Key factors that should be taken into consideration in planning for implementation of IT to support primary care functions at a local level

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Declaration

I declare that the work described in this dissertation 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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Summary

The objective of the research is to establish the perspectives and experiences of primary care stakeholders and IT professionals on IT and IT implementation processes in primary care. The research draws on the data obtained to formulate recommendations on key factors to be considered in planning for implementation of IT to support primary care functions at a local level.

A qualitative research method was chosen. Fifteen semi-structured interviews were conducted using a topic guide that left participants free to discuss relevant topics. Interview data was transcribed verbatim and analysed systematically using Framework, a matrix based analytic method.

Four main themes emerged from data analysis - current primary care processes, desired use of IT in primary care, IT implementation and change management.

There is universal dissatisfaction with current processes. Organisational and management structures do not support primary care team working.

Primary care stakeholders desire an information system that supports team working and clinical communication using a shared electronic health care record. Four GP practices use accredited practice management systems with electronic patient records. HSE professionals in the local team do not have experience of or access to clinical IT systems. Stakeholders outlined the functions that would meet their clinical, administrative and communication needs.

Enablers and barriers were identified by primary care stakeholders and IT professionals. The findings support previous studies. Stakeholders agreed that lack of IT infrastructure and limited IT skills were significant barriers. IT staff identified barriers and suggested that they could be addressed by

attention to excellent communication, training, user involvement and engagement and the commitment and support of senior management.

The study concludes with recommendations at the interrelated levels of people, processes, information, organisation, technology, and environment to facilitate planning for implementation. Political support is required to implement health policy and legislation and to provide resources. Funding is required for physical and IT infrastructure, training and the change management associated with implementation of an IT system. Development of organisational structures to support primary care working and development of effective teams and team processes are essential to build the capacity of the team to use IT-enabled information optimally to support them in meeting the needs of the local population for safe and efficient primary health care.

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List of abbreviations

- AHP Allied Health Professional
- CSO Central Statistics Office Ireland
- DED District Electoral Division
- DICOM Digital Imaging and Communications in Medicine
- DOHC Department of Health and Children
- ECDL European Computer Driving Licence
- EHR Electronic Health Record
- EPR Electronic Patient Record
- **GPIT General Practice Information Technology**
- HIQA Health Information and Quality Authority
- HIS Health Information System
- HOD Head of Discipline
- HSE Health Service Executive
- ICGP Irish College of General Practitioners
- ICT Information and Communication Technology
- IS Information System
- ISD Integrated Services Directorate
- IT Information Technology
- ITASH Information Technology Attitude Scales for Health
- LHO Local Health Office
- **OD** Organisational Development
- OT Occupational Therapist
- PC Personal Computer
- PCCC Primary Community and Continuing Care
- PEST Political Economic Sociological and Technological

PPARS Personnel Payroll and Related Systems ROI Return on investment SLT Speech and Language Therapist SWOT Strengths Weakness Opportunities Threats TDO Transformation Development Officer UI Unique Identifier VFM Value for Money WHO World Health Organisation

1 Introduction

1.1 Background to research topic

The research was undertaken in partial fulfillment of the requirements for the award of M Sc in Health Informatics at Trinity College Dublin. Information Technology is defined as the study or use of systems (especially computers and telecommunications) for storing, retrieving and sending information (Soames and Stevenson, 2005:889). This study focuses on the potential use of computer systems for information management in primary care. The research focuses on attitudes of key stakeholders to, and experiences of, IT and change management. In addition it will seek the perspectives of stakeholders and IT staff in the HSE on the changes required to implement IT successfully in primary care. Recommendations will be made on factors to be considered in implementation to maximise the potential benefits of IT-enabled primary care functions.

1.1.1 Primary care in Ireland

The Primary Care Strategy set the direction for primary care as the central focus for care delivery in Ireland through primary care teams and networks (Department of Health and Children, 2001c). It is planned to have 530 teams by the end of 2011 ultimately enabling people to access up to 95% of their health care in their local community (Health Service Executive, 2010). An IT infrastructure will be required to support the work of primary care teams (Department of Health and Children, 2001c).

1.1.2 Motivation

The author is employed by the Health Services Executive (HSE), on a parttime basis as a Senior Physiotherapist in a large primary care team that was launched in 2008. The team was launched in 2008 and serves a mixed urban and rural population. The interdisciplinary primary care team is supported by additional specialists in the Health and Social care network. She is motivated by the need for better and more widespread use of information technology to support health care work, providing benefits to health service stakeholders and users.

1.2 Research problem/question

The research question is:

What are the key factors that should be considered in planning for implementation of IT to support primary care functions at a local level?

1.3 Research objectives

The research objectives are to establish the perspectives and experiences of primary care stakeholders and IT professionals. The research draws on the key factors identified by health and IT professionals to formulate recommendations on factors that should be considered in planning for implementation of IT to support primary care functions at a local level. There is an identified need to improve the capacity and output of research in primary care and to ensure dissemination of findings with impact on clinical services (Health Research Board, 2006).

1.4 Research outline

The primary research is a basic qualitative study. Data was collected using semi-structured interviews and analysed using Framework, a qualitative methodology.

1.5 Dissertation outline

The following sections describe in detail: a review of the literature on primary care (chapter 2); a review of the literature on IT implementation (chapter 3); the research methodology used (chapter 4); the findings obtained from the data (chapter 5); how the results relate to the literature (chapter 6) and discussion, recommendations and limitations of the study (chapter 7). References and appendices will follow.

2 Literature Review-Primary Care Background

2.1 Introduction

This chapter outlines the background to the development of the Primary Care strategy to transform health service delivery in Ireland.

2.1.1 Health models

Health has been defined as the absence of disease (Boorse, 1977). The scientific biomedical model of health has been the most dominant model in the health services. Disease is individualised. It is diagnosed by a medical expert who prescribes the cure or treatment which may be medication, therapy or surgery. By contrast a biopsychosocial medical model takes biological, psychological and social factors into account (Engel, 1977).

The social model of health views health as a tool for living, permitting all people to lead a "socially and economically productive life" (World Health Organisation, 1978:1). Attention is focused on the influences on health that are outside the control of the health services. The effects of social policy and the social determinants of health on individuals and populations are considered important areas for action and research.

2.1.2 Determinants of health

The introduction of the health field concept challenged the notion that biomedical interventions were the only determinants of health suggesting that the interdependent health fields were environment, human biology, lifestyle and health care organisation (Government of Canada, 1974). The recognition of the importance of the social determinants of health has been underpinned by research linking mortality and morbidity with social class (Working Group on Inequalities in Health, 1980, Marmot et al., 1991, Townsend et al., 1988). Health inequalities have not narrowed in spite of increased prosperity and better overall population health. The inverse care law suggests that "the availability of good medical care tends to vary inversely with the need for it in the population served" (Hart, 1971).



Figure 2-1 Dahlgren and Whitehead Model

The Dahlgren and Whitehead rainbow model depicted in Figure 2-1 draws attention to the different levels of health determinants that impact on the individual and are mainly outside their control (Dahlgren and Whitehead, 1991). Interventions to improve health are required at a range of levels including health care services.

2.2 Primary Care

This section outlines the origins of the primary care movement in health care tracing the development from the Alma Ata declaration to the development of primary care internationally.

2.2.1 Primary health care

Following an international conference on primary health care held at Alma Ata in 1978 the World Health Organisation declared that health is a fundamental human right. Health was defined as a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. The existence of inequalities in health status between and within countries was declared unacceptable (World Health Organisation, 1978).

Primary health care consists of essential health care made universally accessible to all in a sustainable manner while prioritising those most in need. At the first level of contact, the health services should address the main health problems in the community. Governments were urged to develop national policies and action plans to develop primary health care as part of comprehensive national health systems coordinating with all related sectors that influence health (World Health Organisation, 1978). The importance of mobilising the commitment of the workforce and the participation of the public in advancing primary health care reforms is stressed in a recent report (World Health Organisation, 2008). The report recommends reforms of universal coverage, service delivery, public policy and leadership.

2.2.2 International primary health care

In third world countries mortality rates are linked to high levels of infectious disease with low levels of medical care and medication. Improvements in sanitation, water, nutrition, immunisation and access to antibiotics and medical care have the potential to reduce mortality.

In the developed world lower population growth and fewer deaths due to infectious or preventable diseases leads to higher life expectancy. This is associated with a higher rate of degenerative and chronic diseases in an increasingly older population. Technological progress and greater expectations have led to rising health care costs.

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2.3 The Irish Health Care System

The Health Service Executive (HSE) was established in 2005 as a single body to provide health and personal social services replacing the regional health board system. The HSE has a budget of almost €14 billion and employs almost 110,000 people with 48% employed in primary and community services (Health Service Executive, 2010). An Integrated Services Directorate was established in 2009 to facilitate integration between hospital and community services. A Quality and Clinical Care includes Public Health functions. Directorate Information and Communications Technology is part of the Commercial and Support Services Directorate. Future challenges in the health service are expected to include funding for public health services, resource allocation based on population needs, accountability, human resources and the promotion of equity (Mc Daid et al., 2009).

2.3.1 The role of secondary and tertiary care

The acute hospital and primary care systems are interdependent parts of the Irish health care system. The current reliance on hospital care delivery is considered unsustainable. Ireland has high bed occupancy rates. The HSE plans to reduce acute hospital bed capacity. Other countries have increased bed activity with a decreased number of acute beds by improved discharge planning, decreasing average length of stay and improved rates of day surgery (PA Consulting, 2007).

The proposed health system depends on investment in and reconfiguration of primary, community and continuing care (PCCC) to minimise hospital stays and requirement for acute care. It also depends on the use of relevant information to improve the performance of acute hospitals (PA Consulting, 2007). IT implementation is expected to improve the flow of information from hospital to primary care (Joint Committee on Health and Children, 2010). The authors suggest that overall health system capacity will be increased as acute bed reductions are offset by increased capacity in areas such as PCCC, day cases and non acute beds (PA Consulting, 2007).

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Concerns have been expressed that acute capacity could be reduced before the necessary infrastructure is set up or PCCC is adequately resourced. The widespread changes required in behaviour and work practices in all areas of the health system are considered a potential barrier to implementation (PA Consulting, 2007).

2.4 Background to Primary Care Development in Ireland

This section outlines Irish health strategies. Each strategy document published by the government from 1990 will be discussed. The primary care strategy follows in the next section.

2.4.1 Health Strategies

Shaping a Healthier Future: a Strategy for Effective Healthcare in the 1990's DOHC 1990

The strategy aimed to reshape service delivery and planning and was based on principles of access (based on need and programme targeting), service quality and accountability. The strategy proposed that decision-making on service planning must be directed to achieving the greatest health and social gain for the resources available and to ensuring that the treatment or care is provided in the most appropriate setting (Department of Health and Children, 1990). Comprehensive and good quality information on needs, activity, detailed costs and outcomes is recognised as an essential prerequisite for the application of this approach (Department of Health and Children, 1990).

Quality and Fairness: A Health System for You, DOHC, 2001

The goals of the strategy were to achieve better health for everyone, fair access, responsive and appropriate care delivery and high performance. The strategy was based on the four principles of equity, people centredness, quality and accountability. It has been criticised for its focus on managing sickness services and neglect of public health (Burke, 2009).

The strategy referred to the poor integration of services within the system. Inadequate IT systems and sharing of data and information acted as barriers to integration. The strategy proposed six frameworks for change: strengthening of primary care, acute hospital reform, public private partnership, funding for infrastructure, human resource development, organisational reform and information in health (Department of Health and Children, 2001a).

The Health Information Strategy, DOHC, 2001

The Health Information Strategy (2001) sought to support the aims of the Quality and Fairness strategy. The focus is on health information rather than ICT. Health information is defined broadly as "any information used to help make an informed health related decision or to inform oneself of health related issues, whether at personal, managerial or political level" (Department of Health and Children, 2001b:18). A central theme of the strategy is the use of information to support safe and high quality patient care and in planning, developing, evaluating and accrediting the quality of the Health Service. Progress has been limited. An all-Ireland Public Health Observatory was established in 2005. The Health Information and Quality Authority (HIQA) was established in 2005 on a statutory basis. The proposed Health Information Bill to establish a legislative and information governance framework for information sharing and to optimise use of information for secondary purposes has not been published.

The strategy proposes an integrated national approach to systems development and expansion. It proposes processes to ensure that health information is used to underpin policy, planning and service provision and efficient and effective health information systems. The electronic health record (EHR) is central to the strategy and it is recognised "that its complexity and scope poses one of the greatest ICT and change management challenges ever faced by the sector" (Department of Health

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and Children, 2001b:94). Safeguarding the privacy and confidentiality of patient health information is crucial.

Effective use of ICT and information will require significant changes in interactions and information use. The strategy acknowledges that the transition from a paper-based health system to a digital environment will be a significant challenge and will require a change management programme to transform health service responsiveness to needs using ICT as a "powerful enabler and catalyst for organisational change" (Department of Health and Children, 2001b:82).The strategy document suggests that the costs of this change, including appropriate facilities, development of new procedures and training staff in their use, are expected to be an integral part of any systems implementation.

The strategy was supported by the Prospectus report which suggested that IT investment at service user, local and regional level would lead to gains in transaction and process efficiency. The report stated that benefits from improved organisational structures and accountability depends on IT investment to ensure the availability of information for decision making at all levels (Department of Health and Children, 2003).

2.5 Primary Care Strategy

Primary Care: A New Direction, DOHC, 2001

Primary care is defined in the strategy as follows:

Primary care is an approach to care that includes a range of services designed to keep people well, from promotion of health and screening for disease to assessment, diagnosis, treatment and rehabilitation, as well as personal social services. The services provide first level contact that is fully accessible by self referral and have a strong emphasis on working with communities and individuals to improve their health and social well-being (Department of Health and Children, 2001c :15)

Primary care is expected to play a central role in the treatment of chronic diseases based on models of shared care with individual disease management plans. More than 50% of those aged 65 or older report a chronic illness or condition (Department of Health and Children, 2009). It is envisaged that patient registration systems will be key to management of chronic diseases (Department of Health and Children, 2008).

There is an identified need to improve the capacity and output of research in primary care and to ensure dissemination of findings with impact on clinical services (Health Research Board, 2006).

Primary care teams, health and social care networks and the proposed role of IT to support primary care are outlined in the following sections.

2.5.1 Primary Care Teams

Primary care teams (PCT) are interdisciplinary teams originally planned to serve the needs of population groups of 3000 -7000 people. The HSE increased this to a population of 8000 (Joint Committee on Health and Children, 2010). Needs assessment, location and population size should determine the number and ratio of all team members. HSE staff are allocated on a geographical basis based on district electoral division (DED). This is expected to facilitate assessment of needs and disadvantage, enable teams to target the specific needs of their population and permit evaluation of outcomes. This is disputed by Igoe who argues that staff allocation on a population or practice basis could improve core team working and facilitate communication and liaison (Igoe, 2009).

It is envisaged that an interdisciplinary team approach will develop service capacity, will facilitate communication and provide support to team members. Patients will be permitted to self refer and will have access to an improved range of primary care and GP services including out of hours and at weekends.

Primary Care Team	Number envisaged
-	11
	L L

GP	4			
Health Care Assistant	3			
Home Helps	3			
Nurse/Midwife	5			
Occupational Therapist	0.5-1*			
Physiotherapist	0.5-1*			
Social Worker	0.5-1*			
Receptionist/Clerical Officer	4			
Administration	1			
Based on population of 5000, * to be assessed				

Table 2-1 Proposed core primary care team members

The proposed core team membership based on an average population of 5000 is outlined in Table 2-1 (Department of Health and Children, 2001c). Health professional and administration staff are employed by the HSE directly. Health care assistants and home helps are employed directly by the HSE, under contract arrangements with private companies or through home care package funding.

Primary medical care is a private enterprise (Wren, 2003). It is provided by General Practitioners (GPs) in practices ranging from single practitioner to large group practices. Postgraduate GP training takes 4 years including 2 years in an accredited practice. There is evidence to suggest that GP demand will outstrip supply (Mc Grath et al., 2005). It is recommended that training places be expanded, accelerated training is resourced and staff retention and skill mix strategies are used to address expected shortfalls (Joint Committee on Health and Children, 2010). Training places have been expanded by 30% in 2010.

GPs are paid on a fee basis by private patients and on a capitation basis for patients eligible for free consultations only, or those eligible for free consultations and medication under the General Medical Services Scheme (GMS). Practice subsidies are paid and further payments are made for other services such as out-of-hours fees, mother and child services and the production of Social Welfare certificates.

2.5.2 Health and Social Care Networks

Health and social care networks are made up of a range of health and social care professionals who work with more than one team. They may include chiropodist, community pharmacist, community welfare officer, dentist, dietician, psychologist and speech and language therapist.

2.5.3 Proposed role of IT to support primary care functions

Information and communications technology is central to facilitating primary care working. The Primary Care strategy proposes investment in ICT infrastructure. The development of an electronic health record with patient health information, based on a unique client number, is proposed. This will be made available to appropriate team members, with safeguards to protect data confidentiality (Department of Health and Children, 2001c).

2.6 Primary care implementation in Ireland

By July 2009 €48 million had been invested to support PCT development with 300 additional posts appointed in 2009. A total of 1,178 staff have been reconfigured with 2,300 remaining for reconfiguration from community care services. It is recommended that ICT should be used by teams that are not co-located to facilitate team working (Health Service Executive, 2009).

Primary care eligibility has not been established. The HSE has a legal obligation to provide nursing services for patients who have a GMS card. The GMS card entitles patients to GP consultations and prescriptions. It is estimated that it would cost €217 million to provide universal primary care in Ireland (Thomas et al., 2008). A hybrid payment paid to GPs and hospital doctors in the same way for all patients has been proposed to replace the current two tier system of primary and hospital care (Tussing and Wren,

2006). Decisions on eligibility will have implications for staffing requirements.

There is limited evaluation of primary care team implementation. A partial evaluation was carried out on 10 pilot sites using questionnaires (Health Services Executive, 2006). Barriers identified were accommodation requirements, weak ICT infrastructure, staff ceiling, agreement regarding team roles, needs assessment, dual reporting relationships and cultural differences between former health board staff and GPs (Health Services Executive, 2006). Key recommendations related to addressing physical and infrastructure requirements as ICT well as developing teams, communication and governance frameworks. It processes was recommended that service initiatives should be supported by needs assessment and performance measurement and that experiences, learning and innovation should be shared with other teams.

2.6.1 Primary care teams

Date	Teams	holding	GPs		HSE	Health
	clinical m	eetings			Professionals	
July 2009		112		438		754
June 2010		219		755		1500

Table 2-2 Primary care team development

Table 2-3 shows the progress in team development nationally (Health Service Executive, 2009, Health Service Executive, 2010). It is planned to have a total of 530 teams by end of 2011. The current focus is on teams holding clinical team meetings. Teams are considered operational when clinical team meetings are held and attended by GPs and HSE professionals. Issues of time and reimbursement for GPs have not been resolved at national level. This has an impact on GP participation. Once teams are established it is planned to shift the focus to disseminating and standardising best practice across all teams (Health Service Executive, 2009).

Team development supports nationally are limited. In contrast the 10 pilot site teams received a great deal of organisational support and facilitation.

2.6.2 Physical Infrastructure

A total of 150 locations have been approved from 289 advertised for public private partnership for primary care infrastructure. Fifty-one per cent were expected to have PCTs in operation by the end of 2009 (Health Service Executive, 2009).

2.6.3 Management

Organisational changes are required to facilitate integrated service provision. New health care governance arrangements are being developed. Transformation Development officers (TDO) facilitate team development and processes. The roles of PCT Service Manager and Professional Discipline Support Co-ordinator are being developed. Clinical supervision and professional development is currently through line management structures. Industrial action impacted on plans to redeploy staff and introduce new ways of working and reporting. The Public Service Agreement 2010-2014 provides a framework for partnership working to deliver change. Successful change management will require effective stakeholder consultation.

2.6.4 Performance management

Current performance measures are based on throughput data on patient activity and service activity and development. Health Stats provide monthly performance information on 29 hospitals and 32 local health offices. Measures and targets are set for access, integration and resources. Improved clinical outcome measures, standards and targets are required to measure the benefits of primary care working.

2.6.5 IT in primary care

IT in Irish health care has developed on an ad hoc basis. A fragmented approach to system selection and implementation against a background of

low investment in IT has given rise to "an inadequate infrastructure to support information requirements, performance management and VFM" (Deloitte & Touche, 2001:190). ICT systems in the hospital system are mainly for administration (Secta, 2005). National procurement strategies are in place to obtain VFM. A national ICT strategy for the HSE is awaited. National ICT structure and support services as well as clinical and administrative systems are being developed (Ryan, 2007).

A PCCC ICT Strategy report offers an assessment of IT in Irish primary health care. It acknowledges that stand-alone systems, duplication and lack of linkages are significant issues. The importance of effective interfaces between PCCC and hospital based systems and alignment with other national projects is stressed. The authors suggest that agreement is needed on common coding and messaging standards, interface requirements, consent protocols and a national unique identifier (Secta, 2005).

The PCCC ICT report recognises that ICT infrastructure and major changes to organisational structures and business processes are required to support person centred care (Secta, 2005). The report states that

A lack of basic infrastructure, few fit-for-purpose applications, and very low levels of networking make it impossible to share information in a way that could support team-based delivery of patient centred care (Secta, 2005:29).

The need for appropriate and timely information sharing across PCCC supported by a change management programme and training is recognised. There are significant costs to the business process redesign required to realise benefits. The strategy report recommends that the PCCC ICT strategy is led by the needs of health service users and workers (Secta, 2005).

Health professionals in pilot primary care teams recommended a national ICT system to meet the needs of PCCC teams and networks. They recommend ICT usage to develop electronic patient and disease registers and minimum data sets to inform service planning and development (Health Services Executive, 2006). They conclude that ICT needs assessment,

support and training is required as well as resolution of data sharing issues (Health Services Executive, 2006).

The PCCC ICT strategy report recommends direct funding for basic hardware and networking infrastructure. It recommends training to expand e-mail usage to facilitate quick wins to maintain staff engagement (Secta, 2005). Funding was obtained in 2009 to provide hardware for primary care teams. Scoping has been conducted for electronic patient records that are compatible with GP practice management software (Health Service Executive, 2010).

2.7 Primary care development at a local level

The local primary care team is the unit of analysis for this research. The team was launched in July 2008. The local health office area comprises 14 teams in 4 networks. The local health and social network is made up of four teams. The first three teams form the local "super team" providing services to a population of 21,925. The decision to have a single large team was made by prospective team members to facilitate team working and avoid attendance at multiple meetings. The fourth team is due to be launched later this year. See Table 2-3 for demographic profile based on 2006 Census figures from the Central Statistics Office Ireland.

A considerable amount of liaison and communication is required between team members who operate from 11 separate sites spread over a wide geographic area. Four GP practices are in the single large town and the other 2 are sited in a village 3.8 miles away. The nearest general hospital is 35 miles away from the LHO. Team members must also communicate with health and social care network members as well as colleagues in acute hospital care and other specialist services.

Population	21,925	% population
0-18	5701	26
18-65	14251	65
Over 50	3563	25
Over 65	1973	9
Over 80		22
Social Class SC 1 and 2	7403	37
SC7	3333	16
Disability	1809	8.25

Table 2-3 Local area demographics

2.7.1 Resources

The team comprises 20 HSE (13.89WTE) staff reconfigured from community services and 6 GP practices. Home care and home help staff are employed by a community service agency funded by the HSE. One team position and 4 network positions have been filled since the team was established. A total of 34 HSE staff have been part of the team. Four left and others were redeployed by professional heads of discipline (HODs).

Management is through traditional uni-disciplinary line management structures. HSE team members cover different geographical catchment areas. Areas are not aligned. Team support is from the Transformation Development Officer and the part time project manager who are also responsible for 11 other teams at different stages of development. There is no administration or clerical support. To date team development training has not been provided.

There are 3 health centres. The main health centre is in the local health office in the large town. Two smaller health centres are in rural villages that are 8 and 15 miles respectively from the urban health centre. Planning permission has been sought for a primary health centre to be built under a public private partnership to accommodate HSE staff and a number of GP practices. Core team membership, based on TDO returns for July 2010, is

Primary Care Team	Sites	Number	of	staff	Numb	er based	on
		expressed	in	WTE	that	envisaged	in
		(number of	staff)		Strate	gy	
Nursing (PHN, RGN)	3	8.14(12)			15		
OT	1	1.5 (2)			1.5-3		
Physiotherapist	2	2 (2)			1.5-3		
Social Work	1	.75 (1)			1.5-3		
SLT	1	1.5 (2)					
Psychology	1	1(1)					
Receptionist/Clerical	3	0			12		
Officer							
Administrator	3	0			3		
HSE total	5	13.89 (20)			34.5-3	39	
GP	6	17 (6 practi	ces)		12		
Total	11						

outlined in Table 2-4. Team membership is compared with the numbers envisaged in the 2001 strategy.

Table 2-4 Core team members, July 2010

HSE staff members have access to desktop computers with administrative applications in office accommodation only. There is no computer access in clinical areas or in domiciliary practice. Secure networking is available to some HSE staff. Four GP practices have accredited practice management systems with links to secondary care, laboratories and radiology and out-ofhours services. Administration is aligned to business needs. There is GP access to a radiology service in a nearby primary care centre with rapid access and results.

Team meetings are held bi-monthly. There have been 9 team meetings since January 2009. Attendance is between 7 and 17 people with an average of 11 attendees. Six GPs, representing 5 practices, attended at least one meeting in 2009. One GP attended a meeting in 2010.

Clinical team meetings are held as required and are facilitated by the TDO or project manager. They are open to all relevant health professionals involved in a clients care. They are held at the LHO or in GP practices. GPs from 3 practices participate by providing verbal or written reports on request from the TDO. Six GPs have attended meetings and participated in team decision making.

2.8 Conclusion

The author explores the background to the development of primary care internationally and in Ireland in this chapter. The development and implementation of the Primary Care Strategy in Ireland is outlined. The chapter concludes with a profile of the local primary care team that is the specific focus of the research. Literature relevant to the research question is reviewed in the next chapter.

3 Literature Review-Information Technology Implementation

3.1 Introduction

In this chapter the author discusses literature related to the research question. Research in the broad area of IT implementation is outlined before focusing on IT implementation in the health care environment and more specifically in the Irish health care system.

3.2 IT implementation

Early research focused on the technical aspects of IT implementation. It is essential to plan for the cost of technology changes, fixing bugs and increased support staff workload to fully understand spending commitment at implementation and in the future (Tiernan and Peppard, 2004). However a system delivered to specification on time and to budget may not produce the expected benefits. Time must be spent planning how business benefits are to be achieved. Value from technology results when the capability of technology is applied and managed in the context of business changes (Thorp, 2003). It is argued that senior organisational leadership must take responsibility for strategic decisions about the role of IT, the initiatives to be funded and the features, risks and business benefits to be achieved (Ross and Weill, 2002). Developing an IT strategy is a critical business process designed to ensure a clear relationship between decisions about IT investment and organisational strategy (Glaser, 2006).

3.3 Factors associated with success and failure in IT implementation

Failed projects are costly. It is vital that investment in IT is aligned with business strategy (Glaser, 2006). Lippert and Davis (2006) suggest that 50% of IT systems may be considered failures or fail to meet expectations.

They conclude that interpersonal and technology trust impact on the outcomes of change in the IT adoption process. Factors contributing to lack of achievement of benefits include poorly identified or managed benefits, the existence of complex dependencies and latency (Peppard, 2009).

Benefits management is the gold standard for IT projects. Research demonstrates that benefits management leads to clearer planning, improved relationships between IT and business staff, wiser investments and increases the benefits realised (Peppard et al., 2007). Benefits realisation has been defined as "the process of organising and managing so that the potential benefits from using IT are actually realized" (Peppard et al., 2007:2). There are a variety of approaches to benefits realisation. All focus on organisational and business changes rather than IT. The process integrates the realisation of benefits with change management. It is vital to focus on benefits rather than the technology used, as knowledge and its distribution is the key organisational resource (Ashurst, 2008). Benefits from IT arise when it enables people to do things differently as it has no value in itself (Peppard et al., 2007).

Research has shown that successful organisations select projects on the basis of capability as well as desirability (Peppard, 2009). Performing a post implementation evaluation and review of benefits is the strongest differentiator of groups who achieve sustained value from IT investments. Successful groups are three times more likely to identify all potential benefits, three times more likely to quantify benefits and twice as likely to transfer lessons from the post implementation review (Peppard and Ward, 2005).

Change management is a significant aspect of IT implementation to achieve the business process changes required. Managers can expect different reactions to change. Individuals may resist imposed change or the associated real or perceived threat of personal loss associated with organisational change (Lorenzi and Riley, 2000). Change is perceived by participants and change recipients in terms of appeal and the likelihood of change (Dibella, 2007). Kotter (1995) suggests that staff will make

23
sacrifices if they believe change is possible. A powerful coalition is required for change and it is important to plan for and create short term wins (Kotter, 1995). Resistance to change is a socially constructed process. The causes of resistance may be diagnosed as being due to parochial self interest, misunderstanding and lack of trust, different assessments or low tolerance for change (Kotter and Schlesinger, 1979). Resistance may be based on a survival mechanism (Karp and Helgo, 2008).

Managers are the "key actors" in promoting feelings of readiness for change in employees by promoting and supporting individual change (Neves, 2009:228) Difficulties should be anticipated. Clear and consistent communication is essential with adequate feedback mechanisms (Narine and Persaud, 2003). Managers should focus on how change affects work based identity rather than actions (van Dijk and van Dick, 2009). The job of management is to control the change and shape perceptions by expediting, encouraging or reframing as appropriate (Dibella, 2007). Strategies chosen depend on factors such as the amount and kind of resistance expected, relative power positions and the stakes involved (Kotter and Schlesinger, 1979). Organisational analysis and awareness of factors relevant to producing change will aid managers in their choice of influencing strategies (Kakabadse, 1982).

User acceptance is critical. Computer self efficacy is related to perceived ease of use (Venkatesh and Davis, 1996). The information technology acceptance model (TAM) predicts that perceived usefulness and perceived ease of use affect openness to technology adoption. Perceptions are related to user expectations about new technology and lead to acceptance or rejection (Davis, 1989). The UTAUT model offers a unified model of user acceptance based on models and theories of individual acceptance (Venkatesh et al., 2003). Perceived usefulness at pre-prototype testing stage is strongly linked to usage intention and behaviour suggesting that user requirements should be verified at an early stage (Davis and Venkatesh, 2004). Research suggests that changing people's attitudes may improve motivation to learn (Bagozzi et al., 1992).

A number of models for change are available, broadly divided into planned and systems models. The three stage model, developed by Kurt Lewin, is a planned model (Lewin, 1947). It is the basis for other planned models such as the model developed by Beckhard and Harris (1987). Planned models have been criticised for being linear and too simplistic. In contrast, Turrill advocates a more organic cyclical view of change (Turrill, 1986). Systems models highlight the interdependencies within in the system, the differing views of stakeholders and the importance of the environmental context (McAuliffe and Van Vaerenbergh, 2006). The Burke-Litwin model, a causal systems model, is used in the HSE (Burke and Litwin, 1992:528).

There are a number of tools that can be helpful in change management. For example stakeholder analysis facilitates understanding of the abilities, perspectives and capacity of stakeholders. A selection is included in Table 3-1 as follows:

Stakeholder analysis (Beckhard and Harris, 1987)
Responsibility charting (Beckhard and Harris, 1987)
Strengths Weakness, Opportunity and Threats (SWOT) analysis (Credited to
Albert S Humphrey, Stanford University)
Force field analysis (Lewin, 1947)
Political Economic Sociological and Technological (PEST) analysis (Johnson
and Scholes, 1993)

Table 3-1 Change tools(based on Bury and Mead, 1999)

Working processes and relationships will require permanent changes to benefit from IT implementation. Process mapping may be used to bring people together and helps build understanding and mutual accountability (Karp and Helgo, 2008).

It is important that lessons learned are shared. While ICT based strategies for capturing and transferring knowledge across projects are common it has been suggested that the role of intermediaries, personal networks and capturing of process knowledge are more widely useful for cross project knowledge transfer (Newell et al., 2006).



Figure 3-1 A cumulative and recursive model of successive phases of digital technologies implementation

Barriers to access to ICTs have been identified (van Dijk, 2005). Successive phases in a recursive process must be repeated with each new technology implementation with integration with business processes at the highest level in the amended model in Figure 3-1 (Wielicki and Arendt:22). Comparative research in SMEs offered some support for the hypothesis that the perception of barriers to ICT implementation differs with the degree of ICT readiness (Wielicki and Arendt). Van Dijk (2006) contends that the supplyside and technical design dominance and the device or service perspective that is taken instead of a social and contextual perspective leads to the mismatch between system design and demand.

3.4 IT in Healthcare

3.4.1 Introduction

Protti (2005a) suggests that IT in health care may be viewed as a cost or an investment in infrastructure that enables other systems to work. IT in health care can improve processes and outcomes (Parker, 2006). However, IT investment in health care is 2% of budget annually compared with 5%–10% in manufacturing (Protti, 2005a).

Research has produced guidelines for implementation based on the identification of influencing factors. In contrast a socio-technical approach focuses on the health care system and the health professionals that work within it. Using findings from both approaches is likely to be the most effective (Baus, 2004).

3.4.2 Socio-technical approach

IT in health care may be perceived as a socio-technical push to achieve business objectives (Greenhalgh et al., 2008). It is argued that the implementation of a complex technology in a complex organisation is a mutually transformative process, that is highly context dependent and unpredictable (Berg, 2001). Berg (2001:88) argues that there is no fixed list of factors but "insights" to be aware of in the process of implementation. Issues are optimal iterative development, an optimal interrelationship between the IS tool and the skills of health care workers and the complex "collective cooperative" work in the heterogeneous networks of health care (Berg, 1999:94). Berg (1999) contends that system analysis, design and implementation requires similar "collective cooperative" work. The sociotechnical approach has implications for implementation as it suggests that adaptations and learning must be features of a process of organisational change that cannot be totally pre-planned or controlled.

3.5 Factors associated with failures in IT implementation

Failures in health IT projects have been largely due to human factors. It is argued that problems of IT failure in health care are mainly due to sociologic, cultural and financial issues (Kaplan and Harris-Salamone, 2009). Failures in implementing large information systems have been associated with issues of communication, culture, under-estimation of complexity, scope creep, organisational factors, technology, training and leadership issues (Lorenzi and Riley, 2000). Shortfalls in health care return on investment (ROI) have been attributed to "the cognitive complexity, socio cultural aspects, and labour intensive nature of modern medicine" (Sistrom, 2005:440). Obstacles to the use of electronic resources include lack of information literacy and skills and the high workload of health professionals (Khudair and Cooke, 2008). Despite spending £12.7 billion on IT in the NHS a review found poor progress with little clinical functionality and benefits "still theoretical" (House of Commons Public Account Committee, 2009:16). Risk factors associated with health information system implementation in primary health care are in Table 3-2 (Ludwick and Doucette, 2009).

Liability	Privacy	Previous	Patient/Provider		
		experience	Relations		
Efficiency	Quality of care	Staff Anxiety	Patient Safety		
Financial	Time				

Table 3-2 Risk factors

Changes may introduce new risks that must be managed. For example, while Computerised Physician Order Entry (CPOE) offers potential for decreasing adverse drug events, there is evidence that it may increase mortality and facilitate prescribing errors (Koppel et al., 2005, Han et al., 2005). Monitoring and evaluation by management is required to ensure that the required changes are made with CPOE to improve patient safety (Mills et al., 2009).

3.6 Factors associated with successful IT implementation

Implementation success is a contested concept. The perception of success is complex (Bowns et al., 1999, Berg, 2001). It has many dimensions (Berg, 2001). It varies with time and depends on the perspective of the observer (Bowns et al., 1999). Health care work is complex. The primary tasks of health care work are cognitive rather than physical and personal interactions are integral to the process of care (Sistrom, 2005).

Bowns et al. propose a simplified classification that draws together the factors associated with success or failure in health care projects (1999:138). The author uses the classification, outlined in Table 3-3, to guide the next sections in this chapter.

Factors associated with success or failure in healthcare IM & T projects					
Organisation	Culture				
	Strategy				
Project	Management roles				
	Organizational change				
	Human resources				
	Stages				
Environment	Political				
	Technical				
	Commercial				

Table 3-3 Factors associated with success or failure in healthcare IM & T projects

3.6.1 Organisational factors

The importance of organisational and people issues in health care implementation have been acknowledged (Lorenzi et al., 1997, Southon et al., 1997). The requirements for realising the benefits of health system implementation and managing changes need to be clarified pre

implementation (Hindmarsh et al., 2007). Patients' needs must remain at the centre of change.

Health IT initiatives should fit with longer term strategic objectives (Bush et al., 2009, Tiernan and Peppard, 2004). Funding decisions should be based on the core health care business of providing quality care to patients. Short term investment in "something useful" that is not carried forward should be avoided (Chowdhury, 2007:12). Any information technology strategy needs to develop in partnership with all clinical staff, allowing everyone the opportunity to influence how it is developed and delivered (Frame et al., 2008). The analysis of context and external influences is of vital importance (Wells and Bullen, 2008).

The influence of health care culture and subcultures must be considered. Health care culture largely determines work processes in service delivery function (Sistrom, 2005). Complex health organisations with departments that function separately with rigid barriers must give way to changed systems of work (Protti, 2005c). The tribal attitudes that give rise to conflicts between professionals and management, the power of individuals and the innate conservatism of "professional bureaucracy" may give rise to resistance to change (Bate, 2000:498).

3.6.2 Project related factors

Factors related to the IT project include those related to project, change and people management and to factors related to users. Critical factors differ at the stages of adoption, implementation and post implementation (Bowns et al., 1999).

IT success is about good management rather than technology. The prime focus of management is information and its flows to coordinate and control staff activities. IT can be a valuable support for improved decision making (Protti, 2005b). Senior health care management is responsible for project planning and assessing if objectives are met. Scope, resources and schedule must be closely monitored and corrective action taken if required. Communication is critical. The implementation of a good communication plan is vital. Adequate feedback mechanisms must be developed to enable a timely response to unanticipated difficulties. It is essential that feedback on methods for implementing change is obtained from those most affected by it (Narine and Persaud, 2003). Change management processes must be funded to maximise the return on investment so that more reliable and flexible processes of care realise clinical benefits for patients (NHS, 2004).

Leadership and monitoring are critical to obtain benefits. There is evidence of a cause and effect relationship between leadership and organisational performance with the extent of engagement with staff impacting on every element of motivation and well being (Alimo Metcalfe, 2009). Leaders must understand internal organisational dynamics (Lorenzi and Riley, 2000). It is argued that it is necessary to develop leadership across the organisation to promote "layers of leadership and influence" as changes driven by the staff that ultimately take responsibility are more likely to be sustained than top driven (NHS Modernisation Agency, 2004b:3).

Gaining commitment to a change process requires time and resources. Resistance to change must be managed appropriately. An organisational development (OD) approach treats resistance as a "healthy self-regulating manifestation" (Coghlan and McAuliffe, 2003). Individual resistance to change may give rise to organisational resistance leading to a "selfreinforcing loop of increasing resistance" (Lorenzi and Riley, 2000:121). On the other hand it is argued that sceptics offer a valuable perspective challenging assumptions, alerting to potential pitfalls and helping to develop better methods (NHS Modernisation Agency, 2002).

Benefits management may be used to increase the involvement of professionals and management in IT projects, ensuring that investments are driven by agency and stakeholder need. For long term success management must maintain the commitment to change and consolidate gains (Narine and Persaud, 2003). Plant (1995) stresses the importance of striving for a win-win situation for all stakeholders because

"where there are powerful "winners" from change sustainability may be high but not where there are powerful "losers" " (Plant cited in NHS Modernisation Agency, 2004a:9).

Those responsible for people management are important change agents. Line managers are essential agents for fostering organisational change as they are significantly positioned to affect the quality of frontline services (Maguire and Ojiako, 2007). Communicating with and consulting staff on clinical process changes and acting on their feedback is a significant task. Staff will require clinical and technical training but acceptance of the clinical process is far more important than IT skills (Ammenwerth et al., 2006). Agreement on acceptable performance and the appropriateness of the chosen change must be negotiated. Middle and line management must monitor and measure the effectiveness of clinical adoption. Research on the reactions of change recipients can help management sell change and guide change plans so that the key attitudes that shape behaviour can be targeted (Armenakis A. A. et al., 2007).

Multi professional teams require clarity about their roles and responsibilities. Effective team working and communication are critically important factors in providing safe medical care (Leonard et al., 2004). Team working is acknowledged to be a key component of effective organisational change (NHS Modernisation Agency, 2003). Change is more challenging with more teams involved. Communication channels increase exponentially as team numbers increase. Motivation for teams may be achieved by tangible rewards for results or a focus on staff training and engagement (Carignani, 2000). There is need for shared ownership for successful change with staff "bound together by a sense of common purpose and shared responsibility" (Bate, 2000:503). The goal is to link employee involvement with success, encouraging participation and ownership of the process.

The process of care has been traditionally distributed across a range of professionals with inbuilt checks and supports. These can be lost with the introduction of information systems that reduce human interaction (Sistrom, 2005). This has implications for risk management and patient safety. A

structured method for assessing risk exposure with e-health is recommended. An example is the QUiPs model that addresses the interdependent attributes of quality, usability, privacy and safety (Croll and Croll, 2007).

Work process changes are required to implement IT. The impact of redesigning work processes depends on the local context, and how change mechanisms are used (Ham et al., 2003). It is critical to optimise the fit between the attributes of users, technology and clinical tasks and processes as different organisational settings may lead to different adoption processes and effects (Ammenwerth et al., 2006). Research demonstrates that source and target contexts must have a good fit if technology transfer is to be successful (Southon et al., 1997). This has implications for systems procurement and implementation.

Information systems can be expected to work better if based on actual work practices. Sociologically informed approaches focusing on articulation work and tacit knowledge as well as practical tasks in context has the potential to produce systems that are acceptable to users (Timmons, 2002). It is acknowledged that human factors require as much attention as technology development (Lorenzi and Riley, 2000, Ward et al., 2008).

Attitude scales have been used to predict user intentions. The Information Technology Attitude Scales for Health (ITASH) questionnaire has been developed and validated in the UK with health professionals in a range of settings (Ward et al., 2009). The three scales are efficiency of care, education, training and development and control.

Support is required to enable the transfer from manual to automatic documentation. Empirical research by Lee (2007) identified the need for training in system and keyboard skills, sufficient computers for access, workflow modification, increased interdepartmental communications and implementation and guidelines on system use.

Line managers and clinicians/users require evidence of benefits and will adopt if direct benefits are proven (Protti, 2005c). It is argued that benefits for staff are needed to compensate for the effort of change (Leonard et al., 2004) Users will require training needs assessment and training in system use. Super users are individuals with the skills and experience to provide frontline support to other users in the clinical environment where their availability to mentor peers may reduce dependence on the IT department (Boffa and Pawola, 2006). It is suggested that they influence employee experiences and attitudes by enhancing perceptions about usefulness and ease of use consistent with the Technology Acceptance Model (Halbesleben et al., 2009).

3.6.3 Environmental and technical factors

Political policy changes impact on health care organisations. The analysis of context and external influences is of vital importance in implementation (Wells and Bullen, 2008). Commercial contracts and relationships must be managed appropriately. A positive vendor relationship is perceived to impact positively on access to timely support and problem solving (Cohn et al., 2009).

IT in health care is used to support clinical work (Protti, 2005a). It is important that IT systems do not increase workarounds or add to workload (Nemeth et al., 2006). An information system must make the workflow easier or the project will not realise clinical benefits.

It is argued that the optimal way to use IT in health care is to design and implement systems that support the cognitive work of clinicians (Sistrom, 2005). Cognitive factors are very important in understanding how clinicians process information. It is important to work with users to identify the information most useful for them (Boddy et al., 2009). It is vital to anticipate clinical "thoughtflow". This is defined as "how the clinician accesses, assesses, prioritises and acts upon data" (Ball, 2008:6). This can only be done in collaboration with clinicians. Studying human and clinical factors at the point of care aids understanding of complex health care

processes and enables the development of resilient IT systems that improve rather than impede patient care and safety (Nemeth et al., 2006).

User involvement is essential for effective implementation. IT and health professionals must develop teamwork (Lorenzi and Riley, 2000). Research into health system implementation experience in primary care suggests that implementation process quality is as important as system quality (Ludwick and Doucette, 2009).

The technical functionality of the system is important. Standards and interoperability are significant issues. For example successful implementation in radiology has been due to the amenability of medical images to IT solutions and the existence of the Digital Imaging and Communications in Medicine (DICOM) standard ensuring interoperability (Sistrom, 2005).

Risk management is essential. Croll and Croll argue that the biggest risk is endeavouring to understand the complex health care environment and ensuring user awareness and compliance with security policies (2007). This is an important issue as the health care culture and climate may not be conducive to appropriate security measures (Grimson et al., 2000).

Evaluation is important post implementation to ensure that the anticipated benefits are achieved. Kaplan contends that the four interrelated and interactional issues of communication, care, control and context must be addressed in the evaluation of information systems in health care organisations due to the importance of the interrelationships between users, organisational context and system (Kaplan, 1997).

Research has linked a number of factors with successful implementation (Bowns et al., 1999, Frame et al., 2008, Ludwick and Doucette, 2009). These factors are summarised in Table 3-4.

Leadership	and	Middle	management	User 1	friendl	y int	erfaces
commitment	of	leadership		integrate	ed	to	clinical
senior				workflow	/		
management							
Communication	ו	Incentives		Usability	,		
User/clinician		HR manage	ement	Technolo	ogy		
involvement							
Detailed plan		Active	benefits	Organisa	ational	st	ructure
		realisation		change			
Training		Managing e	expectations	Ongoing	IT	suppor	t and
				mainten	ance		
Project		Standardiz	ation	Leadersh	nip		
management							

Table 3-4 Summary of factors linked with successful implementation

3.7 IT in Irish health care

Good management of IT projects and the required change management are critical to successful implementation. The development of IT in Irish health care has been outlined in Chapter 2. There are a large number of administrative and stand-alone systems in the hospital sector with national systems in development across the health care sector. The author discusses some IT failures in the Irish system and research that is relevant to the primary care setting.

IT failures in the health system have created fears of a risk averse culture (Ryan, 2007). Poor management and governance of Personnel Payroll and Related Systems (PPARS) led to the planned national roll out ceasing in 2005. Lack of readiness, vision and a change management agenda to support the transformation of human resources processes in the Health Services were factors identified by the Comptroller and Auditor General (Purcell, 2005). Access to an internal audit on a \in 60 million hospital based integrated patient management system (IPMS) under the Freedom of

Information Act revealed inadequate controls leading to security breaches. The audit revealed that there was no standard implementation - which will impact on proposed future system linkages - and there is no national security system in place (Burke and Kehoe, 2010).

A survey of IT in general practice found that 83% of respondents had a computer in their practice and 88% had a computer in their consulting room. The main reasons given for computerisation were better administration, improved clinical record management and enhanced patient care. Barriers to computerisation were lack of time, cost and poor training (Irish College of General Practitioners and General Practice Information Technology group, 2003).

Research on GP attitudes to computerisation concluded that perceived advantages of computerisation included ease of access to information, legibility, increased efficiency, increased quality of care and efficient billing. GPs sought the use of e-mail to replace letters for communication. The main perceived problems of computerisation included system crashing, transition effort, fear of the unknown or unfamiliar, lack of external support, human error and issues of confidentiality and data protection (Lordan and Normand, 2005).

Comparative studies based on GP surveys in Ireland suggest that particular subgroups of Irish GPs are more likely to use electronic patient records (EPR). Age, gender, practice type and location impact the uptake of electronic patient records. Lack of time, cost and skills are the perceived barriers to adoption (Meade et al., 2009).

Nolan (2002) researched the ICT requirements of Irish health care hospital workers. While 92% used a computer daily, 54% had received no formal training. Fifty-nine per cent of those who received training found it inadequate. Sixty-two per cent of respondents felt the European Computer Driving Licence (ECDL) would be an appropriate basic standard (Nolan, 2002). There is evidence of limited completion rates (66% and 61%)

respectively) for ECDL training, provided for staff by the Eastern Regional Health Authority using a variety of methods (Nolan, 2002).

3.8 Conclusion

This chapter discussed literature on IT implementation in the broader context, in health care generally and in Irish health care in particular. The following chapter outlines the research methodology.

4 Methodology

4.1 Introduction

In this chapter the author will describe the rationale for choosing a qualitative research methodology to meet the research objectives. The underlying assumptions and research design will be considered. The process used for sampling, data collection and analysis will be outlined. The author will also discuss the rigour and limitations of the research.

4.1.1 Research objective

The research objective was to gain an insight into the perspectives of IT professionals and primary care stakeholders within a local primary care team. This is important because there is a lack of in-depth understanding of the views and perspectives of local staff who will use the system and the IT staff who will implement and support it. There is significant literature on IT implementation challenges with the critical importance of human factors well established (Lorenzi et al., 1997, Southon et al., 1997, Berg, 1999, Berg, 2001, Lorenzi and Riley, 2000).

4.1.2 Research question

The research question is:

What are the key factors that should be considered in planning for implementation of IT to support primary care team functions at a local level?

4.2 Research approach

In this section the research approach is outlined and the underlying ontological and epistemological assumptions are discussed. Interpretativist and positivist approaches are based on different goals and underlying

assumptions. The researcher uses an interpretivist approach from an insider or emic view to help uncover meanings.

4.2.1 Ontological assumptions

The researcher subscribes to the position described as "subtle realism". This approach suggests that while social research investigates independent knowable phenomena, knowledge is based on cultural assumptions and purposes and is a human construction (Hammersley, 1992:52). Obtaining diverse perspectives from participants' interpretations of research issues helps capture a deeper understanding of multifaceted reality (Ritchie and Lewis, 2003).

4.2.2 Epistemological assumptions

An interpretative approach is chosen based on the assumption that "the social world is not governed by regularities that hold law-like properties" that would permit exploration of "causal relationships" (Ritchie and Lewis, 2003:23). The importance of understanding people's perspectives led to using "people and their interpretations, perceptions, meanings and understandings as the primary data source" (Mason, 2002:56). However, the researcher aims to be as objective as possible in data collection and data interpretation using reflexivity and a systematic approach with a clear audit trail. Inductive and deductive processes are used at different stages in data analysis.

4.3 Research Design

The purpose of the study is to develop an in-depth understanding of the experiences and perspectives of the professionals who will participate in IT implementation in primary care. It is important to consider research purpose, audience, questions, resources and the data that will best address the research problem in choosing an appropriate design (Patton, 2002).

4.3.1 Rationale for Pursuing a Qualitative Research Approach

As the researcher is interested in how people interpret and attribute meaning to their experiences and construct their worlds a basic qualitative study approach was chosen to gain understanding (Merriam, 2009). Patton contends that "qualitative methods are particularly useful for capturing differences among people and programs" (Patton, 2002:161).

A qualitative research approach will best address research

- that delves in depth into complexities and processes
- that seeks to explore where and why policy and practice are at odds
- on informal and unstructured linkages and processes in organisations
- on real as opposed to stated organisational goals (Marshall and Rossman, 1999:46).

4.4 Data Collection Techniques

There are four core methods for information gathering. These are participation in the setting, direct observation, in-depth interviewing and analysis of documents and material culture (Marshall and Rossman, 1999). Interviewing was chosen as the data collection technique.

4.4.1 Rationale for interviewing

Interviewing was judged to be the most suitable method to ascertain the perspectives and attitudes of participants. Interviewing is a useful technique for collecting data that other methods may not be able to collect (Blaxter et al., 2006). Patton suggests that we " interview people to find out from them those things we cannot directly observe" (Patton, 2002:340).

4.4.2 Semi-structured Interviewing

Semi-structured interviews were conducted using a topic guide, allowing freedom to explore areas of interest. Structured questions were used initially to obtain background information on participants and establish rapport. Open ended questions were used subsequently to encourage interviewees to say what they wished rather than offering predetermined choices. Interview schedules for stakeholders and IT staff are included in the Appendix.

4.4.3 Planning and administering interviews

Detailed and rigorous planning is required for interviews (Mason, 2002). Questions were prepared within broad themes for use by the interviewer with probes and follow-up questions. Permission to interview HSE staff members was obtained from the general manager at the local health office. A total of fifteen interviews were conducted. Ten face to face interviews were arranged and held at office locations convenient for interviewees. Interviews lasted between 30 minutes and one hour. Five telephone interviews were conducted to overcome logistical difficulties that prevented meeting with some staff. Interviews lasted from one to one and a half hours. Interviews were digitally recorded on a Sony ICD-SX 800 with interviewee consent and transcribed verbatim. An Olympus TP7 telephone pick-up device was used with the recorder for telephone interviews. Interview notes were taken for three interviewees who did not consent to recording.

4.4.4 The role of the interviewer

The interviewer is the data collection instrument in qualitative research. It follows therefore that the quality of information obtained depends largely on the interviewer (Patton, 2002). It is argued that successful qualitative research depends on the interpersonal skills of the researcher (Marshall and Rossman, 1999). It is essential to listen carefully to responses (Mason, 2002). This has been described as the "the art of hearing" (Rubin and Rubin, 1995). Rubin and Rubin suggest that the interviewing relationship is developed in a "conversational partnership" (Rubin and Rubin, 2005:79).

The researcher sought to gain rapport with interviewees and put them at ease. It is suggested that interviewers should establish rapport vis a vis the person with neutrality vis a vis content (Greenfield, 2002). The researcher

assured all participants that their perspective was sought with no "right" or "wrong" answers. The interviewer endeavoured to strike a balance between being open and friendly and professional in her approach to avoid undue influence. The interviewer used open questions with probes and follow up questions. The final question offered an opportunity for interviewees to add anything they felt was important.

It is important to reflect on the interviewer's understanding and biases and bracket them to ensure that the participants' perspectives were obtained (Marshall and Rossman, 1999). A contact summary form was used to keep track of interviews, recording strategies and changes in research design (Miles and Huberman, 1994). A template is in Appendix 5. The researcher engaged in a process of "active reflexivity" scrutinising her actions and role as well as interview data (Mason, 2002:7).

The researcher has worked in the non acute public hospital sector and community for 30 years. Initial training in physiotherapy was based on the scientific medical model and a positivist approach. A degree in Health and Social Care introduced the researcher to sociological concepts and interpretative approaches. The taught year of the Masters programme developed knowledge of health informatics. The researcher thus has a broad understanding of health and IT domains. Some participants were known to the researcher. Other participants were chosen by snowballing techniques to identify and access professionals who were not known to the researcher to avoid bias.

4.5 The Sampling Process

Purposive sampling was used to gain in-depth understanding as it "focuses on selecting information-rich cases whose study will illuminate the questions under study" (Patton, 2002:230). Primary care IT system stakeholders were chosen to identify issues for IT implementation. Stakeholders from nursing, allied health, medical and management were interviewed. IT professionals

with experience of implementation in health care were interviewed to obtain data triangulation. Interviewee profiles are provided in tables 4-1 and 4-2.

ID	Job Title	Years o	f	Years	of	Years	of
		experience ir	۱	experience	in	experience	in
		current role		private sector		health service	
IT1	IT Project	8		12		15	
	Manager						
IT2	Senior	4.5		14		8	
	Systems						
	Analyst						
IT3	Acting IT	5		12		12	
	Project						
	Manager						
IT4	Technical	6		5		11	
	Liaison						
	Officer						
IT5	Service	5				28	
	Delivery						
	Manager						
IT6	Technical	9		12		9	
	Liaison						
	Officer						

Table 4-1 IT Professional profiles

ID	Job title	Years	Years of	Private	Computer	
		experience	experience in	health	experience	
		in current	public health	sector	(self rated)	
		role	service		1-10 scale	
HP1	PHN	3	13	1	8	
HP2	Senior OT	3	24	6	6	
				months		
HP3	PHN	2	12		5	
HP4	GP	30		30	9	
HP5	Senior	10	3	7	5	
	Physio					
HP6	RGN	8	9	10	7	
HP7	TDO	3	30		8	
HP8	PHN	24	24		3	
HP9	Community	10		29	8	
	Services					
	Manager					

Table 4-2 Stakeholder profiles

4.6 Data Analysis

Data analysis started from the first interview to permit adjustments and "test emerging concepts, themes and categories against subsequent data" (Merriam and Associates, 2002:14). Memos were used to document decision making and analytic insights. The analysis was organised to illuminate the key issues identified (Patton, 2002). The analytic process was iterative and required data management and the development of descriptive and explanatory accounts at higher levels of abstraction (Ritchie and Lewis, 2003).

All original data was stored separately with back-up copies used as working copies. Interview transcripts were transcribed verbatim using a Sony FS-85

USB transcribing kit. Four interviews were transcribed by others and edited by the author to ensure accuracy. All other transcripts were transcribed by the author. This facilitated greater immersion in the data. Transcripts were set out in Microsoft Word using a template with wide margins to facilitate data searching, making notes and coding. All transcripts, pages and lines were numbered to facilitate data identification and referencing (Denscombe, 2007).

The researcher listened to interviews and read and re-read transcripts to get a feel for the data. Initial reading was followed by reading with field notes to understand data in the context of the interview. Subsequent re-readings aimed to capture significant implied meanings to ensure that appropriate codes could be applied (Denscombe, 2007). A period of reflection aided the researcher in "standing back" from the data (Wellington, 2000:135).

The approach to data management and analysis is based on Framework, a matrix-based method of analysis. It facilitates "rigorous and transparent data management such that all stages involved in the analytical hierarchy can be systematically conducted" (Ritchie and Lewis, 2003:220). The process is iterative throughout the analysis. This is illustrated in Figure 4-1.



Figure 4-1 Analytic hierarchy based on Ritchie and Lewis 2003

4.6.1 Identifying initial themes or concepts

A selection of transcript were chosen and reviewed in depth for recurring themes in line with the stated objectives of the research. An index was devised based on the recurring themes and the issues contained in the topic guide for interviews. Themes were sorted and grouped under a number of main themes to develop an overall framework using a numbering system. The initial index was applied to a selection of transcripts. Some categories were found to be too refined while others required subdivision to capture distinctions. The revised index was applied to all transcripts.

4.6.2 Labelling or tagging the data

The raw data in the transcripts was systematically indexed manually with references written in the transcript margins. Interconnections between

themes were noted where themes were mentioned in discussion of other issues.

4.6.3 Sorting the data by theme or concept

The index was used to create a set of thematic charts in Microsoft Excel. Each main theme and subthemes were plotted on separate thematic charts. Each participant was allocated a row while each subtheme was allocated a column. A column for researcher notes and interpretations was included in each thematic chart.

4.6.4 Summarising or synthesising the data

Key points were summarised and placed in the thematic matrices staying as close to the participant's language as possible working through each transcript chronologically to develop understanding of individual participant's views and to identify relationships between subtopics. All page references were noted to facilitate further data use and asterisks were used to indicate the presence of salient quotations with page numbers. Charted data was reviewed on completing each transcript to identify gaps in transfer of data. Reasons were recorded for lack of data on a subtopic. Researcher comments were added.

4.6.5 Identifying elements and dimensions, refining categories, classifying data

The researcher looked at the range of perceptions, views and experiences of all participants within subtheme columns in the thematic charts. Charted columns were interrogated until all data was described or classified. Key dimensions were extracted and new broader categories identified. All synthesised data was assigned to more interpretive, abstract categories (Ritchie and Lewis, 2003).

4.6.6 Detecting patterns

Associative analysis was used to find links between phenomena. Linkages can only be verified across the full data set. A central chart was constructed from thematic charts to summarise key phenomena and abstract categories for all participants to identify linkages and associations. Linkages were verified by examining distribution across the data set and interrogating patterns found (Ritchie and Lewis, 2003).

4.6.7 Developing explanations

Framework was used to assist explanatory analysis as it gives easy access to synthesised data. It also offers the ability to look within cases across themes and move between thematic and case based analysis. Explanations were generated and assessed from repeated interrogation of individual cases so that explanations are supported by and reflect the data (Ritchie and Lewis, 2003). The researcher sought applications to wider policy strategies on IT implementation in primary care.

4.7 Research rigour and reliability

The research aimed for "symbolic representation" focusing on inclusivity rather than statistical matching (Ritchie and Lewis, 2003:269). Patton suggests that it is possible to make "context-bound extrapolations" (Patton, 1990:489). Replicibility is not possible to establish due to numerous interpretations with multiple realities. It has been suggested that trustworthiness, dependability and consistency are more useful concepts to establish that results are consistent with the data collected (Lincoln and Guba, 1985). Inferring findings to other contexts depends on congruence between contexts (Lincoln and Guba, 1985). The researcher has provided "thick description" (Geertz, 1973). It is left to the reader to decide generalisability to other contexts based on their contextual understanding.

Internal reliability relies on checks on quality of data and interpretation and information on the research process (Ritchie and Lewis, 2003). Purposive

sampling was used to obtain a range of perspectives; analysis was carried out systematically and evidence is provided for data interpretation.

To ensure internal validity participant reality was accessed directly through interviews rather than through an instrument (Merriam and Associates, 2002). Multiple sources of data were used to ensure external validity with individual findings referred back to participants for comments or clarification at the descriptive stage of analysis.

The researcher's assumptions and biases as well as previous connections to participants are made explicit. Decisions are included in an audit trail to enhance reliability comprising memos and journals containing reflections on the author "as a researcher, data collection issues and interpretations of the data" (Merriam and Associates, 2002:28).

4.8 Limitations of research

The research was limited by time and resource constraints. Focus groups were considered initially but rejected due to lack of access to a suitable venue and work pressures on participants. The possibility of bias due to insider researcher is noted. Skills required for research interviewing are different to the researcher's clinical interviewing skills. The research method chosen is considered the most appropriate to achieve the depth of understanding required to answer the research question.

5 Findings

5.1 Introduction

This chapter will present the results of the data collected in fifteen semistructured interviews and analysed by the author using the Framework method. Supporting quotes from interview transcripts will be used. Interviewee profiles are provided in Tables 4-1 and 4-2 in Chapter 4.

Four main themes emerged from the data. A figure illustrating the subthemes and issues identified by participants will precede each theme discussion. Each theme discussion is followed by a summary.

The four themes that emerged are

- 1 Primary Care processes
- 2 Desired use of IT in Primary Care
- 3 IT implementation
- 4 Change management



Figure 5-1 Primary Care Processes

5.2 Theme 1 Primary Care Processes

Theme 1 is related to current primary care processes and the current use of IT by members of the primary care team. It includes barriers to IT use identified by health professionals. Several factors emerged.

5.2.1 Limited IT usage by clinicians

Current IT usage is limited for HSE clinical staff. Travel and Health Stat returns are completed on a mandatory template on computer but require printing for signature and further manual processing by administration and management. Most parts of the business process are paper-based including referrals, equipment ordering by clinicians and all clinical record keeping. There are no computer-based clinical information systems. However, there are administrative and management information systems.

The Transformation Development Officer (TDO) and Community Services Manager use IT extensively in their work for administration and information sharing and communication. Encrypted reports of clinical team meetings are distributed by the TDO although not all can access them due to technology deficits. The GP interviewed uses practice management software. The practice has been fully computerised for 12 years. Three other GP practices use practice management systems that are accredited by GPIT.

5.2.2 Inefficient work processes

Work processes are unwieldy and inefficient. One participant expressed frustration that "current clinical processes are very fragmented and confusing" (HP3). Staff members are based at 11 different sites over a wide geographical area. HSE staff use diverse paper-based methods of recording information which is shared within their own profession only. For example, nursing and OT have a single chart per client whereas physiotherapists have a chart per episode of care with limited access to previous records. Processes are complex and slow with workarounds used to speed up referrals. For example, it can take up to two weeks from initial referral to receipt by the relevant health professional. This has a negative impact on

timely patient assessment and service provision. Policy states that receipt of primary care referrals must be acknowledged by fax. This is rarely done. Limited feedback on referrals within the team is a universal complaint. Only two professional groups provide written feedback to referrers on interventions with patients. Limited information sharing impacts on patient care. For example, one participant expressed frustration that "there are supports there that can be put in [for patients who require them] but you can't put them in if you're not aware of it" (HP8).

HSE team members are accountable within community professional line management structures and within the primary care team. Delays ensue as team members must deal with competing and conflicting priorities and staff redeployment into and out of the team.

Statistics are collected and collated manually by clinicians for line management. Duplication of information collected is common. Communication processes are under-developed with particular difficulties experienced with acknowledgement of and feedback on referrals. There is no agreed protocol for information sharing between team and network members. This is a significant issue with respect to limited information sharing by GPs and sharing of sensitive information within the team. Much communication is by telephone and fax. Difficulties are experienced in contacting busy colleagues to obtain or communicate essential information on patients in a timely manner. The mobile nature of domiciliary work adds to the problem.

5.2.3 Barriers to IT use for stakeholders in the HSE

The main barrier to the use of IT by HSE staff is a lack of IT infrastructure. Funding for computers has improved access for some staff. However, at one health centre, four staff members share a single computer with intermittent access to dial up internet. Secure networking is not easily available to all HSE staff; this limits access to patient information that could otherwise be shared electronically. Others have limited access to information shared by e-mail. This has led to instances of absence from clinical team meetings.

IT skills are at different levels. They range from experience of building computers and assisting with network installations to using e-mail and mandatory forms only. Staff with IT skills accessed training outside the Irish Health Service. Staff attitudes to IT among those interviewed are positive but there is recognition that not all colleagues share this attitude. Security, technical and data protection issues and lack of a legislative framework are perceived to be barriers to IT-enabled health information sharing. Delayed access to IT support is perceived to impact on IT use.

5.2.4 Summary

There is evidence of limited IT use by HSE professionals. This is due to limited IT infrastructure and skills and dependence on paper-based records and processes. There is frustration with inefficient work processes and difficulties in accessing clinical information and communicating with colleagues.



Figure 5-2 Desired use of IT in Primary Care

5.3 Theme 2 Desired use of IT in primary care

Theme 2 is related to the uses and functions desired by staff in the local team. This section includes the impact of IT on clinical processes and how increased computer use might contribute to the safety and efficiency of care. The section also includes issues identified by IT professionals that are specific to Irish primary care.

5.3.1 Stakeholders desire a health IT system

Stakeholders would like a structured shared electronic health record. There is strong desire for a single patient record. Staff would like to have "access to up to date information for efficient decision making and problem solving" (HP2). Ideally this should be accessible "with the press of a button" (HP5). Staff would like to have access to the interventions and assessments made by colleagues. The GP was very satisfied with the EPR and electronic results but expressed concerns about sharing non-relevant patient information with other professionals. A system to track and flag patients for colleagues would facilitate the provision of preventative supports in a timely manner. One participant suggested that a unique patient identifier shared with hospital colleagues offers the potential to improve care pathways.

The potential of IT-enabled communication is recognised. Staff would like improved communication with colleagues on the team and wider network as well as with specialist and hospital services. There is consensus that secure communication of clinical data is crucial. Role based access to appropriate levels of information is required. The potential of secure e-mail to facilitate timely referral, acknowledgment and feedback regarding clients is acknowledged. This includes feedback on referrals. Out of office replies would alert referrers to staff absence and permit an alternative referral. An electronic signature was suggested to ensure that electronic forms do not need to be printed for signing. Computer access would be required at multiple locations including clinics and in the domiciliary setting to optimise benefits.

One participant stated that she "would like IT to facilitate changed working approaches" (HP7). Wider use of IT was considered essential to improve information management and dissemination. One participant expressed her wish "that at the right time, the right amount of information is there" (HP5). Networking for all staff is considered vital. Access to local population health evaluations is seen as key to provide information for needs assessment and measure improvements in population health. Clinicians suggested that management information should be collected automatically from clinical data permitting more time to be spent in clinical work. One interviewee suggested that "It should be automatic. It should be very easy to compile even for me that hates wasting time on the computer" (HP8). This has the potential to improve service delivery and performance management. A scheduling function for appointments is desired. Equipment management functions are required. This includes order processing and tracking as well as tracking equipment supplied to clients. This could facilitate servicing, replacement and efficient resource management.

5.3.2 Uncertainty about the impact of IT on clinical processes

There is uncertainty about how an IT system would impact on clinical processes. There is a shared frustration with current processes that is driving a desire for change. It is recognised that an IT system "would need to work efficiently or [it would be] no better than the current way" (HP6).

The analysis showed that an IT system is expected to impact on professional practice. There would be greater transparency of personal and professional work practice and of the extent of compliance with policies and procedures. This is expected to lead to greater responsibility and accountability but there are concerns that it could also lead to defensiveness among staff.

Participants agreed that IT-enabled communication between professionals would improve patient care, with more timely and efficient referral and up

to date accessible records. Records would be open to audit and automated data collection. Equipment ordering processes would be more efficient. Accurate information is expected to facilitate action planning and forward planning of appointments and check-ups. It was suggested that gaps could be identified more easily using summary reports.

Concerns were expressed about the extra time required to input data and the difficulties of dealing with the computer and the patient. Using electronic records is found to slow down GP consultations. However, it ensures that all client-related tasks, such as referral, are complete at the end of the consultation. This reduces the likelihood of forgetting to follow up on agreed plans. It was felt that the patient's perception of the computer could be negative due to its impact on professional consulting style. The patient might perceive that "the computer rather than the patient was the focus of clinician attention" (HP4).

Concerns were expressed about invasion of patient privacy and maintaining confidentiality. Data security, client consent, access controls and the legal framework are perceived to be important issues.

5.3.3 IT has the potential to contribute to safer and more effective care

Participants saw a potential role for an IT system to contribute to safer and more effective care for patients. The system is expected to improve the ease, speed and accuracy of communications between professionals, for example lab results and X ray reports. It is suggested that "knowing what's going on makes everything safe" (HP1). IT-enabled information sharing is considered to offer the potential for more quality time with patients and could facilitate a more holistic approach to care. It could help to ensure that all professionals are "singing from the same hymn sheet" (HP1) so that health messages and advice are reinforced. However, it was pointed out that "while information can make it easier to deliver health care, it must be targeted and actioned to benefit clients" (HP9).
The flagging of drug interactions can improve care safety. However, oversensitivity can lead to alerts being ignored. Participants perceive that improved access to shared knowledge as well as research and clinical knowledge will improve care effectiveness.

5.3.4 Issues in primary care will influence IT implementation

Primary care teams are a new entity. Teams are perceived to be at various stages of development and functioning. Team protocols and working processes are in being developed, communication pathways are not fully developed and there is a perceived lack of flexibility in service delivery. Health professionals in primary care are dispersed and mobile. IT professionals perceive that there is a range of attitudes to IT in primary care and varying levels of willingness to engage with change.

It is perceived that "IT-enabled information offers an opportunity to review and remodel services" (IT1). The health care system is moving towards a patient-centred model with greater integration between hospital and primary care although clinical information is contained in professional silos. However, while "IT can facilitate and make opportunities for change obvious" (IT1), it is perceived to be vital that senior management engage with ways to make the required changes. Several IT staff expressed concerns that health professionals do not have the ability to take the opportunities provided by IT-enabled information to drive business changes. Established management and administration structures are not aligned to support primary care team working or the integrated model. This has implications for service management and delivery.

Professionals in primary care are perceived to be busy with a focus on clinical tasks. IT requirements identification and implementation are time consuming processes requiring clinical input. Gaining trust and buy-in from health professionals is perceived to be a significant challenge. There is a perceived lack of shared understanding between IT and health professionals. One IT professional expressed frustration that primary care staff "don't seem to realise what the IT people need" (IT1).

There are deficiencies in IT provision in primary care. IT infrastructure is patchy. There is a lack of readiness to use IT with professionals asking IT support staff for help with applications in the absence of appropriate training. There are mixed reactions from staff to computer provision and use with "some very eager to use PC and others who don't want to know" (IT6). There are cost barriers to access and funding processes are perceived to be inflexible. There is a lack of linkages between stand-alone systems. There is need for interoperability and compliance with standards. It is recognised that a business continuity plan is necessary in the event of IT system failure.

5.3.5 Summary

Stakeholders perceive that IT-enabled improvement in communications is vital. They desire a health IT system using a unique identifier with a shared electronic health record. They expressed uncertainty about the impact of IT on clinical processes. The impact on professional practice is likely to be perceived differently by different stakeholders but will lead to greater professional accountability. Stakeholders suggest that IT has the potential to contribute to safer and more effective care by improving access to information for clinical decision-making and improving communications processes for clinicians. IT professionals identified financial, infrastructural, people and organisational issues in Irish primary care that are likely to impact on IT implementation.

Implementing in healthcare environment

Project expectations * Flexible systems Benefits realisation * Risk management Users * Workflow * Stakeholders * Benefits Project management * Communication Resources * Clients * Business Complexity * Technical

Enablers

IT skills * IT support IT infrastructure Attitude * Resources Technical

IT implementation

Barriers

Lack of clinical leadership/ownership Business process change Power * Resources Communication * Data entry Fear, suspicion, cynicism Resistance to change Lack of competence in information use

Success Metrics

On time and to budget System usage Different perspectives Post implementation review C&RM process Customer satisfaction Improvement in service delivery/provision Management information reporting Benefits realisation

Overcoming Barriers

Communication * System testing Corporate commitment * Business sponsor Deal with fears * Identify barriers Prepare for difficulties * Stakeholders Structured process * Benefits * Users Competency to use information

Figure 5-3 IT implementation

5.4 Theme 3 IT Implementation

Theme 3 is related to the implementation of IT in the health care environment. This section includes the success metrics that may be used and enablers for IT use. Barriers to IT use are identified and participants make recommendations on how barriers may be addressed.

5.4.1 Importance of people, organisational and technical factors

IT staff are clear that only system users and managers can derive benefit when implementing IT systems in a health care environment. People issues are expected to pose the greatest challenges. Building trust is vital. IT staff view their role as facilitators. They identify a common purpose with health care staff in that "We're all pitching for the patient" (IT3). Business time and resources commitment is essential. IT professionals are clear that ownership of the system must be with the business side at higher management level to ensure a good system.

Stakeholder consultation throughout the process is considered vital by all interviewees and user acceptance testing should be satisfactory. Benefits for stakeholders and the service should be identified and realised. Participants stress that user commitment is required to make process changes and use the system. Users are expected to require training and education. It is felt that system champions and super users have a potentially useful role. It is stressed that "Users must be allowed to concentrate on core activities, the provision of healthcare" (IT4).

Technical difficulties may arise. Participants suggest that solutions to technical problems can be worked out. There is consensus on the use of a structured method of project management. Prince2 is a structured process of public service project management that is used in the HSE. Workflow mapping and marrying of workflows is vital. Risk management should be adequate including clinical risks. Clients must feel that their information is secure and that it will improve service efficiency. Systems may be developed in-house but are more commonly purchased from vendors. It is

recommended that systems should be flexible so they can be updated without incurring costly changes by vendors. One interviewee expressed concerns about the inherent risk when small commercial entities are developing key systems for the HSE, as there have been instances of vendor collapse.

5.4.2 Inconsistent use of success metrics

Interviewees stress the importance of measuring success. Implementation success may be measured in a variety of ways and from different perspectives. It is considered important that systems are delivered on time and to budget. However, participants argue that post-implementation use of the system and customer satisfaction is essential if a system is to enable the provision of quality health services.

Management information reporting, the change and release management process, surveys, technical testing and post implementation reviews are metrics used in the HSE, depending on the project. Post implementation reviews are not always completed. A benefits realisation approach is recommended as a way to ensure clarity regarding what the project is to deliver and the business owners responsible for making required changes. It ensures that suitable metrics are chosen to assess the extent to which benefits have been realised.

5.4.3 Enabling IT use by stakeholders

Stakeholders in primary care identified a number of enablers to computer use. Resources are required for IT infrastructure. This includes hardware, software and networking. Staff will require training to develop IT skills. Timely access to IT support is considered crucial. Stakeholders stress the need for an IT system suitable for use by allied health professionals and nursing staff. Interviewee attitudes were generally very positive and this was expected to influence computer use. Even the stakeholder with the least It skills was definite that "it'll have to go that way [towards greater IT use]" (HP9).

5.4.4 Significant barriers to implementation identified by IT staff

IT professionals identified several barriers to implementation of an IT system. Lack of clinical leadership may result in failure to achieve the required business process changes. It is recognised that it may be "difficult to use [the] computer and deal with a patient" (IT3). Lack of clinical ownership and responsibility for realising benefits is identified as a major barrier to successful implementation. The impact of the moratorium on recruitment on human resources on the business side is recognised. The cost of resourcing the required IT infrastructure is perceived to be a very significant barrier in the current economic climate.

IT staff identified resistance to change as a factor. There is recognition that some health professionals view IT negatively and will not welcome change. Four IT professionals with extensive experience with primary care staff suggested that public health nursing staff had particular difficulties with IT. Lack of staff buy-in and engagement in the process is a potential barrier to implementation. Fear, suspicions about surveillance and cynicism among staff must be overcome. Data entry and the keying in of existing data are perceived to be major barriers for users. There is a perception that health professionals lack "being comfortable with the computer as a tool that they use" (IT3). There is a perceived lack of competence in business information by stakeholders. Power issues are expected to use impact on implementation as change may lead to the loss of power domains in dependency relationships that exist as a legacy of previous organisational structures.

5.4.5 Barriers to implementation can be addressed

All IT professionals agree that communication is the key factor. It is felt that good communication "will ensure user buy-in, involvement and ultimately ownership of the system" (IT4). Project teams require a communication plan, with the content and approach targeted and appropriate for the needs of individual staff and teams. It is considered essential for the project team to "use as many and varied ways of communicating with people as possible" (IT3).

A structured process of project management and benefits realisation is recommended by IT staff. It is considered vital to "involve all stakeholders from the beginning of the process" (IT5). Thorough stakeholder analysis is required with an action plan for those who are against it. It is considered important to prepare for difficulties, identify barriers and use a planned approach to deal with individual situations.

A business owner or leader and clinical ownership are seen to be critical for success. The aim is that "they're running the show" (IT4). There is a perceived need to build the ability to use information competently on the business side. Corporate commitment, engagement with line managers and business time and resources commitment are perceived to be essential. The system must be workable and thoroughly tested before go-live.

It is considered important to "be sensitive to user concerns and fears" (IT3). Concerns may be related to new ways of working, intrusion on clinical practice or limited computer skills. It is considered important to highlight benefits and to prepare users for difficulties in the process of implementation. It is felt that user groups can help gain buy-in and provide valuable feedback on system issues. System champions with some extra training and strong clinical advocates are enablers for implementation. IT is recommended that support and help should be provided for staff.

5.4.6 Summary

Implementing IT in the health care environment requires attention to people, organisational and technical factors. A number of success metrics are used in the HSE. However, they are not used consistently. A benefits management approach is strongly recommended. Stakeholders identified infrastructure, training and support as enabling factors. IT professionals perceive that significant barriers to implementation include lack of clinical leadership and ownership and resistance to change. They suggest that the key factor in addressing barriers is good communication with all stakeholders. Stakeholder involvement should be sustained throughout a structured implementation and benefits realisation process.

Primary Care stakeholder perspective

Time * Challenge of change * System * Sell change Training * Benefits * Leadership * Funding Clinical processes * IT support * Management Training needs assessment * IT skills * Buy in Funding for facilitation of change * Data entry Perception of change * Clerical support *Client Willingness to change * Information sharing

Change Management

IT perspective

Business sponsors * Communication * Project management Users on board * Business ownership * Benefits realisation Technical * Early user buy-in * Project funding Working relationships * Stakeholders * Lessons learned Getting people to work differently * Can't take anything for granted Willingness to work through difficulties * Listening * Trust IT role as facilitator * Management support * User acceptance Organisational culture * Power issues * CM&R process * Testing Project approval * Risk assessment * Business continuity plan

Figure 5-4 Change Management

5.5 Theme 4 Change management

Theme 4 relates to attitudes and experiences of change management from the perspectives of the primary care stakeholders and the IT professionals.

5.5.1 Primary care stakeholders views on change management

HSE professionals in primary care who were interviewed do not have experience of using an IT system in the clinical environment. In contrast four GP practices use electronic patient records. It is recognised by staff that changes are required. One participant stated that "We couldn't just computerise what we are doing at the moment" (HP6). There is recognition that "Buying computers and giving everyone a computer isn't the solution to the IT problem" (HP6). It is suggested that there is "need to change mindset and thought about how they do things" (HP7). The challenges associated with change are universally acknowledged. One interviewee referred to "the challenge of widespread change" (HP1). One view was that there are "so many obstacles currently that it will be a huge thing to bring it in" (HP1). However, other staff felt excited about the possibilities. One interviewee felt that the "challenges would be exciting" (HP2). There is recognition that clinical work processes must change. Agreement on sharing clinical or sensitive information needs to be negotiated, for example. It is considered essential to "make the information timely pertinent and useful" (HP2). The transition period is expected to be challenging.

Management's role is perceived to be to provide leadership and encouragement with monitoring and to ensure compliance with altered work practices. It is considered important that the project has a joint IT and clinical lead. Consultation must be real and involve listening to staff views and concerns. There is a need to "sell change" and ensure that staff are "brought with the changes" throughout the process (HP2). Funding is required for extra support to facilitate change. It is suggested that the change must be perceived as important as this will impact on staff willingness to change. Stakeholders recommend that people should be prepared for the frustrations likely in the change process.

Training needs assessment and training in IT skills and system use are perceived to be vital. It is perceived as "training people to be fit for the job" (HP2). Workplace training attended by one staff member was limited to learning to turn the computer on and off and to access to e-mail due to the lack of prior computer experience of some attendees.

It is expected to be time consuming to teach everyone how to use the system. There are universal concerns expressed about the time and skills required for data entry. It is argued that clerical support for the intensive labour of inputting files and entering demographics is important. There are concerns that data entry issues will leave less time for clinical work leading to a negative impact on patients.

The benefits of an IT system "must be made visible" (HP2). It is considered essential to connect the system with how the client benefits and what is best for the client. People must be helped to "understand the functions and usefulness of a system" (HP2). Visible benefits are expected to encourage staff buy-in. Client consent is important and will be enabled by good security. An IT system needs to be good technically and from a user's point of view. Timely IT support will be necessary.

5.5.2 IT professionals experience of change management

All IT professionals have experience of the change management process associated with implementing an IT system. They demonstrate a shared understanding of the process and the key factors that impact on implementation.

IT staff are perceived to lack power in the organisation and are outside mainstream influences. Power issues can be a barrier to achieving the changes required for implementation in the hierarchical structure of the HSE. It is felt that organisational culture is a significant factor. Health professionals do not have to engage in the change process which can lead to frustration and delayed projects. Communication is regarded by all interviewees as the key factor in the process. One interviewee stated that "Good communication would be a main factor in getting an insecure and cynical workforce to develop an atmosphere of openness and trust" (IT4).

IT professionals stress that all stakeholders must be identified; those who are involved and those who will be affected by changes. Communication with all stakeholders is perceived to be essential to ensure buy-in and avoid disenfranchising staff. It is considered important to have users on board early with "business/stakeholder involvement throughout the process" (IT5). However, for project success "those who commit to buy-in must deliver" (IT1). The system is for clinical use; it is important to respect clinician's knowledge although it may be necessary to help the business side to clarify their needs. The introduction of an IT system will require health professionals to develop a broader view of clinical processes rather than working separately in their own functions.

Information is the key resource. It is considered important to focus on the information the system can supply and help people know what they want the information to do for them. Staff must identify how things will change for people and plan how to address the change issues required to allow the system to deliver. Hooking people's interest and dealing with resistance and fears are deemed to be important issues. Listening and gaining trust are vital. Risk impact assessment is essential. It is suggested that more user acceptance testing would be beneficial.

IT staff stress that management support is vital at senior and line management levels. Business sponsors and business ownership must be obtained. The Prince2 methodology, used in the HSE, requires a group of key sponsors. A willingness to work through difficulties is important. A business continuity plan is required in the case of system failure.

Project approval and funding must be obtained in advance. The project team must not take anything for granted. Working relationships need to be

developed in the project team. A "lessons learned" document should be produced post implementation. This is not always done. The change management and release (CM&R) process, introduced recently by the IT function, focuses on key reasons and benefits for the introduction of or change to IT. This facilitates decision making and evaluation. Technical testing must be completed satisfactorily before go-live.

A benefits realisation process is recommended to ensure that the benefits to be obtained by the business are clear. This gives ownership to the business people responsible for realising IT-enabled benefits. Post implementation review will identify any unexpected benefits and further work can be done to achieve unrealised benefits.

The HSE offers online resources to support change management initiatives. It is suggested that some of the issues and fears associated with IT projects require a different approach to other changes. Further training and the availability of a number of framework options to support communication planning and other aspects of change with IT implementation are suggested.

5.5.3 Summary

Understanding of change management differs between stakeholders and IT professionals. Stakeholders do not have experience of IT implementation while IT professionals have experience and skills. Stakeholders recognise that clinical processes must change and stress the importance of making IT benefits visible to encourage staff buy-in. There is broad agreement on the role of management in providing leadership and support. IT professionals stress the importance of communication, stakeholder engagement and good project management.

5.6 Conclusion

Findings have been discussed in terms of the four themes identified by participants. These themes are primary care processes, desired use of IT in primary care, IT implementation and change management. The findings of the primary research will be analysed in the next chapter.

6 Analysis and Discussion of Findings

6.1 Introduction

The author discusses the findings of the research undertaken in this chapter, relating it to the wider research context. The perspectives of primary care stakeholders and IT professionals on IT in primary care are outlined. The development of the primary care team and team processes are discussed. The implications for planning for IT to support primary care team functions at a local level are discussed in the light of the barriers and enablers identified by participants. The chapter concludes with the functions that stakeholder's desire in an IT system in primary care. Each section will be followed by a short summary.

6.2 Improved understanding of the perspectives of health and IT professionals on IT in primary care

This study contributes to an improved understanding of the perspectives of primary care stakeholders by representing the views of health professionals in primary care and the views of IT professionals with experience of implementing IT systems in the health care and primary care environments.

Asking users their views on the desired functions of an IT system is a first step to requirements specification and design. The need to involve users and stakeholders is well documented (Frame et al., 2008). A network of supporters can provide the critical mass to drive change effectively. Clinical and business needs must drive the IT development process. The benefits for stakeholders should be clarified and measured to quantify the extent of benefits realisation. Clinicians are expert in their work and are able to articulate the functionalities they require from an IT system to facilitate effective clinical care, despite limited technical knowledge. There is need to examine how clinicians work within primary care as the essential factor is the interrelationship between system functioning and health care work (Berg, 1999). It is important that stakeholders are involved from the start of the design process. User requirements for clinical care must be ascertained. Taking articulation and tacit knowledge into account will help develop a system that is acceptable to users (Timmons, 2002). It is important to verify user requirements early to ensure that user needs are being met (Davis and Venkatesh, 2004).

Health professionals expressed a strong desire for a shared structured EHR. A unique identifier will be required. There is inconsistent use of identifiers by different professional groups with each profession using different identifiers. Charts and processes are paper-based in the HSE. There is evidence that paper records do not facilitate shared care (Grimson et al., 2000). Participants are keen to have electronic records to improve patient care. GP experience of electronic records and messaging is very good. Ensuring the integrity, security and confidentiality of patient data is essential for patients and clinical staff to develop trust and confidence in IT in health care (Grimson et al., 2000, Lippert and Davis, 2006). Clear guidelines on confidentiality are recommended (Staines et al., 2001).

There is evidence of deficits in information management and dissemination. IT-enabled information can lead to improved decision making (Protti, 2005b, Department of Health and Children, 2003). Information is required on local population needs for service planning and resourcing and to measure improvements in population health. It is argued that the development of core competencies in the use of informatics is required for effective use (Ball, 2003). IT has the potential to enable more effective use of health information to inform service planning, delivery and evaluation. It is perceived that health professionals do not have competence in information use. Information is moving vertically in the current organisational structures but lateral movement to meet clinical and team needs is poor. There is poor use of available data and much information is unusable for analysis in its current form. The importance of capacity for

data analysis in health information systems has been advocated (Staines et al., 2001).

There is evidence of a deficit in IT skills. All staff with IT skills accessed training outside the Irish health service. A range of online and classroom computer training is available within the HSE for staff, but there are low levels of awareness of training provision. This information needs to be disseminated and staff will require protected time to access training. Training will need to be at an appropriate level based on needs assessment. Self rated computer experience was a challenging concept suggesting that training to a recognised standard such as ECDL would be useful (Nolan, 2002).

Skills are required in needs analysis and in work process mapping and improvement. Berwick et al. (1992) argue that staff in health care must develop the capability to understand and improve their work processes in a collaborative team effort. They advocate the use of total quality management theory to focus on expanding knowledge of the underlying causes of process inefficiencies, seen as opportunities for a continuous process of improvement (Berwick et al., 1992).

There are significant cultural differences between IT professionals, HSE stakeholders and the GP interviewed. The focus of all staff interviewed is on the quality of patient care but there is evidence of different understandings of the role of IT in supporting health care. Existing links with IT professionals are through the IT helpdesk and support. Concepts such as process mapping, system ownership and change management are understood differently. This has implications for IT implementation as implementing IT will require effective team working between health and IT professionals (Ball, 2003). IT staff have extensive experience of system implementation and the associated changes in work processes required. Medical work may be seen as "messy" in comparison with the more rational standardised work of IT (Berg, 1999:88). They view their role as facilitating health care work and they have insight into health care processes. General practices are autonomous and can choose their software. HSE stakeholders

do not have experience of clinical IT systems. Stakeholders have limited expectations of being consulted or involved in any decisions made.

IT professionals identified factors that impact on IT project implementation and change management processes. Technical issues are seen as more easily solved. Human factors are felt to be more difficult. This is supported by evidence of the importance of organisational and people issues (Southon et al., 1997, Lorenzi et al., 1997, Berg, 1999, Berg, 2001). Factors identified include system ownership by clinicians, senior management commitment, user involvement and resistance to change. It is suggested that the use of a benefits realisation approach focusing on business benefits and business ownership of the changes required would add value to the core business of health care.

IT infrastructure is essential. Investing in infrastructure permits other systems to work (Protti, 2005a). It is acknowledged that adequate resources are required to provide the necessary infrastructure and systems to achieve the expected benefits (Department of Health and Children, 2001b, Commission on Patient Safety and Quality Assurance, 2008, Department of Health and Children, 2001c). The evidence from participants is that the required resources have not been made available to all staff.

Summary

The perspectives of health and IT professionals offer improved understanding of the cultural differences and the people and organisational issues that are to likely impact on team working for IT implementation. The research offers an insight into user attitudes and skills deficits and a first step towards user involvement. There is evidence of a strong desire for a shared electronic health record.

6.3 Improving current primary care team processes and team development

Team processes are poorly developed in the sampled unit. There is an identified need to develop processes for referral, communication,

information sharing and decision making. National guidelines are awaited. The team uses an amended version of a national referral form. This has implications for the introduction of a national computerised referral system. Teams are dependent on informal processes with many staff working in parallel in the team. Interdisciplinary working has been identified as a development need for primary care teams in Ireland (Kinneen and Kelly, 2010). A resource for multidisciplinary team development and working processes in mental health care has been developed (Mental Health Commission, 2006). An amended version of the audit tool for team evaluation has potential for use in the local primary care team.

Users are frustrated that current processes do not facilitate primary care team working. Paper based processes are perceived to be inefficient (Grimson et al., 2000). Stakeholders recognise that transition to IT-enabled processes will be a challenge requiring training and support. Process mapping could help build understanding and mutual accountability within the team (Karp and Helgo, 2008). Supporting team working is vital because team working is a key component of organisational change (NHS Modernisation Agency, 2003). Effective team working and communication are critically important factors in providing safe medical care (Leonard et al., 2004).

IT-enabled secure communication is desired. This supports previous research (Lordan and Normand, 2005, Health Services Executive, 2006). The required IT infrastructure is not in place to facilitate communication between team members. This is a matter for concern as it is argued that "communication failures are the leading cause of inadvertent patient harm" (Leonard et al., 2004:187). Stakeholders are concerned that they spend a great deal of time trying to contact team members by telephone to get essential clinical information. Primary care stakeholders perceive improved communication as key to providing safe quality care. This is supported by the literature (Commission on Patient Safety and Quality Assurance, 2008, Leonard et al., 2004). Physical infrastructure is required to facilitate the personal interaction that is an essential part of the care process (Sistrom, 2005).

There is lack of support for team development and performance. The focus to date has been on staff reconfiguration into primary care teams. Teams are considered operational when clinical team meetings are held and GPs attend. Performance metrics are limited to attendance and activity levels.

Team development has not been provided for the sampled unit. This has implications for team working and performance as motivation for teams may be achieved by tangible rewards for results or a focus on staff training and engagement (Carignani, 2000). Team functioning and effectiveness have not been evaluated.

Supporting the development of teams is perceived to be vital (Tucker et al., 2004, Mental Health Commission, 2006, Kinneen and Kelly, 2010). Data is available from team evaluation and development work (Health Services Executive, 2006, Kinneen and Kelly, 2010). There is no evidence that data is being used to inform action to address the issues identified. The lack of a systematic approach to developing monitoring and reviewing established teams has been identified (Kinneen and Kelly, 2010).

The sampled team is a large one. There have been multiple changes in HSE personnel in two years mainly due to staff redeployment. Communication channels increase exponentially with additional numbers which compounds communication difficulties. For example, a core team of 10 gives rise to 45 communication channels while a core team of 20 gives rise to 190 channels. The core teams envisaged in the strategy are small to facilitate team working. HSE staff members cover disparate geographical patches that are not aligned. GPs provide services to patients from outside the team area as do some HSE staff. For instance, physiotherapists in the team work function as network members and in addition carry a caseload from areas outside the team's geographical area. This leads to lengthy waiting lists. A practice or population approach to staff deployment has been advocated to address these issues (Igoe, 2009).

Structural supports for primary care team working are limited. Organisational infrastructure is aligned with administrative and management functions. There is no management or administrative support for the team. It is argued that organisational and informational infrastructural support is required for the business processes of health care delivery (Grimson et al., 2000). Team members have dual accountability to the team and line management for each discipline. Heads of discipline are not part of the primary care structure. They are expected to be reconfigured to new posts in primary care team management and clinical co-ordination in the future. This has implications for change due to the importance of the role of line management in a change process (Maguire and Ojiako, 2007).

The local team is heavily reliant on the TDO for support, communication and facilitating team meetings. Over-reliance on TDOs for team development and data collection has been identified as a significant issue (Kinneen and Kelly, 2010). There is limited sharing of experience between teams in the area or nationally. Building on good practice and learning from challenges is a valuable resource in developing person centred integrated care (Tucker et al., 2004).

Change management is required to realise the benefits of a different way of working to provide services. The number of changes in Irish health care may have contributed to "initiative fatigue" (Buchanan et al., 1999:25). Professional autonomy and resource constraints are among the barriers to change to be addressed in health care organisations (Coghlan and McAuliffe, 2003). An organisational development approach is recommended by some authors as it pays attention to the process of how change is implemented (Coghlan and McAuliffe, 2003, McAuliffe and Van Vaerenbergh, 2006).

Summary

There is evidence of frustration with current team and communication processes. Stakeholders perceive that there are limited structural or organisational supports to facilitate team working and team development in primary care. The challenges associated with the transition from paperbased processes to IT-enabled processes is recognised as is the need for appropriate skills development and change management processes to enable the transformation of clinical and administrative processes.

6.4 Implications for implementation of IT to support primary care functions at a local level

The research findings have implications for how IT might be implemented to support primary care functions at the local level. The author discusses these implications in terms of enablers and barriers to implementation.

6.4.1 Barriers to IT implementation

People

User involvement cannot be taken for granted. Lack of staff buy-in and engagement in the process is identified as a potential barrier. Fear, suspicion about surveillance and cynicism among staff must be overcome. Patient consent is a very important issue. The GP expressed concerns about information sharing. Research indicates that patients' willingness to share health information depends on the recipient and whether it will be used for clinical care. Patients are less willing to share information of a sensitive nature with professionals other than their doctor (Whiddett et al., 2006).

Processes

Inefficient processes in the primary care team are a barrier. Data entry has been identified as a barrier by IT and health professionals.

Organisation

The different cultures involved in primary care between HSE staff and GPs and IT professionals can be expected to impact on implementation processes. Professional practices vary. The health care culture with its professional bureaucracy has been identified as a barrier to IT implementation (Bate, 2000, Sistrom, 2005, Protti, 2005c). Power issues are expected to impact on implementation processes.

While interviewee attitudes were very positive, there was recognition that some colleagues view IT negatively and would not welcome change. This

suggests that resistance to change will be a factor as professionals will have to work differently to benefit from an IT system. It will be necessary to understand the reasons for resistance to address them. Acceptance of the clinical process is more important than IT skills (Ammenwerth et al., 2006). A lack of IT skills was identified among team members. Some stakeholders have concerns about delays in access to IT support.

IT professionals identified a lack of clinical leadership and ownership as a significant barrier. Their experience is that clinicians are reluctant to take responsibility for realising the benefits of IT systems. There is no plan for information use. Lack of an information plan has been used as a proxy for lack of knowledge and understanding of how to use information to drive the business (Wielicki and Arendt, 2010). This may be linked to the perceived lack of competence in business information use.

Technology

The lack of IT infrastructure for HSE staff is acknowledged to be a significant barrier to implementation. Primary care stakeholders identified technical and data protection issues as barriers to information sharing in the team.

Environmental factors

Lack of funding for IT infrastructure is a key barrier to IT implementation. Health strategies have been clear on the proposed role of IT (Department of Health and Children, 2001a, Department of Health and Children, 2001b, Department of Health and Children, 2001c). However there has been limited progress in implementing health strategies leading to discrepancies between policy and practice. For instance, the legislation proposed in the Health Information Strategy (2001) to support enhanced health information use and governance has not been published in August 2010.

Summary

The most significant barrier is perceived to be lack of funding for infrastructure and IT systems and the slow progress in implementing health

strategies and publishing legislation to support information sharing and use. Other perceived barriers include user resistance, inefficient processes, organisational culture and lack of clinical leadership and ownership.

6.4.2 Enablers for IT implementation

People

Stakeholder involvement is essential from the beginning. It facilitates shared ownership (Bate, 2000). Staff will require support and preparation for the inevitable difficulties in implementation. It is considered important to highlight the benefits of the system and deal with staff concerns. IT professionals stress the importance of user groups, system champions and clinical role models and advocates. This is supported by research (Halbesleben et al., 2009). Feedback mechanisms are important and it will be vital to obtain feedback from those affected by change (Narine and Persaud, 2003).

Health professionals identified training to develop the required IT skills as an enabler to IT use. A wide range of computer skills are represented in the sample. ECDL has been recommended as a formal standard (Nolan, 2002). User acceptance and intention to use can be predicted using suitable models such as TAM and UTAUT (Davis, 1989, Venkatesh et al., 2003). Perceived usefulness and ease of use are vital. The ITASH scales, developed and validated in the UK with a range of health professionals offer potential for use in primary care to assess professionals' attitudes to IT (Ward et al., 2009). General computer self efficacy is linked to perceived ease of use (Venkatesh and Davis, 1996). This has implications for training interventions.

Processes

There is universal agreement that current work processes are inefficient. More streamlined work processes will need to be designed and developed that are capable of being supported by IT. Improvements are required in information sharing at all levels.

Organisation

Change management is essential to benefit from IT-enabled primary care team processes. Funding will be required for the change process if investment in infrastructure is to yield anticipated benefits. IT staff recommend developing the ability to use information competently on the business side.

Corporate commitment, engagement with line managers and business time and resources commitment were perceived to be essential. The role of management and leadership in the change process is critical (Neves, 2009). Management are responsible for identifying strategies to manage resistance to change (Kotter and Schlesinger, 1979). How resistance is perceived and by whom will determine how it is managed.

Technology

Health professionals identified IT infrastructure as an enabler for computer use. Adequate resources are required for effective systems (Staines et al., 2001). Resources are required for IT infrastructure. This includes hardware, software and networking. Scoping for an IT system has been completed and funding obtained for hardware (Health Service Executive, 2010).

Communication is perceived to be the key to IT implementation success and user involvement by all IT professionals. Research suggests that the two most important factors in IT failure are communications deficiencies and lack of user ownership (Lorenzi and Riley, 2000). The purpose of communication should be clear, it must be planned and feedback obtained to ensure the message is received clearly. This is because the perception and response to change is heavily influenced by availability of information and communication channels (Coghlan, 2000).

Health professionals need access to an IT system that is suitable for use by allied health professionals (AHPs) and nursing staff and is compatible with GP practice management software. Clinicians require a resilient system for improving patient care and safety (Nemeth et al., 2006). Research suggests that integrated care needs to be supported by a robust and integrated IT system (Tucker et al., 2004). Sceptics may have a valuable role in developing a better system (NHS Modernisation Agency, 2002).

There is limited in-house development within the HSE. Most software is procured from vendors. The fit with context must be analysed carefully when technology is transferred (Southon et al., 1997, Ammenwerth et al., 2006). This has implications for procurement. The system should be workable and thoroughly tested before go-live. The use of open-source software has been recommended (Joint Committee on Health and Children, 2010). Health professionals argue that timely access to IT support is crucial. Training super users to act as resources in the workplace offers potential to extend support at a local level.

Health professionals raised concerns about data security and violation of patient privacy. A health IT system must maintain the confidentiality, integrity and security of personal health data. It is argued that trust in technology is critical for success (Lippert and Davis, 2006).

A structured process of project management and benefits realisation is recommended by IT staff. It is essential to clarify benefits pre implementation (Hindmarsh et al., 2007). IT implementation requires business leadership and clinical ownership. IT project managers do not always complete a lessons learned document following projects and dissemination is limited. It is recommended that lessons learned are shared by a variety of methods (Newell et al., 2006). Research has demonstrated the usefulness of a post implementation review to ensure that all anticipated benefits are realised (Peppard and Ward, 2005).

The current and future role of IT and the IT department in enabling improved health care delivery needs to be clarified. IT can support the provision of accurate and meaningful health information but must be aligned with core health strategy. An ICT strategy for primary care and the wider health system is overdue.

Environmental factors

Policy and legislative supports are crucial for progress. Political support is regarded as a prerequisite for effective health information systems (Staines et al., 2001). Significant funding is required to implement a national IT system for primary care.

Summary

It is perceived that addressing barriers will enable implementation. Political support is perceived to be vital to progress policy and provide resources to fund infrastructure, a secure system and the training and change management required. Enablers identified include stakeholder and management engagement and ownership and streamlined work processes. This will enable successful implementation and usage of a secure IT system that meets business needs and provides business benefits.

6.5 Desired IT system functions

Primary Care stakeholders would like an IT system to support:

Secure communication Electronic referral processes Information and knowledge dissemination Information sharing Appointments scheduling Management information collection as a by product of clinical data input Information management in a usable form to support decision making eg needs assessment Access to information held on administrative systems eg immunisation Equipment ordering, tracking and management Communication of alerts to colleagues Multiple access points to system eg computer availability in clinics, mobile access Shared electronic record with unique identifier Data security

6.6 Conclusion

This chapter discussed the research finding in the context of wider research findings. In the next chapter the author provides a brief overview and discussion before making recommendations on how IT implementation might be planned to support IT functions in the primary care team. The author discusses the limitations of the present study and makes recommendations for further research.

7 Conclusions and Recommendations

7.1 Introduction

This chapter contains an overview of the study, the research findings and the implications for planning for implementing IT to support primary care processes at a local level. Recommendations on key success factors are made and the limitations of the study are discussed.

7.2 Overview

The research study used interviews to collect data from IT professionals and primary care stakeholders in a large local primary care team. The research objective was to establish the perspectives and experiences of both groups in order to identify factors that should be considered in planning for IT implementation at the local level. Data was organised and analysed using the Framework method. Findings were outlined and analysed.

7.3 Discussion

The recommendations that follow are based on the findings outlined in chapter 5 and the analysis in chapter 6. The recommendations are at different levels acknowledging the influence of policy, legislation and other factors that are outside the control of the primary care team. Recommendations are made regarding team development and process improvements that do not require technology. It is recognised that the potential of technology will not be realised unless business processes are streamlined and effective.

A participant expressed the view that "while information can make it easier to deliver health care, it must be targeted and actioned to benefit clients" (HP9). The targeted actions recommended could facilitate planning for implementation of IT to enhance information flow in the primary care team. Implementing an IT system that supports primary care functions effectively has the potential to improve the quality and safety of patient care by providing access to the information required for effective decision making at all levels for clinicians and management.

7.4 Recommendations

Recommendations are outlined under six interlinked headings. They are people, processes, information, organisation, technology and environmental factors.

People

In view of the skills deficits in IT and information use, identified by participants, it is recommended that

- An IT skills needs assessment is conducted for health professionals working in the local primary care team.
- Appropriate computer training is provided for staff based on needs assessment.
- Staff are informed of computer skills training available within the HSE and given protected time to access training.
- Skills and competency in the use of information are assessed.
- Skills and competency in information use are developed.

Processes

In view of inefficient work processes identified it is recommended that efficient work processes are designed and implemented in consultation with team members. It is recommended that

- Skills are developed in process mapping and workflow planning
- Processes in the primary care team and network are mapped so that bottlenecks and information gaps can be identified.
- Efficient work processes are developed. This should include, but not be limited to, referral and recording processes.
- Team protocols and standard operating procedures are developed locally or adopted from national guidelines.
- Team processes are reviewed and monitored.

Information

In view of the need for information to inform service planning and evaluation, performance measurement and the provision of safe high quality care it is recommended that information management and use is evaluated. Data must be collected in a form that facilitates analysis. It is recommended that

- Current information processes and data flows are reviewed.
- An information plan is developed to determine how information and knowledge should be managed and applied to benefit the organisation, stakeholders and patients.
- Team agreement is negotiated on minimum data set.
- Team agreement is negotiated on health information sharing, particularly with respect to sensitive information.
- Processes are developed for sharing information, experience, expertise and good practice within and between primary care teams.

Organisation

In view of the lack of organisational structures to support primary care working it is recommended that

- Management and organisational structures are developed to facilitate and support primary care working. This includes appropriate administrative staff with the necessary IT training and skills to support teams.
- Staff allocation to the team is based on population needs assessment.
- Current team structure is reviewed and evaluated.
- Team development needs are assessed and met to equip the primary care team to provide an integrated service to the public in partnership with local hospitals.
- Interdisciplinary team working is developed.
- Skills are assessed and developed for change planning and leadership.

Technology

To take advantage of the potential of IT, it is recommended that a baseline integrated system is implemented in consultation with all stakeholders. Stakeholders include teams, researchers, public health, management and the Department of Health and Children. It is recommended that

- IT infrastructure is put in place at all sites with internet and secure email made accessible to all staff to facilitate communication.
- A system is chosen and implemented that is simple, usable and fits with clinical workflow. Software should be suitable for the needs of allied health professionals and nurses and be compatible with GP practice management software.
- A benefits realisation approach is used to ensure clinician involvement and a focus on business benefits.

 Security systems are developed to secure the trust of clients and professionals. A national security policy for staff must be developed and compliance monitored.

Environment

In view of the discrepancies between policy and practice it is recommended that health policy and legislation are advanced and funding is provided to support IT-enabled primary health care. It is recommended that

- The Health Information Bill, proposed in the Health Information Strategy in 2001, is published. This will legislate for health information sharing and governance and secondary uses of information for other functions such as public health and research.
- The primary care strategy is reviewed and fully implemented.
- An IT strategic plan is developed by the Department of Health and Children with senior IT and health care management in the HSE to ensure that IT strategy is aligned with business needs.
- Policy decisions are made on eligibility, national frameworks and targets. Universal eligibility is recommended because it has the potential to address health inequities. Decisions on eligibility will impact on human resources requirements.
- Funding is provided for the IT, physical and HR infrastructures required.
- Funding is provided for an IT system and the associated change management required.
- Resolution is negotiated to issues of GP remuneration and incentives to participate fully in the primary care team to improve local population health, prevention and chronic disease management.

7.5 Limitations

The study was limited by time and resource constraints. However, it has met its stated objectives. Research focused on the perspectives of staff in a single large team and identified issues specific to the team. Primary care teams and networks nationally differ in terms of many factors including size, infrastructure and stage of development. Further research at national level is recommended to ascertain the key factors that should be considered when planning the implementation of an IT system to support primary care functions nationally.

7.6 Conclusion

The local context must be taken into account when planning for IT implementation. The results of the study provide insight into the perceptions and attitudes of primary care stakeholders in a local team and IT staff in the HSE. The participants identified factors, which are supported by the literature, with the potential to enable IT implementation. These factors inform the recommendations for planning for the implementation of IT to support primary care functions at a local level.

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9 Appendix 1 Interview protocol for IT professionals

General

Age Under 25 () 26-35 () 36-45 () 46-55 () 56+ () Gender Male () Female () Professional qualification(s) Year of qualification(s) Job title Job responsibilities How long have you been in your current post? How long have you worked for the Health Service? What experience do you have in the private sector?

Research Question: What are the key success factors in planning for IT implementation to support primary care processes?

How can Information System implementation success be measured? How is it measured in the HSE? What is important when implementing an Information System in the health care environment? How can barriers to implementation be overcome? What issues will be specific to implementing an information system in primary care in Ireland? What will be the key factors in the change management process? That covers the things I wanted to ask. Is there anything you would like to add?

Thank you for your help.

10 Appendix 2 Interview protocol for PCT stakeholders

General

Age Under 25 () 26-35 () 36-45 () 46-55 () 56+ () Gender Male () Female () Professional qualification Year of qualification Job title Job responsibilities How long have you been working in the community? How long have you been in your current post? How long have you worked for the Health Service? What experience do you have in the private sector?

What is your level of computer experience?

Inexperienced 1 2 3 4 5 6 7 8 9 10 Experienced

- 1. Do you use a computer at home?
- 2. What do you use it for?

Social networking e-mail internet study gaming other

- 3. Do you have access to a computer at work? Desktop/laptop
- 4. Is computer access available when you need it?
- 5. Is computer use necessary in your current job? Yes/No

What is your current use of IT at work?

E-mail travel returns health stats creating documents internet collaborative working study other

What is your desired use of IT at work?

How can computers contribute to safer and more efficient care for patients?

What are the barriers for IT use?

What are the enablers for IT use?

How might an IT System in primary care impact on clinical processes?

What challenges are likely in managing changes associated with IT implementation?

What functions would you like in a primary care health information system?

That covers the things I wanted to ask. Is there anything you would like to add?

Thank You.

11Appendix 3 Information sheet for participants

This research is conducted in partial completion of an M Sc in Health Informatics at Trinity College Dublin. I am investigating attitudes and experiences of IT in primary health care and IT staff to make recommendations on key factors that should be considered in the implementation of IT to support process in primary care.

You are invited to take part in an interview. Participation in the research is entirely voluntary. You retain the right to withdraw at any time and you may omit individual responses without penalty. Interviews will last for a maximum of one hour.

Participating in the interviews will give you the opportunity to share your experiences and make suggestions on how IT implementation may be planned to maximize the potential to support primary care processes. I am not aware of any risks for participants but can assist you in making contact with the staff counselor if required.

Participant and third party anonymity will be preserved at all stages of the research. This includes analysis, publication and presentation of the resulting data and findings. By anonymity in the context of this study I mean that no one will see your interview transcript except me. The report will be written in a way that will make it impossible to identify any individual. I will contact you to verify direct quotes and their contextual appropriateness before using them. I will keep all data confidential. All records of interviews will be shredded when the research is complete. In the extremely unlikely event that illicit activity is reported to me during the interview I will be obliged to report it to appropriate authorities. There are no conflicts of interest to declare.

If you have any questions about any aspect of the study I am happy to answer them. I am happy to send a summary of the research findings on request. My contact details are

Mary Burke E-mail : <u>burkem2@tcd.ie</u> Telephone 087 9077222

Thank you for taking the time to read this information sheet.

12Appendix 4 Informed consent form

LEAD RESEARCHER: Mary Burke

BACKGROUND OF RESEARCH: The research is being conducted as part of a thesis to be submitted in partial completion of an M Sc in Health Informatics at TCD. The research will lead to recommendations for key factors in planning for the implementation of information technology to support work processes in primary care.

PROCEDURES OF THIS STUDY: Interviews to obtain a deeper understanding of staff experience of IT issues will be conducted between February and April 2010. Each interview will take no more than one hour. There are no anticipated risks to participants. Results from interviews will be aggregated and used as a basis for recommendations.

PUBLICATION: The research will be published and bound as a thesis in September 2010 and held at TCD library. It will be used in a poster presentation of the findings. Individual results will be aggregated anonymously and research reported on the aggregate results.

DECLARATION: I am 18 years or older and am competent to provide consent. I have read, or had read to me, this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and I understand the description of the research that is being provided to me. I agree that my data is used for scientific purposes and I have no objection that my data is published in scientific publications in a way that does not reveal my identity. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I understand that I may refuse to answer any question and that I may withdraw at any time and have my interview to that time destroyed. I understand that my participation is fully anonymous and that no personal details about me will be recorded. I have received a copy of this agreement. PARTICIPANT'S NAME: PARTICIPANT'S SIGNATURE: Date:

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

RESEARCHERS CONTACT DETAILS: INVESTIGATOR'S SIGNATURE: Date:

13 Appendix 5 Contact summary form-PCT stakeholders

Contact type	Site	
Visit	Contact date	
Telephone	Today's date	

1 What were the main issues or themes that struck you in this contact?

2 Summarise the answers you got (or failed to get) on each of the target questions you had for this contact.

Current use of IT at work	
Desired use of IT at work	
Computer contribution to safer and	
efficient pt care	
Barriers to IT use	
Enablers for IT use	
Possible impact on clinical processes	
Challenges in managing changes for	
IT implementation	
Desired functions in an IT system for	
primary care	
Comments	

3 Anything else that struck you as salient, interesting, illuminating or important in this contact?

4 What new or remaining target questions do you have in considering the next contact with PCCC stakeholder?

Concerns

14 Appendix 6 Contact summary form-IT professionals

Contact type	Site
Visit	Contact date
Telephone	Today's date

1 What were the main issues or themes that struck you in this contact?

2 Summarise the answers you got (or failed to get) on each of the target questions you had for this contact.

IT implementation success metrics	
HSE success metrics	
Factors IT implementation in	
healthcare environment	
Overcoming barriers to	
implementation	
Issues specific to primary care in	
Ireland	
Key factors in change management	
process	
Comments	

3 Anything else that struck you as salient, interesting, illuminating or important in this contact?

4 What new or remaining target questions do you have in considering the next contact with IT professional?

Concerns