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Bringing Knowledge to Imbedded Collaboration Tools Within an Irish Financial Services IT Department

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ABSTRACT

The field of organisational knowledge management attempts to define and identify work practices and the use of technologies which provide an organisation with sustained competitive advantage.

This research presents findings from analysis carried out in an Irish financial services organisation. The organisation has no defined knowledge management strategy yet as this research will indicate that this firm can be classified as a Knowledge-Intensive Organisation. Many of the desired attributes of a knowledge management strategy and characteristics for a knowledge management system can be found within the organisations technology and cultural structures.

This project, having reviewed the established literature which defines the characteristics of knowledge management and knowledge management systems then compares them against the target organisation to identify activities which are in place and identify gaps. The social characteristics are explored through a survey of the employees of the target department with the in situ tools analysed for their knowledge management capabilities.

Finally having identified potential gaps within the departments' current use of technology a new approach to organising and using the existing technology is presented to a peer group for consideration.

Key words: *Knowledge Management, Knowledge Audit, Knowledge Intensive-organisations, KMS, Knowledge Management Strategy and Wiki*

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1 INTRODUCTION

1.1 Introduction

This research is based around the people, technologies and processes within an Information Technology department of a financial services company. The fact that it is based on a financial services company is only relevant to place the research and explain a key challenge of using whatever technologies exist in the department at the time of this research.

The department and the technology should be easily identifiable as the bulk of the technology would be market leaders in their segment. Naturally industry specific and in-house technology also exists. The focus of this research is to investigate if existing applications in use within the subject organisation can be utilised or adapted to meet the typical requirements of a Knowledge Management System (KMS).

1.2 Background

The research is looking at the tools and requirements of a generic organisational department so this research can be identified with and built upon. The department in question is an IT operational department with responsibility for the provision and maintenance of the organisations ICT requirements. The majority of the technology referred to in this research is commonly used with a large global install base.

The challenge for this piece of research concerns the ability to use existing technology in a work place to meet the needs of a KMS and to introduce a structure to existing data in a way which improves the availability and accessibility of tacit and explicit knowledge.

The subject area being studied in this research offers a number of unique challenges; those being:

1. High ratio of subject matter to subject owners
2. Low turnover area with long service typical

3. Subject matter knowledge can be lost or misplaced over time.
4. Capturing appropriate project knowledge

Other common knowledge management issues such as the willingness to share knowledge and time constraints could exist. But it is believed that these will be low risk issues as a positive culture of sharing knowledge exists within the team and management currently allow time for documentation within the existing project framework.

As this research involves the use of existing technologies ranging from well-established standards based vendors to newer open standard entrants gaps may well become apparent that cannot be bridged either in the time constraints of this research or by the technology itself.

1.3 Research problem

The research problem looks at a typical infrastructure management department in existence for over 20 years in a mature company. The challenge of documentation and knowledge management has always existed with various approaches taken over the years but with no formal unified approach established.

Currently the department uses an array of technology to store and manage knowledge and documents which include, file systems, wiki's, MS Sharepoint, blogs, logs and JIRA.

This research attempts to understand the user's knowledge requirements and the Knowledge Management Systems (KMS) capabilities of the existing technology within the department. By combining the requirements and existing capabilities a new approach will be created based on established knowledge management objectives and to allow the departments' team-leaders and management critically review the approach.

1.4 Research objectives

The aim of the research is to establish if existing tools are capable of meeting the requirements of a knowledge management system and that existing and future knowledge can be stored in a way that improves the retention and accessibility of that knowledge. Specifically this research has the following objectives:

- Provide an overview on available literature in the areas of knowledge identification, organisation and maintenance and through research establish the key functionality required to deliver a knowledge management system.
- To conduct a knowledge audit of the department under review with the objective of identifying existing sources of knowledge and the technologies used, the original objectives and the current use of that technology within the department under review. (consider KM objective here)
- To analyse the results of this audit and to identify the potential of the tools to enhance the management of the existing sources of knowledge.
- Establish a working model/strategy which better fits knowledge management objectives and addresses any identified gaps using the existing technologies.
- Evaluate the effectiveness of the model by deploying it with a trial user group and examining their perception of the changes.

1.5 Research methodology

In order to conduct this research both primary and secondary research was carried out.

The primary research consisted of a semi-structured interview with the key instigator for productivity software in the IT department. In addition to this a questionnaire was distributed to the department under review which sought to establish their attitudes and behaviours to knowledge and establish if any barriers existed to inhibit knowledge sharing activities. Following an experiment further post primary research was carried out.

Secondary research took the form of a literature review on; knowledge and the diversity of opinion; knowledge management and knowledge management systems;

knowledge management strategy and what defines a knowledge-intensive organisations and the knowledge worker.

1.6 Resources

Management of the department in scope were consulted prior to the submission of the proposal for this research being submitted. The project objective and deliverables were agreed.

Technology Access

- Internet and email
- Access to the organisations relevant data and metadata
- Permission to use production resources for the experiment.

Organisational resources

- Cooperation of departmental management
- Organisation internet survey tool

College

- Supervisor consultation
- Library resources

1.7 Scope and limitations

This project is attempting to use existing technology and knowledge in a department so that the knowledge is more readily accessible, updateable and retrievable to better serve the needs of the department.

The key limitation of this research is that is it will only use existing technology and is not seeking to create new knowledge but rather pathways to existing knowledge. By using only technology in existence within the department, functional and technological limitations may have a bearing on the experiment.

The project will not review processes in existence within the department or consider a change to processes.

While the review is considering a typical organisational unit there will naturally be traits and characteristics which are unique to the department which influence the outcomes of the analysis and experimentation.

1.8 Organisation of the dissertation

Chapter 2 reviews the available literature on knowledge and knowledge management. It illustrates some of the diverse views on the subject and the characteristics of a knowledge-intensive organisation.

Chapter 3 continues a literature review on the subject of knowledge management systems and how they address the knowledge processes. Also included in this chapter is a review of how Wiki technology is being used to meet KMS requirements.

Chapter 4 provides an overview of the target organisation and the specific department which is the subject of this review. An outline of the culture, communication and technology in use is also presented.

Chapter 5 is concerned with constructing appropriate means of eliciting information about and from the department. A limited knowledge audit in the form of a questionnaire and semi-structured interview is conducted and the results examined along with a static analysis of some of the open knowledge repositories available to the department.

Chapter 6 draws on the findings and conclusions from chapter 5 and designs an experiment which is put to the team for their consideration. A post implementation questionnaire is issued and the results analysed.

Chapter 7, the final chapter presents the conclusions from the research and any recommendations for further research are made.

2 KNOWLEDGE MANAGEMENT

2.1 Introduction

This chapter will present some of the established views on knowledge management with an objective of providing the reader with an understanding of the author's foundation and perspective on the subject. When reviewing the subject of knowledge differing views will be presented which highlight the diversity of thought in the area.

The chapter will start by discussing the nature of knowledge and the categorisations that exist in the literature to differentiate between the types of knowledge that exist and are used within modern organisations. It will then move to discuss challenges related to organisations attempts to manage this knowledge, discussing the role of knowledge management, the typical processes and strategies that can be employed by modern organisations to achieve it.

The chapter will conclude by summarising the characteristics of what makes a knowledge-intensive organisation and the role of the knowledge worker.

2.2 Knowledge in Organisations

When considering what and where knowledge comes from in the organisational perspective. A well referenced view of knowledge, is the knowledge hierarchy, shown in Figure 2-1.

In this view, the foundation, data, is *"the essential raw material for the creation of information"* Davenport, Prusak (2000 p3). In an organisation this is structured records, or transactional data which can be business focused or operational focused. The amount of data presented or managed by an average organisation is growing significantly. The organisation researched in this paper has five billion operational events logged in its central log repository over a two year period. This is data is from standard operating systems and devices, so represents a typical volume relative to the size of the computing environment.

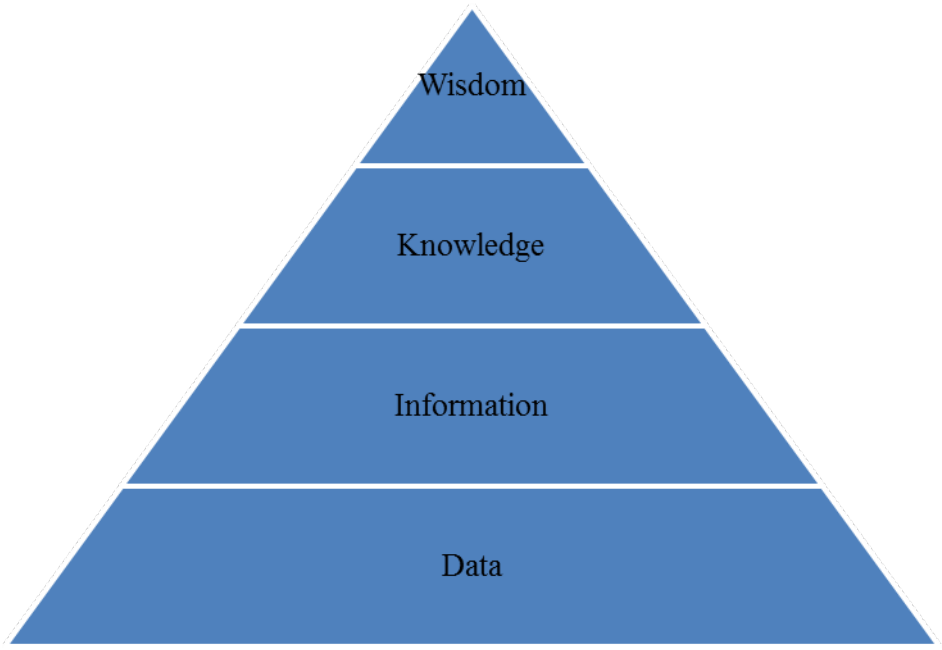


Figure 2-1 The DIKW Hierarchy Rowley (2007)

The next layer of the hierarchy, information, is something that can be *"inferred from data"* Rowley and Hartley (2006 p.5). There is a natural correlation between data and information growth, which pushes the capabilities for the receiver to impact on his judgement and behaviour. Further, Davenport and Prusak (2000, p3) propose that *"Information is meant to change the way the receiver perceives something, to have an impact on his judgment and behaviour."*

Nonaka and Takeuchi (1995 p58), make three observations regarding organisational knowledge. First, knowledge, unlike information, is about beliefs and commitment. Knowledge is a function of a particular stance, perspective, or intention. Second, knowledge, unlike information is about action. It is always knowledge *"to some end."* And third, knowledge, like information, is about meaning. It is context specific and relational. Along with Davenport's and Prusak's, (2000) view that it is intuitive and therefore hard to capture in words or understand completely in logical terms. These observations frame the challenge for Knowledge Management in that capturing and codifying knowledge is difficult.

Although Davenport and Prusak (2000), decide not to explore wisdom on the basis that they have observed that firms have enough difficulty distinguishing between data,

information and knowledge. Rowley and Hartley (2006) considered that *"Wisdom is the ability to increase effectiveness. Wisdom adds value, which requires the mental function that we call judgement. The ethical and aesthetic values that this implies are inherent to the actor and are unique and personal."* But Rowley (2007), observed it is worth bearing in mind that *"there is limited reference to wisdom"* in discussions of the hierarchy model. It is therefore considered to be just a deeper level or understanding of knowledge.

Alavi and Leidner (2001) do criticise the knowledge hierarchy as *'the presumption of a hierarch from data to information to knowledge with each varying along some dimension, such as context, usefulness, or interpretability, rarely survives scrupulous evaluation.'*

Rather than viewing knowledge solely in terms of its relationship to information Blackler (1995) proposes that:

> *"Knowledge is multi-faceted and complex, being both situated and abstract, implicit and explicit, distributed and individual, physical and mental, developing and static, verbal and encoded."*

Blackler's view sums up the complexity and diversity of our understanding of knowledge as it looks beyond knowledge as just data and information. However Hislop, (2013), adopting a philosophical stance, contends that there are two identifiable perspectives on epistemology, or theory of knowledge, which dominate, namely:

- Objectivist perspective, which assumes that knowledge, is an entity that can be codified and separated for the people who possess and use it.
- Practice-based, directly challenges the objectivist view and assumes that knowledge is embedded in, developed through, and is inseparable from people's work-places, practices, and the contexts in which they occur.

The range of definitions for knowledge means that how it is conceptualised by writers can vary greatly. By accepting and acknowledging the divergence of thought on knowledge rather than trying to find 'one' definition allows for acceptance of a great

variety for the application of knowledge. In the next section the types of knowledge are explored, with the variety of views continuing.

2.3 Types of Knowledge

The most common distinction between types of organisational knowledge in the literature is that of tacit and explicit knowledge. Nonaka (1991) is widely acknowledged as the first to explain the relationship of tacit and explicit knowledge in an organisational context which is expanded by Nonaka and Takeuchi (1995) who explained tacit knowledge as '*personal, context-specific, and therefore hard to formalise and communicate'* and explicit knowledge as *"codified" knowledge, 'refers to knowledge that is transmittable in formal, systematic language.'*

The acceptance or the degree of acceptance around what defines tacit and explicit knowledge depends upon your stance on the epistemology of knowledge. According to Hislop (2013), the objectivist perspective considers explicit to be objective, standing above and separate from both individual and social value systems and, also, that it can be codified into a tangible form. Whereas tacit knowledge represents knowledge that people possess, and which, may importantly, shape how they think and act, but which cannot be fully made explicit. He characterises tacit knowledge as something that is personal and is difficult, if not impossible, to disembody and codify. Table 2-1 shows Hiplop's characteristics of Tacit and Explicit Knowledge.

Tacit Knowledge	**Explicit Knowledge**
Inexpressible in a codifiable form	Codifiable
Subjective	Objective
Personal	Impersonal
Context-specific	Context independent
Difficult to share	Easy to share

Table 2-1 The Characteristics of Tacit and Explicit Knowledge

However the practice-based view on knowledge as stated by Tsoukas (1996) sees tacit and explicit knowledge being mutually constituted and recommends that they should

not be viewed as two separate types of knowledge. Furthermore he argues against Nonaka and Takeuchi (1995 P62-63) idea that tacit knowledge cannot be linguistically expressed. Although this view would appear to have misinterpreted Nonaka's and Takeuchi statement by taking their proposition on how knowledge is acquired as an absolute.

2.4 Knowledge Management

Knowledge Management is best considered as an umbrella term which can cover many distinct and established disciplines. There is no agreed definition of Knowledge Management as Nevo and Chan (2007) highlighted in their paper where they presented thirteen definitions from 1994 to 2006. However, Tiwana (2002) provides a summary of what Knowledge Management is not:

- KM is not knowledge engineering. KM is a business problem and falls in the domain of information systems and management, not in computer science. KM needs to meld information systems and people in ways that information management never has.
- KM is about process, not just digital networks. Management of knowledge has to encompass and improve business processes. Technology is only an enable that can rarely produce the same results in two different organisations.
- KM is not about building a smarter intranet. A KM system can use your company's intranet as its front end, but one should never be mistaken for the other. The "just add-water" approach traditionally used with packaged intranets collapses face down when used for KM.
- KM is not about a one-time investment. KM, like any other future-oriented investment, requires consistent attention and continued evaluation, even after it begins to deliver results.
- KM is not about enterprise-wide "infobahns." Although enterprise integration helps, the primary focus of KM is on helping the right people apply the right knowledge at the right time.

Sabherwal, Beccera-Fernandez (2003) definition defines knowledge management *'as doing what is needed to get the most out of knowledge resources (Armbrecht et*

al,2001). Knowledge management focuses on organizing and making available important knowledge, wherever and whenever it is needed.'

Sveiby (1996), considers there to be two distinct tracks when viewing knowledge management, namely;

- IT Track – which is focused on the construction of information management systems and Sveiby considers this group to view knowledge as an object which can be handled in information systems.
- People Track – This is focused on the individual and is involved in assessing, changing and improving human skills and/or behaviour.

The different perspectives on knowledge and knowledge management lead to a range of strategies for organisation to consider how they may manage knowledge; some of these strategies are discussed in the next section.

2.5 Strategies for Knowledge Management

As with most elements of Knowledge and Knowledge Management there are different methodologies to which organisations may approach the management of organisational knowledge, three often cited approaches are considered here.

2.5.1 Codification v personalisation KM strategy

Hansen et al. (1999) presents two broad strategies:

Codification

This approach was seen as most beneficial to companies whose competitive advantage is derived from the reuse of codified knowledge and is primarily motivated to codify knowledge in searchable repositories.

Personalisation

Companies suited to this approach focus on dialogue between individuals, not knowledge objects in a database. Knowledge that has not been codified and probably couldn't be – is transferred in brain-storming sessions and one-on-one conversations.

With both approaches Hansen et al. (1999) make a clear link to Human Resource Management (HRM) strategies but emphasise that different approaches are required for each strategy. Codification requires HRM to motivate people to codify their knowledge with an emphasis on IT skills. Whereas the HRM strategy for personalisation requires people to be motivated to share their knowledge with other and emphasis the development of interpersonal skills.

2.5.2 Earls' seven schools

A more complicated taxonomy is presented by Earl (2001) who describes seven specific schools which are organised into three broad approaches. Recognising the different choices that organisations must consider when they are defining the weighting to IT systems and HRM practices for knowledge management initiatives depending on the role they play in each of the seven schools.

Each school is grouped into one of three classes based on their underlying characteristics, those being:

Technocratic Systems School	This school is primarily concerned with the codification of knowledge into repositories with an emphasis on the knowledge being used as an organisational resource.
Technocratic Cartographic School	The emphasis in this school is for IT systems to facilitate the creation of interpersonal connections between people who possess relevant expertise. This is provided through a map of the organisations knowledge base. Although IT systems are used to direct people to knowledge, transfer of knowledge usually takes place directly between people.
Technocratic Engineering	This school seeks to provide people with task and process oriented knowledge on operational matters. The IT systems deployed in this school makes codified knowledge available to relevant people.
Economic	Earl only has one school in this category with organisations

Commercial	associated with this school commercialising their organisations knowledge management activities to achieve a measurable benefit.
Behavioural Organisational	The key to this school is in the facilitation of the creation of interpersonal networks between people who share a common interest and can benefit from sharing their knowledge and experience with each other. How successful this will be, depends on the participation levels and if the community develops a strong sense of identity. The medium through which connections are made does not solely rely on a face-to-face basis as there is scope for IT systems to be involved.
Behavioural Spatial	This approach sets about creating spaces, both physical and virtual to bring people together to allow or facilitate the exchange of knowledge and experience.
Behavioural Strategic	This school is concerned with shaping attitudes and values with a goal of improving the effectiveness of knowledge management behaviour within the organisation. The approach does not seek to shape knowledge processes. The successful implantation of this approach will see people voluntarily participate in appropriate knowledge management activities.

SCHOOL / ATTRIBUTE	TECHNOCRATIC			ECONOMIC	BEHAVIOURAL		
	SYSTEMS	CARTOGRAPHIC	ENGINEERING	COMMERCIAL	ORGANIZATIONAL	SPATIAL	STRATEGIC
FOCUS	Technology	Maps	Processes	Income	Networks	Space	Mindset
AIM	Knowledge Bases	Knowledge Directories	Knowledge Flows	Knowledge Assets	Knowledge Pooling	Knowledge Exchange	Knowledge Capabilities
UNIT	Domain	Enterprise	Activity	Know-how	Communities	Places	Business
EXAMPLE	Xerox Shorko Films	Bain &Co AT&T	HP Frito-Lay	Dow Chemical IBM	BP Amoco Shell	Skandia British Airways	Skandia Unilever
CRITICAL SUCCESS FACTORS	Content Validation Incentives to Provide Content	Culture/Incentives to share Knowledge Networks to Connect People	Knowledge Learning and Information Unrestricted Distribution	Specialist Teams Institutionalized Process	Social Culture Knowledge Intermediaries	Design for Purpose Encouragement	Rhetoric Artifacts
PRINCIPAL IT CONTRIBUTION	Knowledge-based Systems	Profiles and Directories on Internets	Shared Databases	Intellectual Asset Register and Processing System	Groupware and Intranets	Access and Representational tools	Eclectic
PHILOSOPHY	Codification	Connectivity	Capability	Commercialization	Collaboration	Contactivity	Consciousness

Table 2-2 Schools of Knowledge Management (Earl 2001)

2.5.3 The four knowledge management approaches

Alvesson and Karreman's (2001) topology of knowledge management approaches, see figure 2-2, shows the links between varying management practices and the different approaches to knowledge management that organisations can adopt. Alvesson and Karrenman (2001), '*downplay the boundaries and emphasize the various orientations, recognizing that there is a continuum between the end poles and that there are flows and variations within organisations and in texts with regard to how they refer to knowledge management practices.'*

They identify two dimensions or modes: the mode of managerial intervention and the medium of interaction. These modes link to their '*topology of management'* whereby the managerial intervention relates to the strength of managerial control with the '*control'* mode inferring a stronger form of management control and the *'coordination'* mode inferring a perceived weak philosophy of management.

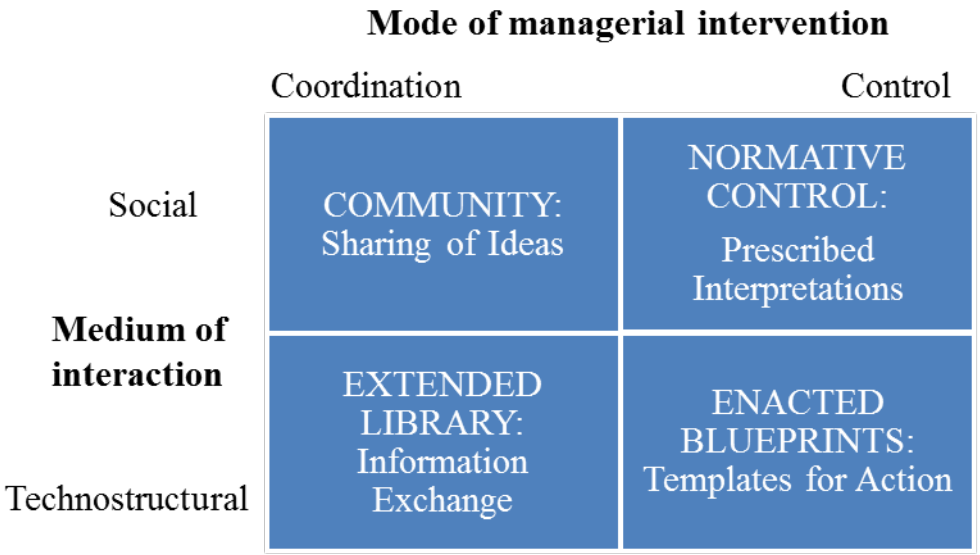


Figure 2-2 A topology of knowledge management approaches (Alvesson and Karreman (2001))

The four approaches that Alvesson and Karreman (2001) construct from their dimensions are described here:

The *Extended Library* approach makes extensive use of technology with senior management having a central role in the creation of databases and encouraging staff to engage with the process by codifying their knowledge and experiences. They see this mode as typically bureaucratic with motivations to achieve *'quicker or better work'*. The outcome for the *'knowledge management system may be one that is accessible as a support for those that need the information.'*

The *'Community'* approach is *'less technocratic'* with management focused on providing a positive environment for the sharing of what is predominately tacit knowledge. Management's role in knowledge management is not very evident as the ability for management to create an environment in which knowledge sharing is actively occurring is difficult as it tends to occur naturally.

The *'Normative Control'* approach sees management playing a more active role towards the socially focused community approach. Management will invest in creating a culture with recognises and rewards employee participation in knowledge management activities.

The final approach which Alvesson and Karrenman (2001) present is the *'Enacted Blueprint'* which sees management heavily involved the prescribing templates which guide employees in desired knowledge activities. This approach, they point out, can have *'ambiguous status and power effects since, on the one hand, it deskills the worker, who doesn't need to have certain qualifications to carry out the task. On the other hand, it empowers the worker, who is now capable of doing things that previously were out of reach or were difficult to accomplish.'*

The range of strategies just described show the diversity of approaches which exist in literature and can be used within the organisation. The next section looks at organisation and what can define a knowledge-intensive organisation.

2.6 Knowledge-Intensive Organisations

There are a number of definitions offered to define a Knowledge Intensive firm from Starbuck (1992) who considered the term

'imitates economists' labelling of firms as capital intensive or labour-intensive. These labels describe the relative importance of capital and labour as production inputs. In a capital-intensive firm, capital has more importance than labour; in a labour-intensive firm, labour has the greater importance. By analogy, labelling a firm as knowledge-intensive implies that knowledge has more importance than other inputs.'

Alvesson (2000) defines them as *'companies where most work can be said to be of an intellectual nature and where well qualified employees form the major part of the workforce', and* offers examples of companies in this category as law and accounting firms, management, engineering and computer consultancy companies, advertising agencies, R&D units, and high tech companies.

Von Nordenflycht (2010) produced taxonomy of knowledge-intensive firms, see table 2-2. His taxonomy took into account the diversity of firms that can be considered knowledge-intensive, but it also links to the concept of professional service firms.

	Characteristics			Challenges & *Opportunities*					Organizational Responses			
Category (with Examples)	Knowledge Intensity	Low Capital Intensity	Professionalized Workforce	Cat Herding	Opaque Quality	*No Investor Protections*	Trusteeship Norm	*Muted Competition*	Alternative Compensation	Autonomy & Informality	No Outside Ownership	Slack
Technology Developers Biotech R&D labs	X			√	√				√	√		
Neo-PSFs Consulting Advertising	X	X		√√	√	√			√√	√√√	√	
Professional Campuses Hospitals	X		X	√√	√		√	√	√√	√√√	√	√
Classic PSFs (or Regulated PSFs) Law Accounting Architecture	X	X	X	√√√	√	√	√	√	√√√	√√√√	√√	√

Table 2-3 A Taxonomy and Theory of Knowledge-Intensive Firms (Von Nordenflycht, 2010)

Von Nordenflycht's taxonomy has three dimensions to it as described by Hislop (2013) those being:

Knowledge intensity of work carried out is *t*he extent to which the development and use of complex knowledge is involved in the creation of its outputs (products/services); *Level of capital intensity; k*nowledge intensive firms have low capital intensity, which means that their output is not dependent upon significant amounts of non-human assets such as factories, equipment, patents, copyrights etc; *Professionalized workforce;* the extent to which firms not only possess specialised

knowledge, but also where this knowledge is institutionally regulated, and where a code of ethics governs behaviour.

The knowledge intensive firm has many attributes that define it as such but a critical attribute is the workforce. In the next section the characteristics of the knowledge worker are examined.

2.7 Knowledge Worker

Bosch-Sijtsema et al. (2010) defines Knowledge Work as follows:

> *'Knowledge Work involves the creation, distribution or application of knowledge (intangible resources) as task contents by highly skilled and/or trained workers who have autonomy in their work who use tools (e.g. Information and Communication Technology (ICT)) and theoretical concepts in order to produce complex, intangible and tangible results to provide a competitive advantage or some other benefit contributing towards the goals of the organisation.'*

Whereas Dul et al. (2011) simply defined Knowledge Workers as *'consultants, marketers, controllers, designers, and managers, who perform "brain work" and usually work in an office environment.'*

Alvesson (2000) having looked at the characteristics of knowledge worker and why they *'represent the ideal subordinates'* identified four reasons why knowledge workers are prepared to involve themselves in knowledge processes:

1. Intrinsic work motivation associated with the qualities of the work content.
2. It represents the norms within the communities of which they are part of.
3. The general norm of reciprocity, whereby the efforts they provide to the organisation is in return for good pay and working conditions.
4. A self-image is developed whereby being a knowledge worker means being a committed, hard-working person.

The values listed by Alvesson (2000) in any employee are to be enjoyed by any employer. However Alvesson (2000) points out that being able to attract, retain and develop competent personnel in a knowledge intensive company is particularly problematic for two reasons:

- Personnel is the most most [SIC] significant – sometimes the only significant – ‘resource of the company. Capital and equipment are normally of less importance.
- In many cases, an established company may risk entire groups leaving their employers and forming new companies, trying to bring the old clients with them, thus emptying the former companies not only of important personnel but also of clients. This risk is, of course, most salient for consultancy firms and other professional service companies.

The knowledge worker is not confined to a knowledge intensive firm as they can exist as an independent entity in any form of employment and likewise just because a firm is classified as knowledge intensive it does not say that all employees will meet the criteria of a knowledge worker.

2.8 Conclusion

This chapter reviewed the principle concepts in knowledge management in the organisation and types of knowledge. Although principle concepts were being presented it was also shown that fundamentally different views are held depending on the epistemology of knowledge held by the writer. The chapter then moved on to look at a number of strategies for knowledge management, some with detailed models, Earls seven schools model. The complexity of some of the models presented goes to underline the diversity of opinion shown in the understanding of knowledge and knowledge management. The final section of the chapter presented a view of the knowledge intensive organisation and what characterise a knowledge worker.

What has been outlined in this chapter will be mapped to the organisation in order to be able to classify it from a knowledge management perspective. The next chapter will examine how organisations implement knowledge management processes into their organisations through the use of knowledge management systems.

3 KNOWLEDGE MANAGEMENT SYSTEMS

3.1 Introduction

This chapter follows on from the discussion on knowledge and knowledge management to look at how the knowledge management processes can be supported by technology. An understanding of what a KMS represents and the knowledge management processes referred to by Alavi and Leidner (2001) that a KMS addresses are reviewed from literature to provide an understanding of each process from an organisational perspective, showing how information technology maps against them. The view an organisation may have of a KMS is also presented to distinguish the dominant types described in literature. Finally consideration is given to Wiki's and the impact they have had in the KMS sphere.

3.2 KMS overview

Having looked at knowledge and knowledge management in the previous chapter and shown some of the diversity of opinion and thought that exists, it will come as no surprise that there are many views on KMS. Alavi & Leidner (2001) said:

> *'Knowledge management systems (KMS) refer to a class of information systems applied to managing organisational knowledge. That is, they are IT-based systems developed to support and enhance the organisation processes of knowledge creation, storage/retrieval, transfer, and application.'*

Maier and Hadrich (2006) also contended that:

> *'a KMS is defined as a comprehensive ICT platform for collaboration and knowledge sharing with advanced knowledge services built on top that are contextualized and integrated on the basis of a shared ontology, and personalization for participants networked in communities.'*

However Davenport and Prusak (2000) remind us that *'knowledge projects are more likely to succeed when they can take advantage of a broader infrastructure of both technology and organisation.'* They also *'believed that all firms in business should have a positive orientation towards knowledge in their cultures'*. So it is clear that as with so many things in knowledge management there is no silver bullet to delivering

knowledge management. But what KMS offers is mechanism to assist in the delivery of knowledge management initiatives.

3.3 Knowledge management processes

Alavi and Leidner (2001) building on the work of Holzner and Marx (1979); Pentland (1995) on knowledge systems, provides an understanding of each process from an organisational perspective; showing how information technology maps against them. But they point out that *'these processes do not represent a monolithic set of activities, but an interconnected and intertwined set of activities.'* Views on each of the processes are considered from literature here;

Creation, Nonaka and Takeuchi (1995) argue that knowledge is only created by individuals and an organisation cannot create knowledge without individuals. Alavi (2000) contends that knowledge can be generated inside the organisation or it can be acquired from external sources. *"Knowledge creation can be viewed as an activity that occurs inside the organisation to generate new knowledge, whereas knowledge acquisition is focused on assimilating existing knowledge from outside the organisation."*Alavi and Denford (2011)

Storage and retrieval; *'Effective storage and retrieval mechanism enable the organisation to quickly access knowledge. To remain competitive, organisations must create, capture, and locate organisational knowledge'* Gold et al. (2001). *'Knowledge storage and retrieval refers to development of organisational memory (i.e. stocks of organisational knowledge) and the means for accessing its content.'* Alavi and Denford (2011) and they further say *'Most IT initiatives for the creation of organisational memory have focused on…the development of the external and explicit knowledge stocks and mechanisms for retrieval of the contents.'*

Transfer, this *'process involves the transmission of knowledge from the initial location to where it is needed and is applied….the source-and-recipient view.'* Alavi and Tiwana (2006). In contrast to this view Renzl (2008) makes the point that, *'knowledge sharing is more concerned with "the collective character of knowledge emerging from interaction and dialogue among individuals.* Alavi and Denford (2011) identified

'*three modes of knowledge exchange in organisations (1) exchange of knowledge between individuals; (2) exchange between individuals and knowledge repositories; (3) exchange among existing knowledge repositories.'* These modes of knowledge lead Alavi and Denford (2011) to identify two models of IT applications in this area;

1. The network model, which focuses on facilitating person to person sharing of knowledge via establishing digital links between them.
2. The stock model, which focuses on the electronic transfer of codified knowledge to, from and between computerised knowledge repositories.

Application; how knowledge is applied and used in organisations is seen as a source of competitive advantage rather than just the knowledge itself, Alavi and Leidner (2001). The use of knowledge for problem solving, decision making and to coordination of organisational individuals and groups provides a competitive advantage for firms. *'Technology can support knowledge application by embedding knowledge into organisational routines. Procedures that are culture-bound can be embedded into IT so that the systems themselves become examples of organisational norms.'* Alavi and Leidner (2001).

Alavi and Tiwana (2006) looked at the technology that supports the 'knowledge processes' as described by (Alavi and Leidener, 2001a; Halzner and Marx, 1979) which are present in an organisation, see table 3-1.

	Knowledge management processes			
	Creation	Storage and retrieval	Transfer	Application
Information technology tools	E-learning	Data warehousing and data mining	Communication support systems	Expert systems
	Collaboration support systems	Repositories	Enterprise information portals	Decision support systems

Table 3-1 IT tools for support of KM processes (Alavi and Tiwana 2003)

Novo and Chan (2007) conducted a Delphi study which captured their panels perceptions as to what are the most important capabilities of a KMS, see figure 3-1.

The findings from their Delphi study broadly fitted the knowledge management activities that KMS typically support namely creation, codification, transfer, and application. Those capabilities that fell outside the four processes lead the authors to conclude that panel members viewed KMS as organisational IS.

Classification of identified capabilities

- General IS capabilities
  - Adaptability (integration)
  - Security
  - Ease of use
  - Cost efficiency
- KMS capabilities
  - Creation
    - Incorporates an incentive mechanism that can be employed to encourage contributions to the system
    - Includes knowledge creation capabilities
  - Storage/retrieval
    - Multimedia(see also under transfer)
    - Includes content management functionality
    - Includes a central knowledge repository
    - Enables easy and fast access to knowledge
    - Includes sophisticated search and retrieval mechanisms
  - Transfer
    - Multimedia (see also under codification)
    - Includes report generation and presentation functionality
    - Enables collaboration and knowledge sharing
  - Application
    - Customizable interface
    - Incorporates a “push” strategy for the knowledge
- Management
  - Provides usage metrics and tracking
  - Includes a mechanism to assure the quality and integrity of the knowledge

Figure 3-1 Classification of identified capabilities (Nevo & Chan 2007)

3.4 Perspectives on KMS

Meso and Smith (2000) review of organisational knowledge management systems (OKMS) as strategic assets within the context of a resource-based view, identified two dominant types of OKMS – the technical perspective and the socio-technical perspective. They described each as follows:

'The technical perspective holds that an OKMS is an advanced assembly of software, and its associated hardware infrastructure, for supporting knowledge work and/or organisational learning through fee access to and increased sharing of knowledge.' Meso and Smith (2000). They hold that technology-centred OKMS in use at the time of the study could be using one technology or a combination of ten technologies with Web browser technologies being the most prominent.

'The socio-technical perspective recognizes that there is more to OKMS than mere technology. Under this perspective, OKMS are seen as being compled combinations of technology infrastructure, organisational infrastructure, corporate culture, knowledge, and people.' Meso and Smith (2000). They conclude that the socio-technical perspective allows an organisation reap sustainable competitive advantage…as the components of system will be difficult to imitate, valuable and non-substitutable.

3.5 Wiki (Web 2.0 O'Reilly (2005)) and KMS

When discussing KMS it is difficult to ignore the impact that Wiki technologies have had on the area. A summary review of the Knowledge Management dissertations published for this course revealed that thirty four percent make use of a wiki to facilitate their experiment. Alavi and Denford (2011) said *'Wikis are ideal Web 2.0 tools as they exemplify the leveraging of network effects of communities.'*

'Wiki technology is the system and concept of collaborative websites maintained by users who are allowed access. A website based on Wiki technology is different from others websites in that content can be created, modified and updated by any user via a web browser.' 'Wiki technology may enable higher levels of collaboration facilitating more effective knowledge processes.' Hester (2008),

Hester (2008) further describes the characteristics of Wiki technology and the alignment to knowledge management processes, as follows:

- Wikis facilitate searching and filtering, by linking and indexing capabilities.
- The revision and history features allow errors to be kept to a minimum allowing for quality assurance.
- The representation and maintenance features of Wiki technology allow for more effective knowledge sharing.

Paroutis and Al Saleh (2009) have a number of recommendations for management who are considering introducing Web 2.0 technologies, those being; (1) senior management should take an active leadership role in the introduction of the technology; (2) ensure that the necessary training and reward structures are in place; (3) management should avoid mandating or enforcing knowledge sharing using Web 2.0; (4) consider introducing soft rewards like praise and recognition.

3.6 Conclusion

This chapter continued to explore knowledge management as described in literature focusing on the approaches that organisations have to manage knowledge management processes through the use of a KMS. The chapter also illustrated that there are different perspectives on KMS and how an organisation choses to approach knowledge manage may determine if sustained competitive advantage is achieved.

4 ORGANISATION OVERVIEW AND EXISTING INFORMATION TOOLS

4.1 Introduction

The purpose of this chapter is to provide the reader with an overview of the target organisation in order that this research can be contextualised. The target organisations industry sector, organisational structure, and culture will be described. This will then be followed by an explanation of the function of the department involved in the experiment and a description of the sources of existing knowledge.

The organisation will be considered from a knowledge management perspective and will be classified based on the models discussed in chapter two. The tools available to the department in question are discussed and their use within the department is explained. The Knowledge Management capabilities of the tools will also be explored.

4.2 Organisation Overview

The organisation is an established life assurance company operating in the Irish financial services industry, one with a history dating back to the eighteen hundreds. Over its history there have been many acquisitions, mergers and divestments. It is currently fully owned by a leading European Insurance group although it is an autonomous entity with loose integration to the parent company.

The organisation operates all of its corporate functions from one location in Ireland. Its products and services are distributed through independent brokers to individuals or companies. The organisation is the only one in its sector to have a National Q-Mark award and to have progressed this to the European equivalent (EFQM) quality accreditation.

Staff satisfaction rates with the organisation are routinely high and this is evidenced by high retention and long service rates. The organisation highly values its employees

offering good remuneration and benefits along with social events and career long education programs.

The effects of the financial and economic crises that affected Ireland in general and the financial sector in particular have also affected this organisation. The impact on the organisation has been significant, with a division closing and voluntary redundancies and cost cutting programs established. During the period from 2008 to 2012 staff numbers decreased from just over 400 to around 250. Also during this time investment in technology was limited to essential items only and assets were "sweated". With the support of its European owner the organisation is beginning to emerge from this crisis. The organisation has been reduced down to its essential elements with less management and a flattened corporate structure.

The organisation has long held the IT department as a strategic asset. This was emphasised, as it was the only department not to be included in the voluntary redundancy program. The IT department is simply organised in to two broad functions, Software Development and IT Operations. The focus of this paper is on the IT Operations team which have responsibility for the following areas:

- IT Service Desk
- Technology Management
- Network Operations
- Information Security
- Data Control

The organisation has no function or strategy which encompasses knowledge management.

4.3 Corporate Culture

The organisation has a stated objective to become the 'most trusted' provider in their assurance sector. This objective was delivered to the organisation by its parent company but it is not something that the organisation is at odds with. There is an ingrained sense of moral and ethical correctness throughout the company. There have been no industrial disputes in the last decade despite the traumatic organisational

events which took place in the company as essentially the employees were treated fairly. Communication and 'open door' policies exist within the company, executive management are accessible and make it their business to meet employees.

4.4 Knowledge Intensity of the Organisation

The organisation when compared to Von Nordenflycht (2010) taxonomy of a knowledge intensive firm would perfectly align itself to the classification of a 'Knowledge Intensive Firm' for the following reasons:

Knowledge intensity of work carried out

The work of a life assurance company is to offer a range of specialised products to its customers. This requires specialist skills in the development of the product, such as actuarial, underwriting, claims and IT system development to name some of the core elements. The incomes received from these products have to be careful invested to ensure the company remains solvent and abides by regulation.

Lack of capital intensity

While life assurance companies will have large asset portfolios they in themselves do not produce output which the company is dependent on to run or administer its business. The value and yield from the asset portfolio is of course very important to a life assurance company but it is the professional management of such portfolios which is critical to the success of the company.

Professionalised workforce

The life assurance industry is heavily regulated and as such a very high percentage of the workforce must have minimum certification with a recognised professional body, the Life Insurance Association (www.lia.ie). The organisation also employs a range of other professionals, such accountants, actuaries and IT developers and operational professionals.

4.5 IT Operations overview

The IT operations department has fourteen permanent staff working in the area which is typically supplemented with contract staff as and when required, see figure 4-1.

Some of the contract staff are in the department for 5 years or more with most there for two years or more. The permanent employees have long service history within the department with five staff having sixteen or more years' service.

Similar to any IT Operations department which has been in existence for long period of time it has seen many Information Technology transformations over the years. In some ways it has almost gone full circle as dumb terminals were the first IT equipment installed and as of last year a virtualized infrastructure was implemented. One nuance about an IT department working in the Life Assurance industry is that data / records can exist for thirty plus year depending on the life longevity of the policy holders. This can mean that technology has to be supported for long periods of time and while records can and are generally migrated, some will be wound down on existing technology.

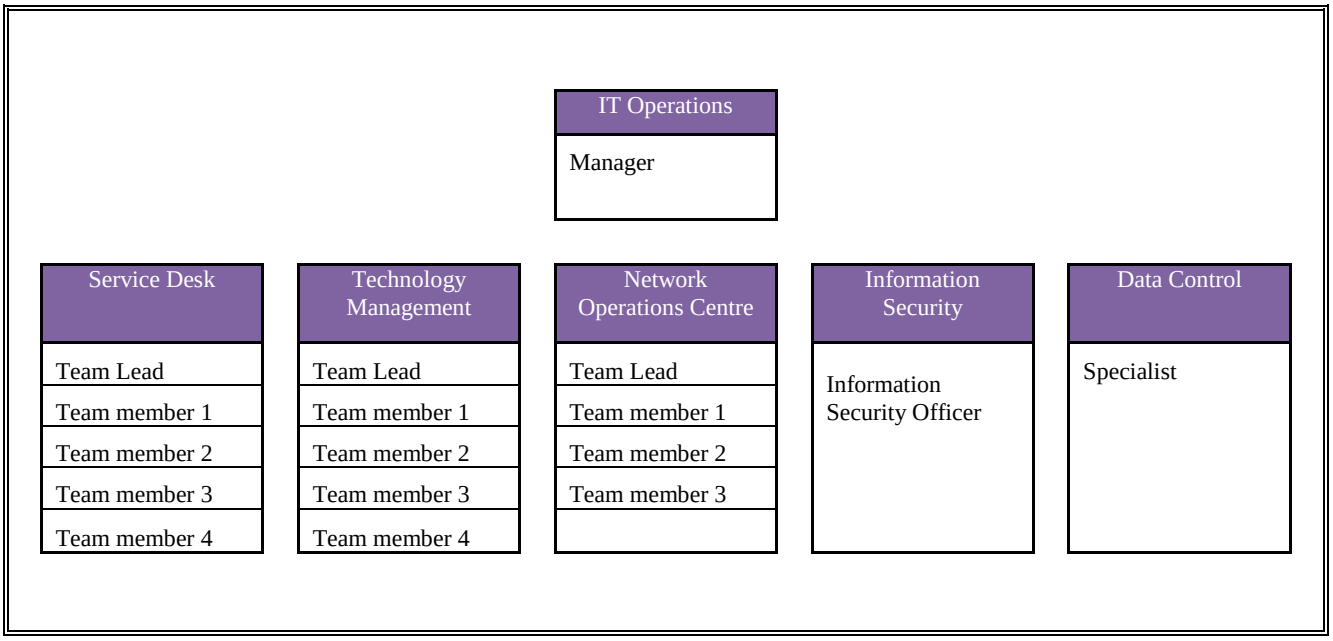


Figure 4-1 IT Operations Organisational Chart

The department has a number of distinct functions and responsibilities but there is a high degree of cross over and interdependency. Viewing it from a support perspective there are three distinct layers of support, those being:

- Frontline, covers the IT Helpdesk which process queries from internal and external customers. This would involve dealing with 'one and done' task or routing support tickets to second-line or third-line staff.

- Second-line, covers support requests which are typically pre-described e.g. install or configure software. They will also cover desktop issues which involve investigation and as a result may involve the final layer, third-line. This line also includes specialist business support analysts who have expert business knowledge and technical skills.
- Third-line, mainly covers problems which are new or where privileged access is required or specialist knowledge. The staff here would typically be involved in design and project implementation.

Outside of the support layers are the Information Security and Data Control functions which operate across the team and the company.

4.6 Departmental Communications

The department is physically located in an open plan area with low desk divides which includes all team members and the manager. There is high degree of face to face communication on the department floor for informal catch-up on the progress of issues or problem solving. The teams within the department will also periodically use 'stand-up' meetings. These meetings occur at a set time in the day, usually morning time, where the team will gather on the floor and stand in a circle with each individual taking it in turn to discuss the work they will be carrying out that day. The stand-up approach to communications is something that the department has adopted from their software development colleagues, but they are not as regular or routine as the software developers. Formal meeting in dedicated meeting rooms are also a routine element of department communications. During large projects a white board will also be used as a visual physical representation of project progress and upcoming activities, in a story board approach. The trusty post-it note is also used by some in the department.

Electronic communication is dominated by email, with IT system generated email tending to outweigh, human initiated email. IT system email traffic is high for this department owing to the role it plays and the array of technology under management. Human initiated mail can come in a number of ways outside of the traditional email system i.e. Updates to most of the technologies discussed in the next section can

generate emails alerts or actionable items. While there is a concerted move to dash-boarding of information email still dominates.

4.7 Technology overview

The purpose of this section is to provide an understanding of the key management technologies in place within the department and how they are currently used.

JIRA

JIRA is a proprietary issue tracking product, developed by Atlassian (www.atlassian.com), used for bug tracking, issue tracking and project management. The product name, JIRA, is not an acronym but rather a truncation of "Gojira", the Japanese name for Godzilla. It has been developed since 2002. Wikipedia (2014).

JIRA is used across the IT department by both developers and IT Operations. It is used both to track issues be they software development “stories” or system changes but also to authorise changes. As such, managers and business testers from outside of IT will also interact with the system.

The JIRA platform is highly adaptable and allows attributes to be customised, work flow processing, and collaboration. To elaborate on the collaboration element, JIRA makes it very easy to add people to an “issue” and once added they will be alerted to updates and changes to the “issue” being watched. It also provides views which show all of the latest activity in an area, see figure 4-2.

Access to the JIRA is provided via users’ network credentials which will allow users search most information available on the system. However some categories are restricted e.g. serious incidents and security risk items.

Within the IT Operations team it is used to record and authorise change to servers / applications, record serious incidents and track risk. Most of the sections in the department have dashboards to show open issues and planned activities relevant to them, see figure

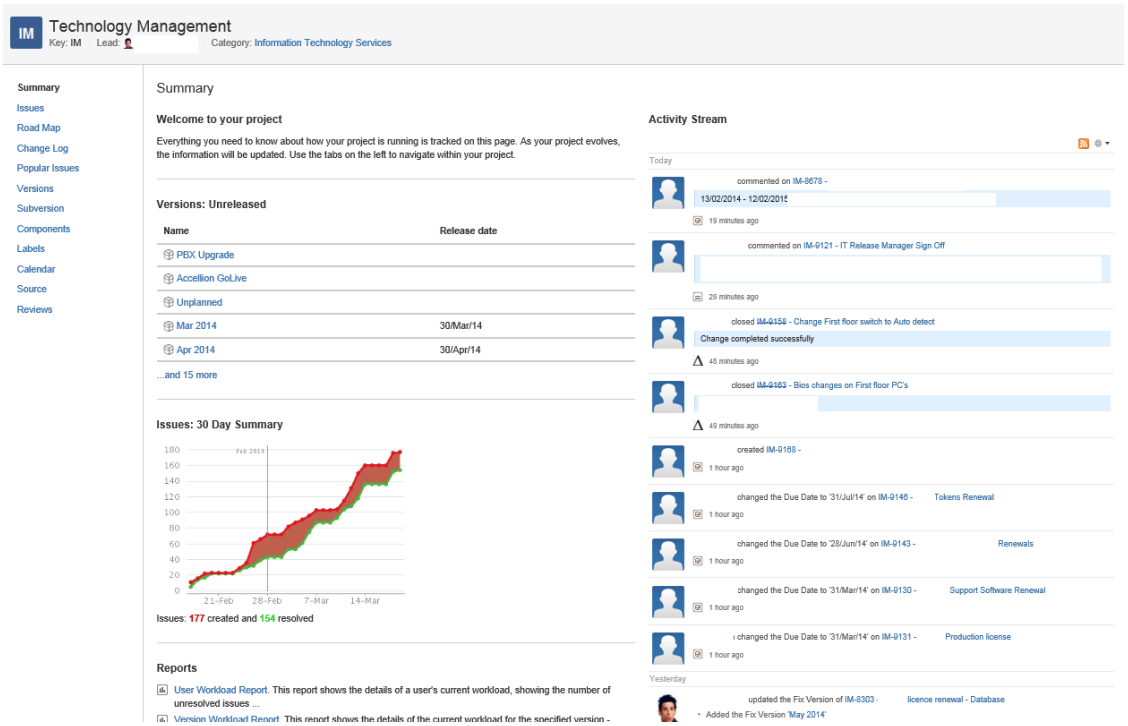


Figure 4-2 JIRA Activity Stream

An example of the Technology Services dashboard is shown in figure 4-3 which demonstrates some of the visual capabilities within JIRA.

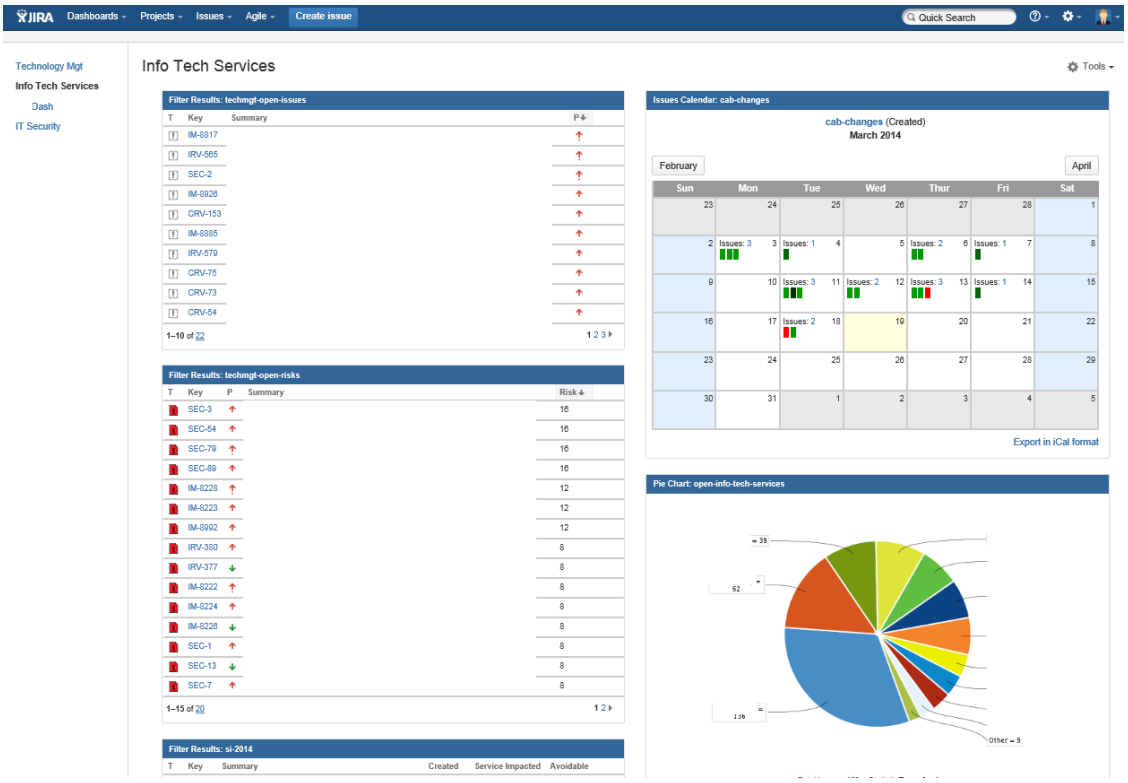


Figure 4-3 JIRA Dashboard

Wiki

The Wiki platform used in the organisation is TWiki (http://twiki.org), and is a structured Wiki. Thoeny (2006), the creator of structured Wiki's describes a structured wiki as follows:

> *'A **structured wiki** combines the benefits of - as it seems like - contradicting worlds of wikis and databases. When you do that you get something very powerful: A collaborative database environment where knowledge can be shared freely, and where structure can be added as needed.'*

The development of TWiki took a notable divergence in 2009 when a group of developers split from the TWiki project to establish Foswiki (foswiki.org). The impact of the split is outside of the scope of this research but it highlights a potential risk with community based / supported applications. In that if a community based / support platform is used and over time the organisation invests resources into it the expected support may not keep pace with market trends.

The Wiki is used across the department with pages published to the entire company but is dominated by IT content, with the only exception being the 'Quality' section. The type of content is a mix of 'what' and 'who' information explaining what goes on in the various IT departments and who is involved in them. Other contents includes how to pages and project pages, see figure 4-3 as an example of the home page for one of the sections within the IT Operations department.

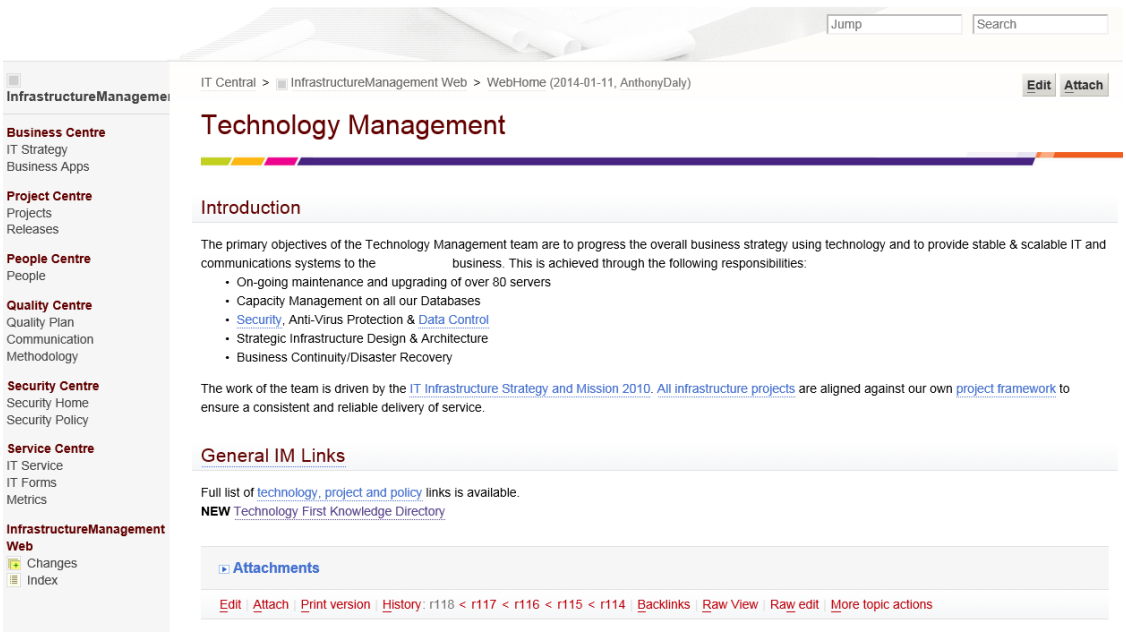


Figure 4-4 Wiki Home Page

Wiki Pages are visible to all and once a user is set-up as a Wiki user they can edit any page. The TWiki maintains a history of page changes at the bottom of every page and who edited the page. A page or topic be subscribed to so that notification of changes are emailed to those interested in the area, see figure 4-5, with changes sent weekly.

TWiki has a search facility built into the application and offers various plugin to enhance search capabilities including the use of Regular Expressions. However in the departments' implementation the search functionality is not regarded as useful and is often cited as a problem. This could be due to a number of factors, including the version of TWiki installed, structure and design of the TWiki and general content management issues e.g. keywords are not tagged on pages.

The usage of TWiki was discussed in the preceding chapter which clearly showed one very active user with the others users have regular but low activity on the Twiki. It also showed that of the 362 pages created 140 pages were never updated.

From: "TWiki Administrator" <wikimaster@ >
Date: 6 March 2014 04:03:01 GMT
To: anthony.daly@
Subject: IT Central.ITSecurity - Automated notification of topic changes

This is an automated e-mail from IT Central.

New or changed topics in IT Central.ITSecurity, since 2014-02-27 - 08:52:

Topics in ITSecurity web:	Changed: (now 04:02)	Changed by:
SSDWI	2014-03-05 - 10:16 - r1->r2	AnthonyDaly
Web ~~Development\Secure Software\Web App Dev Sec Guidelines.doc Web Application Security Development Guidelines~~ Application Security Development Guidelines ~~Development\Secure Software\Secure Web Services Dev Guidelines v1.0 rev1.doc Secure Web Services Development Guidelines~~ Web Services Development Guidelines AnthonyDaly 2011 06 30		
SsD	2014-03-05 - 10:17 - r6->r7	AnthonyDaly
Documentation Guides ~~Secure Software Development Lifecycle~~ Software Development Lifecycle Secure Software Development Policy Secure Software Development Work Instructions ~~Management\TWIKI DATA\web threats.htm Web Threats Visual~~		
SsDevPol	2014-03-05 - 10:58 - r1->r2	AnthonyDaly
Security Home Security Policy Security Guidelines User Alerts Security Awareness SECURE SOFTWARE DEVELOPMENT POLICY Link Preface This policy ...		

Review recent changes in: http://ff-ittools-01/twiki/bin/view/ITSecurity/WebChanges

Subscribe / Unsubscribe in: http://ff-ittools-01/twiki/bin/view/ITSecurity/WebNotify

Figure 4-5 Wiki Topic Change email

The continued use of TWiki in the department is an ongoing and active discussion which has meant that upgrades have been held off and the platform is behind the current release. There is a growing preference that when the department upgrades to Microsoft Sharepoint 2010 that at that point the TWiki content should be migrated to the Sharepoint Wiki environment. However this is proving difficult as due to the proprietary nature of the TWiki implementation there is a difficult migration path.

Microsoft Sharepoint

MS Sharepoint was first adopted by one project manager and then as he migrated on to different projects and areas it started to be used more. There were no departmental objectives or co-ordination around its use in any area.

While Sharepoint is a feature rich application allowing for intranet portals, document & file management, collaboration, social networks, extranets, websites, enterprise search and business intelligence. The organisation has only used it as a document repository for versioning and auditing purposes. The version in use currently is 2007 but management have indicated that they are piloting the 2010 version and are looking at a formal adoption of the technology.

Windows File System

Department data is held within a dedicated branch for the team. While there is some organisational structure to the data it is not consistent. Over the years different styles or organisational structures have layered onto the drive mapping with little or no management overview.

Blog

The IT department has a Blog in operation for a number of years which is administered by one of the members of IT operations. The Blog is almost exclusively used to post links to interesting articles on the internet with very little commentary or discussion taking place.

4.8 Conclusion

This chapter provided the reader with an overview of the target organisations business model and culture. The rationale for it to be considered a knowledge intensive business was also explained. Moving from the corporate view, the department being reviewed was explained along with the communications methods and core knowledge residing technology in use within the department.

This chapter should help the reader to frame and relate to the responses and findings of the next chapter.

5 DATA ACQUISITION AND ELICITATION

5.1 Introduction

This chapter describes the research methodologies used in this study and the design and justification of the chosen methods are explained. The aim of this chapter is to qualify the approach to knowledge in the IT operations department. The objective is to obtain and analysis data from the participants of a questionnaire and semi-structured interview.

Two qualitative approaches were selected, semi-structured interview and questionnaire. The different approaches were selected to elicit different data to enable understanding of the initial rational for the tools available in the department and how those tools are currently being used and perceived by the user body. The approach to designing the questionnaires and the data collection process is explained. The results of the questionnaire are presented and interpreted and the results of the interview were analysed using a ground theory approach.

5.2 Knowledge Audit

As described in the previous chapter the department under review is well known to the researcher but this "knowledge" of the department could actually hinder the research. In order to protect the integrity of the research an approach was sought to provide a sound platform from which to develop a theory. The desired approach was found in the methodology applied during a Knowledge Audit. A Knowledge audit assesses potential stores of knowledge and is the first part of any knowledge management strategy Jay Liebowitz et al., (2000). A full knowledge audit would not be possible within the time constraints of this research but a distilled and localised application of it was considered achievable.

A knowledge audit as proposed by Liebowitz et al., (2000) is a critical part of a knowledge management methodology. The knowledge audit seeks to find what knowledge repositories exist and by doing so establish the most effective method of storage and dissemination. Debenham and Clark (1994) saw a knowledge audit as a

planning document which provides a structural overview of a designated section of an organisation's knowledge as well as details of the qualitative and quantitative characteristics of the individual chunks of knowledge within that designated section.

The knowledge audit objectives as described by Debenham and Clark (1994) and Naguib Chowdhury (2006) were used as a reference to establish a set of objectives for this research.

Debenham and Clark (1994)	• Give a high-level view of the extent, nature, and structure of the knowledge in a specified section • Provide meaningful hard data input to the strategic plan for knowledge processing • Identify the relevant knowledge repositories within the organisation • Provide a statement of the qualitative characteristics of the chunks of knowledge within a particular knowledge repository and • Provide scientific estimates for the quantitative characteristics of the chunks of knowledge within a particular knowledge repository.
Naguib Chowdhury (2006)	• Helps an organisation to clearly identify what knowledge is needed to support overall organisational goals and individual and team activities. • Gives tangible evidence of the extent to which knowledge is being effectively managed and indicates where improvements are needed. • Explains how knowledge moves around in, and is used by, that organisation. • Provides a map of what knowledge exists in the organisation and where it exists, revealing both gaps and duplication. • Provides an inventory of knowledge assets, allowing them to become more visible and therefore more measurable and accountable.

	• Provides vital information for the development of effective knowledge management programmes and initiatives that are directly relevant to the organisation's specific knowledge needs and current situation. • Helps in leveraging customer knowledge

Table 5-1 Audit Objectives

Informed by the sources presented in Table 5-1 the objectives for the audit conducted in this research are defined as follows:

- Provide an overview of the range, type and location of knowledge within the team.
- Identify the key knowledge tools used within the team.
- Provide a map of the existing knowledge available to the team.
- Identify how knowledge is stored, accessed, and shared by members of the team.
- Identify if barriers exist within the team or at individual levels which prevent knowledge creation, sharing and retrieval.

The objectives for the knowledge audit and the literary rational for each are outlined in Table 5.2.

Objective	**Research Action**	**Literary basis**
Provide an overview of the range, type and location of knowledge within the team.	This was compiled by the researches knowledge of the area with validation though peer review and the questionnaire.	Debenham and Clark (1994) – *'Give a high-level view of the extent, nature, and structure of the knowledge in a specified section.'*
Identify the key knowledge tools used with the team	The team questionnaire was used to identify the key knowledge tools.	Debenham and Clark (1994)
Provide a map of the existing knowledge	A mapping exercise was conducted and verified by	Debenham and Clark (1994) -

available to the teams.	senior members of the area under review.	
Identify how knowledge is stored, accessed and shared by members of the team	The researcher reviewed data sources available in the area to collect empirical evidence and used a questionnaire to evaluate how team members access and share knowledge	Jay Liebowitz et al., (2000) with reference to Shah et al. (1998)
Identify if barriers exist within the team or at individual levels which prevent knowledge creation, sharing and retrieval	A questionnaire was used to identify any potential barriers to knowledge creation	Riege (2005) – proposes a series of potential barriers at individual, corporate and technology levels

Table 5-2 Audit objectives

5.3 Static Analysis

This section will look at some of the repositories of information / knowledge on the organisations network to establish usage and attributes of the data. The sources are limited to 'open' sources where no security or data protection restrictions apply.

Departmental Wiki Pages

The Wiki was the only tool where the introduction can be directly linked to knowledge management objectives, namely collaboration and knowledge sharing. However it was not introduced specifically to meet KM objectives, rather project management needs. There is a lose structure around the site which is typically organised on departmental grouping but it is not overtly managed or coordinated. There are also no guidelines regarding metadata for pages e.g keywords or summary descriptions.

Static analysis was conducted of the Wiki application to determine which users within the department were creating content and in what time periods. Figure 4-1 shows the

users who have created 5 or more wiki pages and the time periods over which they were created.

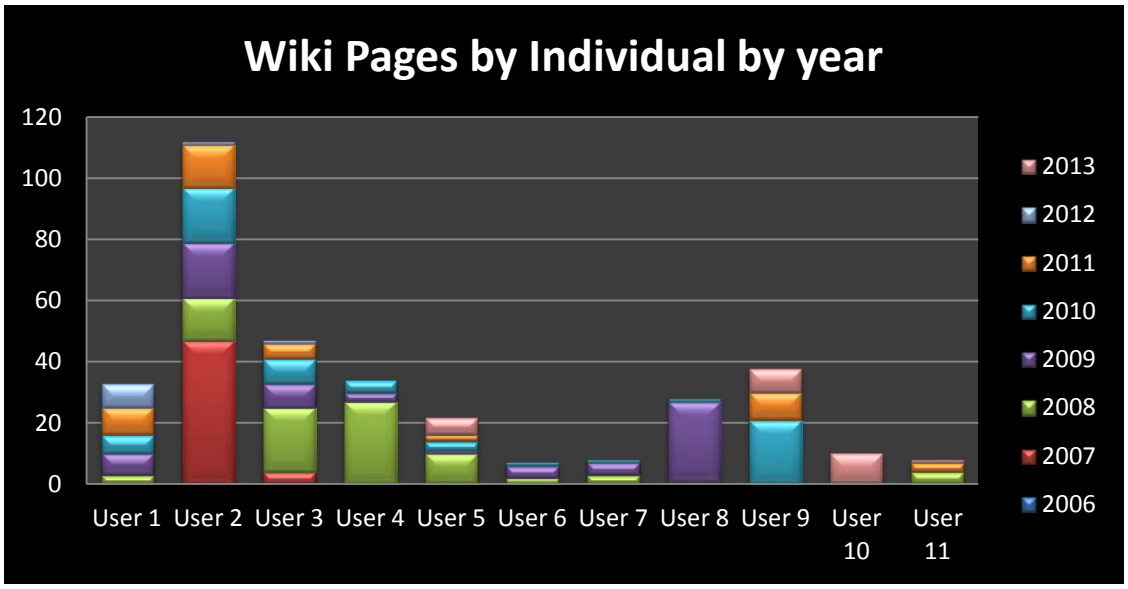


Figure 5-1 Wiki Pages by Individual by Year

At the time of the data collection there were 362 distinct wiki pages and in figure 4-2 it shows the number of page revisions for the distinct pages.

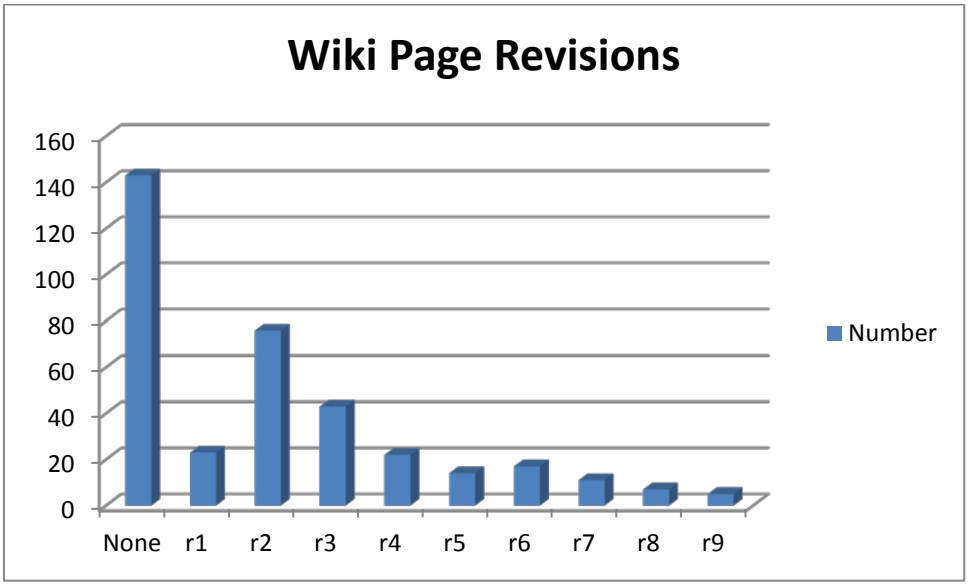


Figure 5-2 Wiki Pages Revisions

This data indicates that when the wiki was first introduced in 2006 there was little use in the department at the time with the first surge coming in 2007 by one user. By 2008 the use of Wiki was set as a department goal and each member of the team had this specified in their individual performance goal sheets;

"For your area of responsibility create at least two wiki pages following the standard template. This should be updated as changes happen within the environment and as "on the job" knowledge is gained throughout the year. All information should be presented at a standard for external consumption e.g. Quality Auditors." This had the effect of more wide spread use of the Wiki but no individual surge taking place. Unfortunately the application does not collect data for page visits as it would be common that there would be more viewers of content than creators. A question posted on the TWiki forum looked for a page counter but a solution for not forthcoming and the thread was closed in 2008 TWiki.org (2014). The team questionnaire has a measure for wiki as a source of information.

Filesystem Data

The department has a number of distinct network file systems on which department data is stored. The main drive, the "I" drive has three branches representing the three major area namely Service Delivery, Technology Management and Information Security. The first two are accessible to all department members with the Security drive being restricted owing to the nature of the data stored on the drive. There is also a directory dedicated to software referred to as the Vendor drive and while this primarily stores copies of software used within the company is not uncommon from procedural notes or information relating to a particular vendor to be stored on this drive also, but the primary area of information storage is on the "I" drive.

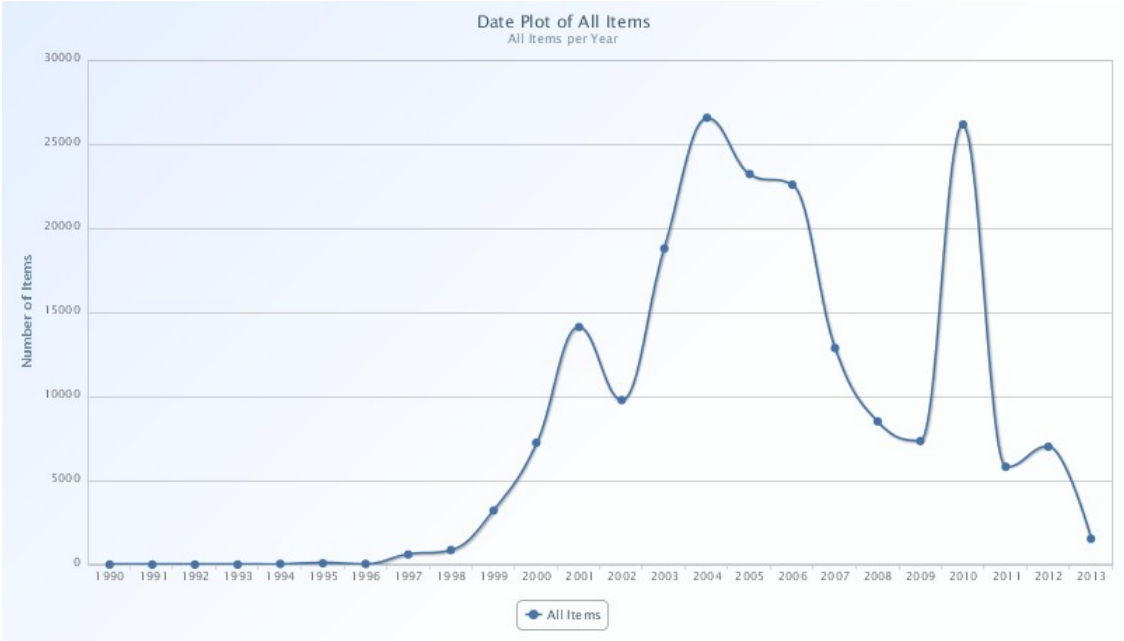


Figure 5-3 Filesystem History

The data within the department was recently (July 2013) indexed using an application called Nuix which is a specialist e-discovery application. This allowed for quick analysis of the typical user generated content by age (figure 4-3) and type (figure 4-4). This shows that there is a considerable history associated to the data, dating back to 1990 but there was steady growth in the data since 1999, interestingly some of the drops in data can be correlated to business down turns. The age of the data is not unexpected, owing to the nature of the business and that a number of the members have over fifteen years' service in the department. In terms of document types the predominant file types are Microsoft Office Word and Excel.

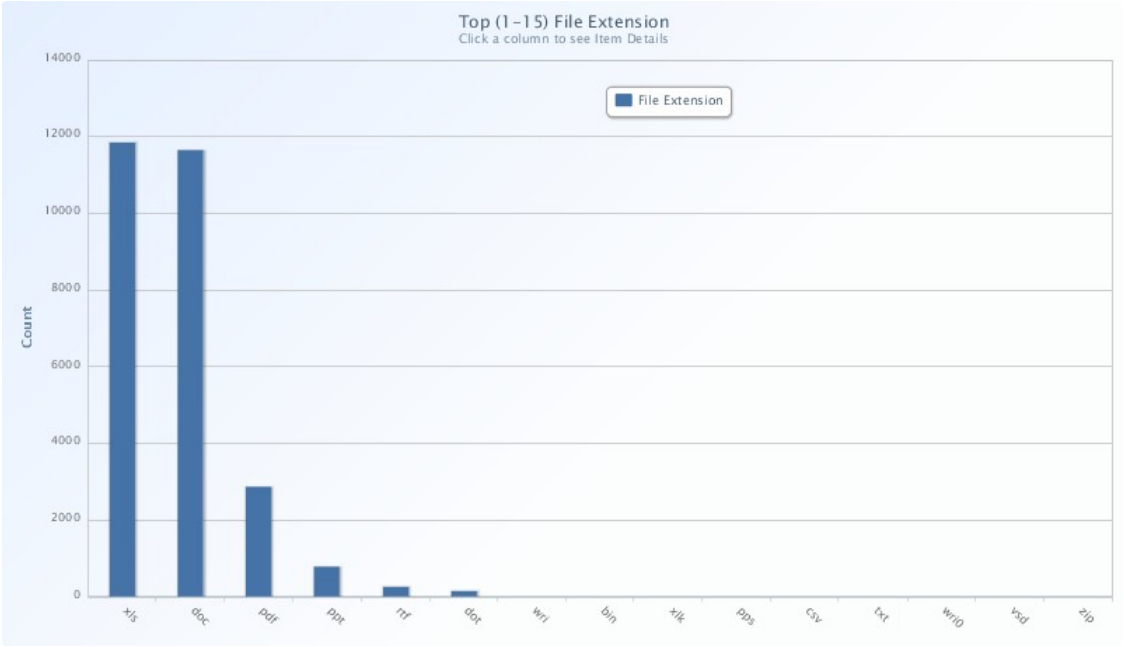


Figure 5-4 Filesystem File types

5.4 Findings

The findings of this chapter can be summarised as follows:

- Willingness to share knowledge is good across the department
- Little or no barriers are deemed to exist to restrict knowledge activities
- There is a lack of integration between the identified knowledge tools
- Sharepoint / JIRA is ascending in terms of usage with Wiki declining or plateaued.
- KM capable tools were introduced with little or no KM objectives

- The organisation of information and knowledge is not uniform across platforms

5.5 Knowledge Acquisition

This researcher identified that the department had knowledge encoded in a range of applications which have been identified by numerous knowledge management authors as good applications to meet knowledge management objectives. However the applications in this department were not explicitly implemented to meet knowledge management objectives. It was therefore important to understand the objectives for the applications and see if any of the original objectives meet knowledge management criteria.

There are standard or common applications which contain knowledge such as e-mail, network file storage and an intranet along with a range of applications for specialised purposes namely JIRA, Wiki, SharePoint and a Blog. As the common tools have a self-evident purpose the researcher focused on the objectives of the specialised tools. Two of the distinct objectives for the knowledge acquisition phase of this research were firstly to establish to original objective of the specialist applications and how current teams members view knowledge within the department. To collect this data it was decided to use two qualitative methods namely Semi-Structured Interviews and a Questionnaire. Both of which will be analysed using a grounded theory approach.

Semi-Structured Interviews

Through enquiry it was established that one individual was responsible for the introduction of three applications; JIRA, Wiki and SharePoint. While another individual is responsible for a Blog they were not involved in its inception. Therefore it was considered that the usefulness of an interview on the rational for the introduction of the tool would not be sound as they would be speculating. As there is only one individual involved with the specialist applications it was decided that a semi-structured interview would elicit the best results for the original objectives for these tools.

As it was established that there was only one individual involved for these applications it was decided that an interview would elicit the best data. A semi-structured approach

was favoured it offered the interviewee a good deal of leeway in answering but there is a guide to keep the interview on track. The interview was conducted by means of a recorded phone call and professionally transcribed. The results of the interview were analysed using an In Vivo coding ground theory approach.

The interview was structured to provide organisational demographic information about the interviewee and then for each application that they lead or introduced establish the following information:

- A history of the application
- If they introduced the application or re-engineered an existing application.
- What the intended purpose or objective of the application was
- If the application is still being used as originally intended

A detailed view of the interview guide is shown below in Table 5-2

Objective / Area	
Demographic	Name
	Age Range
	Gender
	Department
	Time with Company
	The following tools have been identified as data / knowledge repositories:
	Sharepoint
	JIRA
	Wiki
	Blog
	e-mail
	Can you indicate which of the tools you may have introduced or played a role in how they are used?
	For Each tool listed we will discuss the following questions:
Tool History	What was the role you held when initial selection / engagement with tool began
	Did you introduce the tool or become a lead in the deployment / structure of the tool?
New Tool	Did you recognised a gap and search for a tool which best filled the gap?
	If you identified a gap did you document the requirement for a new tool?
	What was your selection process for the tools you implemented?
	Did you discuss the use / implementation of this tool with management?
	Was there a specify objective being meet? What was it?
	How did you decide to implement / deploy the tool?
	Did you train people or create new processes for people to use the tool?
Existing Tool	What lead you to become a key user / advocate of the tool in question?
	Did you have to modify / re-engineer the existing tool to meet a new purpose?
	Did you discuss your changes or new advocacy for the tool with management?
	Was there a specify objective being meet? What was it?
	Did you train people or create new processes for people to use the tool?
Tool Review	Do you think the tool is still fulfilling its original purpose?
	Do you think the tool has increased or decreased in organisational (Team / Department) importance?
	What are your thought for the future of the tool?

Table 5-3 Semi-structured interview guide

The results of the interview are shown in Table 5-:3

	Tool		
	Sharepoint	**JIRA**	**WIKI**
New tool	NO	YES	YES
Rationale	Frustration	Known improvement	Known improvement
Scope	Increased	Increased	Increased
Management approach	No objection to use	Demo and go	Demo and go
Training IT	No	No	NO
Importance	Growing	Growing	In decline

Table 5-4 Findings from Semi-Structured Interview

The results of the interview indicated that at the time there was no formal consideration to the introduction of these tools other that an agreement to purchase the tools in question. Two of the tools were introduced as the instigator sought out or knew of better ways to improve process he was working with. Management did no have any significant role to play in the selection or setting the standards for the tools use.

Questionnaire Design

The questionnaire was structured to cover a number of areas which were identified through research on knowledge audits. Chowdhury (2006), proposed a range of questions covering defined sections, namely

- The overall environment of my department
- Perception about knowledge in the organisation
- Perceptions about team members collaboration and support for KM
- Perceptions about collaboration and responsibility
- Ability to find knowledge
- Reward systems

While Riege (2005) suggests that knowledge sharing barriers must be considered and offered a range of barriers at the following levels:

- Individual

- Organisational
- Technology

The questionnaire was constructed using appropriate examples based on the suggestions by the aforementioned authors. The questions were grouped in a number of distinct sections, those being:

- Demographical – this section sought basic information about the respondents work profile.
- Knowledge Application perceptions – this section looked to understand what the respondent thought of the existing knowledge applications available to them in the department.
- Knowledge retrieval - these questions sought to understand where respondents find knowledge
- Sources of Knowledge with the team – this series of questions sought to understand the perception of how individuals seek and rate knowledge sources.
- Barriers to Knowledge (Individual, corporate & technology) - the series of questions in this section sought to understand if there were any specific blockers to creating or sharing knowledge perceived by the respondents.
- Application usage – the questions in this section were provided to give an understanding of what tools are used and the frequency of use.

Most sections of the questionnaire provided a free form response field so that respondents had an opportunity to comment outside of the prescribed questions.

Once compiled the questionnaire, as seen in Apendix A, was sent to the department management for review prior to being distributed to the team. Management responded positively and engaged in the process by requesting more granular details in some areas. These requests were incorporated into the questionnaire. The questionnaire was published and distributed using the corporate SurveyMonkey account. An e-mail was sent to all department members inviting them to take the survey but stating that it was not obligatory. It should be noted that the department had two other questionnaires to complete within the previous 4 weeks which may be a factor in participation in the questionnaire.

5.6 Data Analysis

The conclusions drawn from the staff questionnaire are outlined here with the full results available in separate submitted file to this paper. The questionnaire was designed and distributed using a corporate account on SurveyMonkey.com. The survey was issued on the 17th of December 2013 to seventeen people of whom thirteen responded to the survey. The findings of the questionnaire are discussed below as per the sections of the survey:

- **Demographic of respondents:**
  - Department participation (Question 1)
    - The two primary sections (Tech Mgt & Service Delivery) of the department were well represented with a 38.5% and 46.2% split with the other category completing the picture at 15.4%. This representation means the results of the survey can be considered to be balanced and reflective of the overall department.
  - Service profile (Question 2 & 3)
    - With almost 77% of the participants in the 36-50 age bracket it indicates experienced or mature individuals.
    - Just under 54% of the participants have worked with the company for 11 or more years.
- **Knowledge application perceptions**
  - Frequency of tool usage (Question 4)
    - The tool which is most used by all participants most frequently is email followed by JIRA and the Internet. When this question is split by the two main teams we can see that the frequency and use of the tools varies considerably between the teams. JIRA is used hourly / daily by all of the Technology Management respondents but only one Service Desk team uses it hourly and two daily. Sharepoint has a similar profile in usage to JIRA but the IT Blog stands out as the least frequently used across the teams with just under half of the respondents never using it.
  - Knowledge retrieval – known artefacts (Question 5)

        - The most frequently used applications to find existing knowledge is e-mail and the Internet. Looking at the top three frequently used apps we see Email, Internet, JIRA, Sharepoint and the network as top sources. But the IT Blog and the Wiki are the least used.
    - Knowledge retrieval – unknown artefacts (Question 6)
        - The internet stands out as the most frequently used followed by email and JIRA again the IT Blog and the Gate are least used.
    - Ability to create, store and find knowledge (Questions 7 & 8)
        - 84% of the participants agree they can create and retrieve knowledge with the existing tools.
    - Ability to share knowledge (Question 9)
        - 100% of participants agree that the existing tools allow them to share their knowledge.
    - Productivity perception of tools (Question 10)
        - Almost 70% felt that the tools provided to them allowed them to complete tasks quickly, but 30% were neutral about this.
    - Tool usefulness to role (Question 11)
        - Over 90% felt the tools available to them were useful to their job.
- **Knowledge retrieval**
    - Individual recall (Question 12)
        - The majority agreed that they used their own recall of where knowledge is stored to search or find information. This coincides with the long service lengths indicated in the demographic profile.
    - Use of external internet sources (Question 13)
        - There was a mixed response to this question with just over half agreeing with this statement. This sentiment is equally shared across the teams.
    - Native tool search functionality (Question 14)
        - Most people used the search functionality built into the native applications but just over 30% were either neutral or disagreed with the statement.

- Breadth of searching (Question 15)
    - Just over half of the participants felt they had to go to a number of tools before they found what they are looking for. 23% disagreed with this and a further 23% neutral on this question.
- Search time (Question 16)
    - Over 70% felt that they found the knowledge they were looking for within 15 minutes.
- Social versus technology (Question17)
    - There was almost an even split with participants with 53% agreeing that they find knowledge is held with individuals rather than in tools.
- Relevance or current time accuracy of documentation (Question 18)
    - Only 8% of participants felt that the knowledge held in documents or tools were likely to age quickly and only act as a guide. But almost 40% were neutral on the question.
- Retrieval success rate (Question 19)
    - 76% of participants felt that they would often find what they are looking for within team application, with no one disagreeing.
- Individual knowledge sources (Question 20)
    - Participants agreed strongly that they could find knowledge by asking a team member.
- Requirements for new knowledge (Question21)
    - Just over 60% felt that they had to find new knowledge.

- **Barriers to Knowledge - Individual**
    - Time to share knowledge (Question 22)
        - Just over half the participants agree with this statement. There is an even split in the technology management team between those that agree and disagree with this statement.
    - How knowledge is shared - social (Question 23)
        - Almost 70% agreed that the culture is to share knowledge conversationally or through hand on learning.
    - Contact time to share (Question 24)

        - While slightly over half of the participants felt there was a lack of contact time to be in receipt of knowledge the service desk area were strongly of this opinion.
    - Individual perception to sharing knowledge (Question 25)
        - 92% did not feel that sharing their knowledge would lead to a negative situation for them.
    - Free text opinions on the sharing of knowledge (Question 26)
        - Three comments were made in this section, those being:
            - A technical barrier to some knowledge sources was raised, with youtube being mentioned.
            - The lack of standards for information / knowledge management was raised.
            - One user highlighted a missed source of knowledge, namely the "Service First" helpdesk application.
- **Barriers to Knowledge – Corporate**
    - Storage restrictions (Question 27)
        - Just under 77% felt that there were no storage restrictions to share or create knowledge
    - Lack of reward or recognition (Question 28)
        - 60% are neutral about this question with 15% agreeing that there is no reward or recognition for knowledge creation or management but 23% feel there is.
    - Corporate culture discourages sharing (Question 29)
        - 53% did not agree that corporate culture prohibited knowledge sharing but 23%, a noteworthy amount felt that there was a corporate issue with sharing.
    - Environmental inhibitors to sharing (Question 30)
        - Almost 77% of people felt that there were no physical work impediments to sharing knowledge
    - Free text opinions on the sharing of knowledge (Question 31)
        - One comment was positively made regarding the environment and how it facilitates knowledge sharing.
- **Barriers to Knowledge – Technology**

- Integration between tools (Question 32)
    - Participants either agreed or were neutral on the question of the lack of integration between tools, only 1 participant felt there was integration.
- Familiarity and experience with tools (Question 33)
    - Almost 70% of participants felt that there was no issue with how to use the tools at their disposal.
- Lack of training on new knowledge tools (Question 34)
    - 30% disagreed with this question but 45% agreed with it , the service desk made up the majority of those agreeing with this question.
- Lack of communication on new applications (Question 35)
    - There is a split between those agreeing with this statement and those who are neutral on the statement but the majority of those agreeing are the service desk area.
- Free text opinions on the sharing of knowledge (Question 36)
    - One comment was made in this section regarding how the respondent felt that “we tend to fall into using certain apps and they become the standard by accident.”

- **Attitudes to Knowledge Creation**
    - Willingness to share knowledge (Question 37)
        - 92% of participants said they would not keep knowledge to themselves.
    - Sharing of knowledge (Question 38)
        - Over 76% of participants publish their knowledge to their team.
    - Where is knowledge published (Question 39)
        - The most common place to publish information is on Sharepoint and network shares, followed closely by JIRA. There is a difference between the teams as to where they publish information.
    - Maintenance of created knowledge (Question 40)
        - 46% of participants believe that knowledge is kept up to date once published with 15% believing that knowledge is not kept up to date. The remainder, 38% were neutral on the matter.

- Created knowledge use (Question 41)
    - There is almost a split between those that agree that knowledge they create is used frequently and those who are neutral about it.
- Category of Knowledge published (Question 42)
    - The most common types of knowledge published are, project, administration and operations.

Questionnaire Findings

The results of the questionnaire showed good engagement from the participants with only one reminder e-mail necessary. The results clearly showed that participants felt comfortable with sharing their knowledge and did not see any significant barriers to knowledge sharing.

The tools available to the department were seen to meet their needs and did not overly hinder their activities. Retrieval activities showed a high success rate with most feeling that they found information within a reasonable time period. However half of the respondents felt that they need to go to a number of tools to find information with half saying that individuals were the source of knowledge. The wiki rated poorly in terms of usage and as a source of knowledge yet participants indicated that the majority of them use it at least weekly. Taking neutrals into account with the exception of one participant felt that there was a lack of integration between the tools.

E-mail, JIRA and the internet rank high in usage terms but of note is that e-mail is seen as source of knowledge and the internet also. The questionnaire doesn't reveal if e-mail is seen as a source of knowledge or a mechanism to acquire knowledge but asking someone a question. The use of the internet is not surprising but further analysis would be required to establish if the knowledge being sought on the internet is something that already exists within the department.

Sharepoint, the file system, JIRA and Wiki are the typical area where knowledge is published with a definite split between the teams in terms of application. Service Delivery uses Wiki whereas Technology Management use Sharepoint. This can be explained as the Technology Management team have been working heavily on large

projects of late and it was decided by the project manager to make use of Sharepoint for version control.

5.7 Conclusion

This chapter provided a view on the rationale behind the use of some of the technology used by the department under review. A limited knowledge audit was carried out to elicit the thoughts and attitudes of the staff in the department. The findings were then analysed and conclusions established. It was evident that despite there being no organisational strategy for knowledge management it was clear that activities taking place within the department could be mapped to a knowledge management approach.

A number of gaps emerged during the reviews which may be limiting the effectiveness of the team. These gaps will be addressed in chapter six when an experiment will be put to the team for peer consideration.

6 EXPERIMENTATION & EVALUATION

6.1 Introduction

This chapter builds on the findings presented in previous chapters and delivers a knowledge centric view of the information in the department. The rationale used to construct the experiment is explained along with constraints and issues encountered. Finally the results of a peer review of the experiment are analysed.

6.2 Experiment Overview

Having reviewed the Questionnaire data, analysed the existing sources of knowledge and the capabilities of the existing tools the following elements were decided upon for the experiment:

1) Topology
2) Collation of knowledge in a 'Topic' Page
3) Collaboration medium

The rationale for each element is explained here:

Topology

Across the various tools there is no consistent structure to how information or knowledge was stored. However having reviewed the core elements of the department a simple topology was constructed. The purpose of the topology was twofold;

- Facilitate easy navigation to target knowledge
- Provide a structure for the storage or classification of knowledge

'Topic' Page

This is the core element of the experiment, which is to bring a number of the existing knowledge sources together. Once the desired page is navigated to it will present a set of standard information with pre-defined links to other repositories which are filtered or directed directly to relevant information for that topic. Other elements which

support knowledge sharing and a loose “communities of practice” concept also exist on the page.

Collaboration medium

This element of the experiment was explained as concept rather than presenting a working model. It sought to use the in-built functionality within the application(s) to facilitate better collaboration. It was explained that when employees added themselves in the “Go To People” section that they would then be alerted to changes to the content of the page.

A defined constraint for the experiments was that only existing tools could be used in the experiment. It also did not seek to create a new knowledge repository; rather assist employees locate existing knowledge.

6.3 Experiment Implementation

The concept for the experiment was presented to the acting senior manager where it was agreed to proceed and focus on a limited set of domains which he was interested in. This did not represent a problem to the experiment as the domain was not relevant to the experiment.

The existing TWiki was used to host the experiment but there was initial conversation held with the manager to use a new version of Microsoft Sharepoint which was installed and under evaluation. When this was attempted there was performance issues encountered so it was felt it would both compromise the experiment and the perception of the new Sharepoint install so this was abandoned.

Although in previous chapters the use of TWiki was seen to be in decline it is familiar to the department and a link on the department home page was used to provide the access into the experiment area, see figure 6-1. Again the use of a declining platform did not compromise the experiment as the platform was not crucial, although a wiki platform would be desirable.

A simple topology was constructed covering the core technology streams that the department is responsible for. The topology was shallow with typically no more than three layers associated with it before you landed on your desired Topic page, see figure 6-2 and 6-3.

The core elements of the topic page were constructed and links to other repositories added, see figure 6-4. Links to Sharepoint and custom queries were produced in JIRA to facilitate the change history section. The queries in JIRA where constructed with simple filters for topic in question. In the case of the RedHat page there were existing wiki pages in place so the links were added to the Topic page, see figure 6-5.

Once there was a demonstrable set of pages available an emails was sent to the team leads detailing the concept of the experiment. It was left with them for just over a week at which point I spoke to each team lead to see if they are review the work. The response was mixed with some having not reviewed it at all but promises were made that they would give it their attention.

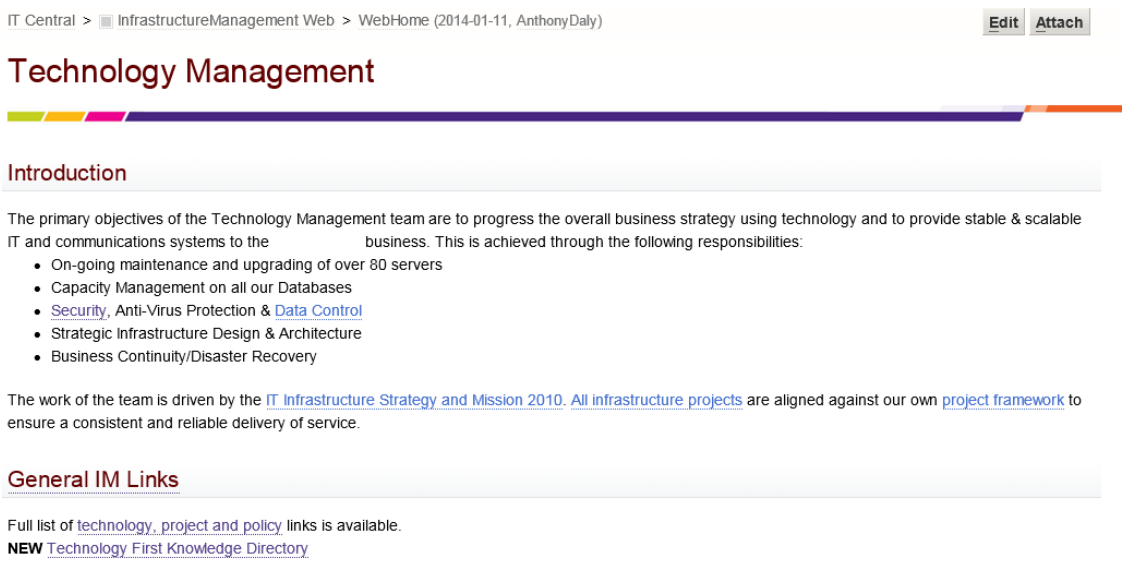


Figure 6-1 Technology First Knowledge Directory

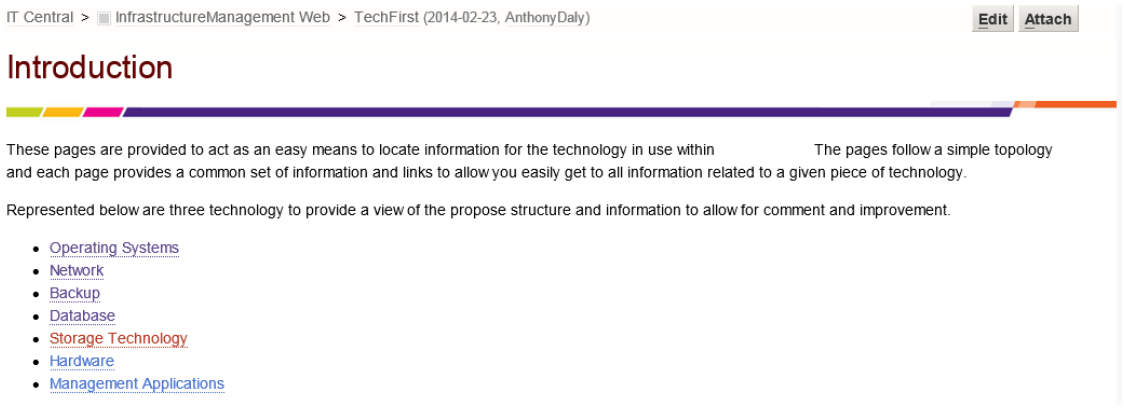


Figure 6-2 Technology First Topology

Figure 6-3 Technology First - 2nd Level

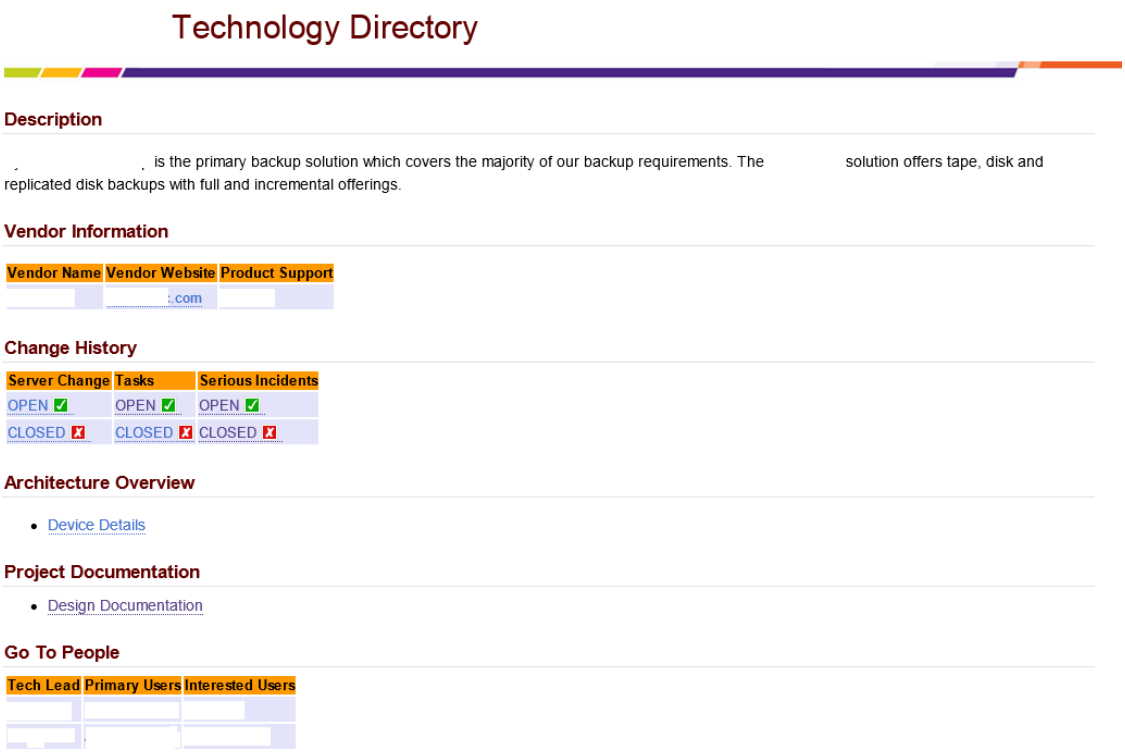


Figure 6-4 Technology First - Topic Page

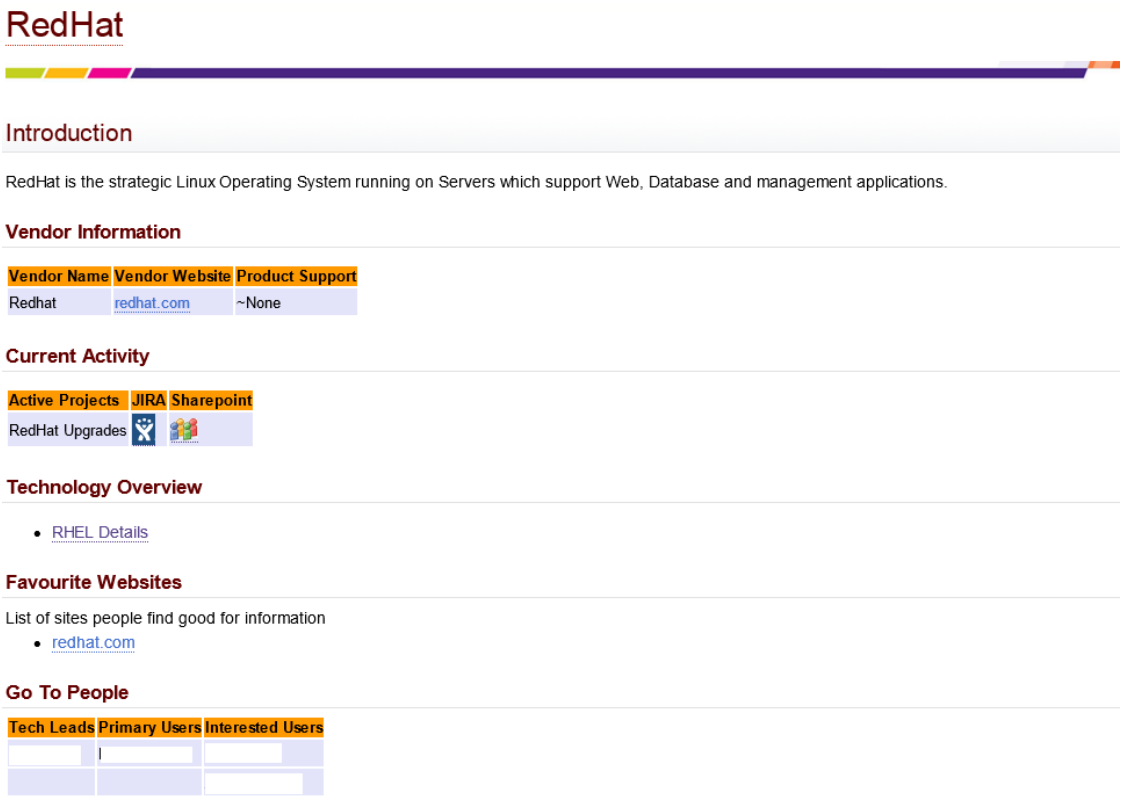


Figure 6-5 Technology First - Redhat Page

6.4 Problems encountered

The planned experiment was to demonstrate the new concept to the entire department and elicit feedback. An unforeseen event took place in the department whereby the senior manager for the area tendered her resignation in early January. This had a considerable impact on the department as a significant amount of handover had to take place between her and her team-leads and management outside of the department. Alongside this a planned department reorganisation was accelerated which saw new functions established and existing functions re-organised with new team-leads. These events simply meant that there was little capacity or desire to demonstrate another potential change to the department.

6.5 Evaluation

In light of the problems encountered and the time constraints for this paper it was decided to conduct a peer review with the team leaders and use their experience and knowledge of the staff to decide on the merits or not of the experiment. The author does not believe that this approach has significantly compromised the value of the

experiment as these leaders will either engage or not with an initiative and their teams will follow.

6.6 Post Experiment Questionnaire

A questionnaire was prepared to elicit feedback from the team-leaders and the manager of the department.

Question 1

What section do you represent?		
Answer Options	**Response Percent**	**Response Count**
Service Desk	0.0%	0
Technology Management	50.0%	2
Network Operations	25.0%	1
Management	0.0%	0
Data Control / BCM	25.0%	1

Question 2

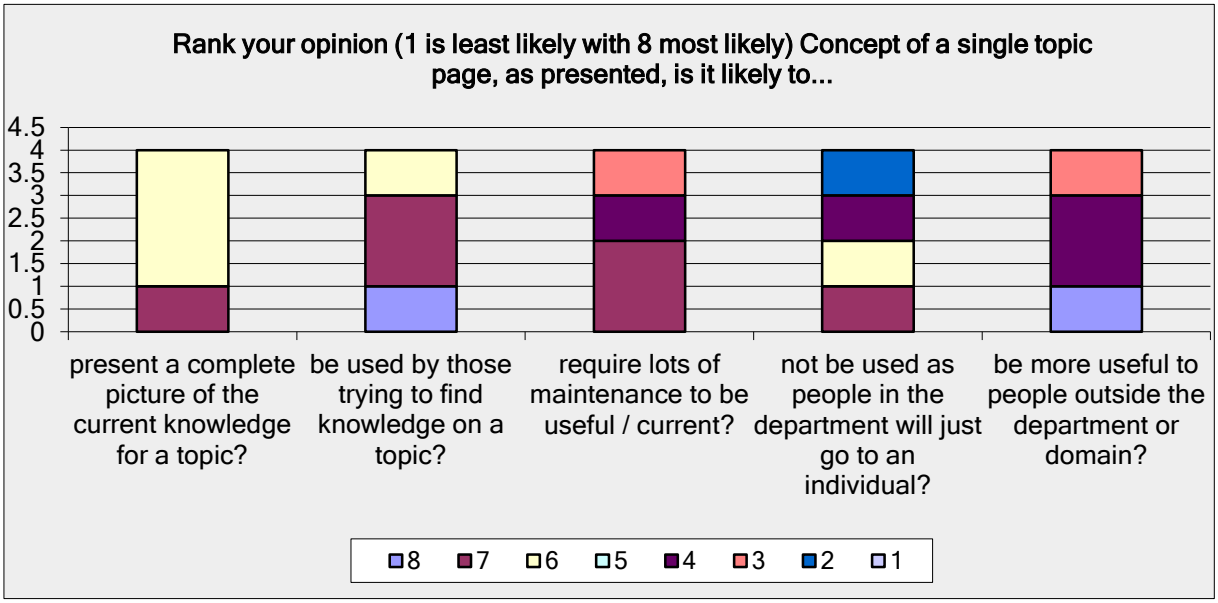
Does the topology presented...				
Answer Options	**Yes**	**No**	**Neutral**	**Response Count**
represent the department domains?	4	0	0	4
logically flow and aid retrieval of knowledge?	4	0	0	4
work across other technology e.g SharePoint, FileSystem	4	0	0	4
Other thoughts you may have on this topic can be presented here.				1

Number	**Response Date**	**Other thoughts you may have on this topic can be presented here.**	**Categories**
1	Mar 18, 2014 4:56 PM	It's a good start	

Question 3

Applying this topology across all relevant technologies is a good idea.		
Answer Options	**Response Percent**	**Response Count**
Strongly Agree	100.0%	4
Agree	0.0%	0
Neutral	0.0%	0
Disagree	0.0%	0
Strongly Disagree	0.0%	0

Question 4



Question 5

Do you believe that Wiki technology will continue to be used within the department?		
Answer Options	**Response Percent**	**Response Count**
Strongly Agree	0.0%	0
Agree	50.0%	2
Neutral	25.0%	1
Disagree	25.0%	1
Strongly Disagree	0.0%	0

Question 6

Automated alerting of changes to the topic page should be enabled for page owners and interested people		
Answer Options	**Response Percent**	**Response Count**
Strongly Agree	25.0%	1
Agree	25.0%	1
Neutral	50.0%	2
Disagree	0.0%	0
Strongly Disagree	0.0%	0
What are your thoughs on alerting?		2

Number	Response Date	What are your thoughts on alerting?	Categories
1	Mar 18, 2014 4:59 PM	Not sure about this. Want to avoid spamming people. Need to make sure the information is considered trustworthy and accurate. I'd favour that relevant updates would be alerted weekly (at the most) - or else that people would mention it at standups or the like. Daily alert updates are not good.	

2	Mar 18, 2014 2:54 PM	This can go 2 ways - no alerting and an important change in a topic may be missed by interested people but too may alerts and the end user may ignore them thus also missing the info. As long as the info has a clearly marked updated date and maybe one area where all changes could be viewed would work better

Question 7

I think the concept of a topology will help my team find knowledge with greater ease.

Answer Options	Response Percent	Response Count
Strongly Agree	25.0%	1
Agree	75.0%	3
Neutral	0.0%	0
Disagree	0.0%	0
Strongly Disagree	0.0%	0

Question 8

Being able to go to a single page to find "all" relevant knowledge is beneficial.

Answer Options	Response Percent	Response Count
Strongly Agree	100.0%	4
Agree	0.0%	0
Neutral	0.0%	0
Disagree	0.0%	0
Strongly Disagree	0.0%	0

Question 9

Being able to see all the interested people in a domain will help me / my team.

Answer Options	Response Percent	Response Count
Strongly Agree	75.0%	3
Agree	25.0%	1
Neutral	0.0%	0
Disagree	0.0%	0
Strongly Disagree	0.0%	0

Question 10

I can see my team engaging and using this approach.

Answer Options	Response Percent	Response Count
Strongly Agree	0.0%	0
Agree	50.0%	2
Neutral	50.0%	2
Disagree	0.0%	0
Strongly Disagree	0.0%	0

6.7 Questionnaire analysis

Only one of the team-leaders failed to complete the questionnaire and although not indicated in the results the manager of the area did complete the questionnaire. They selected the "technology management" option in error. The analyses of the results are presented here:

Topology section

The results in this section where 100% positive with all participants feeling that the use of a topology was "good idea". The participants all verified that the topology presented represented the domains of the department. While 75% of the participants agreed and 25% strongly agreed that the topology would help their team find knowledge with greater ease.

Topic Page Section

The concept of a single page view of knowledge was 100% strongly agreed by all participants. There was also a very good result for the "interested people" section of the Topic Page. In terms though of the perceived use of the page by their respective teams the response was muted as 50% agreed it would but the other 50% were neutral on the matter. Question 4 presented a mixed set of results but would broadly indicate that further investigation would need to be carried out with the team-leads to gain insights into some of the perceptions of the topic page, such as effort to maintain.

Use of Wiki

While 50% of the respondents could see wiki technologies continued use within the department the remaining participants were either neutral or disagreed that it would continue.

Communication / Alerting

Broadly the use of alerting was welcomed with caveats that the volume of alerts are kept to a minimum.

6.8 Conclusion

This chapter presented the experiment which was drawn up based on the analysis of the data acquisition and elicitation chapter. The implementation was explained and following a release period a questionnaire was put to the team-leaders and management in the IT operations department to illicit their perceptions of the experiment.

The results of the experiment show a favourable response to many of the concepts presented although it was not without some concern having being expressed regarding the maintenance effort and the engagement of employees with the approach.

The experiment was compromised from its original intention of being presented to all of the original participants of the elicitation questionnaire however as explained unforeseen circumstances arose but owing to the fact that almost all of the team-leaders and management of the department provided feedback the researcher does not feel that the results have been compromised.

7 CONCLUSION

7.1 Introduction

This chapter reviews the previous chapters considering the research problem posed and examining how it was reflected upon and examined in the body of work presented. The chapter will consider the contribution that this research may have provided to the body of knowledge. It looks at the experiment conducted and the evaluation and limitations associated with it. Finally consideration is given to possible future work that arises out of this work.

7.2 Research Definition & Research Overview

The organisation under review in this research paper has no knowledge management strategy in place or under consideration. In this environment the research sought to understand if knowledge management approaches could be incorporated into an existing set of tools currently being used by an organisation.

7.3 Contributions to the Body of Knowledge

This research by examining an organisation where no knowledge management strategy either organisationally or departmentally exists offers and insight in to practices which can be aligned to meet knowledge management objectives.

The research was conducted against an organisational unit which should prove identifiable in many organisations within Ireland or globally. Naturally, scale will have a significant bearing on the relationship.

The examination of the department was conducted from a sound literature base allowing the questions to be comparable to existing work in this area.

7.4 Experimentation, Evaluation and Limitation

The experimentation was designed to address identified gaps as result of the primary research conducted so as such is very specific to the department in question. The results of the research through the answers of the knowledge audit identified that knowledge management activities were taking place in the department without being formally recognised.

There are a number of limitations to be acknowledged within this work; time will always be against any researcher but it was poor timing which impacted the desired review of the experiment as identified in chapter 6 an unforeseen organisational change hampered the experiment.

The unique characteristics of any organisation and department dynamic will always greatly influence research on this scale so care was given to expose some of the traits to assist researchers classify the organisation.

7.5 Future Work & Research

The future work which could be perused by further research is to examine a group of organisations who have no Knowledge Management strategies in place but examine them through a knowledge audit to establish if their practices or technologies satisfy knowledge management objectives and criteria. By examining a larger population and organisational profile it may eliminate any bias that may exist in this research. A suitable questionnaire could be constructed and distributed to willing organisational participants.

7.6 Conclusion

Knowledge management being *'multi-faceted and complex'* Blackler (1995) faces many difficulties to stand a unified domain which can be succinctly explained to organisations so that they will invest in the effort to embed KM practices. However organisations do not need to have a label associated with their practices to be doing

something which achieves the organisation aims of knowledge management to create *'sustainable competitive advantage'* Meso and Smith(2000)

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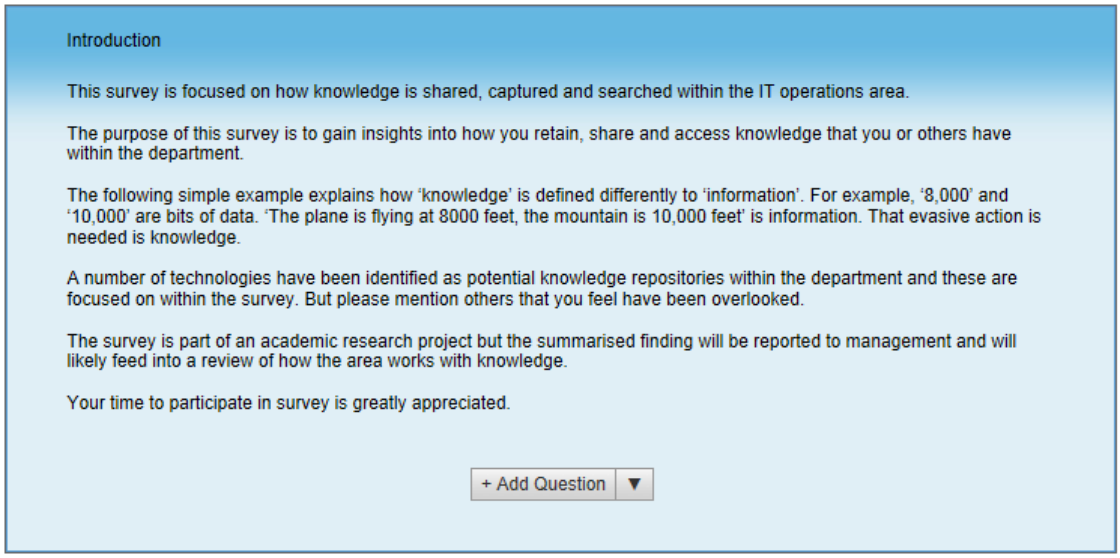
APPENDIX A

Questionnaire issued to the department.



Question Number	Question
	A little bit about you
1	Section (Service desk, technology Mgt)
	Age group
2	19-24 25-35 36-50
	Length of Service
3	1 to 5 year 6 to 10 years 11 to 15 years 16+ years
4	**Tool Usage** Of the following tools indicate how frequently you use / interact with the tools **Tool** JIRA WIKI Sharepoint Dept. / Team network file share IT Blog E-mail (for business / team matters) Internet (for business / team matters)

Other (please specify and indicate frequency of use)

Of the following tools rank which tools you would use to find existing knowledge
5 (something that you know should exist)
Please rank all (1-7) with 1 being the most frequently used and 7 the least
Tool
JIRA
WIKI
Sharepoint
Dept. / Team network file share
IT Blog
E-mail (for business / team matters)
Internet (for business / team matters)
Other (please specify and rank)

Of the following tools rank which tools you would use to find new knowledge
6 (something that you have not encountered before)
Please rank all (1-7) with 1 being the most frequently used and 7 the least
Tool
JIRA
WIKI
Sharepoint
Dept. / Team network file share
IT Blog
E-mail (for business / team matters)
Internet (for business / team matters)
Other (please specify and rank)

Knowledge sharing practice and attitude

Section: The Knowledge applications / tools available to me in my team:
7 help me to create knowledge
8 allow me to store and find knowledge
9 allow me to share my knowledge
10 allow me complete my tasks quickly
11 are useful to my job

Section: How I search / find knowledge
12 I generally remember where knowledge is stored and go directly there.
13 I have identified sites on the internet which help me aquire the knowledge I need
I use the search function within one of the applications in the department e.g. Wiki,
14 JIRA, Sharepoint
15 I will go to many applications before I find the knowledge I am looking for
16 I typically find the knowledge I am looking for within 15 minutes.

Section: Sources of knowledge within my team:

17 I find that specific knowledge required by me is held by individuals rather than in applications or documents

18 knowledge stored within documents or within applications / tools tends to age quickly and only provide a guide

19 I can often find the knowledge I need within team applications / tools

20 I can often find the knowledge I need by asking team members

21 As I have to deal with a lot of new requirements / problems I am always having to look for new knowledge outside of the team.

Section: Your thoughts on knowledge:

22 there is a lack of time to share knowledge

23 the culture is to share knowledge conversationally or through hands on learning

24 there is a lack of contact time between knowledge sources and recipients

25 I don't like sharing my knowledge because it can be misused or credit is taken by the recipient.

26 Any Additional thoughts on this Section

Section: Your thoughts on the companies approach to knowledge:

27 there is limited storage space to share, reflect and create knowledge

28 there is no reward / recognition for the creation or maintenance of knowledge

29 the corporate culture does not promote a culture for sharing knowledge

30 the physical work environment and layout of work areas restrict effective sharing practices.

31 Any Additional thoughts on this Section

Section: Your thoughts on the knowledge technology available to you:

32 there is a lack of integration between the applications / tools which impedes how I manage knowledge

33 there is reluctance to use IT systems due to lack of familiarity and experience with them;

34 there is a lack of training on new IT systems and processes

35 there is a lack of communication and demonstration when new application / tools are introduced

36 Any Additional thoughts on this Section

Section: Knowledge I create is:

37 just required by me so I keep it to myself

38 typically documented and "published" to my team

39 Rank where you typically publish your knowledge (1 most common to 7 least common or never use)

JIRA

WIKI

Sharepoint

Dept. / Team network file share

IT Blog

E-mail (for business / team matters)

Internet (for business / team matters)

Other (please specify and indicate frequency of use)

40 just written once and typically not updated again by me or others

41 used frequently

42 more likely to be: (Rank the the type of knowledge you typically create (1 most common to 5 least common or never use)

Project related

Administration related

Operations related

Incident related