupations, common to most innovations, are generic to all processes of organisational change, regardless of type and of the target clientele. A preoccupation is a worry, concern or question related to an object. The following seven preoccupations make up the cognitive universe of actors in a transition.

- a. **No preoccupations:** Individuals do not feel concerned by the change and deny the existence of the change by ignoring it.
- b. **Personal impact:** Individuals experiences discomfort or egocentric insecurity. They worry about the impact of the change on them and on their work.
- c. **Organisational willingness:** Individuals no longer questions their own status, but rather that of the organisation.



- d. **Nature of change:** Individuals question the subject of the change. They want details about the change and answers to specific questions.
- e. **Personal capacity:** Individuals are preoccupied with their capacities to face the requirements of the change and they question the support, and the conditions put in place to enable them to manage the change.
- f. **Collaboration:** Individuals become involved in the change process, they are now interested in cooperating with others.
- g. **Continuous improvement:** Individuals seek new challenges to face and new methods of improving the change already put in place.

Continuum Model

Leon Coetsee (1999) attempts to explain the nature of resistance to change through a continuum model. He states that, in organisational development literature, acceptance of change (commitment) and rejection of change (resistance) are typically treated as separate, unrelated phenomena. Through his model, Coetsee argues that they are closely linked in the sense that they represent a polarity, with each being the far end of the continuum. Movement from resistance to commitment is done through sequential phases.

Collinson (1994) challenges this polarity concept found in much of the critical literature, and laments that it is a too simplistic conceptualisation of resistance to change, inadequate in accounting for the multiplicity of oppositional practices in different workplaces. According to Collinson (1994), resistance and consent are usually inextricably and simultaneously linked, often in contradictory ways within particular organisational cultures, discourses and practices.

ADKAR Theory – 5 stages

The ADKAR model (Prosci, 2002) proposes that employees must go through the following five stages in order to change:

- a. **Awareness** – of why the change is needed
- b. **Desire** – to support and participate in the change
- c. **Knowledge** – of how to change



- d. **Ability** – to implement new skills and behaviours
- e. **Reinforcement** – to sustain the change

The model examines the inclination of the employees at each step and enables management to develop a plan to induce willingness to accept the change.



Appendix E- Behaviour

Conscious And Unconscious Behaviour

Behaviour has been defined as physical actions that can be seen or heard and also includes mental processes which cannot be seen or heard (Matlin, 2005) Unconscious processes are simply thoughts and desires that are below the level of conscious awareness (Matlin, 2005).

People unconsciously use well-developed and habitual defence mechanisms to protect themselves against change and alleviate the feelings of anxiety caused by change (Andrews et al., 1993; Oldham and Kleiner, 1990; Piderit, 2000). The forces of the unconscious mind could often out-power that of the conscious one (Van der Erve, 1990; Wade and Tavis, 1996).

On a different tack, other authors view manifestations of resistance across a broad spectrum of behaviour, from being passively uncooperative to engaging in physically destructive behaviour (Marakas and S., 1996), from lack of cooperation to sabotage (Carnall, 1986), and including phenomena such as denial, inaction, and repression (Agócs, 1997).

O'Connor (1993a) advocates that when evidence of resistance first appears, it helps to examine how it has been expressed using two extremes -overt versus covert and unconscious versus conscious. Using this classification O'Connor describes the following 4 profiles:

Covert and Conscious: The Saboteur

These resisters undermine change while pretending to support it. They believe that by verbally supporting the change and then doing nothing, the initiative will go away. These individuals may even intend to sabotage the company or an individual's plans for their own gain.

Covert and unconscious: The Survivor

These resisters do not realise that they are undermining change. They often do not know that they are failing to meet targets or even understand the implications of their behaviour. They simply soldier on, getting the job done in the way they know how to do it. When their lack of adaptation to



change is discovered, they are as surprised and disappointed as anyone in management. They often believe they are doing a good job and feel discouraged by the wasted effort.

Overt and Unconscious: The Sombie

These resisters are an extreme case of the survivor. They are so accustomed to acting in a certain way that they seem unable to change. While they verbally agree to do whatever is asked of them, they have neither the will nor the ability to create the change. They are simply avoiding the change until they are reminded once again that they must alter their behaviour.

Overt and Conscious: The protestor

These resisters believe that their refusal to change makes a positive contribution to the company. Protester resisters never seem to rest when pointing out the failings of a change. On the positive side, they serve to protect company tradition and discourage rash or sudden change. On balance, these are the easiest and certainly the most interesting kind of resisters to manage. Their resistance is not only open, but they are able to discuss their position clearly and rationally. Still, some authors are cautious on the use of these classifications as they might lead to false results and expectations. For example, apparent acceptance can mask passive forms of resistance (Marakas and Hornik, 1996; Tetlock, 2000) In some of these instances severe resistance could result in tipping the scales from short-term success to long-term failure.

Adaptive And Maladaptive Mechanisms

The findings of Bovey and Hede (2001) investigation discusses two 'adaptive' defences, (humour and anticipation), and five 'maladaptive' defences, (denial, dissociation, isolation of affect, projection, and acting out). Individuals who are unconsciously inclined to use maladaptive defences are more likely to resist organisational change; whilst that of using adaptive ones is less likely.

Bovey and Hede (2001) cited Bond (1995) that 'humour' is strongly associated with good coping and it reflects an individual's capacity to accept a challenging situation. On the other hand, 'projection' is revealed having the strongest association with resistance to change. A projecting person has a tendency to put blame and responsibility on others instead of accepting their own



impulses (Bond, 1995), The source of anxiety then becomes externalised and something objective to be resisted (de Board, 1978). This is considered an important source of resistance.

Bovey and Hede (2001) concluded that individuals were more likely to resort to projection as a defence until the individual understands the internal source of the anxiety, bringing the unconscious to the conscious and accept it.



Appendix F- Personality Theories

Freud's Psychoanalytical Approach

Freud's described personality in terms of three dimensions namely, the identity, the ego and the superego. The Identity refers to the primitive, instinctive and inherited aspects of personality and has no social refinements but derives its energy directly from bodily processes (Hjelle and Ziegler, 1992). The Ego develops out of the Identity to deal with the outside world and can distinguish between the things in the mind and things in the outside world (Hall and Lindzey, 1985). The Superego develops out of the Ego and represents the ideals and values of society. The Superego forces the Ego to adhere to these rules, ideals and values. Humans are not born with a Superego and children must acquire it through interactions with their parents (Meyer et al., 1997; Phares, 1984).

Five factor model

The Five-Factor model of personality (John and McCrae, 1992; Paunonen, 2003) is founded on the belief that personality based variations in behaviour are largely interpretable in terms of the 'big five' dimensions of personality that arguably represent the minimum number of traits needed to describe personality (Lee-Bagley et al., 2005; McCrae and Costa, 1986). These five personality dimensions are described below:

Extraversion: the quantity and intensity of interpersonal interaction and activity level. This gives the degree to which individuals are gregarious, assertive, and sociably (high extraversion) versus being reserved, timid, passive, and quiet (low extraversion, or introversion).

Agreeableness: the quality of a person's interpersonal interaction along a continuum from compassion to antagonism. This describes the extent to which individuals are cooperative and warm (highly agreeable) versus cold and hostile (highly disagreeable).



Conscientiousness: the amount of persistence, organisation and motivation in goal directed behaviours. This gives the extent to which individuals are hardworking, organised, tidy, dependable, and preserving versus lasy, disorganised, careless, and unreliable (low conscientiousness).

Neuroticism: the tendency to experience negative affect such as anxiety, insecurity, and psychological distress. This is also referred to as emotional stability and gives the degree to which individuals are insecure, anxious, depressed, and emotional (emotionally unstable / highly neurotic) versus calm, self-confident, and secure (emotionally stable / not neurotic).

Openness to Experience: the proactive seeking and appreciation of new experiences. This gives the extent to which individuals are creative, imaginative, curious, and cultured versus practical and with narrow interests (closed to experience) (Greenberg and Baron, 2002; John and McCrae, 1992)

Personality and Environment type fit Holland (1985) identified six personality types, namely realistic, investigative, artistic, social, enterprising and conventional. He also divided the working environment into these six types and argued that each environment's corresponding personality types would dominate that working environment. Thus, understanding the personality and environment in these terms, helps to identify who is most 'at ease' and adaptable in that environment and who is more 'stressed' and more likely to resist change. These 6 types are described below (Nel, 1999):

Realistic type: These people are physical and practical and tend to avoid occupations that require social skills. Examples of occupations that these people would prefer are that of electrician, land-surveyor, plumber, farmer and mechanic.

Investigative type: These people are usually intellectually and academically orientated and like to observe and investigate physical, biological or cultural phenomena systematically. Examples of occupations that these people would prefer are that of geologist, mathematician, physicist, chemist and biologist.



Artistic type: These people prefer aesthetical activities, rather than conventional occupations. They are usually creative, expressive, emotional, independent and spontaneous. Examples of occupations that these people would prefer are that of artist, journalist, interior decorator, actor and musician.

Social type: These individuals usually have good verbal and interpersonal skills and are kind, generous, idealistic and cooperative. They prefer human orientated occupations, such as teacher, social worker, psychologist and nurse.

Enterprising type: These people are fast-paced, energetic, ambitious, adventurous, independent and attach value to economic and political achievements. Because enterprising people have good verbal skills, they prefer occupations in politics, sales, law and management.

Conventional type: These people prefer systematic and precise work with distinct procedures and like to work with numbers and to do clerical tasks. They prefer occupations where the work is structured, like bank tellers, clerks, accountants and secretaries.



Appendix G- Pitfalls Of Participation

Spurious Participation

Bjorn-Andersen and Hedberg (1977) lament that user participation has often a manipulative flavour that appears to pay more attention to users' feelings of influence than to their actual ability to influence. They go on to state that the effects of such insincere pretences of democracy are questionable and may well counteract their purposes of facilitating change.

Elaborating on this, Markus (1983) clearly advises against participation where powerful authorities have decided that a specific change, unpopular with users, takes place. In such situations, users are likely to resent strongly a tactic that is meant to make them feel as though they have some say in the matter, when they obviously do not.

Hostage And Propagandist Roles

Hedberg (1975) argues that users who are involved in the system design process may find themselves in one of two equally invidious positions: that of a 'hostage' or that of 'propagandist'.

In the 'hostage' role user involvement is effectively blocked by the professional design team. Instead the potential users operate in a way that promotes 'social comfort' and mutual esteem but limits real communication. No effective communication takes place partly as users feel too ill-informed and inadequate to contribute to IT decisions.

In these circumstances users have a belief that there is something mysterious about computers which reinforces their feeling of being in a process they do not understand and cannot control. This is fuelled by cultural issues between IT and the business as discussed in the previous chapter. The hostage role is particularly damaging because it fails to deliver any of the benefits of user involvement while sustaining the delusion that users are represented in the design team.



Hedberg (1975) refers to the 'propagandist' role as an 'indoctrination alternative'. In this role any potential disruption to design from user involvement, as perceived by the designers, is handled by exposing the user representatives to training in systems design methods. On emerging from such training, the representatives often no longer represent their original group's perspective, but begin to adopt the designers' view of the design process. Over time there appears to be a tendency for such indoctrinated 'representatives' to perceive user problems and issues from an IT perspective. In such a role user 'representatives' fail to safeguard the needs of the constituency they were intended to represent.

Identifying Quality Participants

During organisational change new user groups and their requirements are difficult to identify and cultural and political issues need to be taken into account. Moreover, most organisations provide little briefing on the users' role in participative activities. Users are therefore confused about their brief and concerned about their lack of expertise in computing. Worse, users might feel to be in a difficult situation as if they do not know all the details it might be seen as if they do not know their work. (Damodaran, 1996)

Delays And Costs

Increased participation can give rise to constant change requests in the system's design which can cause havoc on project plans and estimates. This needs to be addressed by a well balanced project team which ensures that organisational issues are taken into account, but not at the expense of implementing the system within a realistic time frame. (Doherty and King, 2001)



Appendix H – End User Interview Schedule

The following are the topics discussed with the end-users. Each question is followed by a number of secondary points communicated through subsequent dialogue:

Q1 Could you tell me a bit about your role here?

- Have you specialised in this role-Training, experience?
- Do you work within a team?
- Do you like your work? (Identify personality/environment fit)

Q2 What project activities did you participate in?

- Do you feel your input was valued and had an impact on the project?
- Did you ever feel you were invited when a decision was already taken?

Q3 In general, what is your perception of IT projects?

- Did you experience similar projects in the past? What was the outcome?
- Did participation in alter this perception?
- What was the reaction of your colleagues when they heard about this project?
- Were more experienced colleagues more resistant?
- Do you feel that the personality and character of the individual have a high influence on their attitude towards an IT system or PACS.
- Were your reactions the same (group influence)?
- How would you describe your emotions at the time?
- Did you feel the organisation was addressing your concerns?

Q4 Did you feel the system would have a high impact on the organisation?

- Division of work-new/redundant roles? People promoted/made redundant?
- Did you feel there would be problems with these organisational changes?
- Did participation influence these concerns?
- Did you consider the degree of control you would have on the new system?
- Did you feel you were losing something with the change?

Q5 Did these perceptions and emotions change through participation?

- Increased fairness/understanding, lower stress, emotions?
- Did participation change these perceptions, possibly by allowing you to change the design



to improve the impact?

- Do you feel participation helped you achieve a degree of control over the change?

Q6 Did you feel the system was offering benefits to your work?

- Did you consider it would be simple to use?
- Did participation help you understand these better?

Q7 How was your relationship with IT (or system supplier)?

- Did you find difficulties in communication – technical/business jargon?
- Did you have doubts on the capability of IT to tackle organisational issue?
- Did participation have an effect on this relationship?- Communication? Trust?

Q8 Conclusion

- Do you feel the project was successful?
- How would you summarise the benefit of participation?
- Is there any factor which was important that we did not mention?



Appendix I – IT Interview Schedule

The following are the topics discussed with the project/IT managers. Each question is followed by a number of secondary points that will be communicated to the interviewee through subsequent dialogue:

Q1 Can you tell me a bit about the project?

- Was this a planned project or a response to a changing environment?
- What was the purpose of this project?-Focused or broad objectives
- What Participation / involvement activities were carried out?

Q2 Did the system have a high impact on the organisation?

- Radical changes in division of work-new/redundant roles?
- Did it fit with organisational culture, bureaucracy/free flow etc?
- Were changes in “power” structures envisaged?
- Did users have concerns on this impact?
- Did participation influence these concerns?

Q3 What was the initial reaction when end users first heard about the project?

- Was there a common reaction within the same groups?
- How would you describe users’ emotions at the time?
- Were users anxious, stressed or worried? Why?
- How did they manifest these feelings? Openly and consciously
- Did these perceptions and emotions change through participation? How?

Q4 Did you find higher resistance/ Concerns in specialised roles?

Q5 Was there a general negative perception of IT projects?

- Did participation in this project alter this perception?
- Did participation change these perceptions?
- Do you feel participation helped users achieve a degree of control over the change?
- Do you feel being involved in those activities increased commitment to the project?

Q6 Did users understand the benefits of the system?

- Did they consider it would be simple to use?
- Did participation help to communicate these better?



Q7 How was your relationship with the users?

- Did you find difficulties in communication-technical / business jargon?
- Did users have doubts on the capability of IT to tackle organisational Issues?
- Did participation have an effect on this relationship? Communication? Trust?

Q8 Conclusion

- Do you feel the project was successful?
- What in your opinion is the primary benefit of participation?
- Is there any other factor which you feel was important that we did not mention?



Appendix J – Sample Interview Transcripts

Interview Details	
Organisation	Galway Regional Hospital
Name	George Murphy
Role	System Trainer
Interview	
<p>Q: Can you tell me a bit about your role here?</p> <p>A: I have been doing this role as a trainer for some 7 to 8 years.</p> <p>Q: Were you involved with Patient Admission System?</p> <p>A: Yes, when I started this role, PAS was just in its early beginning so I was involved from the start to train users on the initial modules. Over these years I have been training on practically all the additional PAS modules.</p> <p>Q: Your background is in IT or in the business?</p> <p>A: My background is in office administration, then there was this call for applications and I applied and now I am here as a trainer and currently I'm acting application support manager.</p> <p>Q: What is your involvement with the users, how do you train them?</p> <p>A: We train them and then we handhold them for the first few days until they are confident enough to proceed without support. In most cases they tell us that they do not need us anymore because they feel comfortable with the system. But the foundations of everything is the training. Once you deliver good training session you reduce drastically the support you will have to provide in live</p> <p>Q: When you say training. How is it typically structured?</p> <p>A: Usually we deliver training in a hands on style. We do not stand there preaching about the system, but we let them use the system as we go along. Through this approach they familiarise with the system, build confidence and more importantly any problems are revealed there and then. (benefit of participation) If you have a user who is afraid from the computer it is revealed there and you can give him special attention on the spot.</p> <p>Q: How many sessions would a typical user attend?</p> <p>A: Because of the critical nature of the users work, we cannot afford to have them absent from their work for lengthy training. So we prepare ourselves before hand to be in a position to deliver training in either one or maximum 2 focused training sessions. This often depends on the system or on the receptive capability of the users, because not all users are literate to keep up with the rest.</p>	



Q: Given that most users see the system for the first time during the training session, in your experience how do users react to new systems, what is their typical reaction?

A: Well, on PAS you cannot say that, this is a system that is used extensively and when we train users nowadays it is not their first encounter with the system. So, they know what is the PAS, there is no fear of something new. The biggest stumbling block we find is when we have a user who is not IT literate.

Q: If we take the scenario of users being trained on the PAS way back when it was being implemented, how did people react?

A: At that time we had a lot of problems. When you have an individual who has been working on papers for a number of years (inertia) when you show him a computerised system he is going to fear it, for a number of reasons. One of the reasons is that they think (perception) that the entire workflow is going to change. They are also afraid that they will not be capable of using the new system. They are used to a manual system which they are very familiar with. This sort of change always brings resistance.

Q: How do they manifest this resistance?

A: In most cases they start creating problems, raising concerns that this will take too much time, it is not usable in their environment, it will increase their workload, those sort of comments to resist the system. In these cases we work to show them that initially all changes will raise difficulties. I like to tell them that it is like when you get your driving license. When you start driving, everyone seems to be coming on you, the roads seem narrower etc, then when time passes and you become more familiar with the vehicle you'll be able to drive with your eyes closed. I like to bring this example, and we try to work with the users. In most cases it is easy, in some cases it is difficult. Going back to the initial implementation, we even had a person telling us that if we go in his office with a computer, he will throw us out of the window together with the computer! This is because they were afraid that they will not be able to cope.

Q: From your experience, why do some people resist change and others are more open to change?

A: I think the major problem is when you have people of a certain age who had not ever used a computer. They had this perception that the computer (change) was something terrible. When I have such people in a training session, I usually start by telling them that if they know where the Enter and Esc keys are they will not have problems (simplify, reassure their concerns, start from the basics – benefits of participation – address concerns by starting from the foundation, do not assume) So, you portray the system as if it is the easiest thing on earth, and actually it is. But in these training sessions, we need to help the users overcome their fears, and we do not stop until we are sure that they know how to use the system. That is why in some cases we have users who might attend 3 or 4 sessions.

Q: Do you encounter problems with mixed skills in the same training sessions?

A: Yes, we do have. Due to the pressure of work, we cannot choose users to create a group with similar



skills. When we realise that there is someone who is not coping, we try to give him special attention in the session itself. Then we pass the message that we are there to help and support, and offer additional training sessions. However, when a user comes straight to us in ahead, we schedule him for personal training over a number of sessions. So, you need to adapt to every individual case. (tailor made participation – most effective in alleviating concerns)

Q: Were there users who were concerned that they will lose their expertise and ‘power’ and respect he enjoyed from his colleagues?

A: Yes, there are. Those who have their niche and are afraid to lose it (power/equity) In that situation you need to tackle it in a personal manner. You need to show him that with the system he will have more control on his work. A typical example would be that whereas before I someone phoned to check an appointment, he needed to scroll through registries, now he just key’s in the id number. So, you need to show him these benefits. You need to build your argument based on his viewpoint. The system is the same for all users, but not everyone looks at it in the same way. You need to focus on the individual concerns, and address them. We say that if you do not believe in something you cannot sell it. Now to get the user to accept the system, he must believe in it and you can do that by showing him the benefits. You cannot impose, if you’re imposing he’s going to accept it in front of you, and he will not try not to use it in live. You, must make him understand that with the system is life will be better. (Increased equity) And that is what me and my colleagues target, we focus on the benefits the system will provide even by comparing to the old system. We build this argument, knowing the past and how the system can make the future better.

Q: Are all users trained and involved to the same degree?

A: We have access levels. Operator, basic and supervisory, Training, and the ‘selling’ of the system vary according to these roles.

Q: Where there cases where you had a mixed session with some key users who were involved directly with IT?

A: Well we have some users who are more involved with us as well, such as when they re setting up a new clinic. We work closely together to understand the requirement, setup the templates etc.

Q: What I’m after is whether you see a difference in attitude between users who were more involved in the project than others?

A: Definitely, they try to jump the gun. When you have a mixed class, with users who are seeing the system for the first time and others who are already familiar with the system and what it offers, they try to anticipate what you’re trying to say for obvious reasons to show how much they know (gain power, additional respect, take the opportunity) That is where the skill of the trainer comes to play by acknowledging their comments without going off track in the session. You have to be careful not to shun



him away in front of his colleagues especially when they are from the same 'clan'. You would need to say 'Thanks for pointing it out, we will discuss it shortly etc...'

If you have a problem with an individual, he might become the joker of the clan and disrupt your session. Another trick is not to use eye contact because that shows you're giving him importance which will encourage him to say more.

Q: But do these people who are involved to a greater degree show resistance?

A: No, they are already familiar with the benefits of the system so they do not require much 'selling' to buy it. I would say that resistance in general is being phased out, even by the older generations they are now familiar and conversant with IT systems and that makes our life easier.

I had a session this week where all the users were over 50 yrs old, and I was a bit concerned, but I was proved wrong. What helped was that they were already familiar with the system, they knew how it worked and what were its benefits (being prepared reduces resistance). That is an advantage, when you are facing something new and you already know that you're going to benefit from it. There might be a change in the workflow but it's not a change that you absolutely do not have a clue what it is and does but you feel that it will change your life. We are encountering less resistance nowadays as I think all users have experienced a project nowadays. (experience factor) Initially we had problems where users would tell us openly that I am not going to use the system, and we had cases like that, 4, 5 years ago.

Q: During the training sessions, do you have users asking for changes and improvements?

A: We had cases, where the users are not happy with the interface. This is a problem as it's very difficult to change the interface especially as it is used throughout all hospitals and clinics.

Q: Do you feel this might lead to increased resistance as there might be disappointment that he does not have a say in the design of the system?

A: I think it is an accepted fact, that this is a proven system, it is working well, so they accept that there are no particular changes required. I think this fact, that the system is proven reduces resistance to the system functionality in the users as they do not want to go against the establishment.

Q: You were mentioning the 'clan' earlier on, do you see an influence of the group on individuals, or vice versa an individual trying to influence others on his viewpoint?

A: You encounter all sorts of people. There are sessions, where someone who knows the system sits near another who is a bit weak to guide her through. I try to be careful not to make it evident that there is someone struggling, as that is the worst thing, to show that someone is weak in front of his clan. If you put him under the spotlight that he is at a disadvantage they will start grumbling and staring at him etc.

Q: What about users encouraging others to resist the system?

A: I encounter that occasionally and I had a case not so long ago. At that point when you see group resistance, the entire class is resisting, it is futile to proceed with the session. In those cases I talk openly



with this person, .and ask them to list their problems. As I said users must believe in the system to accept it. So in those cases first I listen to the problems, we try to solve them and then we can proceed. But its futile if I keep on trying to push a system when the attitude is to resist. We could impose it, this is part of your work and you have to use it, but in my opinion it will not work. You must give them the space to highlight heir concerns. When you hear the concerns you realise that in most cases they are misconceptions on what others have told them about the system. These might be when someone explained something badly to them about the system etc. you discuss them and resolve their concerns. Ultimately, we cannot change the functionality of the system so that is what we have to sell.

Q: Do you feel that the personality and character of the individual have a high influence on their attitude towards an IT system?

A: Definitely. Yes, we say that you carry your character wherever you go. You must be careful that these type of users who criticise everything do not drag others with them. These people tend to find problems in everything they are asked to do. You need to bear with them and try to solve their problems. It is not easy. Usually we succeed, and its not the first time when these people at first tell us not to go anywhere near them with a PC and then when we told them that the system is going to be unavailable to test them out, they told us that they cannot afford to stop using the system.

Q: Have you experienced users who see the system as an opportunity for personal gain?

A: I encounter people who want to show how computer literate they are, and try to impress. I can say that they tend to become the point of reference for their group, but I cannot say if this led them to some advancement in their career. What really pleases me is when you encounter someone who tells you that he is going on evening courses on computer literacy. They consider it a milestone in their personal life. The fact that finally they will be able to use a computer, it is a change for the better in his life. He considers himself that now they are on an equal footing with others. I see this as immensely positive, the fact that they see this as an opportunity, to learn something new. These people have a positive attitude, and genuinely try to learn the system.

Q: How was the relation between the users and the trainers or IT, was there any friction?

A: In general no. I think it depends on the mood of the persons involved on the day. If someone calls with a support issue and starts shouting and confronts you personally etc, it does not help the relationship. But as trainers and support we try not to get dragged into arguments But in general we have a good relationship, I would dare say that most users see us as their salvation. You see this when someone calls panicking, saying that he needs to shift some 20 appointments, and you tell him that he can do them through a system feature. You cannot believe how pleased they are as you have saved them a morning worth of work. We try to offer a solution, there are cases when some users understand what we're trying



to say, and unfortunately others who can only see the problem with no solution.

Q: Did you encounter people who resisted the system because it did not offer them sufficient control over their work. Maybe they had to start depending in others now?

A: I think some people had that concern in the beginning that their niche is going to end with the system. That they were going to lose the absolute control they had on their job. However, But when it was implemented and they saw that through different access levels they could still see and control the information they needs for their role they did not complain about that aspect. I also think that some users are pleased with the fact that now there are other people who can do the same job as they can do, as the system, has streamlined the processes. This might actually help reduce their pressure and reduce instances when the section depended so much heavily n them that they could not go out on leave etc.

Q: How would you summaries the benefits of the training sessions?

A: First of all it is an opportunity to sell the system benefits. It reduces his concerns over the change, you are sitting near him and able to address his problems. Ultimately, I think the fact that they see someone who is there to listen to their concerns and assists them, feels that they are cared about. They feel that they are part of the system. It was not imposed on them but we are training them, listening to their problems, understanding their requirements to help them setup new clinics. And you feel this, their involvement is giving them a sense of power, which translates into positive energy. They start chasing you up to push the system in, instead of you chasing them.



Interview Details	
Organisation	Galway Regional Hospital
Name	Clare Roche
Role	Manager Pathology Department
Interview	
Q: Can you tell me a bit on the systems you have recently implemented?	
<p>A: The latest system we're rolling out is the laboratory Information System (LIS). This is a database which collates all result data, obviously matches them with user demographics and generates a result in printed format. We already did that before, more or less in a piece meal basis, but the difference now is that the system is integrated. Integrated in the sense that whereas before, the biochemistry section had their own system, so the results are on that computer, the haematology have their own system, so I have 13 sub-units or departments, each with their own system. So, at best I would have to go around 13 computers, with most of the data being replicated, demographics that is, and the data is spread around. To make matters worse, some units such as bio chemistry have 3 sub sections so they have a further 3 computers. Now, if I wanted the result of a patient, I would have to go around 13 departments, and gather the data by moving from one machine to another, and if I find the data print it out. The new system is fully integrated so all the data pertaining to a client can be retrieved from one point. The system's benefit is that of integration with the rest of the health system, the clinics can order tests directly through the system, and the results once they are in the system can be viewed directly from the wards. The real time aspect of it is also important, as the new system, is integrated with the instruments. Before the old systems were in-house developed databases, some through Mitts, some through staff from the department and some were even developed by myself. (user familiar with IT). And so these were not integrated with instruments, now the new system being integrated will cut down a lot of data entry, such as patient demographics will be automatically retrieved instead of keyed in. So once the data has been validated on input in PAS, we know that our data is accurate also.</p>	
Q: Was this system requested by the users or enforced by top management?	
<p>A: No, we have been asking for this system for the past 10 years. Over these 10 years we had made 3 calls for tenders and these were all abandoned. The first one because we didn't reach a deal with the supplier, the 2nd one abandoned also, and the 3rd one, because just when we were going to award the tender, the decision was taken to go for a wider vision and implement an integrated health system. In this 4th attempt we seem to have succeeded.</p>	
Q: Is the system currently operational?	
<p>A: It is being rolled out, some units are live others are in the process of going live as we have some logistics</p>	



problems. Obviously, it has been touted (advertised) as a cost saver. At this stage the cost saving aspect cannot yet be proven, because we need some time to quantify this. However the costs will be felt when we do not need to repeat tests because the results have been lost. When we do not have to ask people to spend hours looking for results, that have already been issued. These are hidden costs which cannot be easily quantified. For example if we need to retest, the patient would have to spend another day in the hospital at a cost.

Q: Are the users in your department specialised? Have they been doing their job for long?

A: Of course, since most of our people are technical, they are not intimidated with computers. Also, we have been using some sort of computer systems since 1992, we build a database in-house, so we didn't have computer familiarisation issues with LIS. On the other hand, their complaints were 'how long are we taking to get this system'

Q: What was their reaction when they heard that there is a project to implement this integrated system?

A: The first reaction was 'We'll believe it when we get it!' As I said there were another 3 times when we were almost there and everything was abandoned. This did not fail because it was a strategic decision, tied in with the new hospital. The government had to choose the most critical systems to support the new hospital operations, and it was decided that the radiology system with digital x-rays as the new x-rays machines were film-less, so obviously you needed a system to see these x-rays, the LIS to address the existing delays and its cost benefits, and the ward integration system.. You can say that these systems were the bare minimum to support operations so we managed to get it in. However the users, were still sceptical about it initially.

Q: When the users realised that the system is going ahead and will be operational, did their reaction change?

A: No, there was a lot of enthusiasm as users felt a need for the system, they were seeing inefficiencies in their work, the old systems was increasing their workload. However we had some teething problems as no system will work exactly as the current process down to the last detail. So, as it was an off-the-shelf system, and we could only customise within its parameters, there will not be any changes in code, due to expense and to minimise problems in upgrades. So, we had to do some compromises in business processes and people had to adapt their way of working.

Q: Did users have concerns about this? Maybe they will not be capable of adapting?

A: There are some requests which are not negotiable, and others which users had to accept. Those which were non-negotiable we tried to find workarounds by sitting with the users, understanding their problems and showing them in detail how the new process would work. This alleviated their concerns. For example in Bacteriology, the system was totally different from our working practices. Then by sitting down with the



key users we managed to set the system parameters to minimise the impact, showed them some work-arounds, and they are now very happy with the system.

Q: How were users involved throughout the project?

A: The supplier trained a number of super users, and system administrators who would setup new users, grant access rights etc. These were people within the department.

Q; So new roles were created because of the system?

A: Well, I had a person, the principal who is my deputy, and I put him in charge of IT over 3 years ago, because we have several systems. And we do not always enjoy the level of support we would like, so I asked this person to be in charge and even offer first line support. For the implementation of LIS, I also assigned another person to assist him as system administrator. This person was doing a work of senior technologist, and then she did an MBA, and then she also did a Masters in business processes. When she returned, I then decided that it would be better to use her in administration rather than on the workbench. At this point in time, I assigned her on the implementation of LIS, eventually when we calm down on the issues, data migration and setup I can start using her on other projects in the pipeline such as accreditation.

Q: So when you talked to this person about her new role and responsibility in the project, I imagine this was in line with her personal aspirations?

A: Yes precisely.

Q: Did she have a positive attitude throughout the project?

A: Yes, definitely, This person is a workhorse, she has initiative, and she saw the system as an opportunity to do the work she had been studying for. The only minor issue I have is that she likes to jump the gun, but I see that as a positive issue not negative.

Q: Was there a negative reaction, maybe resentment, by her colleagues, maybe other people wanted that role?

A: Yes of course. There were people who said we had given her a role of a consultant, now nothing is further from the truth, I had told her that all the existing contract conditions would remain as they are, but I can give you this opportunity that you can use what you learnt. And she took this opportunity. Even, if say she had to resign and finds a job in the private sector, this experience would benefit her, but she must not expect a promotion or rise in salary while she's here as those are beyond my control and fall under government regulations.

Q: Nevertheless there were complaints?

A: Yes some people gossip a lot, and they were spreading rumours about this fictitious new post. This didn't help our environment at all. I would say that people who were aspiring for his role, maybe because of their IT background were supporting these rumours. These people complained about the system and caused other problems throughout the project



Q: How did they manifest these complaints?

A: Well, they didn't come here and tell me openly, but I was well aware of what was being said.

Q: On this group influence, did you experience a positive aspect were people used to assist others who were finding problems?

A: Yes, when you have a large number of users, we have over 250 on LIS, there are people with a different degree of computer skills. By and large, most of them are technical and are not intimidated, but we do have the odd fellow who encounters problems and would need additional assistance. We have a particular nurse for example that does not even read e-mails. As you know today email is as important as a telephone, but she needs assistance to read an email. Again, I had a case which ended up with him being boarded out with a severe depression.

Q: Because of new systems at work?

A: Well, I don't think you fall into a depression because of one thing. This person was a one job man. Assign him one task and he would carry it out well. But if you ask him to change his method, he would get lost and goes out on a week sick leave. He cannot cope with change. And I'm afraid that he is one of those people, I insist that everyone have to use email as I cannot go round distributing circulars manually to all people. This person was the only one in over 250 who did not want to use email at all costs. Because of his particular situation I ended up with no choice but to accept this refusal. (resistance) .-change LIS instead of email? I reasoned that if I enforced him to use email he would end up something seriously insane. It was that bad, I think he had mental problems, and maybe the new system or the use of email, was something that triggered something in him, something amongst many. Even the change to the hospital, maybe that was really what he couldn't cope up with.

Q: So this was something which happened fairly recently?

A: Yes, last summer when we were in full swing preparing for the migration, he went out on a few months sick leave.

Q: How did this particular person manifest his concerns?

A: He used to come in my office and talk to me openly. "I am not going to use email" I would ask him to clear his mailbox as it was full and he would tell me that he refused to use it. But thankfully these are one off's. Then I have other people who strive to get the most out of the system. And if I tell him that they can only see the new module next week, they start jumping around....

Q: Did you see any difference in attitude between people who were specialised in their roles and others who joined fairly recently?

A: As I said most of the people are technical and have been using IT systems for over 10 years so they all had a petty much positive attitude. They were not intimidated.

Q: Even in the section which required a change in business processes?



A: Yes, there the problem was that their principal is not very computer literate, so the long term benefits of the system were not so evident. There was a bit of resistance as this person did not see the benefits and he influenced those around him. Also, if we find a problem and we see that it can be solved, it does not remain that much of a problem. On the other hand, if you encounter a problem, and because of your limited knowledge you do not see a solution then it will remain a problem for you. (Participation can address this – surface problems and use skills of group to find solutions).

Q: So you feel that the major issue which helped in users accepting the system in your department was computer literacy?

A: Yes, and database literate, so they know that from the DB they can generate reports with the tests they carried out etc.

Q: Apart from the obvious high level business benefits, does the system also offer benefits to the user keying in the system?

A: Yes, the fact that the system is integrated is helping them a lot. There are downsides, for example it is very strict, you cannot input an invalid ID number. So, if we receive an invalid number we have to go to its source and check why it is wrong etc. Now, it may be wrong because it was written incorrectly which we're trying to address with the use of labels. For me it is a positive factor, as I know that the data is consistent, but the user may not understand this long term benefit and reacts by complaining that the system is not allowing him to key data in. This reaction might also be because the database is still being populated; the more data there is, the more the user will find it easier by retrieving historical information instead of keying in. For example, in clinical details we have a bottle neck at this point in time to key-in all the data, but this is the process of implementation not a fault with the system (participation – explain these, rollout process, ensure users understand and set their expectations for the pressures they will face in roll out, potential bugs etc) We had to employ some data input clerks to input data and we asked for them to be employed 3 months before rollout to familiarise them with the hospital systems. This was not accepted and now we are encountering problems, because we receive forms with data in codes such as 'DM' I who have been here for 30 years know that it stands for Diabetes Mellitus. But obviously these new operators have to ask the one sitting next to him, probably he is also new, when someone tells them, they ask how do you write it? etc....this is a bottle neck and is slowing us down. Having people who know the systems beforehand, is extremely important, because you end up with these sort of problems which are not the fault of the system but they still create bottlenecks.

Q: Did training sessions help on this matter?

A: Not really, because the training sessions explained how to use the system not what DM stands for. Its operations business jargon.

Q: After these training sessions, did users understand better the benefits of the system?



A: Yes, we now have people who are happy using it, the smaller units are already live with it. The larger units because of this data input bottleneck are still in the process of rolling out.

Q: Returning back to the fact that users now depend on other departments to supply them with correct data, otherwise they will not be able to proceed, were there complaints on this, was it seen as a sense of loss of control over one's job?

A: No, because how it was before, if you received incorrect data, either genuinely or as intentional abuse, and you did not realise, you did not have control on it. You would just carry out the task and waste your resources. Now at least the system is helping them by stopping them from proceeding with their task until all the data is validated. Users understand this as it has been touted as one of the cost cutting benefits of the system and it helped them accept the system as they realised it will reduce their workload in the longer term. (participation explain benefits) On the other hand there is a sense of frustrations because we are stalled because of someone else's mistakes.

Q: Can you tell me a bit about the relationship between the users and IT?

A: Well, my users have relationships with other departments on the system and with IT (internal and MITS) The relationship with the wards (departments) is good. Last week we had a meeting with the heads of departments, to discuss the phased rollout of LIS on the other departments, and the million dollar question was asked: 'From which department are we going to start?' And everyone was astonished, when the head of the ITU, who is known for his occasionally excessive openness, volunteered. We though he was being cynical about it but we realised he was genuinely asking for it because he wanted to see the results immediately when they were generated by the instruments. So, he was seeing the benefits and wanted to be one of the first to implement it This sort of attitude from one of the most senior persons, who has an influence on his peers, and is generally critical about everything, helped other heads overcome their concerns and reservations over the system. It was a very, very good sign. We are now using him as a project champion, even Dr X is very enthusiastic about the new system! Actually, the problem we are encountering is that wards will get a whiff of the benefits of the system enjoyed by other departments, and do not want to wait their turn in the rollout plan. (political influence but contrary to resistance) They would want a faster rollout than we can handle. As regards IT, we do have some problems. MITTS are the first line, but we encounter some communication problems as they are offsite. Sometimes its difficult to explain the problems, especially when users are not very technical. Sometimes, we might report that the computer is not switching on when it could only be a faulty monitor. We try to have an intermediary, such as the system administrator to check problems before they are escalated to MITTS, but this is not always possible as we work on shifts with skeleton staff over night. Unfortunately we are not very happy with the quality of support offered as sometimes by IT as they do not understand the urgency of the issue.

Q: Can you tell me more about this?



A: The service offered is not how we would like it. When they are here they do a wonderful job, but they do take long to come over. For example if the database is unavailable we cannot wait for 3 days to get someone over.

Q: Do you think this is because they do not understand the business sufficiently?

A: Well we had an agreement that urgent for us means now. I cannot afford to have a consultant who is idle because he cannot use the computer. Unfortunately we still encounter these problems

Q: Do you feel a users personality, influence their attitude to a system?

A: Yes, we have persons who complain on everything. There is a particular person, who wasn't pleased, and even took it personally that on the login form he had to use the section from a dropdown. He was insisting it should be defaulted as it takes time to select it. He was right, it would be better but there wasn't a need to make such a fuss about it. When he saw that his suggestion was not accepted he was saying that no one listens to what he says etc.....it just shows a negative attitude. (risk of participation) He has this attitude on all sorts of things....you can say he is a perfectionist to the extreme, if there is a minor problem he's going to make a fuss about it.

Q: When user requests for change are not accepted is there a sense of disappointment?

A: Yes there is, here people sometimes pretend that money is not a problem. Probably because at one point that was the impression given by the authorities to take people on board in the migration. You want a fancy desk you can have it etc....even during migration, overtime was a blank cheque because we needed overtime, but now that we do not need it and I reject requests unless justified, I have people complaining and asking me whether I am paying them personally.....

Q: How would you summarise the benefits of participation?

A: Trough training users got familiar with system and understood the benefits of the system. We also had key users who were involved in the system specs who were essential to customise the system to our way of working.

Q: Did you see a difference in attitude between key users and other less involved users?

A: No, all users were enthusiastic about the system, they wanted it. The key users simply provided more input. But users were really enthusiastic, just yesterday one user came over and told me how their workload had reduced with the system when she had to sort samples manually and now she just places them at random and they are identified through barcodes.

Q: Are there some users who are concerned with this decreased workload? Maybe of becoming redundant?

A: No, we have done some analysis over these past 3 years and found that our workload has increased and staff decreased. We have explained this to the staff, and I think they all feel secure. They also, have experienced other projects and no one ever got redundant so they do not have that concern.



Q: Was there any other issue we did not mention you feel important?

A: Well, on the downside, it is a bit labour intensive. To rollout a system is good, but the challenge is to rollout a change in mentality. You will always encounter people who try to abuse, who do not provide you with the information you require. For example we have doctors who do not supply us with their unique registration number, this causes us a huge problem and we cannot send him back the result. We will only fix these issues when the system is integrated with other systems in the clinics used directly by doctors and these problems are stopped at source. On the plus side we will benefit at least thousands will gained every month just by abolishing the need for repeated tests.



Appendix K – Research Code Book

The following table lists the codes identified in the literature and supplemented by the fieldwork analysis. The latter are marked in red:

Code	Description
Change context	
Change Process	Planned / emergent / contingent approaches to change
Change Content	Degree of broad (Pluralism) vs. narrow (Maximisation) objectives
Organisational Focused Resistance	
Structural Inertia	The extent to which employees have been selected and trained to perform certain jobs and rewarded for doing them well -the greater this is (inertia) the greater the expected resistance
Internal Track Record	Previously unsuccessful change efforts will lead to low staff motivation to change (Attributional Model Internal)
Cultural fit	Incongruence between proposed system and organisational culture generates resistance (eg. Bureaucracies, information flow viscosity beliefs and values)
Political Focused Resistance	
Individual interest	Conflicts with individual interests and aspirations more resistance is expected
Structure	Conflicts with current structure will generate conflicts and resistance. If power conflict 'won' by who is already 'above' it will be more readily accepted.
Information control	Competition between users/groups to seek power through information control (Less resistance for more power)
Task allocation	Competition between users/groups for preferred task allocation and division of labour aspects (interaction theory) Users resist less when they are assigned preferred task allocations.
System focused Resistance	
Cultural divide	Tensions between IT [technical] and business (executive) lead to difficulty in implementing change.
Communication	Poor communication and Jargon between IT and business restricts organisational



	linkages increasing resistance
Relations / Trust	Lack of trust from business in IT people to manage organisational issues generates resistance. This can be fuelled through external track records and horror stories
Existing System Satisfaction	Degree of perceived usefulness and satisfaction in existing system
Individual Factors -Perceptions	
Complacent	Reality constructed from attitude to "just leave things as they are" in view of the current success.
Resigned	Reality constructed from past failure "this will also fail" -lack of motivation and unwillingness to participate
Cynical	Reality constructed from past failure due to an external cause, people or group, can generate aggressive hostility
Maladaptive	People can be negative about themselves and their life events which A socio-technical perspective on resistance to change distortion leads to a naturally pessimistic attitude.
Group Influence	Individuals behaviour influenced by perceptions on group reactions
Support Group	Majority view dominates, justified by truth in numbers and fear of group disapproval. Identified as work group inertia in literature.
Challenge Group	Individuals may resist strongly if they see others around them supporting the change
Change in Equity	Perceived sense of loss (power, security, role identity, usefulness, social relations, direction) may give rise to strong emotions (anger, sadness, anxiety and low self-esteem) increasing resistance
Consciousness	Degree of understanding of the drivers for change
Individual Factors – Cognition (Logical)	
Usefulness	User perceptions of benefits of system usefulness (TAM)
Ease of use	User perceptions of ease of use (TAM) -Increased ease of usage lowers resistance
Individual Factors - Emotions	
Personality Type	How a person appraises situation
Extraversion	Extraverts -gregarious, assertive, seek excitement. Introverts are reserved, thoughtful, and self-reliant
Agreeableness	Agreeableness is a tendency to be pleasant and accommodating in social situations
Conscientious	Conscientiousness is the trait of being painstaking and careful, or acting according to



	the dictates of conscience.
Neuroticism	Neuroticism is tendency to experience negative emotional states. These Individuals respond poorly to environmental stress, and are likely to interpret ordinary situations as threatening. Also identified as negative affectivity in literature.
Openness	People who score low on openness are considered closed to experiences. They tend to be conventional and traditional in their outlook and behaviour. They prefer familiar routines to new experiences.
Environment Fit	Users with a close personality fit with their environment will be less resistant to change (Realistic, Investigative, Artistic, Social, Enterprising, Conventional)
Rigidity	Rigidity refers to the degree of openness or fear to change. The more rigid is less adaptable to change.
Change Control	As perceived control of change increases, resistance decreases
Impact of change	The higher the perceived impact of change on the individual the greater the resistance
Stress of change	Stress increases resistance and may result in overt cooperation / covert resistance (Passive resistance misuse)
Organisational justice	If perception of fairness according to the Psychological Contract is marred, individual will increase resistance. This is influenced by employees degree of commitment.
Capability uncertainty	Anxiety & resistance as users are uncertain in their capability to change and learn new things to meet management expectations
Individual Behaviour	
Consciousness	Unconscious behaviour as a defence mechanism -Overt / Covert reactions
Extent of resistance	Resistance behaviour can be manifested in different degrees -from passive to destructive
Adaptive mechanisms	Humour, anticipation -indicates good coping -less resistance to change
Maladaptive mechanisms	Denial, dissociation, isolation of affect, projection, and acting out is likely to increase resistance
Dynamic Behaviours	User behaviours and perceptions vary as the implementation progresses (Multilevel model)
Forms of Involvement	
Informative	Users simply provide information



Consultative	Users provide feedback and some input
Participative	Users have a say in IS design not merely 'rubber stamp it'
Participation Benefits –Cognitive (Tangible)	
System Quality	Improved quality of the system through more accurate user requirements
Cost	More effective use of budget by avoiding costly system features that the user did not want or cannot use.
Effective Use	Greater understanding of the system resulting in more effective use.
Participation Benefits – Motivational	
Support & Commitment	People support what they help to create
Organisational inertia	Participating addresses user passiveness by providing challenging activities
Acceptance & satisfaction	Participation leads to acceptance and satisfaction by encouraging realistic expectations, facilitating the perceived usefulness, user's system ownership and committing users to the system
Participation Benefits - Situational	
Trust	Participation facilitates trust creation through the sharing and discussion of issues.
Justice	Perceptions of procedural justice are enhanced when affected parties are allowed to express their opinions and values regarding a pending decision
Communication	Participation activities provide the stage for effective information dissemination on the change process.