A Framework for Knowledge Management in European Regional Development Funds Audit

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I certify that this dissertation which I now submit for examination for the award of MSc in Computing (Knowledge Management), is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the test of my work.

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ABSTRACT

Leveraging organisational knowledge is a key aim of knowledge management (KM). For many decades, organisations have tried to avoid reinventing the wheel and repeating mistakes through formal KM processes that embed learning into organisational systems. Although current literature suggest that different KM approaches have been successfully applied in many organisations with a number of best practices evolving over time, many organisations fail to demonstrate the application of these best practices in reality.

This research investigates the knowledge sharing practices in an audit unit within a public sector organisation. It considers the knowledge sharing peculiarities of the public sector and highlights the enablers and barriers to effective KM in this type of group with particular focus on how the purposeful introduction of a formal KM tool could affect knowledge sharing in the European Regional Development Fund (ERDF) Audit Authority in Ireland. Rather than identify the best-fit KM approach for ERDF audit, this research will examine existing KM applications with the aim of highlighting their suitability for ERDF audit. Ontologies defining the audit vocabulary that will be used in the KM system will be developed and surveys and interviews with staff in the audit unit will be carried out. The findings will present a framework for the best-fit KM application for capturing and sharing the knowledge arising from ERDF audits and an appropriate KM tool will be proposed and deployed based on the framework developed. The use of this tool will be monitored to identify some of the benefits and drawbacks associated with its application to ERDF audit as well as those factors that may be responsible.

This framework is intended to be the starting point for development of KM tools for other audit units and the basis for future research in this area.

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1 INTRODUCTION

1.1 Background

Knowledge Management (KM) is an ageless and broad topic that serves a very important role in every organisation. It helps an organisation to efficiently manage its resources by increasing collaboration and facilitating knowledge creation and sharing. It is widely acknowledged in academia that efficient management of knowledge is necessary for maximising survival potentials of an organisation (Nunes *et al.*, 2006). The creation and application of new knowledge is essential to the survival of almost all businesses (Gurteen, 1999).

Every organisation is a treasure house of knowledge. Besides using knowledge directly in the course of day-to-day work, individuals are constantly interacting and sharing knowledge, with themselves. However, there is no real advantage until the organisation becomes aware of this knowledge and is able to manage it. The ability to locate and make knowledge visible, as well as ensuring that the knowledge stays within the organisation is what translates to an advantage. KM empowers an organisation to keep track of the knowledge and experiences of its individuals and systems in order to create a basis for organisational memory and thereby improve its performance and responsiveness to future occurrences of similar experiences.

The background setting of this research is in the area of the audit of ERDF co-funded operations in Ireland. The audit is carried out by the ERDF Audit Unit within the Department of Public Expenditure and Reform (DPER). The initial findings suggest that knowledge sharing and collaboration already exists in largely informal and unstructured forms within the Unit. However, an intentional and systematic KM process is considered to be more appropriate since auditing is largely based on heuristics and judgement. Even though no two audits are exactly the same, knowledge created in one audit may be applied to similar situations in another audit to ease the learning curve for acquiring knowledge in a new knowledge area.

In addition to improving the quality and efficiency of audits, KM will enable the Unit to create an environment that supports knowledge sharing and empower the Unit to know what it knows. It will ensure that knowledge does not leave with the exit of individuals from the unit.

1.2 Project Description

Many research projects have been conducted in the area of KM in general, however, this research will address the requirements and structural plans that must be in place in order to effectively implement a KM system particularly in an audit organisation. It will investigate the variety of KM approaches that have been successfully implemented by other organisations in addition to an in-depth review of literature in the area.

The audit organisation that has been selected for review in this research is the ERDF Audit Unit in the DPER. The Department is a particularly upcoming knowledge-driven organisation with highly experienced employees. The Department was set up in July 2011 to focus on the functions of the reform of public expenditure which was previously the remit of the Department of Finance. This was done in response to the post-Celtic tiger effects on the economy of Ireland. Seven years ago, the public sector embarked on a benchmarking policy with the private sector, in order to attract the best skills in the labour market.

The implication of this for the public sector in Ireland has been a rich workforce with a high level of knowledge and skill in diverse areas of expertise. This is particularly so in the ERDF Audit Unit where all the auditors and controllers are professionals. A larger portion of the work done in the Audit Unit is based on individual judgement of the auditor. It is therefore imperative for this knowledge to be made visible and available for reuse when similar situations are encountered.

The overall goals and strategies of the unit will be highlighted in the earlier phases of the project and these will directly influence the factors that will be considered as critical in developing the framework. Also as part of the initial phases of this research, a general overview of the KM systems currently in use in the Irish Public Sector will be conducted. The major KM enablers in the Public Sector will also be identified. Initial findings regarding the knowledge sharing practices in the ERDF Audit Unit highlight the use of emails and file shares as the main means of collaboration. This suggests that there could be many versions of a single document stored in different locations. A consequence of this research may include the introduction of a version control facility that will minimise duplication of documents and eliminate contradictory information.

Interviews and surveys will also be conducted in addition to knowledge elicitation in order to establish the current state of knowledge sharing and collaboration in the unit. This will result in the creation of a knowledge base for the ERDF Audit Unit.

The resulting framework, the analysis of surveys and interviews conducted on the individual auditors and controllers in the unit and the knowledge base created will be used as a starting point for the development of the KM system.

1.3 Project Aim and Objectives

The aim of this research is to develop a framework for a suitable KM system that will facilitate knowledge sharing within an Audit Unit in Civil Service Government Department. It will apply the insight derived from the following, to determine the particular set of rules which may be applied in any public sector audit organisation for the introduction of KM.

- A review of the current literature in the area of KM and KM frameworks
- A review of literature in the area of KM in Public Sector organisations
- A review of the factors affecting KM in organisations
- A knowledge audit of the Unit
- Interviews for establishing the tacit knowledge arising from the audit experience of the individuals in the unit

The framework will then be used as a basis for selecting KM tool for the audit unit, the use of which is anticipated will successfully highlight the strengths and weaknesses of the framework developed.

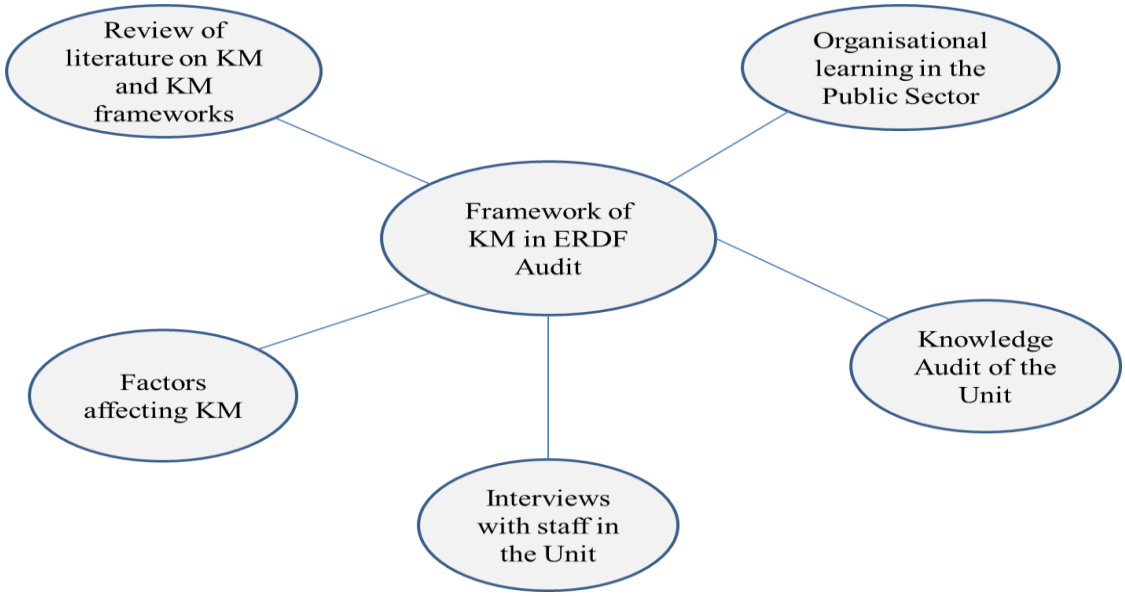


Figure 1.1: Project Aim

1.4 Research Methods

In order to arrive at a robust and relevant framework for KM in ERDF audit, a number of research methods will be applied to the design, implementation and evaluation of this research project.

1.4.1 Design and Implementation Approach

There will be an initial critical review of KM literature in the context of knowledge sharing. This will involve a detailed review of journal publications and other related literature in this area of KM. A comparative analysis of the different schools of thought will establish the applicable approach for this project. This review may reveal approaches that may be useful for identifying the KM system that could potentially be adapted for the purpose of this research project.

In addition, this research will analyse the key KM enablers and critical success factors for KM as it applies to Public Sector organisations. A knowledge audit will be carried out and the individuals in the ERDF Audit Unit will be encouraged to develop new thoughts and ideas through formal and informal discussion sessions in small groups.

A framework will then be developed based on the outcome of the above research approaches and the process for testing the findings using a KM application will be initiated. Knowledge elicitation techniques such as the three card trick will be used to elicit knowledge from the individual auditors in order to build an initial knowledge library for the KM system and to establish the hared vocabulary in the Unit. Existing explicit knowledge available in documents and reports will be organised and also included in the initial knowledge base. It is planned that the KM system will evolve over time as the need to adapt it to suit changes in the ERDF audit processes arises.

A key consideration in the implementation approach for this research is the need to obtain results that can be tested at an early stage. For this purpose, the system will be implemented in phases so that the results from evaluation of one phase will be considered during the implementation of the next phase. A typical ERDF audit is divided into ten definitive areas. It is planned that the initial implementation will focus on only one of the ten sections. This will ensure that some results can be collected quickly, learnt from and then applied to the subsequent areas.

1.4.2 Evaluation

In order to assess the strengths and weaknesses of the proposed framework, the selected audit process will be modelled on a KM application with the explicit knowledge gathered through this research project. The individuals in the ERDF Audit Unit will be encouraged to use the system for a period, after which a brainstorming session will be organised in order to obtain their initial reactions. These will be documented, analysed and the results contextualised in terms of the findings from similar researches that exist in the wider KM body of research.

2 KNOWLEDGE MANAGEMENT

2.1 Introduction

Before delving into the framework for KM in the ERDF Audit Unit, it is important to set the scene a little. This chapter begins with an explanation of the fundamental KM concepts of data, information, knowledge and wisdom, discussing the relationship between them and highlighting their differences. Types of knowledge as well as the conversion of knowledge from one type to another are also discussed in line with the spiral of knowledge suggested by Nonaka (1994).

Later on in this chapter, is a discussion centring on the people, process and technology elements of KM. This is followed by an analysis of the different approaches to defining KM with a view to identifying the definition as well as the strategy that contextualise the subject matter of this research in relation to the wider domain of KM.

This chapter also analyses some KM strategies and concludes with a review of KM applications.

2.2 Fundamental Concepts: Data, Information, Knowledge and Wisdom

The terms data, information and knowledge are sometimes used interchangeably (Stenmark, 2001) and have led to much debate in organisation theory and KM literature. The different research approaches to the definition of knowledge has led to the use of its distinction from data and information (Alavi and Leidner, 2001) as an acceptable way of explaining it. This approach has become a common feature in KM literature and has helped to distinguish between the concepts and also explain the relationship between them. Davenport and Prusak (1998) make the point that even though knowledge is related to data and information, it is quite different from both; but the differences are a matter of degree. Data is generally referred to as raw facts and numbers, information is processed or interpreted data and knowledge is information that has been personalised (Alavi and Leidner, 2001).

It is generally accepted that data, information and knowledge exist on a continuum which is referred to as the knowledge pyramid, knowledge hierarchy or the knowledge spectrum. The hierarchy suggests that knowledge is derived from information and information in turn is

derived from data. Kebede (2010) suggests that the knowledge hierarchy is a widely accepted conceptualization of data, information and knowledge and that it reveals the relationships of these foundational concepts. This continuum is traditionally depicted in a pyramid popularly called the Data, Information, Knowledge Wisdom hierarchy or pyramid (DIKW hierarchy/pyramid) as shown below.

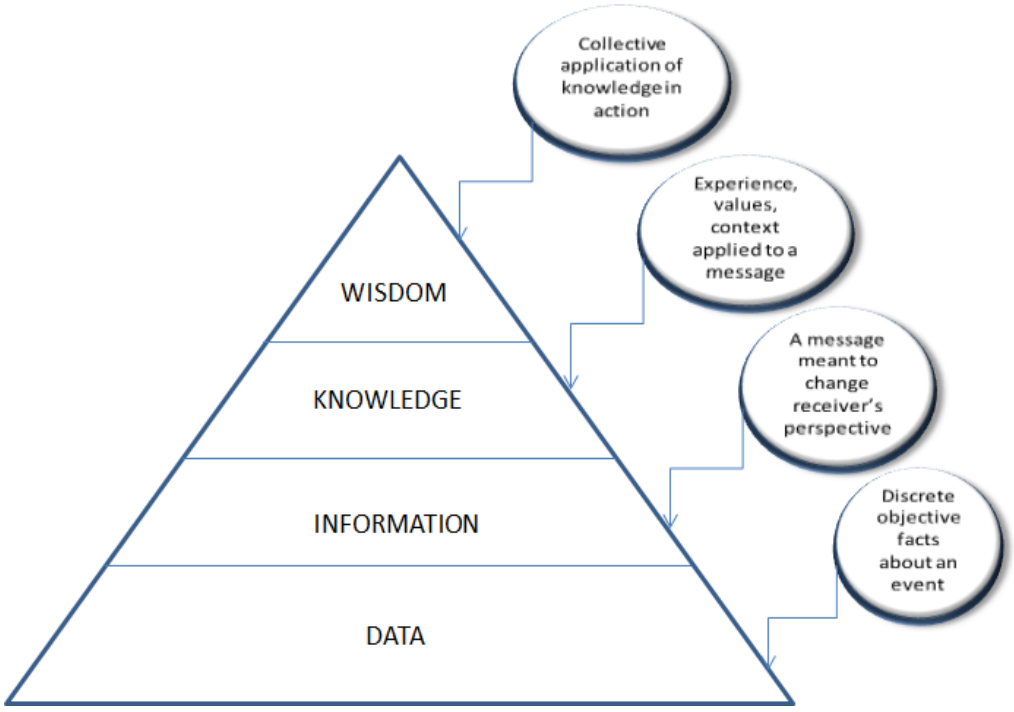


Figure 2.1: Data Hierarchy

There have been arguments that the hierarchy is unsound and methodologically undesirable (Frické, 2009). In addition, critics have suggested that the conventional view of the DIKW requires rethinking especially if a working support for KM and organisational memory must be developed (Tuomi, 2000). However, despite the varying perspectives of different researchers, the underlying definitions and relationships of these concepts still remain intact with the general presumption that data, information and knowledge are in a hierarchy with varying dimensions in context, usefulness or interpretability (Alavi and Leidner, 2001).

Gurteen (1999) uses the metaphor of a cake to describe data, information and knowledge. He refers to an analysis of the molecular constituents of the cake as data which has no meaning when considered by itself, so much so that a reader of the list may not even be able to tell that they are the constituent molecules of a cake. Also, according to Davenport and Prusak (1998) data is a set of discrete, objective facts about events. Although it has no inherent meaning, it is the building block from which information can be derived.

Information is described as a message which has a sender and a receiver; it is data that makes a difference (Davenport and Prusak, 1998). With the cake metaphor by Gurteen (1999), a list of the ingredients for baking the cake constitutes information which is more useful. He explains that the data has been given context at this stage and an experienced cook may be able to bake the cake. Information makes sense because the data will have been put in context and will be able to provide insight that affects decision making.

Davenport and Prusak (1998) explain that data can be transformed to information in the following five ways;

- **Contextualising**: To know for what purpose the data was gathered
- **Categorising**: To know the units of analysis or key components of the data
- **Calculating**: To analyse the data mathematically or statistically
- **Correcting**: To remove errors from the data
- **Condensing**: To make the data available in a more concise, user friendly form

Although knowledge can be considered as a form of rich information, Gurteen (1999) considers knowledge to be more about the know-how and know-why. He uses the cake metaphor to suggest that the recipe is written knowledge that contains relevant actionable information that tells the reader how to make a cake. The fact that this knowledge is actionable is what makes it more valuable to an organisation in comparison to data or information (Davenport and Prusak 1998). Knowledge contains judgment and has the capability to judge new situations in light of what is already known and also refine itself in response to new situations and information. They define working knowledge as "a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information". They further suggest that knowledge is broader, deeper and richer than information and that information becomes knowledge through the following four processes;

- **Comparison**: How does information about this situation compare to other situations?
- **Consequences**: What implications does the information have for decisions and actions?
- **Connections**: How does this bit of knowledge relate to others?
- **Conversation**: What do other people think about this information?

The table below summarises some of the differences between data, information and knowledge.

DATA	INFORMATION	KNOWLEDGE
Raw facts	Processed data	Personalised information
Raw numbers	Interpreted data	Contextualised information
Discrete facts	Has a sender and a receiver	Interpreted and rich information
Building block for information	Data that makes a difference	

Table 2.1: Differences between Data, Information and Knowledge

2.3 Types of Knowledge: Tacit and Explicit Knowledge

There are different classifications of knowledge that are identifiable in KM literature. These include tacit knowledge, explicit knowledge, declarative knowledge, procedural knowledge, casual knowledge, general knowledge, specific knowledge, conditional knowledge and relational knowledge. While these classifications are useful for KM the focus for this research is the well-known classification of knowledge by Nonaka (1994), an organisational theorist and one of the earliest to develop the knowledge creation theory. In his research, he identified two broad categories of knowledge; explicit or documented knowledge and tacit or subjective knowledge.

According to Henezel (2000), knowledge is constantly being created by employees as they do their jobs but while some of this knowledge can be articulated, captured, stored and accessed for re-use, the vast majority in most cases is tacit and remains unarticulated until the need for re-use arises.

Tacit knowledge is highly personal knowledge embedded in the minds of individuals, entrained in practice and action based. It is therefore not easy to describe or codify but is considered to be the fundamental backbone of organisational knowledge. Explicit knowledge on the other hand, is more systematic and formal. It can be easily communicated and shared, in product specifications or a scientific formula or a computer program (Nonaka & Takeuchi,

1996). The modes of knowledge creation (Nonaka, 1994), popularly referred to as the SECI model as shown in Figure 2.2, describes the conversion of knowledge from one form to another and has become a paradigm in the field of KM.

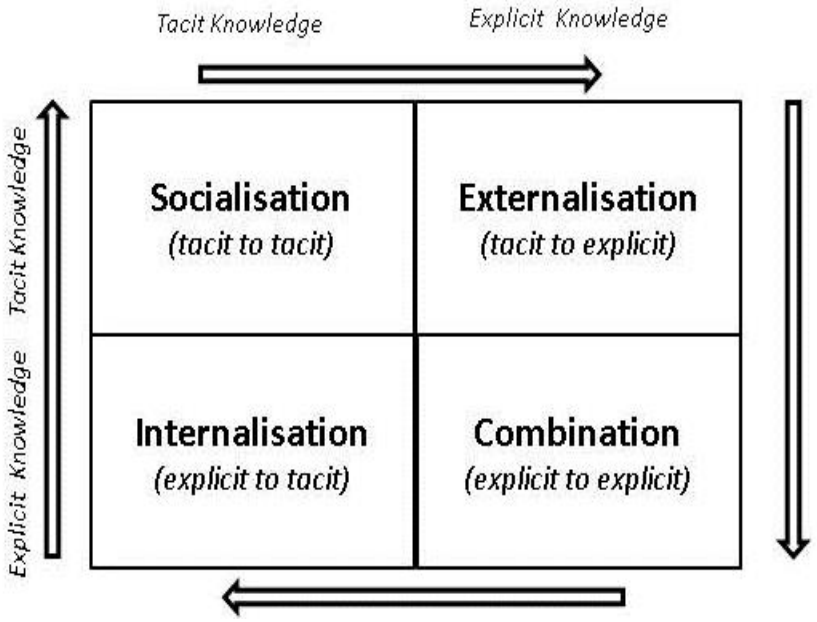


Figure 2.2: Modes of Knowledge Creation

The SECI model describes how an organisation creates knowledge through the interaction between tacit knowledge and explicit knowledge, a process referred to as 'knowledge conversion', Nonaka, *et al.* (2000). Table 2.2 describes the four stages of knowledge conversion suggested by Nonaka, *et.al.* (2000).

KNOWLEDGE CONVERSION	DESCRIPTION
Socialisation	This is the conversion of one form of tacit knowledge to another form of tacit knowledge. This is usually achieved through shared individual experiences from spending time together and discussions at both formal and informal meetings. Nonaka et al. (2000) suggest that socialisation 'typically occurs in a traditional apprenticeship, where apprentices learn the tacit knowledge needed in their craft through hands-on experience, rather than from written manuals or textbooks'.

KNOWLEDGE CONVERSION	DESCRIPTION
Externalisation	This is the process of converting one or more forms of explicit knowledge to another form of explicit knowledge. Nonaka and his colleagues distinguish between two combination processes; Firstly, knowledge synthesis which is the combination of different sources of knowledge into context and secondly, breakdown which involves the breaking down a concept into smaller identifiable units.
Combination	This is the process of converting one or more forms of explicit knowledge to another form of explicit knowledge. Nonaka and his colleagues distinguish between two combination processes; Firstly, knowledge synthesis which is the combination of different sources of knowledge into context and secondly, breakdown which involves the breaking down a concept into smaller identifiable units.
Internalisation	This is the conversion from explicit knowledge to tacit knowledge. It involves the study or review of codified knowledge (for example procedures) and gaining an understanding which the individual is then able to apply to their work. According to Nonaka et al. (2000), 'When knowledge is internalised to become part of individuals' tacit knowledge bases in the form of shared mental models or technical know-how, it becomes a valuable asset.'

Table 2.2: Knowledge Conversion

Nonaka (1994) further explains that the process of knowledge creation in organisations can be viewed as an upward spiral process starting at the individual level, moving up to the collective (group) level and then to the organisational level.

2.4 People, Process and Technology

It is widely accepted that KM comprises people, processes and technology, as shown in Figure 2.3. Even though different researchers may not agree on the relative level of influence that each of these components has on the effectiveness of KM, there is a general consensus that successful KM involves all the three components.

Whereas Zack (1999a) views information technology infrastructure as a necessity for providing a seamless pipeline for the flow of knowledge in an organisation, Hylton (2002) contends that KM is more about people, using technology to enable more efficient processes so that they are better able to capture, store, retrieve, use, re-use and share knowledge for the general benefit of the organisation. In addition, while Alavi and Leidner (2001) are of the view that technology is an important enabler of KM, Davenport and Prusak (1998) admonish against an emphasis on technology at the expense of the social and cultural facets of KM. Regardless of the view taken about the relative importance of people, process or technology as a separate component of KM, it must be acknowledged that a KM initiative needs to take cognisance of each of these components in relation to the particular situation of the organisation being considered.

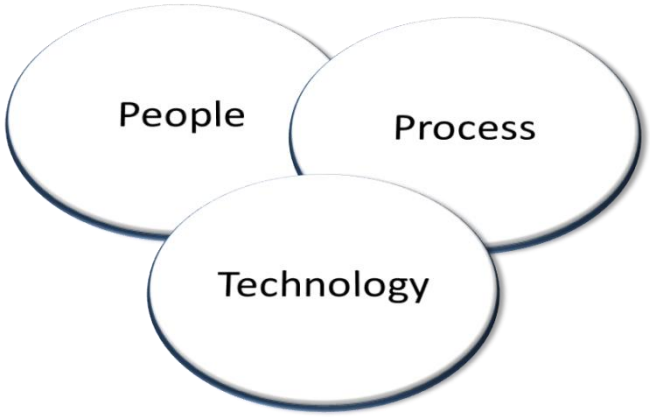


Figure 2.3: Knowledge Management Components

2.5 Defining Knowledge Management

Even though many KM and related literature have provided a wide variety of definitions of KM and the processes that it involves, the underlying concepts are similar. It is widely accepted that KM is the way an organization can leverage the knowledge of its individuals and external contacts for its benefit. Nonaka (1994) emphasises the importance of KM, stating that successful companies are those that consistently create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products'. KM processes are considered to be significant predictors for organisational creativity (Choi and Lee, 2003).

However, as valuable as knowledge is, it is of little benefit to the organisation if it is not accessible to the right people at the right time. Alavi and Leidner (2001) explain that due to

the personalised nature of knowledge, it can only be useful for others when it is expressed and communicated in a way that makes it interpretable by the receivers. The main reason for KM initiatives is to ensure that knowledge, both internal and external, is leveraged for the benefit of the organisation (Ambrosini and Bowman, 2001). KM involves the process of integrating practices aimed at the identification, sharing and creation of knowledge within an organisation in order to efficiently manage its knowledge resources. Alavi and Leidner (2001) describe KM as the support of the creation, transfer and application of organisational knowledge.

Whereas Wiig (1997) gives a working definition of KM, stating its objectives (to make and enterprise act as intelligently as possible and to realise the best value of its knowledge assets), Gurteen (1999) considers KM as a business philosophy. He defines KM as "*an emerging set of principles, processes, organisational structures, and technology applications that help people share and leverage their knowledge to meet their business objectives.*"

However, regardless of the view taken in relation to the definition of KM, it is essential that organisations manage knowledge in a manner that is suitable for its particular circumstances due to the strategic importance of knowledge.

2.6 Knowledge Management Strategies

According to Zack (1999a), managers are unable to articulate the link between knowledge and strategy, even though they intuitively know that there are strategic advantages in knowledge as an organisational asset. They sometimes perceive KM initiatives as information system projects. This view is also shared by Hansen *et al.* (1999) after a study of KM practices in several industries. It was concluded that executives lacked successful models that could guide them in their pursuit of KM.

However, while the foregoing applied in the 'early days' of KM as a conscious practice, current studies of KM practices in organisations have revealed relative successful models. Many researchers have identified different KM strategies that have been successfully applied in organisations and some of these are shown in Figure 2.4 and discussed in turn below.

Figure 2.4: Knowledge Management Strategies

2.6.1 Codification Strategy and Personalisation Strategy

Hansen *et al.* (1999) identifies the codification and personalisation strategies, based on the type of knowledge to be managed (whether tacit or explicit) and the role that IT plays in the management of such knowledge. The codification strategy is centred on the use of the computer to codify and store knowledge in databases, where it can be easily accessed and used. It is based on the assumption that an organisation's key knowledge can easily be codified and stored on a system. From the perspective of knowledge conversion (Nonaka *et al.*, 2000), this strategy reflects the combination process whereby one form of explicit knowledge is converted to another form of explicit knowledge. It could however reflect, to a smaller extent, the externalisation process whereby knowledge that exists in the minds of individuals, tacit knowledge, can be converted to explicit knowledge. The organisation may successfully employ knowledge elicitation techniques such as the three card trick to capture the tacit knowledge of its staff for the purpose of codification and storage.

The personalisation strategy on the other hand, would be applicable to an organisation in which the knowledge mainly resides in the minds of its individuals and as such cannot be easily translated into systems. The computer and other IT systems are used to help individuals to communicate knowledge rather than to store it. This KM strategy attempts to facilitate direct knowledge transfers between individuals, without the need to codify knowledge and it reflects the 'socialisation' process described by Nonaka *et al.*(2000) where one form of tacit knowledge is converted to another form of tacit knowledge. The

personalisation approach in effect, is a KM approach in which the tacit knowledge of one individual is converted to tacit knowledge in another individual.

2.6.2 Exploratory Strategy and Exploitation Strategy

Apart from the codification and personalisation KM strategies, Zack (1999a) identifies the exploration and exploitation KM strategies. These two strategies are based on the gap between the actual and the desired (or ideal) knowledge resources or capabilities of an organisation at a given point in time. Karadsheh *et al.* (2009) sees KM as a fast response to an organisation's weaknesses and threats when viewed from the perspective of a strengths-weaknesses-opportunities-threats (SWOT) analysis. Both the exploration and exploitation strategies focus on the actions that an organisation needs to take in order to preserve or sustain its strengths, offset its weaknesses, mitigate threats and capitalise on opportunities.

An exploratory strategy is applicable when the organisation needs to step up its level of knowledge resources and capabilities in order to close the knowledge gap between its current position and the ideal position. This implies that the organisation needs to become a creator or an acquirer of the knowledge required in order to, at least, become competitive in its strategic position.

The position referred to could be the organisation's position in relation to the execution of its strategy or its position relative to those of its competitors or it could simply be the requirement for the organisation to keep pace with rapid changes in knowledge in the industry.

An exploitation strategy on the other hand, is required where an organisation is in a position to exploit its knowledge platform, because its knowledge resources and capabilities exceed what it requires for occupying a competitive position.

2.6.3 Provincial Strategy and Cosmopolitan Strategy

Zack (1999a) also identifies another orientation of knowledge strategy in line with the organisation's primary sources of knowledge. The two strategies depend on whether knowledge resides within or outside the organisation. Sources of internal knowledge include organisational documents, procedures, repositories and also in the minds of the organisation's individuals. External knowledge on the other hand may be in the form of publications, professional associations, consultants and vendors. According to this orientation, *'provincial'* firms tend to acquire most of their knowledge internally while *'cosmopolitan'* firms acquire

most of their knowledge externally. The argument is that although internal knowledge is very valuable due to its uniqueness and specificity, external knowledge is also important as it can stimulate fresh thinking and provide a context for benchmarking the organisation's internal knowledge. An organisation's KM strategy must be able to integrate both its internal and external knowledge to create new insights.

2.7 Classification of Knowledge Management Applications

Depending on the KM objective to be addressed, Zack (1999b) suggests two broad classes of KM applications; *integrative* and *interactive.* Both classes differ in their primary focus and the role that the KM application plays as shown in Table 2.3.

Integrative Knowledge Management Applications	**Interactive Knowledge Management Applications**
Focus on repository: sequential flow of explicit knowledge to and fro	Focus on knowledge producer – consumer interactions
Explicit knowledge	Tacit knowledge
Repository is the primary medium for knowledge exchange	Repository is merely a by-product of interactions
Varying extent of producers and consumers membership of the same community	Dynamic and emergent contents
Electronic publishing: different knowledge communities and repository contents are stable with little or no modification e.g. where an organisation publishes its policies	Distributed learning: interaction between expert and novice
Integrated knowledge bases: the same knowledge communities where users refine and build on their collective knowledge e.g. a best practice database	Forums: interaction between individuals with common tasks – more emergent and ad hoc

Table 2.3: Classification of Knowledge Management Applications

2.7.1 Integrative Knowledge Management Applications

With integrative applications, the knowledge repository, together with the explicit knowledge it contains is the main focus. There is less emphasis on the individual users of the repository and their tacit knowledge. The individual users may be knowledge producers or knowledge consumers and do not necessary have to belong to the same knowledge community. 'Electronic publishing' is the term used by Zack (1999b) to describe the situation where the consumers and the producers do not belong to the same practice community. The repository involved tends to be stable, requiring little update even where the facilities for updating the repository exists. It is generally the case that the knowledge consumers accept what the knowledge producers have documented. 'Integrated knowledge bases' is used to describe the situation where the knowledge producers and consumers belong to the same practice community and individuals use the repository as a means of integrating and building on their collective knowledge.

The organisational roles identified for the integrative class of KM applications include knowledge creators and knowledge collectors for the acquisition of the contents of the repository, interviewers to capture verbal knowledge and reporters to document observed experiences. In addition, editors, integrators and analysts will be required to refine the knowledge before it is stored in the repository.

2.7.2 Interactive Knowledge Management Applications

Interactive applications on the other hand place more emphasis on supporting the interaction among people who hold tacit knowledge. The knowledge repository used in interactive applications is merely a by-product of the interactions between individuals and its contents are dynamic and emergent. Zack (1999b) describes a situation where the interaction is between an expert and a novice and is structured around a discrete subject as a 'distributed learning' application. On the other hand, 'forums' are used to refer to the more emergent interactions among individuals that perform common tasks. These forums usually support on-going collaborative discussions where individuals are continually responding to and building on each individual's contributions to the discussion. Interactive applications may lead to the emergence of a knowledge repository which affords the reapplication of knowledge across the organisation.

In order to manage interactive applications, an organisation will require the commitment of the communicators in recruiting and encouraging membership of and participation in the

discussions. In addition, the contents of the resulting repository need to be structured and also checked for quality by subject matter experts.

2.8 Conclusion

Although this research does not aim to produce a new definition of KM, the explanations given by Alavi and Leidner (2001) and Gurteen (1999) and Davenport and Prusak (1998) have supported the contextual view of knowledge for the purpose of this research. KM is viewed as a personalised combination of information and insight and it forms the bedrock of an individual's inference from reasoning, reflection and choice of action in any given situation.

In addition, KM in summary deals with making knowledge visible, accessible, useable and applicable as and when required for the benefit of the organisation as a whole. Beginning with their discussions on data, information and knowledge and also following the concepts of tacit and explicit knowledge suggested by Nonaka (1994), these authors have provided clarity in setting the context for the KM framework, which is the subject matter of this research.

The knowledge audit that will be carried out as part of this research will apply the insights derived from the different KM strategies and the classification of KM applications discussed in this chapter. The foregoing discussions and analyses in this chapter will be useful in arriving at the appropriate class of KM application that will be proposed for the ERDF Audit Unit.

Finally, in order to ensure that the KM approach selected for the ERDF Audit Unit is compatible with its overall goals and strategies, all the elements of KM discussed in this chapter will be considered in conjunction with the insights from review of different approaches in existing literature relating to the provision of a framework for Km.

3 KNOWLEDGE MANAGEMENT FRAMEWORK

3.1 Introduction

The need for a KM process becomes obvious once an organisation comes to recognise that knowledge is a major factor in its survival and its competitiveness. However, because every organisation has its own environment, situations and circumstances, there is no general-purpose, one-size-fits-all KM initiative that can be simply introduced. Some thought needs to go into the implementation approach that is particularly applicable to the organisation's circumstances.

This chapter examines some KM framework approaches outlined by different researchers and also discusses the benefits of a KM framework. The chapter concludes by analysing the factors that contribute to the success of a KM initiative from the perspective of whether they are KM enablers or KM barriers. These factors are identified as being people or process or technology related.

3.2 Knowledge Management Framework Approaches

According to Robertson (2002), an organisation does not just require a KM project; it needs a framework that builds an approach to KM that is specifically tailored to its environment, processes and goals. Rather than embark on a haphazard exercise, the implementation of a KM initiative and any type of initiative for that matter, will benefit from an organised and structured approach. A KM framework provides guidelines for executing KM successfully and also helps the organisation to avoid inaccuracies, thereby saving time and effort (Karadsheh *et al.*, 2009). Although there are different KM approaches suggested in research literature, some of which are shown in Table 3.1, the common theme identified is that a KM framework is typically partitioned into a set of constructs.

Alavi and Leidner (2001) described and elaborated on a KM framework that is based on the view of organisations as knowledge systems. It does not present KM as a discrete, independent phenomenon, but rather as consisting of dynamic and continuous processes. This approach suggests that a KM framework is organised into the four distinct socially enacted knowledge constructs: knowledge creation, knowledge storage and retrieval, knowledge transfer and knowledge application.

Alavi and Leidner	Davenport and Prusak	Bouthillier and Shearer	Stollberg *et al.*
Creation	Codification	Discovery	Identification
Storage & Retrieval	Mapping	Acquisition	Acquisition
Transfer	Transfer	Creation	Preparation
Application	Roles an skills	Storage & Organisation	Allocation
		Sharing	Dissemination
		Use and application	Usage
			Maintenance

Table 3.1: Knowledge Management Framework Approaches

Similarly, Davenport and Prusak (1998) suggest that a KM framework consists of knowledge codification, knowledge maps and knowledge transfer. These are identified as critical for successful KM in any organisation. However, information technology as well as knowledge roles and skills are also highlighted as important and inseparable enablers of KM.

Another KM framework is identified by Bouthillier and Shearer (2002), based on their exploratory study of KM practices in a variety of organisations both in the public and private sectors. It involves knowledge discovery, acquisition, creation, storage and organisation, sharing, use and application.

Stollberg *et al.* (2004) also suggest a KM framework which emphasises the enabling technologies and functional design of a KM system. The framework consists of knowledge identification, acquisition, preparation, allocation, dissemination, usage and maintenance.

Other researchers have also suggested KM frameworks that combine the processes and constructs from the frameworks described above. For example, the research conducted by Peachey *et al.* (2005) consolidates the frameworks suggested by Alavi and Leidner (2001) and Davenport and Prusak (1998). Their research suggests a five-process framework that includes knowledge creation, knowledge storage and retrieval, knowledge transfer, knowledge application and knowledge roles and skills. Similarly, the KM framework suggested by Parkh (2001) consists of knowledge acquisition, organisation, dissemination

and application, which are all present in the framework suggested by Bouthillier and Shearer (2002) and that of Stollberg *et al.* (2004).

The different processes that make up the KM frameworks considered are shown in Figure 3.1. Gupta and McDaniel (2002) note that even though the framework is presented in a linear fashion, one phase of the framework may require input from other phases and the methodologies subsumed in each phase are presented as discrete activities unique to that step in the process, but in reality often overlap considerably. Notwithstanding this, the different phases in a typical KM framework are analysed below.

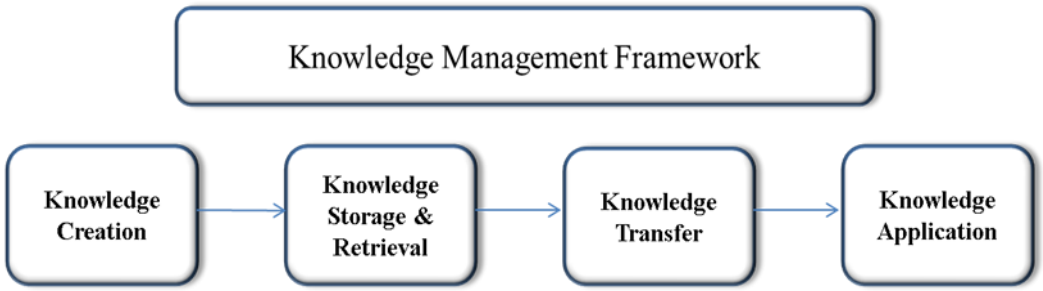


Figure 3.1: Typical Knowledge Management Framework

3.2.1 Knowledge Creation

This phase uses social and collaborative processes to create, share, and amplify knowledge in an organisation (Alavi and Leidner, 2001). This is done in an attempt to make knowledge as organised, explicit, portable, and as easy to understand as possible (Davenport and Prusak, 1998). Knowledge creation focuses on describing the different methods of generating new knowledge from the organization and from outside (Peachey *et* al., 2005).

In order to achieve this, the internal knowledge within an organisation must first of all be discovered, especially where the organisation is large or geographically dispersed and external knowledge brought into the organisation (Bouthillier and Shearer, 2002).

On one hand, knowledge creation is viewed as the process of adding value to information by analysing it in order to create new knowledge (Bouthillier and Shearer, 2002). On the other hand, as described in Section 2.3, knowledge creation is viewed as a continuous process of knowledge conversion between the tacit and explicit dimensions in the socialisation, externalisation, combination and internalisation modes of knowledge creation identified by Nonaka (1994). Although they are presented as separate processes, Alavi and Leidner (2001)

argue that these knowledge creation modes are highly interdependent and intertwined and do not necessarily occur in isolation. For example, whereas the combination mode of knowledge creation refers to the conversion of knowledge from one explicit form to another, the argument is that there is need for two intermediate steps whereby an individual first of all draws insight from the explicit source of knowledge through the internalisation mode and then codes the new knowledge into an explicit form through the externalisation mode of knowledge creation.

As knowledge passes through the different processes, the organisation needs to ensure that its distinctive attributes are kept intact and that the knowledge is maintained in a form that is capable of changing easily to reflect the flexibility of the knowledge itself (Davenport and Prusak, 1998).

3.2.2 Knowledge Storage and Retrieval

In the KM framework described by Alavi and Leidner (2001), this phase is concerned with organisational memory, organisational culture, processes and procedures, organisational structure and information archives. It involves the use of tools such as query languages and database management systems to support organization memory as well as to speed up the individual's access to knowledge. The focus of this phase is on how to present information (Stollberg *et al.*, 2004).

As will be discussed in next chapter, the effective storage and retrieval is important if an organisation must keep track of its acquired knowledge. The use of bulletin boards, corporate intranets and general document management technology allows efficient storage and retrieval of organisational knowledge.

Davenport and Prusak (1998) suggests a knowledge map which typically points to people as well as to documents and databases where knowledge can be found. It involves locating important knowledge in the organization and then publishing some sort of list or picture that shows where to find it so that individuals know where to go when they need expertise. Technology plays a major role in this phase since large volumes of knowledge can be stored, processed and manipulated using a variety of technology tools.

Davenport and Prusak (1998) suggest the use of knowledge online yellow pages which allow users to search by topic or keyword for locating and comparing potential knowledge sources.

3.2.3 Knowledge Transfer

Knowledge transfer describes the relocating of knowledge between individuals, from individuals to explicit sources and between groups and organizations, (Peachey *et al.*, 2005). The transfer of knowledge can occur from one individual to another, from one group to another, from individuals to explicit sources, etc. both formally and informally (Alavi and Leidner 2001).

While most of the knowledge sharing in small and medium enterprises happen informally and are rarely supported by deliberate information and communication technology systems (Nunes *et al.*, 2006), the use of IT for knowledge transfer is particularly important in larger and less decentralised organisations. Zack (1999a) suggests that IT infrastructure should provide a seamless "pipeline" for the transfer of information in an organisation.

This phase is concerned with the provision of communication channels to support quicker access to knowledge sources. It recognises that knowledge transfer in organisations is driven by communication processes and information flows and therefore focuses on the particular channels that are appropriate for the organisation's circumstances. The communication channels could be informal, ranging from unscheduled meetings and coffee break conversations to more formal training sessions and the use of organisational repositories.

While, according to Alavi and Leidner (2001), the transfer of knowledge to locations where it can be accessed and used when needed is seen as an important process in KM. Bouthillier and Shearer (2002) contends that the focus of KM is not on the distribution or transfer of knowledge but on its sharing. The argument is that too much distribution can lead to overload which could paralyse action. However, Davenport and Prusak (1998) concluded that knowledge is transferred in organisations whether or not the process is managed although it tends to be local and fragmentary if not managed. Even though KM implies a formalised transfer of knowledge, an essential element of this is the development of specific strategies to encourage spontaneous and informal knowledge exchanges through personal conversations.

3.2.4 Knowledge Application

The usage and application of knowledge is an indication of a successful KM cycle (Bouthillier and Shearer, 2002) and an organisation can only begin to enjoy competitive advantage when it is able to turn its knowledge into effective action (Alavi and Leidner, 2001). The knowledge application phase describes the application of knowledge from different areas in the organisation to those activities that are core to its success. It involves the

integration knowledge into organizational practices by applying technology to guarantee its effectual usage (Peachey *et al.*, 2005). These may be in the form of workflow automation or the deployment of rule based expert systems.

Organisational culture and the extent to which reliance is placed on information technology play important roles in the success of knowledge application (Alavi and Leidner, 2001). In many cases, information technology provides support for knowledge application by embedding culture-bound procedures into the organisation's routines and allows for the application of knowledge across time and space, which is particularly useful to organisations that operate from more than one location.

Pfeffer and Sutton (2000) suggest that KM systems work best when the people who generate the knowledge, are the same people who store it, explain it to others, and coach them as they try to implement it. Although they argue that the systems must be managed by the people who are implementing what is known, not necessarily those who understand information technology, Davenport and Prusak (1998) highlight the importance of defined knowledge roles and skills as enablers of the process of knowledge application. Recognising that there are only a few organisations that have many workers who are skilled at framing and structuring their own knowledge and also have the time and inclination to feed this knowledge into a database, they suggest the introduction of dedicated roles with specific responsibility for extracting knowledge from associates and from other sources, putting this knowledge in a structured form and refining it over time.

There are four levels of roles that have been identified as relevant in the process of knowledge application in organisations;

- Line workers who manage knowledge within their own jobs
- KM workers
- Knowledge project managers
- Senior knowledge executives

With the increasing popularity of organisational social networks and the amount of organisational memory that is available through the use of information technology systems, organisations are better positioned to maximise the application of their knowledge if the four roles identified by Davenport and Prusak (1998) are embedded in the organisation hierarchy.

3.3 Benefits of a Knowledge Management Framework

Pfeffer and Sutton (2000) suggest that companies have wasted hundreds of millions on KM systems that did not achieve the desired objectives. Implementing a KM initiative from a framework that addresses the specific situation of an organisation has a higher potential for success and can also maximise the benefits of the organisation's effort (Karadsheh *et al.*, 2009). In addition to saving time and avoiding inaccuracies, Robertson (2002) identified the following benefits of applying a KM framework as summarised in Figure 3.2.

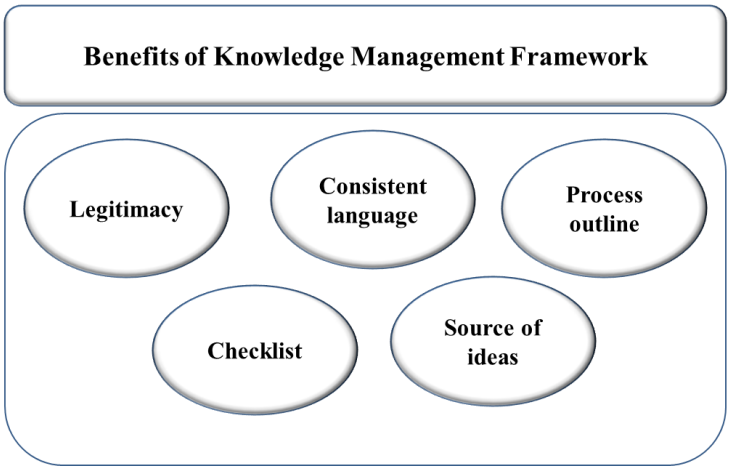


Figure 3.2: Benefits of a KM Framework

Legitimacy: a framework lends credibility to a KM initiative thereby giving it business recognition and providing a starting point for meaningful discussions with management.

Consistent Language: a framework helps to bring the KM project stakeholders such as management, end users and external consultants together. It eliminates confusion by defining a consistent set of KM terms and concepts.

Process Outline: a framework forms the basis for specific project management planning by offering high-level processes that will be followed for the KM project.

Checklist: since it addressed all the key aspects of the KM process, a framework is suitable for use as a checklist to provide assurance that the business goals will be met. It also helps to improve consistency, quality and repeatability of KM projects.

Source of Ideas: as part of the development of a framework, the viable practical processes and approaches are listed for consideration and there is always a lesson to be learnt from each of these approaches.

3.4 Factors Affecting Knowledge Management

The perfect situation would be to have a robust and effective KM system running well once the three components of KM – people, process and technology, are present. However, this is usually not the case in practice.

The provision of technology tools that support KM, the development of KM processes and indeed, the presence of knowledge workers in an organisation is not a guarantee that a KM initiative will be successful in that organisation. Pfeffer and Sutton (2000) found that the managers of KM systems know a lot about technology but little about how people actually use knowledge on the job. In some cases, the most valuable employees have the greatest disdain for KM and they find themselves badgered to enter what they know into the system, even though few people will ever use the information.

There is much discussion in KM literature about the reasons for varying levels success with KM initiatives in different organisations. It may in fact be difficult to conclude that there is any one organisation that has successfully derived the full potential benefits from its KM systems. There are many barriers that affect the success of KM systems and Riege (2005) identified three dozen which he analysed at the individual level (people), the organisational level (process) and at the technology level.

Figure 3.3 shows a few of these factors which are then discussed from the viewpoint of whether they are enablers or barriers.

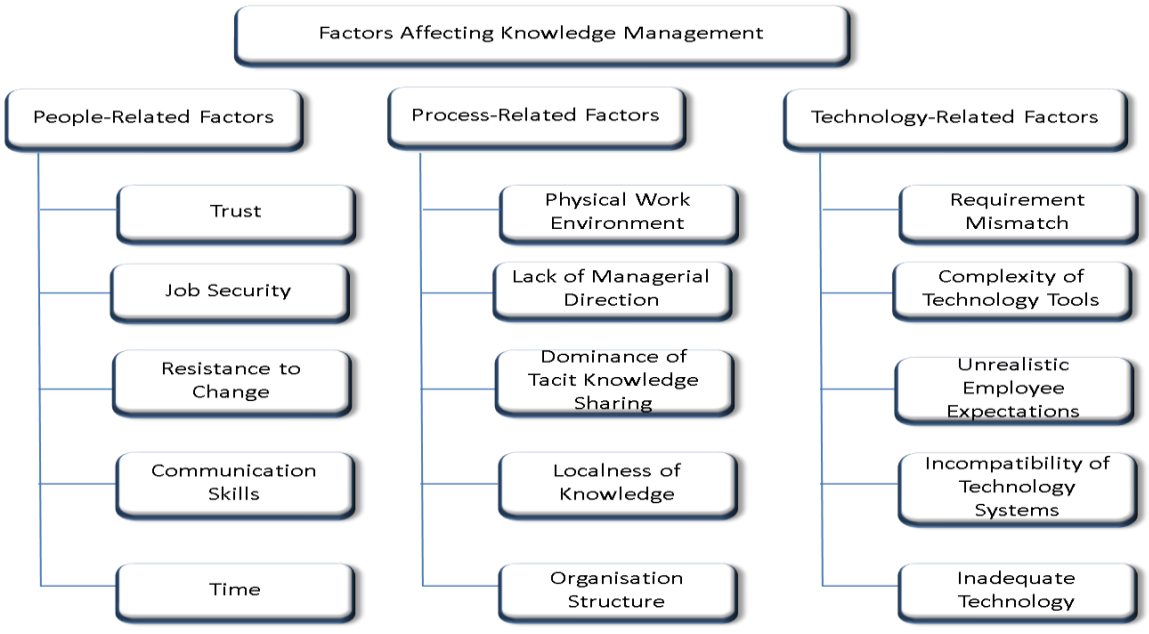


Figure 3.3: Factors Affecting Knowledge Management

These factors are not arranged in any particular order and also do not represent an exhaustive list. In addition, even though they are outlined separately, the reality is that these factors are intertwined and most organisations will experience a combination of these factors at any given time.

3.4.1 People-Related Factors

According to Milton (2011), there are three groups of people that need to be influenced, particularly in relation to addressing a culture change.

First are the 'advocates' who see the introduction of a KM initiative as a good idea and will be the early adopters. They should be recruited into the KM community, and enabled to speak on behalf of KM.

Next are the 'interested parties' who would like know more and understand where the initiative will deliver value. They may only join the KM community after getting more convinced following the first few KM successes.

Finally, there are 'sceptics' who will only believe that a KM initiative can be successful if it can be demonstrated that KM consistently delivers value. They may agree to follow established procedures and may join the KM community.

There are also 'cynics' who believe that KM will never work and may never buy into any KM initiative and Milton advises that this group of people can be ignored.

Some of the people-related factors that affect KM are described below.

Trust

According to Davenport and Prusak (1998), respecting and trusting the source of knowledge is an important factor in the success of a KM initiative. Both the individual giving the knowledge and the individual receiving the knowledge need to exhibit a considerable level of trust in order for knowledge sharing to take place and this only exists where there is visibility and ubiquity.

As the source or giver of knowledge, there has to be assurance that releasing the knowledge will not turn out to be a disadvantage at a future date. Most individuals, because of the limitations of human nature, have a strong knowledge-hoarding propensity (Tiwana, 2002). Individuals will only be willing to release their knowledge if they are assured that it is being received into trustworthy hands and that there is a good chance of reciprocity (Ghosh, 2004).

Likewise as the user or the receiver of knowledge, there has to be assurance that that the knowledge being received is of reliable quality. A lack of respect or trust for the source of the knowledge can affect the success of a KM initiative.

Job Security

One of the reasons identified by Stenmark (2001) for the failure of knowledge sharing processes is that individuals often fear that it means giving up valuable competitive advantage. Some employees tend to hold on to their ideas or concepts for fear of losing their intellectual property or indeed, their source of competitive advantage. According to Skyrme (2008), while sharing in some organisations is natural, the old dictum that "knowledge is power" reigns in others. It is not uncommon to find that employees will not be willing to share tacit knowledge except they believe that there is either nothing to lose or there is something to be benefited from it. This is especially so with lower level employees who may deliberately hoard their knowledge, out of fear of losing their chances of getting a promotion for appearing to be more knowledgeable than their counterparts (Riege, 2005).

Resistance to Change

It is natural for employees to exhibit some resistance when faced with new work situations. Our self-esteem is based on what we know and how we've done things in the past. We are likely to resist when someone points out a better way of doing work (Davenport and Prusak, 1998). This is even more so when the change involves technology and affects their day-to-day work practices and every organisation will be faced with the need to manage this kind of inertia from time to time. The way in which this is managed could determine the success or failure of the knowledge sharing initiative being introduced. Riege (2005) suggests a change management strategy of involving the proposed users of the technology in the design and implementation of the KM system.

Communication Skills

The most common vehicle for the transfer of tacit knowledge is verbal communication. Riege (2005) points out that the ability of employees to share knowledge is dependent on their communication skills. Individuals engaging in work related discussions, a manager explaining a work process to a subordinate, a training session are some of the situations that result in knowledge sharing within organisations.

Where individuals with tacit knowledge find it difficult to put expression to it, such knowledge may never be transferred to other individuals in the organisation. This difficulty

may be due to language or cultural differences which in most cases may be resolved over time and with active integration efforts. Beyond language and cultural differences however, where an individual's personality interferes with their ability to interact with others, as is the case with introverts, the transfer of tacit knowledge is even more of a challenge.

Time

Being task focused, individuals might not have the luxury of enough time even if they want to share knowledge (Tiwana, 2002). Even where some time is dedicated to the transfer of knowledge, as is the case with training a new hire, there is a greater focus on on-the-job training. There is almost always not enough time to deliver more than the basic background training that the new hire requires for carrying out their job.

On one hand, employees that work by the hour and have a certain amount of work to deliver by a certain time will seldom have slack periods during which they can engage in informal discussions. On the other hand, even though Davenport and Prusak (1998) argue that random conversations should never be seen as a spare time activity, employees may refrain from engaging in informal discussions in the workplace for fear of being 'caught' wasting man hours. Such random and informal discussions need to be encouraged as they have the potential to foster social relationships between colleagues and may lead to the transfer of knowledge.

3.4.2 Process-Related Factors

Reige (2005) suggests that companies fail to reach their knowledge sharing goals due to the lack of a clear connection between their KM strategy and overall company goals, perhaps because knowledge sharing is perceived as a separate activity and not embedded into the organisation's processes. **In** order for KM initiatives to succeed, they need to be embedded in the organisation's work processes through careful attention and managerial leadership and not merely tied to established activities. The right corporate environment and conditions can enhance the effectiveness of a KM initiative in an organisation. Some of the process-related factors that affect KM are described below.

Physical Work Environment

Another factor that affects KM is the spatial arrangements of work areas and company floor layout. Where this is structured without consideration for the need for basic communication that is capable of creating a trust-based relationship, it has the potential to limit the level of

communication between individuals and hence the level of knowledge sharing that will occur in the organisation.

Riege (2005) suggests that where the traditional arrangement of offices and departments along the lines of hierarchies and management seniority is adopted, there may be little benefit in the area of knowledge exchange. The alternative approach of clustering work groups in an area has more potential of supporting the sharing of useful knowledge between the individuals.

Lack of Managerial Direction

Riege (2005) suggests that the managerial direction on the need to share knowledge has to be detailed, providing a clear picture and guideline to employees because it is capable of either enhancing or limiting knowledge sharing practice in the organisation. Managers need to encourage employees to develop their ideas or concepts in collaboration with others. Nonaka (1994) places much emphasis on the role of an organisation's management for the process of knowledge creation and sharing. Where the leadership and management of an organisation fail to clearly communicate the benefits and values of knowledge sharing practices, it becomes difficult, if not impossible to experience a change in practices that can bring about knowledge sharing.

Bearing in mind that these benefits must be communicated in a transparent manner, the managers themselves need to be prepared to demonstrate their long-term commitment to knowledge sharing as an example to be followed by their employees. Managers need to have and be seen to have an attitude of long-term commitment and support for the process of developing a knowledge sharing culture in their organisation.

Dominance of Tacit Knowledge Sharing

Although knowledge exists in both tacit and explicit forms, many organisations may already have the sharing of explicit knowledge built into their processes and procedures. However, there is still the need to capture and share tacit knowledge, especially since this type of knowledge leaves the organisation when the individual who possesses it leaves.

However, when an organisation considers the complexities involved in attempting to identify, capture and disseminate tacit knowledge compared to the relatively easy dissemination of explicit knowledge, they are more likely going to pay more attention and concentrate more effort on the latter. Riege (2005) points out the need for companies to emphasise core reasons for sharing tacit knowledge, even though it is acknowledged that it cannot be easily

transferred. It is more common to find that organisations operate with job descriptions, task procedures and other documentation of work related processes rather than formal training or brainstorming sessions in which tacit knowledge can be transferred between employees.

Localness of Knowledge

Although Milton (2011) suggests that the local focus which is often perceived as a knowledge sharing barrier can be converted to a network focus by the establishment of communities of practice, Davenport and Prusak (1998) argue that face-to-face meetings are often the best way to get knowledge. People generally tend to get knowledge from their neighbours and reliable information about more distant knowledge sources is usually not available.

In addition, due to occasionally weak mechanisms for getting access to distant knowledge, individuals may settle for whatever knowledge the person in the next office may have rather than try to discover who in the company may know more.

Besides, with the typical small number of employees in individual offices within an organisation, the question will be whether there is any need to look for any information on an organisational wiki for example, when the individual who has the knowledge sits in the room next door, or is just a phone call away (Desouza and Awazu, 2006).

Organisation Structure

Large organisations tend to support collaboration across teams and functional areas, fostering the emergence of project-centric organisational structures. With such structures, the skills developed may be lost after the team is broken up and redistributed among other newly formed teams (Tiwana, 2002).

In addition, Riege (2005) suggests that irrespective of an organisation's formal structure, knowledge will be less likely shared in a highly structured and formally defined hierarchical setting. He highlights that an organisation that focuses on hierarchies and internal regulations expects the employees to adhere to rules and procedures. This stifles creativity and constrains knowledge sharing. It is not uncommon to find that where mistakes and failures are punished rather than highlighted as a learning experience, an employee may not be interested in looking for and applying new ideas. Tiwana (2000) notes that the knowledge gained from failure should not be undervalued.

To address this, Nonaka *et al.* (2000) suggest that the introduction of redundant information in such organisations may reduce the impact of managerial hierarchy since it follows procedures that are not necessarily similar to the organisation's formal and official structure.

3.4.3 Technology-Related Factors

It is generally accepted that technology is an enabler for KM. As mentioned earlier on in this chapter, it is regarded as a necessity for providing a seamless pipeline for the flow of knowledge in an organisation. Although it is argued that technology alone cannot deliver successful KM, all except the smallest organisation will require technology (Milton, 2011). IT enables better access to knowledge resources within the organisation and facilitates knowledge retrieval. Riege (2005) concludes that technology has the ability to offer instant access to large amounts of data and information and to enable long distance collaboration.

However, technology can be as much a potential barrier as it is an enabler to effective KM. According to Riege (2005), KM is a technology issue in the same way that it is a people and organisational issue. He found that even though technology may not be the ultimate driver of a KM strategy, the integration of the right technology is important. Some technology-related factors that affect KM are now described below.

Requirement Mismatch

It is pointless for an organisation to invest its resources in acquiring technology that does not support the work-related processes of their employees. These employees are the individuals that will determine what information to store, access or disseminate Riege (2005) and the technology may itself become a problem rather than provide a solution to the problem.

Although Davenport and Prusak (1998) conclude that a KM initiative requires a culture change and a change in individual behaviour in order to be successful, Riege (2005) identifies the real issue as the organisation's ability to choose and implement a suitable technology that provides a close fit between people and organisations. The argument is that knowledge sharing practices often appear to be unsuccessful because organisations attempt to adjust their organisational culture to fit their KM instead of implementing KM so that it fits the organisational culture. For example, if the culture in the organisation is such that employees will be more likely to share their tacit knowledge through informal meetings where discussions can be recorded and later played back, it could be a waste if the organisation decides to invest in an organisational wiki.

Also, while supportive infrastructure is essential for successful KM, Ruggles (1998) found that the real challenge for organisations is to get users to contribute their own knowledge willingly and to use that of others. Nonetheless, in addition to providing infrastructure and architecture, the organisation needs to promote a knowledge-friendly culture that has a positive orientation to knowledge and highly values learning on and off the job.

Complexity of Technology Tools

Riege (2005) suggests that relatively complex technology is required to streamline business processes and maximise outputs which include the process of sharing knowledge. In fact, Davenport and Prusak (1998) propose a general rule that, the richer and tacit knowledge is, the more technology should be used to bring people together to share that knowledge directly. Milton (2011) however noted that an investment in IT for KM is an excellent start but it needs to be followed up with an equal or greater investment in coaching and training of the users if the full benefits are to be realised.

Even though most people may be willing to adapt to new technology, its introduction could be a potential barrier. The unfamiliarity of some recent technology in itself may discourage employees from making any attempt to use it. Where there are simpler alternatives for sharing tacit knowledge, it is more likely that employees will make effort to familiarise themselves with the new technology.

For example, if the organisation decides to implement an organisational wiki to capture and disseminate tacit knowledge, there is no guarantee that the individuals with tacit knowledge will input their knowledge on the wiki. Small and medium enterprises in particular seldom use IT for more than database management and automation purposes.

Unrealistic Employee Expectations

It is not unusual to find that the role and capabilities of technology can sometimes be misstated or exaggerated which in turn causes confusion on what technology can and cannot do (Riege, 2005). This in may lead to the disappointment of the individuals at the perceived 'failure' of the KM system.

According to Skyrme (2008), even though good technology products exist, too many of them still lack the necessary customisation to make them totally fit for purpose. Besides, a significant challenge which he describes as representing a competing philosophy is the

determination of the balance between how much a user should do and how much should be left to technology.

Incompatibility of Technology Systems

In some cases, the implementation of a KM initiative does not necessarily mean that the organisation discards of its existing technology. It is possible that new technology is added to the existing one if both are capable of supporting KM. However, product shortcomings such as inadequate interoperability, scalability and flexibility (Skyrme, 2008) are magnified unless there is a close fit between both the existing and new technology. In such a situation, the technology itself can constitute a barrier to KM.

Also, Riege (2005) identified the compatibility of technology infrastructure as a potential barrier to the effectiveness of KM. An immediate barrier to its effectiveness is raised, unless there is an integration of existing and new systems such that the transfer of knowledge from one to the other can be achieved seamlessly. For example, when existing hardware and software suited for one purpose need to be used in conjunction with another system, which may even be in a different location which is usually the case with global organisations, the process of KM may become tedious and laborious.

Inadequate Technology

While Riege (2005) argues that technology may not be altogether necessary for a KM initiative, Davenport and Prusak (1998) maintain that a lack of good knowledge transfer infrastructure, such as effective computer networks and communication systems may impede its success. According to Skyrme (2008), KM initiatives depend on good information technology. He argues that after more than a decade of intranets, email and other collaborative technologies, many information technology solutions still have a long way to go to help knowledge workers be more effective.

3.5 Conclusion

This chapter has reviewed literature in the area of KM framework approaches in in order to identify the different sets of elements that KM researchers have suggested for inclusion in a KM framework. The outcome of the knowledge audit that will be carried out during this research project will be analysed in line with the discussions and analyses in this chapter for the development of a framework for KM in ERDF Audit.

It is also hoped that the KM framework will identify the position of this research within the

larger body of KM research and highlight the knowledge sharing issues as well as the peculiarities of the ERDF Audit Unit resulting from its public sector setting.

An in-depth understanding of KM enablers, the critical success factors and the barriers to effective KM is a good starting point for the consideration of KM framework for any organization. This chapter discussed some of the factors that affect KM, basing the discussion around the people, process and technology components of KM.

Finally, in addition to the foregoing discussions, the next chapter examines the peculiarities and complexities in the public sector and it is hoped that an in-depth analysis of the results obtained from the knowledge audit questionnaire that will be administered as part of this research will give an indication of the effect of the factors discussed in this chapter and indeed, other factors identified during the audit on KM in the ERDF Audit Unit.

4 PUBLIC SECTOR ORGANISATIONS

4.1 Introduction

It is widely accepted that public sector organisations (PSO) are different from those in the private sector. In contrast to the profit making focus of private sector organisations, PSOs operate in an environment where competitiveness and the *bottom line* rank low in the list of priorities. PSOs are more concerned with the formulation and implementation of policies to ensure the best possible quality of service delivery to the general public. They are generally associated with a long list of stakeholders, including citizens, local governments, private firms, users of public service, politicians, public servants, unions and lobby groups with the resulting complexity in managing each group.

In addition, because they are funded by the taxpayers in the society, PSOs are laden with the responsibility of achieving value for money for the taxpayers in the provision of public services.

The aim of this research is to develop a framework for KM in ERDF Audit and the target organisation selected this is a Section within a PSO. It is therefore considered useful to review literature relating to PSOs. This chapter addresses some of the peculiarities that are expected in this type of organisation and the potential impact on the framework for KM in ERDF Audit. The chapter begins with an overview of PSOs, highlighting their peculiarities and the key issues and challenges that are typical of this type of organisation. This is followed by a consideration of the application of the four pillars of KM in a PSO. Finally, the chapter analyses the relevance of organisational learning to the public sector by carrying out a critical review of the building blocks for a learning organisation.

4.2 Overview of Public Sector Organisations

As mentioned earlier in this chapter, drivers such as profit and market share generally do not apply to PSOs. Although they share complex external challenges with private organisations, PSOs have different drivers and goals for knowledge management (Rashman *et al.*, 2009).

The rapid global change driven by globalisation not only offers opportunities, it also poses some challenges for both private and public sector organisations. However, the scale of PSOs

is of sufficient significance to draw attention to the specific features that influence their approach to learning and knowledge (Rashman *et al.*, 2009).

PSOs are responsible for creating the conditions and infrastructure that ensure national competitiveness. They play a crucial role in leading and governing local communities and managing complex inter-relationships between the state, the market and the civil society (Syed-Ikhsan and Rowland, 2004).

However, the delivery of these core services to the general public through PSOs, is an area where governments are facing challenges with increased levels of international competition. Governments are in competition with foreign organisations delivering similar service. For instance, research institutes compete to attract the best researchers and funding, universities are increasingly in competition to attract the most investments, the best students, professors, etc.

Another area of challenge for PSO service delivery is the increased competition of private firms for delivery of services that were traditionally the sole remit of the public sector. For example, through distance learning, private firms have increasing influence on the public education and training of citizens.

Apart from these challenges that governments face in the delivery of effective public services, there are other more localised issues facing PSOs in general. Some of these are shown in Figure 4.1 and outlined below.

Figure 4.1: Factors affecting Public Sector Organisations

4.2.1 Ageing Workforce

It is generally accepted that an ageing workforce is a challenge for the retention of knowledge and preservation of institutional memory in the Public Sector (Cong and Pandya, 2003). The frequent transfer of skilled knowledge workers across departments and staff turnover also contribute to this challenge. However, in Ireland for example, the Department of Finance implemented a moratorium on recruitment and promotions in the Public Service in March 2009 as part of the Government's policy on transforming public services. The implications of this moratorium are restrictions in recruitment to fill gaps created by exits through retirement. These gaps are being filled by redeployment or the transfer of public servants across Departments which further heightens the challenge in the area of preservation of institutional memory.

4.2.2 Political Influences

Noting that PSOs operate in a complex policy and political environment under the formal control of politicians, Syed-Ikhsan and Rowland (2004) highlight the impact of political influence on the ability of PSOs to learn as there could sometimes be unwritten policies or directives from politicians that need to be followed. The retention of organisational memory in PSOs is further complicated by the frequent change in government. In the discussion on the building blocks of a learning organisation, Senge (1990) raises the point of the relationship between action and consequence occurring over different time spans. This means that the consequences of the actions of one government may not be realised until years later when a new government is in power.

4.2.3 Public Scrutiny

In addition to operating in a complex political environment, PSOs are subject to a high degree of scrutiny and accountability. This is especially so because they are effectively financed by the public. The requirement for transparency and openness is further strengthened in the Irish public sector by the Freedom of Information Act 1997 (FOI) for Government Departments, Offices and certain other Government bodies. One of the basic principles of the FOI Act is that those affected by decisions of public bodies should have the right to know the criteria used in making those decisions. The FOI Act allows citizens, as shareholders in public bodies to request for and examine the deliberations and processes of public bodies.

4.2.4 Organisational Structure

The organisational structure in a typical PSO is well defined. The grade structures, salary structures as well as the hierarchy and reporting structures are fixed from time to time. This encourages bureaucracy and according to Davenport and Prusak (1998), formal reporting structures are more detailed at the top than at the bottom of the hierarchy. In addition, with this kind of structure, the flow of decision making is only up and down the chain of command and this has the potential to slow down knowledge sharing (Syed-Ikhsan and Rowland, 2004).

4.2.5 Organisational Culture

Another challenge facing PSOs is in the area of the attitudes and behaviour that constitute their organisational culture. Organisational culture can be thought of as a relatively rigid tacit infrastructure of ideas that shapes thinking as well as the behaviour and perception of a business environment (Gurteen, 1999).

Attitudes and behaviour are considered to be one of the important elements that could affect creation and transfer of knowledge and the extent of learning within an organisation. According to Syed-Ikhsan and Rowland (2004), individualism in the organisational culture of PSOs has the potential to limit learning, both on an individual level and on the organisational level. Nonaka (1994) notes that many individuals cannot share their knowledge freely and the negative effect on learning is even magnified where individuals thrive on the paradigm that knowledge is power.

4.2.6 Responsibility for Knowledge Management

Another challenge in PSOs is in the issue of the location of knowledge and the responsibility for managing knowledge. In an empirical study in a public organisation, Syed-Ikhsan and Rowland (2004) found that knowledge in the public organisation was available and embedded in the Department's procedures and policies, desk file, work flow, databases, etc. In addition, they found that most of the employees felt that the head of the Department or heads of the divisions/units were the ones who were responsible for managing knowledge. They also note that the confidentiality status of certain items of information and documents restrict the level of employees that have access to them. For example, a lower grade employee may never be in a position to learn from document that is classified as top secret.

4.3 The Four Pillars

In a research into various KM formulations and practices, Stankosky (2005) identified four principal areas which are considered to be critical elements of KM. These are popularly known as the *four pillars* as shown in Figure 4.2 and comprise of leadership, organisation, technology and learning. It is generally accepted that even the most basic of all KM programs needs to address all four pillars. This section outlines each of the pillars.

Figure 4.2: The Four Pillars of Knowledge Management (Stankosky, 2005)

4.3.1 Leadership

This deals with environmental, strategic, and enterprise-level decision-making processes and develops business and operational strategies for survival and success. Management support is a key requirement for a successful KM initiative in an organisation. This is mainly because getting the culture right is a major yet difficult challenge when implementing a KM system (Cond and Pandya, 2003). The support of a key management staff to champion the cultural changes that will be required for the success of the system must be provided at an early stage.

4.3.2 Organisation

This pillar deals with the operational aspects of knowledge assets. The focus here is to align the operational processes in the organisation with the new vision and the KM strategy. In order to achieve the organisational culture that is usually required for a KM initiative to be successful, effort must be made to ensure that operational needs are allowed to dictate the

alignment of KM strategy with operational processes by integrating KM into business processes

4.3.3 Technology

This pillar sees IT as an enabler and support for KM strategies and operations. Although it is acknowledged that cultural and organisational changes are important for achieving a KM strategy, the absence of the right technology can lead to failure. With a proper infrastructure, individuals in the organisation are likely to obtain information faster and can make faster decisions. However, failure to assess and define IT capabilities can also contribute to the failure of a KM strategy. The functional requirements that can be used to build a KM solution include capture and store, search and retrieve, structure and navigate, etc.

4.3.4 Learning

Learning is described as the acquisition of knowledge or a skill through study, experience or instruction. The pillar of learning deals with the behavioural aspects of the organisation as well as social engineering. This is based on the knowledge that organisational behaviour that supports a KM strategy will continue long after the system is established. According to Riege (2005), better and purposeful sharing of useful knowledge translates into accelerated individual and organisational learning and innovation. The approaches that can address organisational learning include increased communication, cross-functional teams and the creation of a learning community.

4.4 The Building Blocks of a Learning Organisation

Learning from the past is how things should work Tiwana (2002). A learning organisation is one that has developed the capacity to transfer experiential knowledge from one project, location or person to another. Such an organisation is positioned to avoid inefficiencies associated with repeated mistakes and attempts to reinvent the wheel.

Senge (1990) explains how a learning organisation can be built. He defines a learning organisation as "*an organisation where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning how to learn together*" and explains five building blocks as shown in Figure 4.3 which are discussed in below.

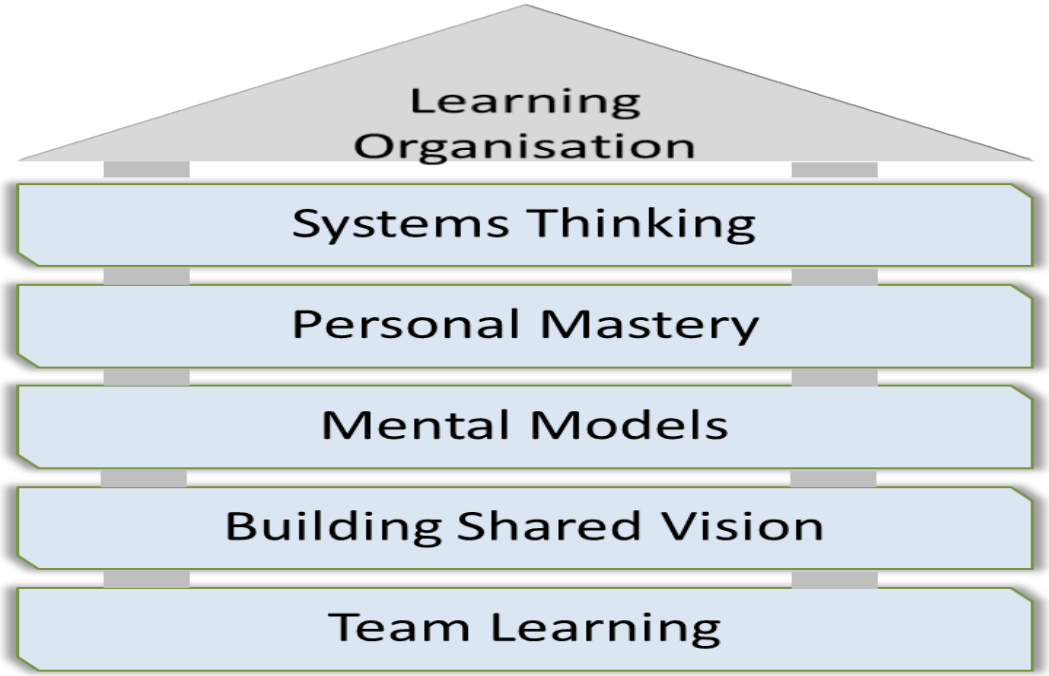


Figure 4.3: Building Blocks of a Learning Organisation

4.4.1 Systems Thinking

System thinking refers to the observation of a whole system as opposed to focusing on complex individual issues. It suggests that the existence of a shared vision and a sense of ownership at all levels of the organisation.

As noted earlier in this chapter, PSOs are particularly complex when one comes to stakeholder issues and this makes systems thinking rather unachievable. It is not uncommon to find that each stakeholder group will pay more attention to the satisfaction of their own interest even where it is in conflict with the interest of other stakeholder groups. While dialogue and negotiations attempt to address this situation, the reality is that the 'middle ground' is hardly satisfactory to all concerned.

With the requirement for transparency and accountability to the taxpayer, it is necessary for public servants to focus on complex individual issues, particularly with the provision of the Freedom of Information Act which makes it possible for external parties to demand information regarding issues of interest. In such cases, the public servants tend to focus heavily on reacting to external consequences, whether real or perceived, as opposed to maintaining a shared vision of the 'big picture'.

In addition, systems thinking requires an understanding of the relationship between action and consequence and the possibility of these occurring over different time spans such that the

full impact of an action may not be realised until after many years. When this is considered from the perspective of a PSO, particularly the central Government Departments where there is limited autonomy and policy formulation reflects the theme of the current political government, the concept of systems thinking has minimal application. It is not uncommon to find current government facing the consequences of actions taken years earlier by previous governments, which will also be the case for future governments.

4.4.2 Personal Mastery

This is the discipline of continuous clarification and deepening of personal vision, focusing of energies, developing patience and seeing reality objectively. Maintaining an accurate perception of reality while envisioning the desired position is what Senge (1990) believes is the source of "creative tension" that energises the individual to acquire the necessary capacities and rules that are required to realise the vision.

It is believed that individuals with personal mastery tend to be able to realise the results that matter most deeply to them, being committed to their own lifelong learning. This of course, begins with the individuals' identification of those things that matter most to them.

Personal mastery is identified as being the discipline that is most difficult to accept. This is perhaps because the average individual is more likely to focus on the immediate material issues as opposed to lifelong learning. Personal objectives such as family and work-life balance may take priority over organisational issues and career development. This is particularly understandable where a job in the public sector is regarded as a '*job for life*' and there is the tendency for individuals to become comfortable with the job security that accompanies public service. It is quite likely that the individuals will find their enthusiasm wane with time on the job and with age.

4.4.3 Mental Models

These are deeply ingrained assumptions, generalisations, or even pictures of images that individuals are often oblivious of and which influence their behaviour and how they take action.

A learning organisation is one whose individuals change their shared mental models of the organisation and their markets. Its success as a learning organisation depends on its ability to anticipate a change in business activity and match this with a corresponding change in the mental model of the organisation among its employees accordingly. Where this is missing,

new insights that conflict with deeply held internal images may fail to become reality in practice.

Considering this in light of the peculiarities of PSOs immediately brings to mind their limited flexibility. Again, knowing that a job in the public service is regarded as a *job for life* highlights the idiom that *'you can't teach an old dog new tricks.'* Where an individual has worked in a PSO for nearly forty years and has literally *seen it all,* it may be difficult to achieve a change in their mental models. Many PSOs have made attempts to address this through the recruitment of a *vibrant* workforce but even then, as mentioned earlier, the enthusiasm soon wears out and their own mental model also becomes difficult to change.

4.4.4 Building Shared Vision

Having a shared vision is an idea that has inspired organisations for many years. It is believed that the creative difference between reality and the vision is a way of seeing progress an objective that serves as motivation for individuals.

However, there is a difference between a genuine shared vision and the all too familiar "vision statement". A successful implementation of a shared vision requires open communication, ensuring that it is developed by involving all levels in the organisation rather than applied with a top-down approach.

Even though it is expected that the organisation's vision should change over time, this change should be in response to the changes in its environment rather than changes in leadership. It is noted that in order to build a learning organisation, the people must pursue the shared vision at all times and not only in response to the charisma of a leader. This may be a challenge for PSOs especially because leaders change often and there may be no commitment on the part of the new leader to continue to pursue the vision created by a former leader and this could be quite demotivating for individuals. As noted by Bolger (2009), a strategic change within a PSO must be able to blend existing approaches with new initiatives and thereby result in a shift in cultural values.

Although there are generally accepted and understood public sector-wide themes such as value-for-money, excellence in service delivery, customer satisfaction and transparency, individual organisations may not find it easy to develop an organisation-specific vision and get employees to adopt and follow it. People excel and learn where there is a vision, but only because they want to, not because they are told to.

4.4.5 Team Learning

It is generally believed that the intelligence of a team can exceed the sum of that of its members. However, this only holds true if there are good team dynamics in place. The discipline of team learning involves the ability of team members to enter into dialogue and "*think together"*.

Where team members do not define each other as colleagues with a shared vision but rather approach one another as competitors, it will be difficult to achieve team learning. Also, where team members are afraid to admit ignorance on a subject matter, learning can also not take place. Team learning needs to be identified as an important process and requires support from management.

Team work in the form of project teams, inter organizational collaboration are examples of ways in which team learning can take place in PSOs. However, while management support for this kind of arrangement exists, their success in resulting in team learning depends more on the members of the team. Where the individual members have not excelled in the discipline of personal mastery and the discipline of shared vision has not been firmly rooted, it may be difficult for learning to take place in such teams.

4.5 Conclusion

The chapter provided an overview of PSOs and highlighted their difference from private organisations in terms of the drivers of KM. This was followed by a discussion of the factors that affect KM within PSOs.

The four pillars of KM explained by Stankosky (2005) were also discussed from the perspective of their application in PSOs.

Finally, the five building blocks of a learning organisation described by Senge (1990) were analysed in order to highlight their application to KM in PSOs.

Overall, this chapter addressed some of the peculiarities in PSOs that are considered relevant to the development of a framework for KM in ERDF Audit. As mentioned earlier, the target organisation is set in a PSO background. The challenges of PSOs identified in this chapter will be built into the knowledge audit activity that will be carried out as part of this research and this is discussed in the next chapter.

5 KNOWLEDGE AUDIT

5.1 Introduction

Although the term 'audit' implies a counting, a knowledge audit not only 'counts' knowledge resources but also examines how they are used, by whom, for what purpose and how critical they are to the successful completion of each task (Henezel, 2000). It is not dissimilar to inventory taking in a manufacturing company. A knowledge audit is very important because it answers some of the first questions that need to be considered before the introduction of any KM initiative in an organisation, i.e. What kind of knowledge exists? Where can the existing knowledge be found? What knowledge is required in order for the organisation to become a learning organisation (Ghosh 2004)?

Every organisation has unique needs that must be identified before developing a KM strategy (Henezel, 2000). Therefore, it is necessary to identify the specific needs of an organisation before deciding on the best-fit knowledge audit approach to adopt.

In addition to discussing knowledge audits from the perspective of its objectives, this chapter also critically analyses different approaches to knowledge audit with a view to identifying the elements of each that can be adapted to suit the knowledge audit to be carried out as part of this research.

5.2 What is a Knowledge Audit?

A knowledge audit is generally regarded as a critical and indisputable first step that lays a concrete foundation and provides the necessary information for any KM initiative (Cheung *et al.,* 2004; Hylton, 2002; Liebowitz *et al.,* 2000). According to Henezel (2000), it involves an appraisal of the knowledge resources in an organisation with a view to identifying where knowledge already exists, where it is being created and where it is needed to support decisions and actions in the organisation. Although a knowledge audit generally begins by assessing the existing knowledge in an organisation, it goes far beyond a quick assessment of the state of knowledge in an organisation (Hylton, 2002). It is an independent and thorough examination, verification and validation exercise.

It is expected that carrying out a knowledge audit will place an organisation in a better position to determine the most effective approach to KM. Hylton (2002) links much of the

mistakes of both the early and more recent adopters of KM to the serious oversight of not including a knowledge audit in their overall KM strategy and initiatives. The outcome of a knowledge audit should be the basis of what forms the agenda for any KM initiative.

5.3 Objectives of a Knowledge Audit

According to Hylton (2002), the ultimate objective of a knowledge audit is to give insight as to the readiness of an organisation for becoming knowledge-centred, especially from a social point of view. It provides a structural view of what an organisation knows or does not know about its existing knowledge.

In addition to providing a structural view of an organisation's knowledge, a knowledge audit also provides details of both quantitative and qualitative characteristics of such knowledge. It is a useful technique for monitoring KM on quality issues such as completeness, effectiveness and accuracy (Che Pa *et al.*, 2012). Since it is expected that a knowledge audit produces the necessary information for the design of a KM system, Liebowitz *et al.* (2000) believe that the need to identify tacit knowledge in the organisation and to make this tacit knowledge more accessible is an essential objective of a knowledge audit. They suggested that the achievement of these objectives may involve the creation of a skills databases or searchable skills profiles.

A knowledge audit also evaluates the knowledge enhancing social and behavioural culture of the people within an organisation (Hylton, 2002). It investigates the organisation's knowledge environment in order to provide an understanding of the knowledge workers' perception of KM effectiveness within the organisation. This could be done at various levels of details that may involve an evaluation of the information systems, processes and other knowledge enabling technology.

Che Pa *et al.* (2012) considers the need to identify, measure and assess both tacit and explicit knowledge in an organisation as some of the most important reasons for conducting a knowledge audit. It is only through the assessment of existing knowledge in an organisation that knowledge issues such as knowledge gaps, inconsistencies and duplications are brought to limelight.

5.4 Knowledge Audit Approaches

Just as there is no generic model for carrying out a KM initiative (Cheung *et al.,* 2004), there is also no generic model for conducting a knowledge audit. A common theme identified in recent knowledge audit literature is that there are many approaches to carrying out a knowledge audit and three of these are described in this section.

5.4.1 Integration of Knowledge Inventory, Mapping and Knowledge Flow Analysis

This is a systematic approach suggested by Cheung *et al.* (2004) which suggests that there are three phases involved in a knowledge audit is as shown in Figure 5.1.

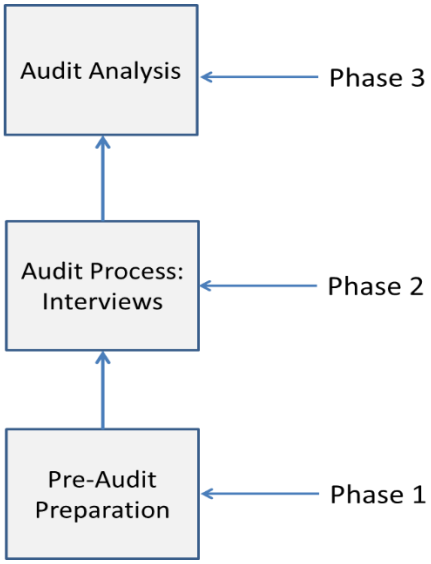


Figure 5.1: Integration of Knowledge Inventory, Mapping and Knowledge Flow Analysis

Firstly, surveys are conducted, to reveal the culture profile in the organisation. Secondly, in-depth interviews are used to obtain a clearer picture of the available knowledge resources in the selected critical process of selected interviewees. Finally, knowledge inventory, knowledge mapping, and social network analysis are used to analyse the knowledge flow in the audit scope.

In particular, this approach was applied by Cheung *et al.* (2004) in the knowledge audit conducted in the Engineering Division of Hong Kong Dragon Airlines Limited (Dragonair) and summarised below.

Phase 1 – Pre-Audit Preparation phase

This begins with a culture assessment which involves orientation programs, surveys and radar charts. This phase identified the Fleet Technical Management aspect of the airline as the area

for focus of the audit and the specific task of processing *Deferred Defects* was selected. A pilot test was carried out before launching the survey, to check whether the respondents understood the questions as well as to assess the time required to complete the surveys. An orientation in the form of formal presentations was also given to the managers of the Fleet Team in order to seek their support for the knowledge audit and then the surveys were distributed to the staff of the Fleet Team. One of the outputs from this phase was a culture radar chart which indicated that the organisation was ready for the implementation of a knowledge management initiative.

Phase 2 – Audit Process: Interviews

With an overall return rate of the culture readiness survey of 80%, it was considered appropriate to proceed with the next phase of the knowledge audit. This phase involves detailed interviews aimed at capturing process-critical knowledge in the organisation. The questions were asked in three sections. Firstly, the interview candidates were asked to state the knowledge, expertise or skills that they need to master for making the related decisions. The purpose of this was to take stock of the knowledge assets and organise them into a knowledge inventory.

Next, the interview candidates are asked to list out their knowledge sources and what kinds of knowledge they get from these knowledge sources. This was done in order to keep the knowledge assets in the knowledge inventory and to visualise the knowledge exchange path among different parties in the business unit.

Finally, the interview candidates were required to rate the expertise that they consulted from the knowledge sources on criteria such as significance, complexity, credibility and response time, on a scale of 1 to 5. Carrying out a social network analysis on the rating provided a clear picture of the main knowledge providers and knowledge customers in the organisation. The results of this phase of the audit are then fed into the next phase of the knowledge audit, i.e. the audit analysis phase.

Phase 3 – Audit Analysis

This phase involves a knowledge inventory, knowledge maps and knowledge flow analysis. Firstly, a knowledge inventory was developed from the process-critical knowledge gathered during the interviews. Secondly, a knowledge map was created for the *Deferred Defects Clearance* process that was selected and finally, the interactions between employees within

the team and outside the team in relation to this process were captured with a knowledge flow analysis.

The knowledge audit conducted at the Fleet Technical Section of Dragonair revealed that in addition to personal knowledge and experience on the job, employees and managers still had to refer to manuals in order to handle *Deferred Defects* processes. In addition, they were also required to record the steps they had taken to resolve *Deferred Defects* issues. It was then proposed that a centralised system such as a knowledge portal where employees could record their experiences should be developed to support knowledge management for this process.

5.4.2 A People-Focused Model

A knowledge audit is ideally an enterprise-wide activity since knowledge exists and flows in all areas of an organisation. It would normally be expected that the full benefits of a knowledge management initiative will not be achieved if some parts of the organisation are left out of the process. However, the reality is that it may be necessary, due to reasons of practicality, to carry out a knowledge management initiative only for specific units, sections or processes within the larger organisation (Hylton, 2002). Regardless of what unit, section or process is selected for the knowledge audit, Hylton (2002) contends that the people in an organisation need to first of all, develop a knowledge management culture for any knowledge management initiative introduced to stand the chance of being successful. This model is highly people-centred and approaches knowledge audit on 3 levels as shown in Figure 5.2

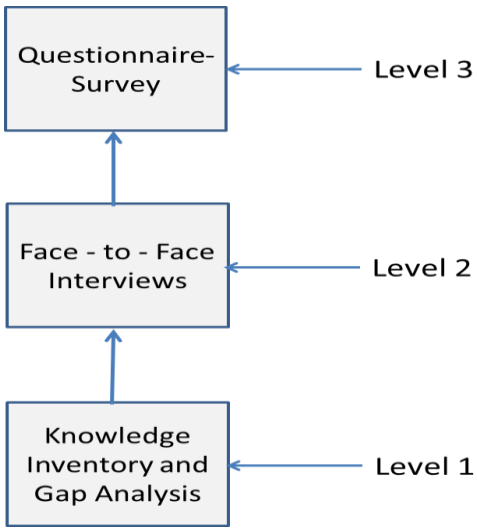


Figure 5.2: People-Focused Knowledge Audit Model

Level 1: Questionnaire-Survey

This level of the knowledge audit process involves a survey of the people in the organisation through questionnaires. These questionnaires should be carefully planned to ensure that as much information as possible will be gleaned from the respondents and should be distributed to as many individuals as possible. The responses to this survey should be collated and thoroughly analysed to identify trends, patterns and relationships between the different knowledge areas of the organisation. The results of the analysis are then documented in a knowledge audit report, outlining the audit findings up to this point.

Some organisations proceed to implement a knowledge management solution at this stage, particularly where it relates to the development of a knowledge management culture in the organisation. However, this level does not deliver a complete knowledge audit. It merely sets the stage for the next phase in the knowledge audit process.

Level 2: Face - to - Face Interviews

This level of the knowledge audit is concerned with conducting face-to-face interviews with some of the individuals that took part in the questionnaire survey. In addition to providing additional insight about the organisation, these interviews will serve as a means of clarification of individual respondent's queries regarding the questionnaire. The individual's responses to the questionnaires can be clarified and discussed in greater details.

Level 3: Knowledge Inventory and Gap Analysis

This is the final stage of the knowledge audit. It uses scientific and technical tools and methods to locate, chart and map the main sources of knowledge within the organisation. It requires knowledge inventories, knowledge maps, charting of knowledge flows and gap analysis. At the end of this stage in the knowledge audit, a comprehensive document detailing the explicit and quantifiable benefits that could be derived from a knowledge management initiative in the organisation is produced. It provides a basis for decision making regarding the organisation's investment in the short, medium or long term.

5.4.3 A Core-Processes Approach

This approach is based on the generally accepted position that an organisation must be able to leverage existing organisational knowledge and learning to create new knowledge if it wants to succeed (Perez-Soltero *et al.*, 2007). This is a model that considers strategic elements,

organisational core processes, the nature of knowledge, knowledge management processes and an ontology-based formalism to represent knowledge audit outcomes.

Perez-Soltero *et al.* (2007) contends that many knowledge audit methodologies do not really establish a clear strategy that explains the area in the organisation where a knowledge audit should be initiated. They believe that the focus should be on knowledge that exists in those core processes that are critical to the success of an organisation and suggest a knowledge audit that is carried out in ten stages as shown in Figure 5.3 and discussed below.

Figure 5.3: Core-Process Approach

Stage 1: Acquire Organisational Strategic Information and Identify Organisational Processes.

This involves the use of interviews, general organisational documentation and exploratory questionnaires to identify the mission, vision and objectives of the organisation with a focus on its environment, culture and traditions.

Stage 2: Identify the Organisation's Core Processes and Establish Measurement Criteria.

This stage collates answers from the exploratory questionnaire, quantitative documentation and other documents that allow a valuation of the impact of the processes on the

organisation's mission and its performance. These are used to identify the organisation's core processes that contain useful knowledge to be managed.

Stage 3: Prioritise and Select the Organisation's Core Processes.

The information obtained from the previous stage is used to prioritise and select those core processes with the highest impact on the organisation's performance. These are used as the initial study objects. This is in line with the Pareto principle, i.e. a smaller number of processes account for the largest share of potential improvement.

Stage 4: Identify the Key People.

This stage uses a combination of information gathered from the general organisation documents, the résumé of the staff and some answers from the exploratory questionnaire to identify those people who hold knowledge that is key to the selected core processes.

Stage 5: Meeting with Key People.

Materials and presentation slides on knowledge audit and knowledge management processes are prepared at this stage. These are used at meetings with the key people identified in the previous stage to provide information about the knowledge audit and knowledge management processes. It is also an opportunity to clarify questions that these key people may have while also reinforcing their support for the knowledge audit process.

Stage 6: Obtaining Knowledge Inventory.

In-depth questionnaires and interviews are used at this stage to locate and obtain existing knowledge assets in the organisation. The focus will be on the details of both tacit and explicit knowledge existing within the core processes of the organisation and where they are located within or outside the organisation. The questionnaires and interviews used at this stage need to include questions that will support the next two stages of the knowledge audit process.

Stage 7: Analysing Knowledge Flow.

An analysis of the results from stage 6 will reveal the flow of knowledge within the organisation. The knowledge flow considered here will relate to those core processes selected for audit. However, this can be further integrated with the knowledge flow of other processes in the organisation in phases until the general knowledge flow of the entire organisation is obtained.

Stage 8: Knowledge Mapping.

This stage involves the use of diagrams, graphs, tables and software knowledge maps to develop a visual representation of organisational knowledge. The knowledge map demonstrates *who* has *what* knowledge, *where* such knowledge can be located, the accessibility of these individuals and the persons with whom they most often share their knowledge.

Stage 9: Knowledge Audit Reporting.

This is required for strategic planning by management. It may be in the form of a written report document, a presentation to management, workshops, etc. (Henezel, 2000). Regardless of the form it takes, the knowledge audit report uses information from the knowledge map to inform the managers of the outcome of the knowledge audit and it provides the final justification for any knowledge management strategy that will be proposed.

Stage 10: Continuous Knowledge Re-auditing.

The first audit is considered to be a baseline (Henezel, 2000). It is expected that subsequent audits will be performed to provide a mechanism for updating and re-assessing the validity of this baseline to reflect changes in the core process audited. The rest of the core processes of the organisation are then selected in turns and a knowledge audit carried out on them in phases, until all the core processes of the entire organisation are audited.

5.5 Analysis and Evaluation of the Approaches

This research will involve a detailed knowledge audit that will be designed as a combination of different elements of the approaches reviewed above. These elements will be adjusted to suit the specific circumstances of the ERDF audit unit that has been selected as the organisation to be used for this research. These different elements and how they will be applied in this research are briefly discussed below.

5.5.1 Planning

Whereas Hylton (2002) recommends a people-centred approach that begins with a questionnaire-based survey, Cheung *et al.* (2004) suggests that a pre-audit preparation is required in order to enhance the results that will be achieved by the knowledge audit. Although it is expected that some level of pre-planning will be done before administering the surveys in the Hylton (2002) approach, the suggestion of a pre-audit preparation as a stand-

alone phase in the knowledge audit process is an indication that planning is important. This suggestion will be adopted in the knowledge audit to be carried out as part of this research and will be discussed in greater details in subsequent chapters.

5.5.2 Core Process

Secondly, the picture painted by Hylton (2002) is that a knowledge audit should be carried out on only a specific unit, section or process within the organisation at any given time. While this is the more practicable alternative to carrying out the knowledge audit on the entire organisation in a single audit, Perez-Soltero *et al.* (2007) raises the issue of a lack of clear strategy for selecting the unit, section or process where the audit should be initiated. However, when the approach of Cheung *et al.* (2004) which begins with a culture assessment through orientation programs, surveys and radar charts is considered, some useful insights into the readiness of different areas within the organisation will be gleaned. Apart from selecting a single unit within the DPER this research concerns itself with a single process within the unit, i.e. the audit of expenditure eligibility, which is only one of the sections audited during the fieldwork aspect of an ERDF audit.

In addition, the core-process approach suggested by Perez-Soltero *et al.* (2007) which focuses the knowledge audit on the core processes that are critical to the success of an organisation will be applied to this research. The audit of eligibility of expenditure which has been selected for the knowledge audit in this research is considered a core process for many reasons. As will be seen in the next chapter, one of the major reasons for selecting this process is that a vast majority of audit exceptions are raised in this area and much of the audit work required here involves personal experience and judgement on the part of the individual auditor.

5.5.3 Interviews

Finally, just as the interview phase in the approach suggested by Cheung *et al.* (2004) builds the logic behind the questionnaire into the interviews, the knowledge audit that will be carried out in this research will also include knowledge elicitation interviews that will be aimed at

- Taking stock of the knowledge assets in the ERDF unit
- Organising the knowledge assets into a knowledge inventory
- Understanding the knowledge exchange path among different individuals in the unit
- Identifying the major knowledge providers in the Unit.

5.6 Conclusion

A fundamental conclusion from the literature reviewed in this chapter is that carrying out a knowledge audit prior to introducing a knowledge management tool in an organisation is highly recommended. The objectives of a knowledge audit as well as an analytical review of three approaches were also covered in this chapter.

In line with the approaches reviewed above, the choice of knowledge management tool that will be recommended depends heavily on the outcome of the knowledge audit process.

Finally, rather than carrying out an enterprise-wide knowledge audit, this chapter has highlighted the need to focus on a specific unit, section or process within the larger organisation. The rationale behind the selection of a particular unit, section or process was also discussed and for the purpose of this research, the process of testing the eligibility of expenditure in an ERDF audit has been selected.

The following chapter discusses the ERDF and explains the audit of projects (or operations) that are co-funded by the ERDF and the process of testing the eligibility of expenditure during and ERDF audit.

6 EUROPEAN REGIONAL DEVELOPMENT FUND AUDIT UNIT

6.1 Introduction

This chapter begins with a brief overview of European Regional Development Fund (ERDF) co-funding in Ireland, explaining the process of auditing co-funded projects with detailed discussions around the audit tests that are carried out in relation to the eligibility of the projects' expenditure for co-funding by the ERDF.

This is followed by an overview of the ERDF Audit Unit in a knowledge context and from the perspective of the people, process and technology as elements of knowledge management.

6.2 Background Information on the ERDF

Financial instruments and initiatives to address economics and social imbalances in the European Community have existed since the beginning of European integration (EU Structural Funds in Ireland). These aim to stimulate growth and employment in the least developed regions of the European Union (EU) to ensure continuous and balanced expansion across the EU Member States.

The ERDF is one of the Structural Funds that form part of these financial instruments of the EU's regional policy. It has helped to reinforce economic and social cohesion by addressing regional imbalances in the EU, through the support of infrastructure and job-creating investment since 1975. The ERDF, along with the other Structural Funds is based on multi-annual development programmes over specific programming periods with the current one covering 2007 to 2013.

The European Commission uses the Nomenclature Units for Territorial Statistics (NUTS) as a system for classifying regions within the EU. The relevant NUTS for the ERDF is the NUTS II. There are two NUTS II regions in Ireland, both established in 1999 and each covering thirteen counties in the country. These are the Border Midland and Western (BMW) Region and the Southern and Eastern (S&E) Region.

The Irish Government established Regional Assemblies to operate as the Managing Authorities for the Regional Operational Programmes and to give effect to the division of the country into two regions for Structural Funds purposes.

Financing new projects in key strategic sectors is one of the salient points in the Annual Report 2013 of Ireland's Programme for Government. The objectives of the ERDF and the co-financing eligibility criteria for EU Member States are defined in the European Council Regulation (EC) No 1083/2006. Millar (2012), outlined the priorities set by the Irish Government for the ERDF as follows;

a) Supporting innovation, knowledge, and entrepreneurship in the regions and
b) Strengthening the competitiveness, attractiveness and connectivity of the National Spatial Strategy Gateways and Hubs through improved access to quality infrastructure and promoting environmental and sustainable development.

ERDF co-financing is obtained for qualifying projects (or schemes or programmes) in both regions. Successful applicant projects receive a percentage of their financing from the ERDF in line with the EU's *additionality principle* where the funds only complement rather than replace normal public expenditure of the country.

The audit of ERDF Operational Programmes is a statutory requirement of the EU Council Regulation (EC) No 1083/2006 and European Commission Regulation (EC) No 1826/2006. In particular, Article 62 of Council Regulation (EC) No 1083/2006 sets out the functions of an Audit Authority. These are summarised below.

(a) Carrying out audits to verify the effective functioning of the operational programme's management and control system
(b) Verifying expenditure declared to the European Commission by operations based on an appropriate audit sample
(c) Presenting an audit strategy to the European Commission within nine months of the approval of an operational programme.
(d) Preparing an Annual Control Report and Annual Opinion for submission to the European Commission on 31st December of every year

In accordance with the requirements of the Regulation summarised above, ERDF audits are carried out by the Audit Authority to verify the effective functioning of the management and control system of the programmes. The Audit Authority sets out the audit plans and sampling methods in a document referred to as the Audit Strategy which is presented to the European Commission after the Operational Programmes have been approved. At the end of the year, the Audit Authority reports the significant findings and financial irregularities in its audit of

the management and control systems of the Operational Programmes. The is reported in the Annual Control Report and Annual Opinion which must be uploaded to the European Commission website by 31st December .

6.3 Financial Control and Audit

The European Institute of Public Administration (EIPA) interprets financial control to mean that *management and control systems shall include procedures to verify the delivery of the products and services co-financed and the reality of expenditure claimed.*

The main objective of an audit of ERDF Operations is to check the quality of management and control systems being used in order to give an opinion as to whether the management and control systems are effective and to provide a reasonable assurance that the statements of expenditure presented to the European Commission are correct. According Smail *et al.* (2008), the European Commission has come to rely increasingly on the audit work conducted by each Member State.

An operations audit also involves checking the nature of expenditure to obtain reasonable assurance that the underlying transactions are legal and regular and also checking that value-for-money has been achieved. The next section describes the process of auditing an ERDF co-funded operation.

6.4 ERDF Operations Audit

As mentioned earlier, the ERDF Audit Unit is the designated Audit Authority for the ERDF in Ireland. The process of carrying out an audit of a co-funded operation is briefly outlined below.

6.4.1 Sample Selection

The European Commission provides guidance documents on sampling methods for audit authorities. This guidance document is followed for the process of selecting the sample of operations to be audited in a reference year. The recommends the monetary unit sampling method and requires the audits to be performed in line with internationally accepted Auditing Standards. Based on the audit risk, assurance or confidence levels applicable to the operational programmes for the year, a conservative approach to monetary unit sampling is applied to determine the sample size (number of operations to be selected for audit).

To calculate a sample size *n*, the following information is required:

- The population book value, *BV* which is the total of all the expenditure declared by for co-financing in the reference year
- The reliability factor, *RF* which is a constant from the Poisson distribution for an expected zero error. It is determined by the confidence level as shown in Table 6.1
- The maximum tolerable error, *TE* which is usually 2% of the total expenditure and indicates the value which errors identified by audits should not exceed.
- The anticipated error, *AE* bases on the auditor's professional judgement and prior information
- The expansion factor which is also a constant based on confidence level as shown in Table 6.2 and is used when errors are expected.

The sample size is then calculated as follows

$$n = \frac{BV \times RF}{TE - (AE \times EF)}$$

Confidence level	99%	95%	90%	85%	80%	75%	70%	60%	50%
Reliability Factor (RF)	4.61	3.00	2.31	1.90	1.61	1.39	1.21	0.92	0.70

Table 6.1: Reliability Factors by Confidence Level

Confidence level	99%	95%	90%	85%	80%	75%	70%	60%	50%
Expansion Factor (EF)	1.9	1.6	1.5	1.4	1.3	1.25	1.2	1.1	1.0

Table 6.2: Expansion Factors by Confidence Level

After the sample size has been determined, then the operations are selected for audit using an audit interrogation software, IDEA. Details of the operations are recorded on a Microsoft Excel spreadsheet referred to as the *operations audit register* with columns labelled as shown in Table 6.3 Field numbers 1 to 8.

6.4.2 Audit Allocation

The audit manager allocates the audit of these operations to individual auditors based on a number of factors including:

- The business sector of the operation (private/public sector, higher education institution, local authority, etc.). This is considered to ensure that auditors and managers develop experience and knowledge in the different sectors audited.
- The allocation of auditor – manager such that each auditor is supervised by each manager at least once during the year.
- Where the operation or the PBB had been audited in previous years, the manager is required to make a judgement call as to whether, for efficiency reasons, the previous auditor should be assigned to the new audit.
- The location of the audit in relation to the individual auditor's home in order to optimise travel requirements
- The skills and abilities of the auditor in relation to the requirements of the operation to be audited.

The details of the each operation are recorded in the *operations audit register* Field numbers 9 to 11.

Field Number	Field Name	Description
1	Sample File Number	This is a unique file identifier number that is made up of the audit reference year, the Region and a serial number. For example, a sample file number 2012/S&E/001 refers to the file for the first operation in the sample selected for audit in the Southern and Eastern Regional Operational Programme in the audit reference year 2012
2	Operation Name	This, as the title suggests, is the name of the Operation
3	Sub Priority Theme	This is the applicable sub-priority theme of the Operation
4	Public Beneficiary Body (PBB)	This is the organisation that benefits from the co-financing
5	Operation Contact	Contact person in the PBB, usually the project coordinator
6	Contact Email	The email address of the operation contact
7	Unique Number	This is a number generated by the IT system used for EU Structural Funds Programme in Ireland

Field Number	Field Name	Description
8	Sample Hit	This is the amount of expenditure declared for co-financing by the PBB on this Operation
9	Allocated Auditor	The auditor that has been given the responsibility to carry out the audit of this operation
10	Allocated Reviewer	The audit manager that has been given the responsibility of reviewing the audit file prepared by the allocated auditor
11	Date Allocated	This is a record of the date that the audit of this operation was allocated to the auditor
12	Date Notified	This is the date that the auditor sends a formal notification of audit to the PBB.
13	Fieldwork	This is the date indicated on the notification letter for carrying out the audit at the client's premises
14	Submit for Review	This is the date that the auditor presents the completed audit file to the allocated reviewer for review
15	Date DOAR Issued	This is the date that the Draft Operations Audit Report (DOAR) is sent to the PBB. The contradictory process commences on this date
16	Date of Response	This is the date that the PBB's responses to the audit findings are received by the auditor / audit manager
17	Date of Final Report	This is the date that the ERDF Audit Authority issues the Final Operations Audit Report (FOAR). The contradictory process ends on this date
18	Total Expenditure Declared	This is the same value as the Sample Hit above
19	Total Expenditure Verified	This is the value of expenditure tested for eligibility
20	Percentage Verified	This is the Total Expenditure Verified as a percentage of the Total Expenditure Declared.
21	Irregularities	This is the total value of the expenditure items found to be ineligible for co-funding from the total expenditure verified
22	Percentage Irregularities	This is the value of Irregularities expressed as a percentage of the Total Expenditure Verified.
23	Number of Irregularity Reports	This is the number of reports arising from the audit, that need to be sent to the European Commission
24	Systemic Issues	This is an indication of whether audit findings are systemic in nature
25	Action	This is the action taken to address any systemic issue identified.
26	Hyperlink to FOAR	A hyperlink to the PDF document version of the FOAR is inserted here.

Table 6.3: Audit Register Columns

6.4.3 Audit Notification and Planning

Once the operations have been allocated to auditors and the details of this have been entered on the register, the audit manager notifies all the auditors and each auditor is responsible for identifying those audits that have been allocated to them on the register.

The auditor contacts the relevant person in the PBB using the operation contact details in Field number 5 of the register in order to agree the dates on which the audit fieldwork will be carried out. After the dates have been agreed, the auditor prepares and sends a formal engagement letter to the PBB notifying them of the upcoming audit. The purpose of a formal engagement letter is to ensure that the PBB is prepared for the audit and also to request for the initial information that will be required before the auditor arrives at the PBB's premises. The audit then records the audit dates in field number 12 and 13 of the register.

The next step is to prepare for the audit by carrying out a pre-visit review of the information about the operation, selecting a sample of transactions to be tested for eligibility and requesting for specific information about the operation from the PBB as required, to be received for review prior to the commencement of the audit fieldwork.

6.4.4 The Contradictory Process

After the fieldwork has been completed, the auditor prepares an audit file for review by the allocated manager and records the date in field number 14 of the register. The manager may raise queries and comments about the audit work and the operation during the review, to which the auditor provides responses. The auditor then prepares a Draft Operations Audit Report (DOAR), stipulating the date by which the PBB's response to the DOAR must be sent back to the ERDF Audit Authority. The date on which the DOAR is sent is then recorded in field number 15 of the register.

This initiates the contradictory process, which provides the PBB with an opportunity to reply to the audit findings, either by accepting the findings and committing to carry out the recommendations or by providing additional information to address the findings. The auditor then reviews the new evidence which may clear the findings. This right of reply is enshrined in the EU treaty principles and are very important for fairness and transparency of the audit process in line with the ethos of ERDF Audit.

Next is the preparation of the FOAR which is the final step in the contradictory process. Only those findings that were not cleared during the contradictory process are included in the FOAR.

6.4.5 The Annual Control Report and Audit Opinion

The process described in the two preceding sections are repeated for all the operations in the selected sample and are expected to be completed by 30th June of the year following the audit reference year according to the audit strategy presented to the European Commission. This allows for the compilation of the results from all the audits and preparation of the *Annual Control Report (ACR) and Audit Opinion.*.

In addition to providing the European Commission with details of any changes in the management and control systems, changes in the audit strategy, etc., the ACR includes the audit opinion on the functioning of the system which the ERDF Audit Authority provides on the basis of its conclusions from all the audits carried out in the year. The ACR also includes an Appendix which is a table of the principal findings and recommendations from all the operations audits carried during the year. The ACR is uploaded unto the European Commission's website latest by 31st December of every year.

6.5 Testing of Eligibility

As mentioned in Chapter 5, the testing of eligibility of expenditure is one of the activities carried out as part of the audit of and ERDF operation. This section provides an overview of this activity which is the core process that has been selected as the focus of this research.

6.5.1 Sample Selection

Operations selected for sampling can vary significantly. Large capital infrastructure operations may only involve a small number of large value transactions. However, research projects in third level institutions may involve hundreds of small value transactions. In order to limit the audit on a practical and proportionate basis, operations with large number of transactions can be further audited on a samples basis. The rule of thumb is as follows: *"As regards the coverage of transactions, below 30 invoices, they should all be examined. Above 30 invoices, a random sample of minimum 30 invoices can be extracted, but it must represent a minimum 20% of the number of invoices and 20% of the total amount claimed under audit review. Moreover, the auditors should exercise their judgement to verify that the invoice sample is reasonably representative of the invoice population".*

So when the auditor has received a complete list of all the transactions included in the declaration to the European Commission for co-funding, they are arranged in descending order of value, the first 20 transactions are selected for inclusion in the sample. The remaining 10 transactions are selected from the rest of the transaction listing by choosing every n^{th} transaction where n is calculated as

$$\frac{T - 20}{10}$$

and T is total number of transactions in the transaction listing

The selected transactions are then entered on the *eligibility testing* working paper as discussed later in Section 6.5.2.

The details of the process of selecting a sample for eligibility testing are recorded in the *planning* folder indicated in Figure 6.1.

6.5.2 Audit Tests

The main regulatory document for carrying out the audit test of eligibility is the Department of Finance Circular 16 of 2008 (DoF Circular 16/2008), "*EU Structural Funds Programmes 2007-2013 National Eligibility Rules For Expenditure Co-financed by the European Regional Development Fund (ERDF) Under Ireland's National Strategic Reference Framework (NSRF)"* which may be found at:

http://eustructuralfunds.gov.ie/files/Documents/Circular%2016%20of%202008.pdf

In addition, a clarification document, "*EU Structural Funds Programmes 2007-2013 National Eligibility Rules For Expenditure Co-financed by the European Regional Development Fund (ERDF) Under Ireland's National Strategic Reference Framework as set out in Finance Circular 16/2008 dated 23rd September 2008"* was prepared by the 'National Eligibility Rules Group'.

The group was established by the Department of Finance, (now Department of Public Expenditure and Reform) to ensure consistency in the application of the National Eligibility rules outlined in Circular 16/2008. The clarification contained in the document relate to rule numbers 1, 2, 7 and 14 in DoF Circular 16/2008.

An electronic working paper set up as a matrix is used to record the audit tests carried out. The first six columns of the matrix are used to record the serial number, details of the payee, description of the goods or service, amount paid to the supplier, date paid, and the amount

declared as eligible expenditure. The remaining 35 columns of the matrix are used to record the test as shown below. The auditor is required to indicate whether or not, the transaction satisfies the eligibility rule with a ✓ or x as appropriate.

Column Number	Column Heading	Test
7	Rule 1 - General Rules on Eligibility	Proof of Expenditure - Invoice or Accounting documents of equivalent probative value
8		Evidence that Expenditure was Incurred & Paid (Bank Statement)
9	Rule 2 - Salaries, Wages & T&S Costs	Salaries & Wages costs including PRSI are based on real costs
10		Timesheets or equivalent available to support salaries & wages costs
11		T&S costs relate to operation & evidence available to support costs
12		Total cost of T&S does not exceed civil / public service subsistence rate.
13	Rule 3 - Overheads / Indirect Costs	Overheads based on real costs and apportionment basis is fair & equitable
14		Approval of Managing Authority has been obtained
15		If overheads based on a flat rate, maximum of 20% direct costs of operation allowable
16 to 40	Rule numbers 4 to 16	Audit tests relating to rule numbers 4 to 16 as outlined in DoF Circular 16/2008
41	Rule 17 - Location of Operations	Ineligible unless written approval of MA & 2 conditions must be met

Table 6.4: Eligibility Testing Matrix

A transaction must satisfy all the tests on the matrix except where the test is identified as "not applicable". Otherwise it is regarded as ineligible. This is noted and brought to the attention of the PBB contact before the end of the fieldwork.

6.5.3 Working Papers

There are three main working papers used to record the audit activities relating to testing of eligibility of expenditure as shown in Figure 6.2.

The first is *"5.0 Eligibility Summary Schedule".* This is used to record a summary of all exceptions and ineligible expenditure identified during the audit tests described in the previous section as well as any exception arising from the audit tests carried out on working paper *5.3 Income.*

It records the details such as the description of the ineligible transaction and the reason why it is considered ineligible. This summary is used when the auditor is preparing other working papers such as *audit exception listing, audit programme, draft operations audit report,* which are in other sections of the audit file.

The second working paper is *"5.1 &5.2 Eligibility Testing".* This is used to record details of the audit tests carried out as described in the previous section and the final working paper is *"5.3 Income".* This is used to record details of any income or potential income generated by the operation. This is required because income generated by the operation must be netted off the total amount of the expenditure before making a declaration to the European Commission.

There are some other working papers in other sections of the audit file that are impacted by the tests carried out in this section and these are mentioned in the Section 6.6.

6.6 Organisation of the Electronic Folder

An electronic folder is created for each Operation that is audited as shown in Figure 6.1 but only subfolders 1, 2 and 5 are relevant for the testing of eligibility of expenditure.

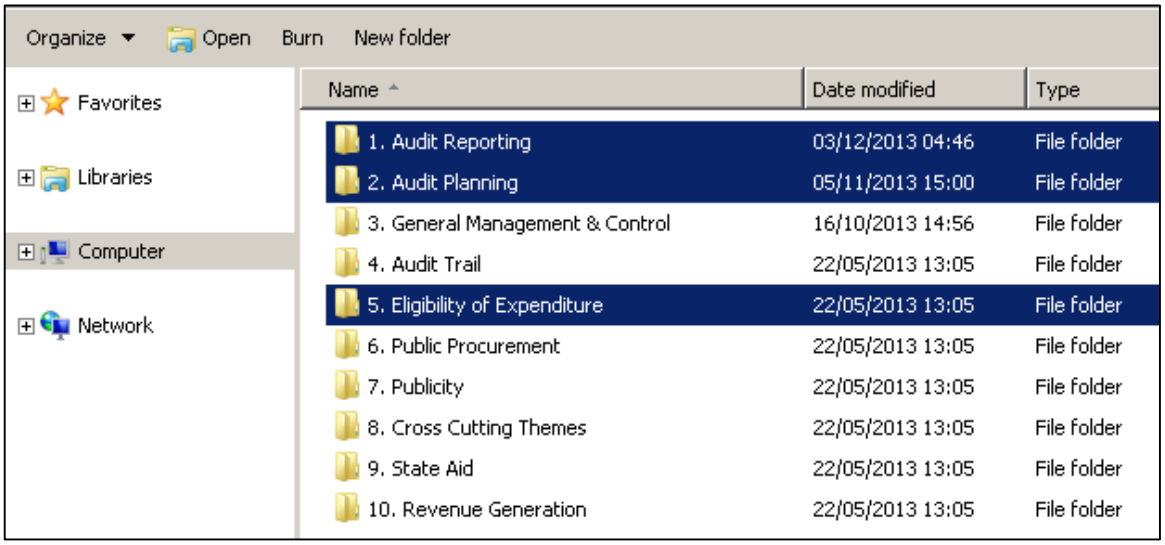


Figure 6.1: Operations Audit Folder

6.6.1 Audit Reporting Folder

The Audit Reporting folder, subfolder 1 in Figure 6.1 contains Microsoft Word documents which include:

- **Exception Listing**: This documents the exceptions arising during the audit and is used during the end of the audit fieldwork meeting with the client, to record their

agreement (or disagreement) with the issues raised. It also indicates whether the audit exception will be included in the DOAR.

- **Audit Managers Review Sheet**: This is used to document the review comments of the audit manager, the responses of the auditor to the review comments and an indication as to whether the comment has been satisfactorily addressed by the auditor.
- **Draft Operations Audit Report (DOAR)**: This document contains details of the operation selected, the regulatory framework, objectives and scope of an Operations Audit, the principal results from the audit detailed in an appendix as audit findings and recommendations. It also contains a summary of the results that will be reported to the European Commission in the ACR. This DOAR is sent to the PBB for their responses to the audit exceptions in the appendix and copied to other relevant parties (the Intermediate Body and the Managing Authority) for their information and comments as applicable.
- **Final Operations Audit Report (FOAR)**: This is the final report which concludes contradictory process. It contains all the details in the DOAR as well as the co-funding beneficiary's responses to the audit findings and recommendations. It also contains the Audit Authority's final verdict as to whether the audit findings have been satisfactorily addressed by the PBB and whether any financial corrections are required.

6.6.2 Audit Planning Folder

As discussed in Section 6.4, a letter of engagement is sent to the PBB, who is expected to respond by sending some documents that will be reviewed by the auditor prior to the audit fieldwork. These documents will also assist in planning prior to the fieldwork.

The Audit Planning folder, subfolder 2 in Figure 6.1 is used to collate the files received from the PBB as well as other documents relating to the planning of the audit such as the letter of engagement issued to the PBB, the details of the Operation to be audited, the sample of transactions that will be audited, etc.

6.6.3 Eligibility of Expenditure Folder

The Eligibility of Expenditure folder, subfolder 5 in Figure 6.1 typically contains three working papers and a copy of Department of Finance Circular 16/2008 (DoF 16/2008) as outlined in Figure 6.2.

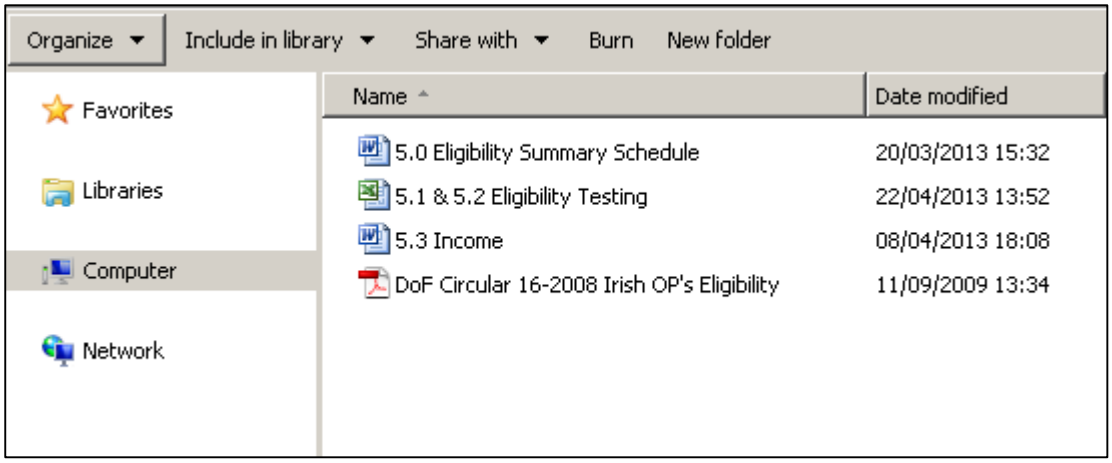


Figure 6.2: Eligibility of Expenditure Subfolder

- **Eligibility Summary Schedule**: This working paper records all the audit exceptions arising from the testing of eligibility of expenditure that will be included in the exceptions listing document discussed in Section 6.5.1.
- **Eligibility Testing**: This working paper contains a list of all the transactions in the sample to be audited and records the results of testing each transaction against each of the rules contained in DoF 16/2008.
- **Income**: This working paper records details of any income that may have been generated by the Operation being audited.

DoF Circular 16/2008: This is a Department of Finance Circular titled 'EU Structural Funds Programmes 2007-2013 National Eligibility Rules for Expenditure Co-Financed by the ERDF under Ireland's National Strategic Reference Framework'. This circular addresses the rules that an item of expenditure must satisfy in order to be considered eligible for co-funding. There are seventeen rules altogether, each containing a number of paragraphs addressing different scenarios and situations. A copy of this circular can be accessed at

http://eustructuralfunds.gov.ie/files/Documents/Circular%2016%20of%202008.pdf

6.7 Overview of ERDF Audit Unit

In order to develop a knowledge management framework for the ERDF Audit Unit, an understanding of the knowledge elements of the unit is important. This section provides an overview of the ERDF Audit Unit in a knowledge context from the perspective of the people, process and technology as elements of knowledge management described in Section 2.4.

6.7.1 People

As discussed in Section 1.2, one of the Government's responses to the economic recession following the 'Celtic Tiger' in the mid to late 2000s was the establishment of the DPER in 2011.

The ERDF Audit Unit is currently in the Expenditure Management and EU Policy Division of the Department. Among other responsibilities, the Unit carries out audits on ERDF co-funded operations under the two regions in Ireland (BMW and S&E region) as described in Section 6.2.

There are currently six auditors, three managers, one senior manager and one support staff working in the Unit as shown in Figure 6.3.

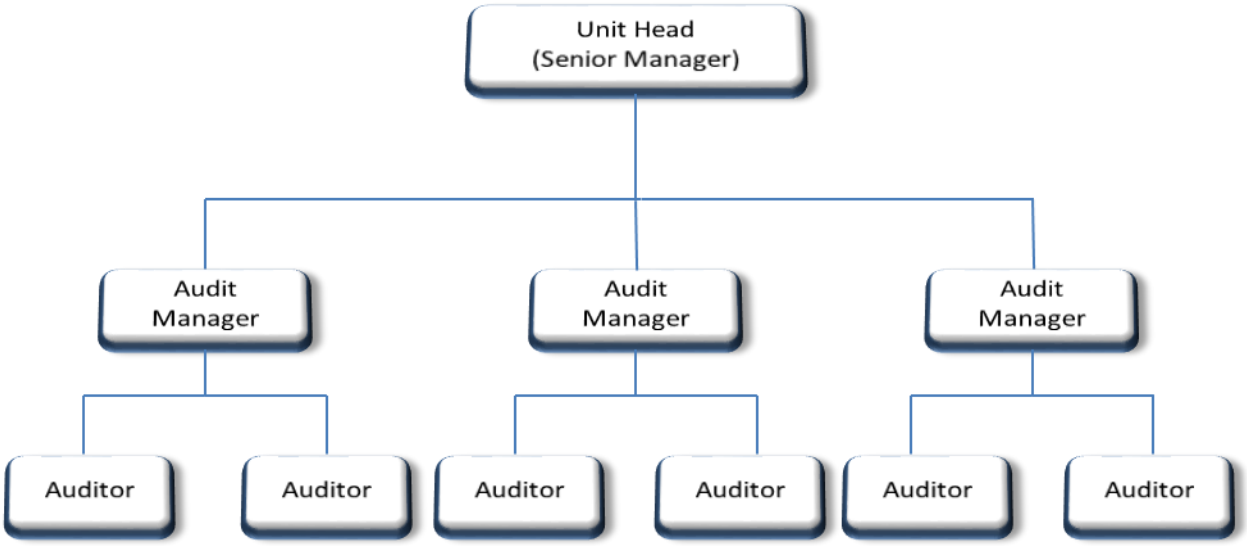


Figure 6.3: Organisational Chart

Although it is a relatively small Unit, it exhibits the hierarchical structure that is typical of Public Sector organisations as noted in chapter 4. The auditors carry out the audit of ERDF co-funded operations at the PBB premises within the two regions and have direct contact with the management and staff who implement the operation. Needless to say, they require considerable people management skills in addition to sound technical knowledge in order to carry out their work.

While there is a sizeable amount of explicit knowledge in the form of documents and procedures in place within and outside the Unit, the knowledge required for carrying out an

audit is relatively more tacit in nature. The tacit knowledge required is applied in the form of intuition and judgement on the part of the auditor in the process of carrying out different tasks such as documenting findings in relation to the audit tests carried out and also in preparing an audit file for the audit manager's review.

The audit managers are Assistant Principal Officers in the DPER. Although they do not usually have face-to-face interaction with the management and staff of the operation, they are responsible for reviewing the audit files and drawing conclusions from the work of the auditor. They then summarise their conclusions in an audit report to be sent to the operation management. Apart from applying knowledge gained from explicit sources, audit managers also apply tacit knowledge from experience. In addition, over time, the audit managers would have recognised individual report writing style, organisation of work and other patterns that are specific to the different auditors and apply a certain amount of tacit knowledge to tweak their approach to ensure consistency when reviewing each auditor's work accordingly.

The Unit head is a Principal Officer in the DPER and has the ultimate responsibility for the opinions expressed in all of the audit reports. In addition to knowledge intensive people management and work coordination skills, he applies judgement and experience in relation to high-level decisions that are required in his role as the head of the designated Audit Authority of ERDF in Ireland. He reports an audit opinion annually to the European Commission based on the consolidated results of the operation audits carried out during the year.

6.7.2 Process

As indicated in Section 1.1, some knowledge sharing and collaboration already exists in the Unit. Besides the application of knowledge contained in the guidelines, circulars and other reference documents, knowledge management has been built into some of the processes in the Unit.

For example, all the electronic audit files created for each operation audited are stored on a network drive to ensure that everyone in the unit has access to all the existing files for reference. In addition, these audit files are organised in folders that correspond to the year of the audit and the region of the operation as shown in Figure 6.4, for ease in locating a particular audit file.

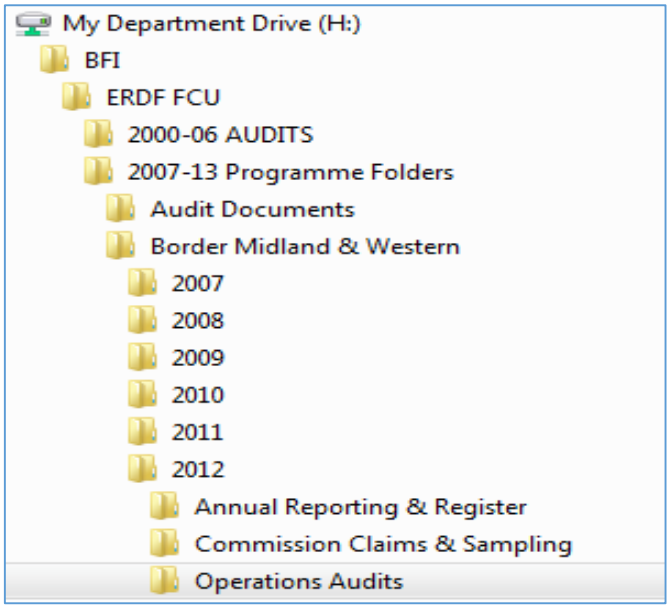


Figure 6.4: Organisation of Audit Folders

Another process in which knowledge management has been embedded in the unit is the use of 'operations audit registers.' The operation audit register is a spread sheet document which is created annually to monitor the progress of all the audits to be carried out by the Unit. The fields of the register and the updates to the register at different stages as the audit progresses are shown in Table 6.3. The table also gives a description of the knowledge context of each field on the register. This dynamic process provides the status of a particular audit at any point in time as well as the overall picture of all the audits carried out during the year.

Knowledge management is also embedded in the audit allocation process whereby the manager responsible for allocating audit operations to auditors and managers considers a number of factors when allocating operations to auditors as described in Section 6.4.

6.7.3 Technology

Although an elaborate use of technology for KM does not exist in the Unit, the use of emails and shared folders have contributed to the storage, retrieval and transfer of knowledge. Section 2.4 discusses technology as an element of KM and notes the position of Hylton (2002) that knowledge management is more about people using technology to enable more efficient processes. The use of audit registers and shared folders described in Section 6.6 are classic examples of this position as they enhance knowledge sharing in the Unit, albeit at a basic level. It is also not uncommon to use emails to disseminate information about a new European Commission or National guideline, or to distribute an update to existing

documents. An individual may even provide a summary of new knowledge gained from a training course to colleagues by email.

While these examples indicate awareness and attempts at sharing knowledge in the Unit, they also highlight potential issues such as lack of co-ordination of knowledge, multiple and/or conflicting versions of a document, inefficiencies accessing and retrieving knowledge and other issues that are typical in an environment where formal KM systems are not in place.

Although it appears from the foregoing, that there is no formal KM tool in the Unit, the DPER has a number of collaboration tools in place. The tool that appears to be particularly relevant and applicable for use in the ERDF Audit Unit, and consequently, relevant to this research will be discussed in detail in subsequent chapters.

6.8 Conclusion

In addition to providing background information about ERDF co-funding in Ireland, this chapter explained the activities involved in carrying out an audit of the co-funded operations. Emphasis was laid on the audit tests relating to the eligibility of expenditure for ERDF co-funding, having been identified as a core-process of the ERDF Audit Unit.

An overview of the electronic folders holding the relevant files for this core-process was also covered in this chapter, in addition to an overview of the ERDF Audit Unit in a knowledge context from the perspective of the people, process and technology elements of knowledge management.

The discussion in this chapter has been considered in the selection of the knowledge audit approach which is described in details in the next chapter.

7 KNOWLEDGE AUDIT OF THE ERDF AUDIT UNIT

7.1 Introduction

It is a coincidence that the word 'audit' appears in the name of the target group for this research; the knowledge audit is being performed on a Unit (department) which itself carries out audits on ERDF co-funded operations.

This chapter gives a detailed description of the knowledge audit approach that was adopted as described in the Chapter 5, explicating the reasoning behind the choice of the core-process selected for this research. It describes the steps taken in carrying out the audit survey, the selection of the respondents, interaction with them as well as the mode of administering the questionnaires.

It also outlines the composition of the knowledge audit questionnaire that was administered with an explanation of the logic behind the questions and their relevance to the interview process and the knowledge management framework for the ERDF Audit Unit.

Finally, this chapter concludes with a discussion of the knowledge elicitation interviews and knowledge acquisition processes that were used to capture the relevant tacit and explicit knowledge in the Unit.

7.2 Audience and Approach

There were ten technical staff in the ERDF Audit Unit at the time of the knowledge audit and it was decided to include all ten in the survey due to the small number of individuals and also in order to get as close to a complete set of results as possible. These individuals include male and female, top management and middle management staff of different ages and academic background.

As discussed in Section 5.5, the suggestion of Cheung *et al.* (2004) was adopted and a pre-audit preparation was carried out before the knowledge audit questionnaire was administered. Each of the individuals that were selected for participation in the survey was approached in order to seek their support for the knowledge audit. Most of the interaction with these individuals was kept informal and random due to the individuals' tight schedules and limited availability.

In addition, since a formal knowledge elicitation interview is still planned for a later stage in this research, it seemed appropriate to hold off formal interactions until then. The general impression gathered at the end of these discussions was that majority of the individuals were open to the idea of a knowledge audit in the Unit.

7.3 Scope of Audit

As described in Section 5.5, the approaches of Hylton (2002) and Perez-Soltero *et al.* (2007) were adopted and the knowledge audit was carried out on one of the core activities of an operations audit, i.e. the testing of expenditure eligibility.

The choice of this activity for the knowledge audit process was informed by the informal discussions with the individuals in the Unit. When asked about which aspect they considered as being the most critical activity during an operations audit and the common theme that emerged was the testing of eligibility of expenditure. The individuals suggested that majority of the audit findings or exceptions arising in an audit report are in relation to issues with eligibility.

In addition, a review of the Annual Control Reports for 2011 and 2012 also showed that more than seventy per cent of the audit findings relate to issues arising from eligibility of expenditure.

The individuals also highlighted the depth of knowledge, personal experience and judgement involved in this aspect of an audit and indicated that they would welcome an initiative that would be capable of making the requisite knowledge more visible in the Unit.

7.4 Distribution and Collection

The knowledge audit questionnaires were distributed by an email that was sent ‘to’ the head of the Unit who had given the permission to use the Unit as the target organisation for this research, and ‘copied’ to the sender’s address. All the other nine respondents were ‘blind copied’ on the email so that each respondent would not be able to determine the other respondents from the email distribution list. This was however, not achieved as four out of the completed questionnaires were sent together as hard copies in a single envelope. This observation will be discussed in the relevant analysis section of the next chapter.

The email was sent on 7th November 2013 and respondents were asked to return the completed questionnaires at their earliest convenience. Nine out of the ten questionnaires distributed were completed and returned. As mentioned above, four were returned as hardcopies on 13th November 2013 and the other five returned by email on 7th and 8th November 2013.

The prompt response of the individuals is also considered as another significant evidence of their support for the knowledge audit and their openness to the development of a framework for knowledge management in the Unit.

7.5 Development of the Questionnaire

Trainmore-Knowmore Partners (2008) proposed a general model for implementing a knowledge audit process. This general model could not be used directly for the purpose of this research as most of the questions were not suited to an audit organisation. The questions were adapted to make them relevant to the proposed respondents and to suit the purpose of proposing a framework for knowledge management in the ERDF Audit Unit. These questions were structured in such a way as to enable the assignment of discrete values to the responses for ease of cataloguing and analysing the results which will be discussed in details in the next chapter. In most cases, the respondents were asked to select from a Likert scale of 1 to 5.

In addition to adapting the questions to suit the ERDF Audit, the sequence of the different sections of the questionnaire was also adjusted so that rather than having the respondents supply their demographic data at the initial stages of the questionnaire, this section was moved to the end and was tagged optional. This was done in order to encourage the respondents to answer the questions in the other sections in the knowledge that their demographic data was required only to the extent that they were comfortable enough to provide it.

In addition, the draft questionnaire was subjected to the following four main review stages.

1. It was first reviewed by an independent senior manager from an unrelated organisation who was considered to have excellent attention to details and is very experienced in the review of documents and reports from a professional perspective. This was done in order to ascertain the sense-making and logical flow of the questions and the sections.

2. The resulting updated draft was then reviewed by one of the audit managers in the Unit to ensure that the most critical aspects of the eligibility testing process have been reflected in the questionnaire.
3. Further editing was done and the updated questionnaire was also reviewed by another independent individual, who had just completed an M.Sc. in an unrelated discipline. This was done in an attempt to filter out any 'knowledge management' related terminology which may not be easily understood by the proposed questionnaire respondents.
4. The edited draft was reviewed by the supervisor of this research before it was issued to the respondents.

This final version of the questionnaire is included as Appendix A.

7.6 Composition of the Knowledge Audit Survey

This section describes the different parts of the questionnaire and as a follow on from the literature reviewed in earlier chapters, it discusses the rationale behind the questions that have been included.

Structure of Knowledge Audit	
Section A	Work Analysis
Section B	Knowledge and Information Sources
Section C	Organisational Culture
Section D	Motivation
Section E	Knowledge Management in the ERDF Audit Unit
Section F	Personal Knowledge Profile
Section G	Demographic Data

Table 7.1: Structure of Knowledge Audit

7.6.1 Section A: Work Analysis

This section presents three questions to the respondents. The first question tries to assess the relative amount of time that the respondents spend on each of the activities involved in the testing of eligibility of expenditure during an ERDF operations audit. Analysis of the responses to this question will provide an estimate of where the individual's effort is spent.

This is an important consideration as it indicates the candidate areas for focus during the development of a knowledge management system.

As discussed in Section 4.2, highly structured and formally defined hierarchies are typical in Public Sector organisations and according to Riege (2005), discussed in Section 3.4 this stifles creativity and constrains knowledge sharing. The second question in this section therefore aims to identify the frequency of communication within and between the different levels in the Unit.

In the development of a knowledge management framework for the ERDF Audit Unit, the responses to this question will be considered in line with the argument of Nonaka *et al.* (2000) discussed in Section 3.4, that the introduction of redundant information may reduce the impact of managerial hierarchy.

The final question in this section addresses the 'what', 'how', 'who' and 'where' knowledge issues that may arise during the testing of eligibility of expenditure. This will highlight the knowledge gaps that exist in the Unit and will also indicate the area of focus during the development of a knowledge library.

7.6.2 Section B: Knowledge and Information Sources

The first question in this section tries to assess the usefulness of the existing explicit knowledge resources in the Unit. The responses will indicate the relative importance of each of the sources. In addition, Section 3.5 notes that knowledge management deals with making knowledge visible, accessible, useable and applicable as and when required for the benefit of the organisation. These sources of explicit knowledge will be collected to develop a base knowledge library described in Section 1.4 for the knowledge management system that will be proposed as part of this research to make the knowledge visible and easily accessible to the individuals in the ERDF Audit Unit.

The next two questions aim to rank the usefulness and frequency of some of the possible social interactions between individuals in the Unit as well as with external parties. As discussed in Section 3.4, these forms of interactions are identified by Davenport and Prusak (1998) as having the potential to foster social relationships between colleagues and may lead to the transfer of knowledge.

7.6.3 Section C: Organisational Culture

The aim of the questions in this section is to assess the cultural elements and the physical work environment in the ERDF Audit Unit that will be considered in the framework for knowledge management in the Unit.

As discussed in Section 3.4, Davenport and Prusak (1998) as well as Tiwana (2002) highlight the importance of trust in the success of a knowledge management initiative. The first question in this section tries to assess the respondents' perception of management's recognition of their knowledge, individuals' dedication to the Unit, team-work, co-operation, confidence and trust among staff as well as barriers to effective communication in the Unit.

Section 3.4 also discusses the importance of job security in knowledge management as noted by Stenmark (2001) and Skyrme (2008). The second question is concerned with the respondent's level of satisfaction with the current work situation in the area of their work tasks, salary, job security, work environment and relationship with colleagues.

In addition, as highlighted in Section 3.4, Riege (2005) notes that where mistakes and failures are punished rather than highlighted as a learning experience, an employee may not be interested in looking for and applying new ideas. The third question tries to assess organisational culture as it relates to learning in the Unit as well as how the respondents generally perceive learning and knowledge sharing.

Section 3.4 notes that random and informal discussions need to be encouraged as they have the potential to foster social relationships between colleagues and may lead to the transfer of knowledge as highlighted by Davenport and Prusak (1998). Section 3.4 also discusses the need for managerial direction evidenced by an attitude of long-term commitment and support for the process of developing a knowledge sharing culture in the organisation. The final question focuses on the assessment of the organisational culture in the Unit especially in the area of attitudes and resources that can facilitate informal, open and random discussions.

All the organisational culture elements addressed in this section are considered to be particularly important for the sharing of tacit knowledge in the Unit and the responses will indicate the likely barriers that the knowledge sharing culture in the Unit may present when a knowledge management system is deployed.

7.6.4 Section D: Motivation

This section seeks to identify the other types of motivation that could be given to individuals in order to improve knowledge management in the Unit. The ERDF Audit Unit is a section within a Civil Service Government Department and therefore has fixed and pre-determined grade structures with equivalent salary structures and little scope for change as discussed in Section 4.2. The question relating to salary policy in the general questionnaire model proposed by Trainmore-Knowmore Partners (2008) was therefore not included in the audit questionnaire.

The question in this section asked the respondents to rank their level of agreement with the introduction of a list of non-monetary incentives for knowledge sharing in the ERDF Audit Unit. The analysis of the responses to this question will identify the incentives that are desirable by the individuals and this will be included in the knowledge audit report with a view to empowering management within the Unit to introduce the relevant incentive as appropriate.

7.6.5 Section E: Knowledge Management in the ERDF Audit Unit

As discussed in Section 3.4, the factors affecting knowledge management could be three-fold: people, process and technology related. Both questions in this section aim to identify the people, process and technology related factors that could affect knowledge management in the ERDF Audit Unit. These factors are considered to be very important to the development of a framework for knowledge management in ERDF Audit as they directly point to the fundamental elements that must be considered as well as those elements that must be eliminated.

In line with the discussions surrounding the management of resistance to change discussed in Section 3.4, the questions in this section are structured to ask for the respondent's point of view if empowered to control the knowledge management resources of the Unit. As suggested by Riege (2005), it is believed that this approach will minimise the possible resistance to any knowledge management initiative that will be deployed.

As discussed in Section 3.2, a typical knowledge management framework will consist of knowledge creation, knowledge storage and retrieval, knowledge transfer and knowledge application. The first question asked the respondents for an indication of how far they would pursue certain actions that could support these components of a knowledge management

framework in the area of communication, information flow, electronic files, change of culture and people.

The second question was asked from the point of view of likely barriers to the success of knowledge management initiative, assuming that a company policy exists in relation to knowledge sharing in the Unit.

7.6.6 Section F: Personal Knowledge Profile

This section was designed to collect information that could help to profile the personal knowledge of the respondents as well as to determine the general awareness of others' personal knowledge within the Unit. There are four questions in this section, the first of which records the level of education of the respondents.

The second question asks the respondents to rank their level of skills in relation to Microsoft Office and basic computer skills. It also asks the respondents to rank their level of skills in relation to the interpretation and application of the National Eligibility rules outlined in Circular 16/2008. This is the major regulatory document guiding the testing of eligibility of expenditure for ERDF co-funded operations in Ireland. Being perhaps, the most important source of explicit knowledge for the testing of eligibility of expenditure during an ERDF audit, the auditor's understanding, interpretation and application of the 17 rules detailed in the circular is considered critical.

The third question asks the respondents the extent to which they agree that the theoretical knowledge from their education, the practical knowledge from their work experience and their personal business networking could be useful for both their own work as well as the work of their colleagues.

The last question in this section records how the respondents perceive their colleagues' awareness of their entire educational achievements, professional experience and personal business contacts. These questions are considered to be very important because they highlight whether or not the individuals are aware of who the knowledge producers and the knowledge consumers within the Unit are.

7.6.7 Section G: Demographic Data

As mentioned earlier on in this chapter, the questions in this section were left to the latter part of the questionnaire and the respondents were asked to answer the questions only if they wished to.

This section was intended to collect the demographic details of the respondents and it includes questions about their age, gender, grade at work and years of work experience, both in the ERDF Audit Unit and prior to that. The questions are considered to be very important because the responses will be used at the analysis stage to stratify the data into headings such as men, women, manager, employee, years of experience, etc. This will be done in order to highlight the similarities or differences between the responses from these groups of individuals.

7.7 Knowledge Elicitation and Acquisition

This section outlines the knowledge elicitation and knowledge acquisition activities carried out as part of the efforts towards the development of a knowledge management framework for the ERDF Audit Unit. As discussed in Chapter 5, the interview phase in the approach suggested by Cheung *et al.* (2004) builds the logic behind the questionnaire into the interviews. Face-to-face interviews with some of the individuals that took part in the questionnaire survey are considered to be an important activity in the development of a framework for KM in ERDF Audit and the main objectives of the interviews were to take stock of both tacit and explicit knowledge existing in the Unit and to obtain information on to how to organise the knowledge and make it accessible to all the individuals in the Unit.

Three individuals were selected for interview, one manager and two auditors. The interviews were conducted on 4th December 2013, each lasting between thirty and forty-five minutes.

The interviews were semi-structured with only a small number of questions. It was intended to allow the candidates decide to a large extent, what items or topics they would like the interview to include. This was done in order to give some structure to the interviews and at the same time, leave enough room for both the interviewer and the interviewees to manoeuvre around topics that could come up during the discussion.

Firstly, each interview candidate was asked to describe the activities involved in the audit of expenditure eligibility. The aim of this question was to identify any activity that may have been omitted from section A of the knowledge audit questionnaire. This question was also intended to spark up conversation around the need for documented procedures or a knowledge map or other methods of explicating the tacit knowledge required for the activities.

Next they were asked to identify the documents required for the testing of eligibility of expenditure. Section 5.3 discusses the importance of identifying and assessing both tacit and explicit knowledge for the development of a knowledge management initiative. The aim of this question is to assist in the assessment of existing explicit knowledge in the organisation. As noted by Che Pa *et al.* (2012) in Section 5.3, this assessment will identify issues such as knowledge gaps, inconsistencies and duplications.

The third interview question relates to the identification of tacit knowledge sources, i.e. the knowledge producers within and outside the unit. This question was intended to generate more conversation around the individuals that would be often contacted when unfamiliar situations arise during an audit. The three-card-trick was also used to help the candidates match individuals with the relevant knowledge areas.

7.8 Conclusion

This chapter detailed the approach adopted for conducting the knowledge audit, the development of the questionnaire as well as a detailed description of the seven sections of the knowledge audit questionnaire explaining the rationale behind each question.

The concluding section of this chapter briefly discussed the knowledge elicitation interviews and the knowledge acquisition activities. The analysis of these activities and the responses to the knowledge audit questionnaire will be covered in the following chapter as the next step in the process of developing a framework for knowledge management in the ERDF Audit Unit.

8 ANALYSIS OF KNOWLEDGE AUDIT

8.1 Introduction

Following the distribution of the knowledge audit questionnaires explained in the previous chapter, a spreadsheet document to be used for analysing the responses was prepared and the process of this analysis and the process and that of collating the questionnaire responses are explained in this chapter.

The main focus of the chapter is the actual analysis of those responses. All the questions in each of the 7 sections of the questionnaire are analysed in light of the insights gained from the review of literature in previous chapters

All the analysis charts and graphs used for analysing the questionnaire responses are detailed in Appendix C. Only the most significant charts are selected and analysed in this chapter.

Finally, this chapter briefly discusses the issues raised during the interviews and discussions with individuals in the Unit.

8.2 Collation of Survey Responses

As discussed in the preceding chapter, a total of ten individuals were identified for participation in the survey. Nine out of the ten questionnaires administered were completed and returned, representing a ninety per cent response rate. This is seen as an indication of the willingness of the individuals in the ERDF Audit Unit to consider new developments.

It was also noted in Section 7.4 that four out of the nine survey responses were received as hard copies. Upon receipt, each completed questionnaire was given a reference number from 1 to 9, to serve as an index for ease of reference during the results analysis process.

Also, since the questionnaire was designed in a way to facilitate the assignment of discrete numbers to the responses, it was appropriate to record the responses using a spreadsheet application. A spreadsheet document with 23 separate worksheets was created to record the responses. The first worksheet labelled '*master*' contains the responses to the questions from all the respondents. Each of the remaining 22 worksheets is labelled to correspond with the questions in sections A to G of the questionnaire. The responses in each section are recorded

in the corresponding worksheet. The rows in the worksheets represent the questions and the columns represent each respondent. Refer to Appendix B for the collated survey responses.

8.3 Analysis of Knowledge Survey Responses

An analysis of the results of the knowledge audit survey was done using a spreadsheet as suggested by Henezel (2000). The findings from analysing all the responses were presented using charts and graphs the details of which can be found in Appendix C.

This section outlines only a few of the findings that are considered important for the development of a framework for KM in ERDF Audit.

8.3.1 Demographic Data

The analysis of responses in this section is considered very important because it can be used to further analyse the responses to questions in the other sections based on factors such as gender, age, grade, years of experience, etc. It would be interesting to see how the responses to the questions in other sections of the questionnaire differ across different demographics.

For example, if responsible for KM in the ERDF Unit, would managers focus more on communication than auditors, or would the managers focus more on change of culture than the auditors? These and other interesting analyses can be carried out based on the comprehensive list of charts and graphs in Appendix C.

In this section of the questionnaire, the respondents were given the choice of leaving the questions unanswered if they desired. This option proved to be welcome, as will be seen in the analysis of the responses in this section where only question 1 relating grade at work and question 5 relating to total years of experience were answered by all the respondents.

Question 3 asked the respondents to indicate whether they are male or female but only 5 out of the nine respondents answered as shown on the chart in Appendix C. Although the responses were highly anonymised as indicated above and highlighted to the respondents, it can be inferred from knowledge of the Unit that there are four females and six males. Due to the incompleteness of responses to this question, any analysis of the data by gender will not present a complete picture. In view of this, no gender analysis has been included in this research.

Also, question 4 asked the respondents to indicate their number of years of experience in the ERDF Audit Unit. Again, only 5 out of the 9 respondents answered this question as shown on

the charts in Appendix C. It is also noted that it is the same set of individuals that left both questions unanswered.

Question 2 asked the respondents to indicate their age bracket and as before, only 5 (55%) of the respondents answered this question as shown on the *Age Bracket* chart in Figure 8.1

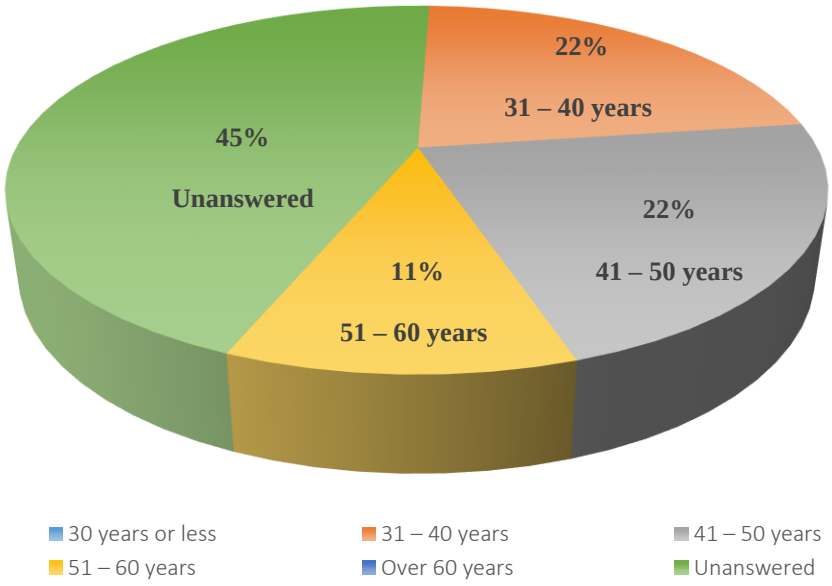


Figure 8.1: Age Bracket

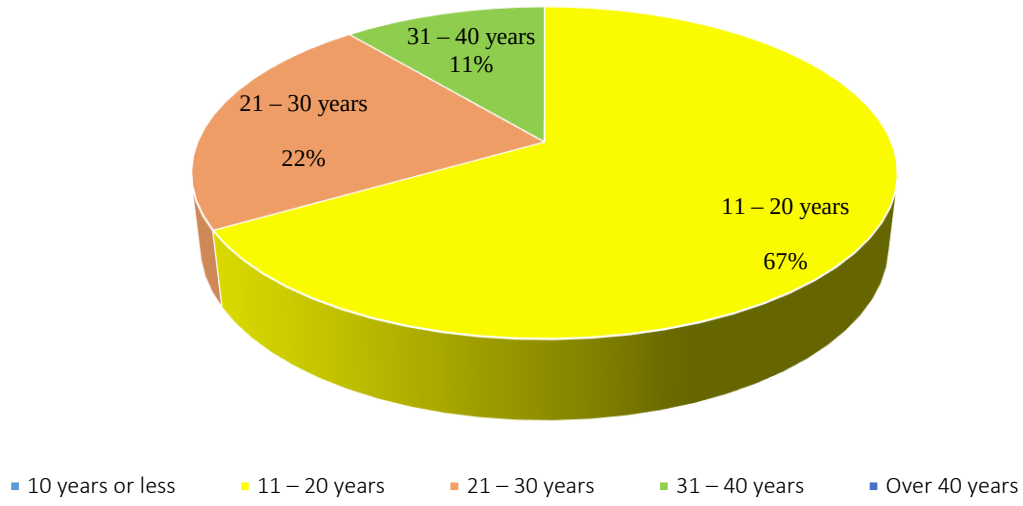


Figure 8.2: Years of Experience

The raw data for this *Age Bracket* chart in Figure 8.1 includes the age bracket *'30 years or less'*, to which none of the respondents belong. Although it is not possible to determine whether the respondents who did not answer this question may belong to this age bracket, the zero value compares with the *Years of Experience* chart in Figure 8.2, where 100% of the respondents have had at least 11years experience. That is to say that it is not possible to have had over 11 years work experience after a first degree and be less than 30 years old at the same time.

In addition, the raw data for the chart in Figure 8.1 also includes the age bracket *'over 60 years'* to which none of the respondents belong. This compares with the general situation in Public Sector Organisations in Ireland at present, where public servants usually retire between the ages of 60 and 65. Again, it is not certain that any of the individuals who did not answer the question may belong to this age bracket.

8.3.2 Personal Knowledge Profile

The analysis done in this section profiles the knowledge of the respondents in the area of their education, level of skills in some work requirements and their work experience to date. This section also assesses the respondents' gauge of their colleagues' awareness of their achievements in the three areas.

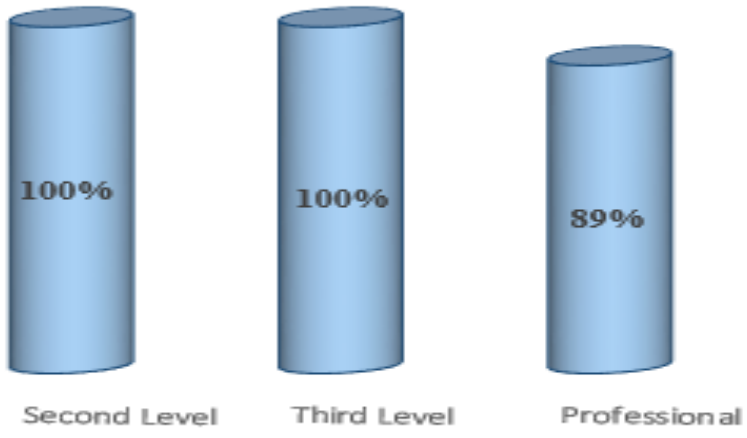


Figure 8.3: Level of Education

The respondents were asked to indicate whether they had attained second, third or a professional level of education as shown on the *Educational Achievement* chart in Figure 8.2.

The chart shows that 89% of the respondents have obtained a professional qualification in addition to second and third level education. This is suggestive of a career focus as indicated

in the *motivation* chart in Figure 8.20. This is also reflected on the knowledge gap chart in Figure 8.9 where an overall total of 86% of the respondents indicated *'never'* and *'rarely'* for the four knowledge areas considered.

A set of skill areas required for the testing of eligibility of expenditure was selected and the respondents were asked to rank their level of proficiency in those areas. The responses are depicted on the chart in Figure 8.4.

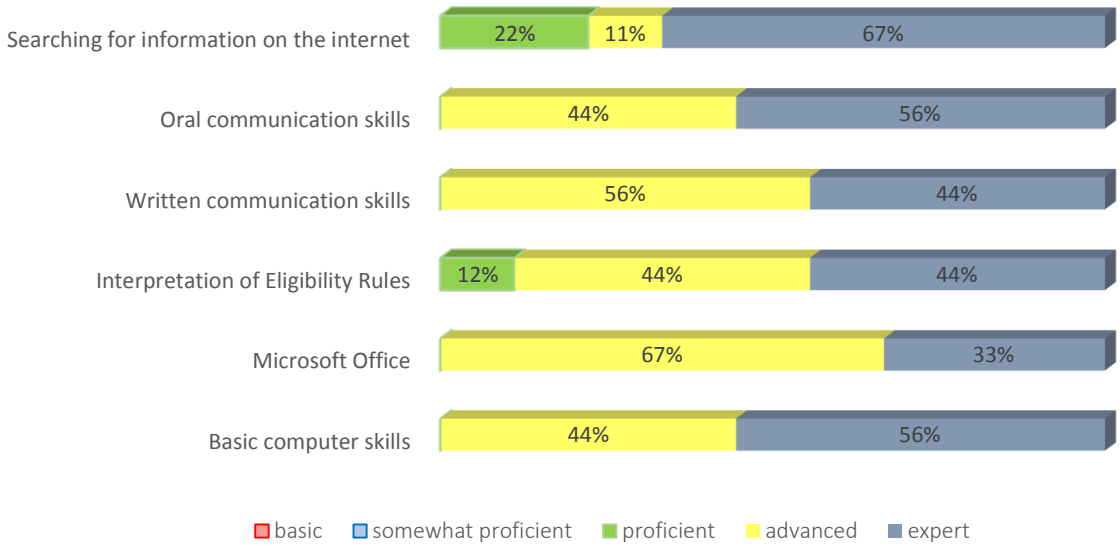


Figure 8.4: Levels of Skill

The chart shows that all the respondents have indicated that they are either expert or advanced in four out of the six skill areas considered. Of particular interest is the area of oral communication skills where 56% of the respondents consider themselves to be experts while the remaining 44% see themselves as advanced. It was pointed out in Section 3.4 that some of the situations that result in knowledge sharing within organisations include work related discussions among individuals and training sessions. Riege (2005) points out that communication skills determine employees' ability to share knowledge and oral communication is especially important for the transfer of tacit knowledge.

Also, for written communication skills, 44% of the respondents consider themselves to be experts while the remaining 56% see themselves as advanced. This is considered to be an important skill because 34% of the average time spent on testing of eligibility of expenditure

in ERDF Audit goes into the documentation of audit details and preparing a summary for the audit report (19% and 15% respectively) as shown on the *Average Time Spent on Different Audit Activities* chart in Figure 8.7.

Overall, a total of 94% of the respondents ranked themselves as either advanced or expert in the six areas of skills considered and none of these areas constitutes a potential barrier to effective KM in the Unit.

The next chart considers the usefulness of the respondents' personal knowledge from their work experience, both for their own work and for the work of their colleagues. It shows that for 55% of the individuals, the knowledge gained from their previous work experience is useful for their work and for their colleagues' work (44% agree and 11% strongly agree).

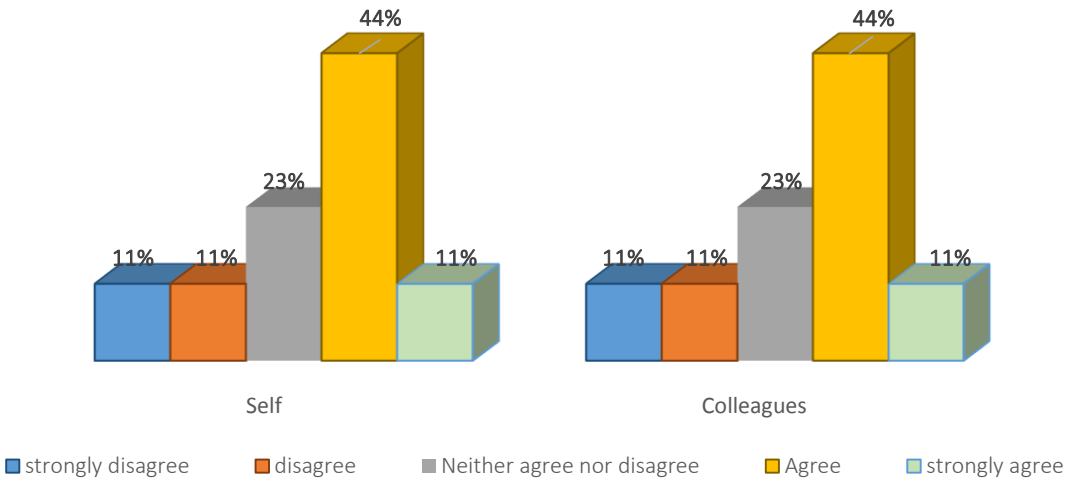


Figure 8.5: Usefulness of Knowledge from Work Experience

Also, from the additional analysis charts included in Appendix C, 44% of the respondents said knowledge from their education as well as knowledge from their personal contacts is useful for their work and the work of their colleagues.

However, the usefulness of the respondents' knowledge from education, experience and personal contacts draws attention to the next chart on *Colleagues' Awareness* in Figure 8.6. The chart shows that only 44% of the respondents agree (33% agree and 11% strongly agree) that their colleagues are aware of their knowledge from education and work experience. In

addition, the chart shows that none of the respondents agree that their colleagues are aware of their knowledge from personal contacts.

An electronic curriculum vitae (CV) may be useful in this situation, to serve as a source of information on individual knowledge profile. It is interesting to see in Figure 8.21 that 66% of the respondents agree that they would introduce an electronic CV if they were responsible for KM in the Unit. The use of an electronic CV will be considered in the framework for KM in the Unit.

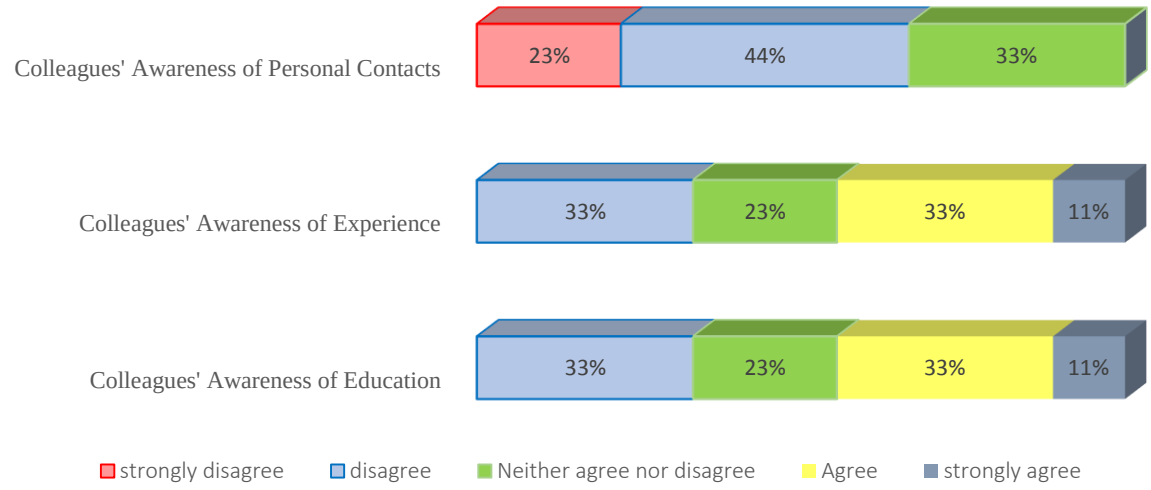


Figure 8.6: Colleagues' Awareness

8.3.3 Work Analysis

This section analyses the testing of eligibility of expenditure during an audit in a knowledge context.

The first question asked the individuals to allocate their work time between the different tasks in a typical audit assignment. The chart in Figure 8.7 shows the average responses to this question.

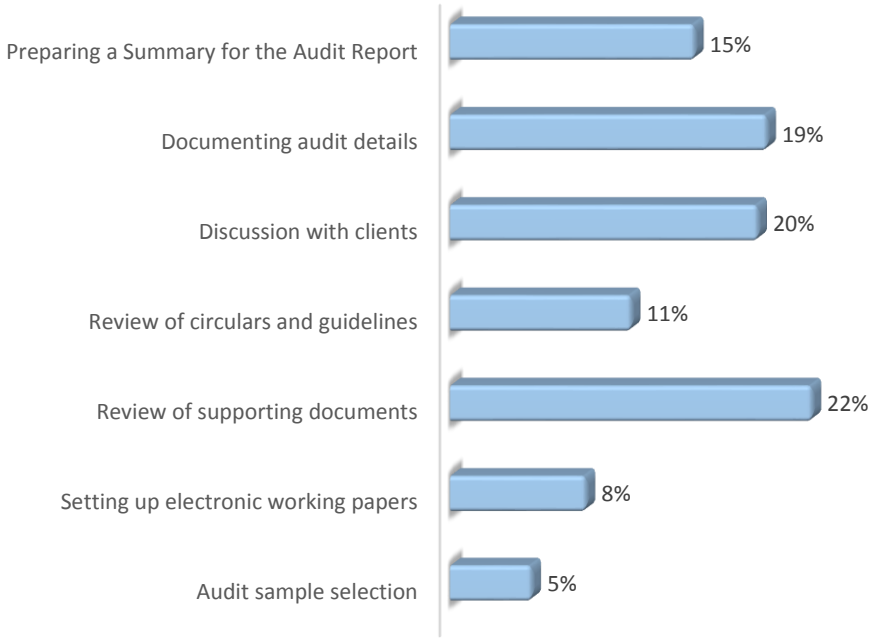


Figure 8.7: Average Time Spent on Audit Activities

In addition to showing how much time is spent on the activities required during the testing of expenditure eligibility, the chart in also gives an indication of the relative time spent on those tasks that require tacit knowledge as opposed to those that require explicit knowledge.

The analysis shows that individuals spend the least amount of time selecting an audit sample (5%), setting up electronic working papers (8%) and reviewing circulars and guidelines (11%). From discussions with staff in the Unit and from the interview responses, it appears that there are documented procedures for carrying out these activities and the knowledge required is therefore explicit rather than tacit by nature.

On the other hand, the review of supporting documents (22%), discussion with clients (20%), documenting audit details (19%) and preparation of a summary for the audit report (15%) are the activities on which individuals spend the more time. The interview responses also suggest that these activities require a high level of experience which in turn is considered to be an important index of tacit knowledge.

Since the individuals in the Unit spend more time on those audit tasks that require tacit knowledge, it is necessary to find ways of explicating this knowledge and making it available for use as required by everyone in the Unit. This will be highlighted as an area of focus in the framework for KM in ERDF Audit.

The second question asked the respondents to indicate how often they communicate with their co-workers at different grades. The chart in Figure 8.8 shows the comparative average levels of communication across the grades in the Unit.

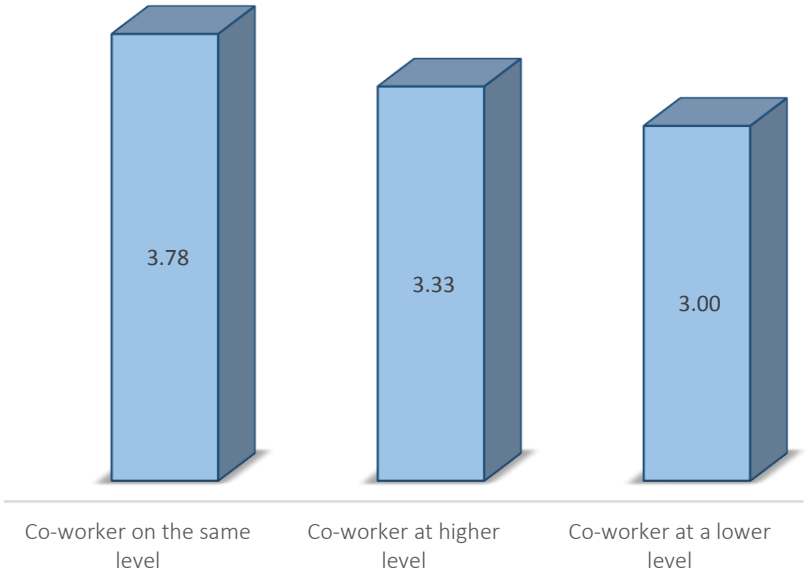


Figure 8.8: Communication with Co-workers

Although there is only a marginal difference between the three bars in Figure 8.8, on average, the respondents communicate more often with co-workers on the same grade than with co-workers on a higher grade or on a lower grade. The chart also shows that the communication between individuals across all grades in the Unit is below the 'often' and 'always' bracket. This is in line with the observation of Riege (2005), discussed in Section 3.4, that the highly structured and formally defined hierarchies that are typical in Public Sector organisations may constrain knowledge sharing. One of the ways in which this features in the ERDF Audit Unit is in the seating arrangements where managers have separate individual rooms and the other staff seat in shared offices. Even more significant is that the Unit is in two geographical locations, one in Dublin and the other in Tullamore.

The introduction of redundant information as suggested by Nonaka et al. (2000) will be considered in the development of a framework for KM in the Unit in order to reduce the impact of managerial hierarchy.

The third question in this section assesses the possible knowledge gaps that may exist in the Unit as a result of knowledge-related scenarios that may arise during the testing of eligibility of expenditure.

Each bar of the chart in Figure 8.9 represents a knowledge-related scenario that could suggest a knowledge gap in the Unit and the segments of bar represent the percentage of responses for the categories shown in the chart legend.

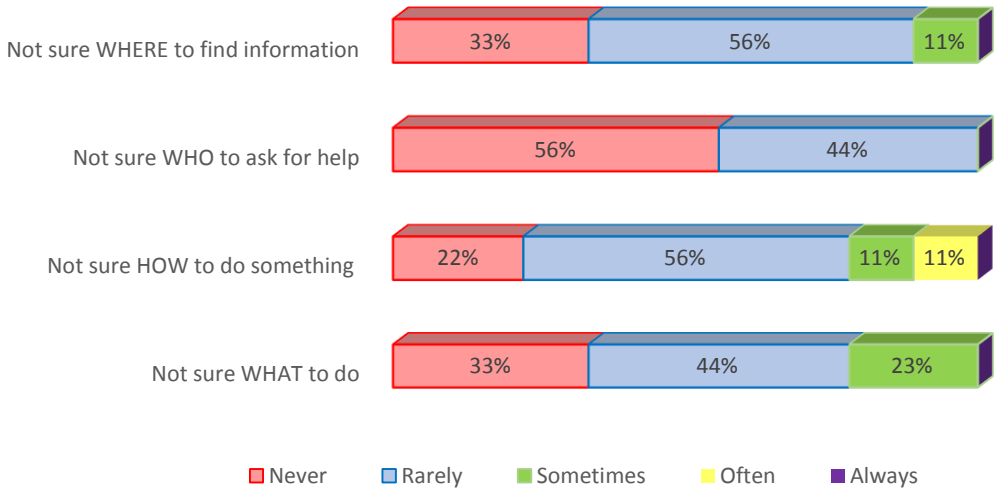


Figure 8.9: Knowledge Gap

Although the *HOW* bar shows that 22% of the respondents (11% often and 11% sometimes) exhibit a gap in the knowledge of how to carry out a task, all the respondents know who to ask for help as shown on the *WHO* bar (56% never and 44% rarely). This indicates that the knowledge producers for the purpose of auditing the eligibility of expenditure in the Unit are known.

The knowledge gap in the Unit is relatively small and as mentioned in the analysis of the charts in Figure 8.3 and Figure 8.2, this may be a result of the experience and level of education of the individuals in the Unit.

8.3.4 Knowledge and Information Sources

This section deals with the different sources of both tacit and explicit knowledge in the Unit. Some examples of explicit knowledge sources were selected and the respondents were asked to indicate how often they use each of these sources of knowledge for the audit of eligibility of expenditure.

Each bar of the chart in Figure 8.10 represents one source of explicit knowledge and the segments of the bar represent the percentage of responses for the categories shown in the chart legend.

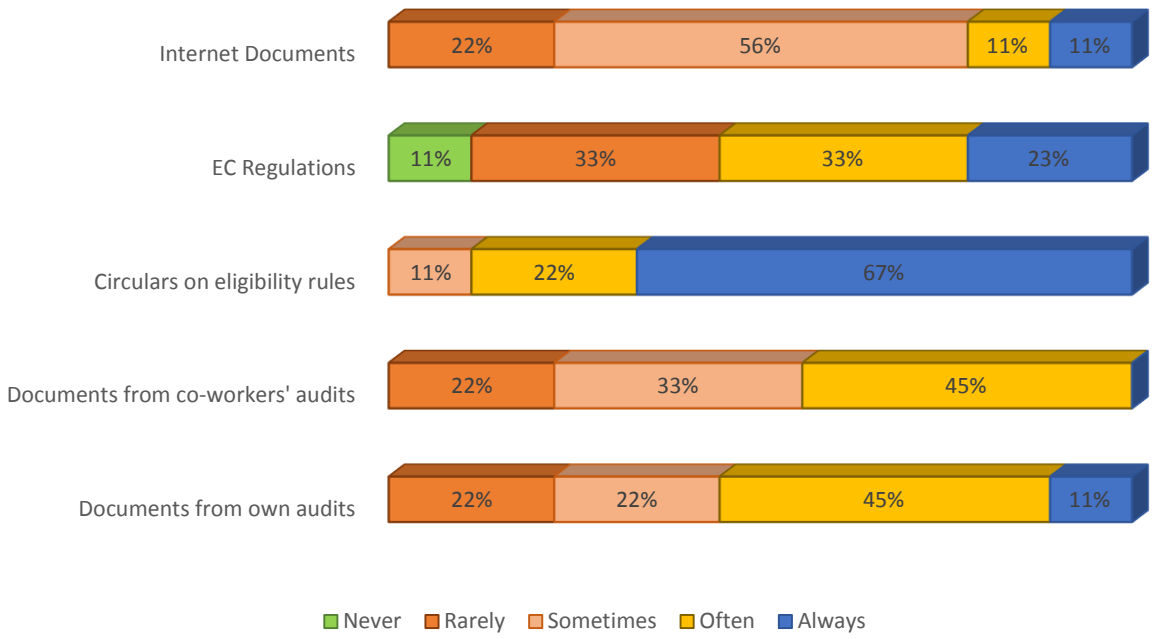


Figure 8.10: Knowledge and Information Sources

The chart shows that a total of 89% of the respondents indicated that the circulars containing the rules for eligibility of expenditure are the most frequently used source of explicit knowledge in the Unit (67% always and 22% often). The next most important documents are the EC Regulations and the individual's own audit documents where a total of 56% of the respondents indicate that they *always* or *often* refer to these documents.

It is also notable that on average, the respondents use documents from their own audits as well as those from a colleague's audit, with a marginal difference of only 11% (56% use own documents *often* and *always* while 45% use colleagues' documents *often*).

The next two questions in this section relate to some social interactions between individuals and the preferred channel of knowledge exchange, as a potential means of fostering the transfer of tacit knowledge.

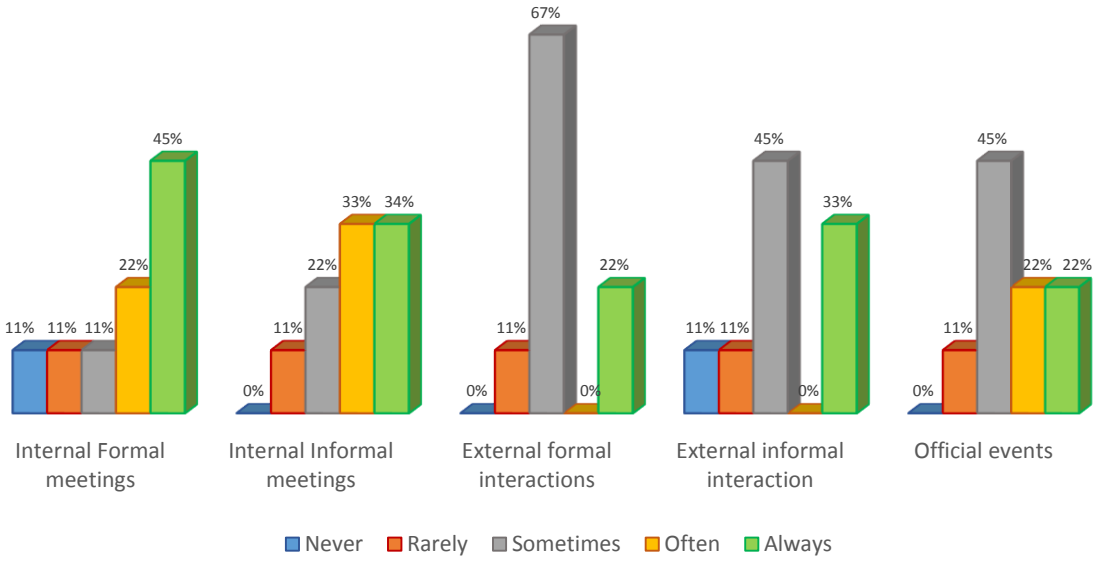


Figure 8.11: Social Interactions

The chart in Figure 8.11 shows that 67% of the respondents indicated that they often or always participate in internal formal and informal meetings. It is however interesting to find on the chart in Figure 8.12 that only 11% of the respondents will always ask their colleagues for knowledge relating to testing eligibility of expenditure at these meetings. As discussed in Section 4.4, good team dynamics where team members are not afraid to admit ignorance has to be in place before learning can occur.

It was discussed in Section 3.4 that Davenport and Prusak (1998) identified these forms of interaction as having the potential to foster social relationships between colleagues and may lead to the transfer of knowledge. This is not the case in the Unit and will be a consideration in the development of a framework for KM in ERDF Audit.

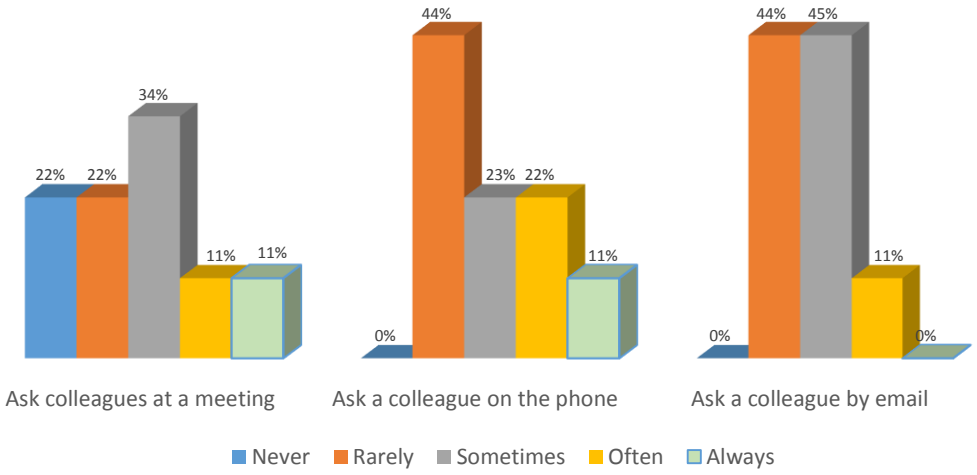


Figure 8.12: Mode of Communication

Figure 8.12 shows how often individuals will ask their colleague at a meeting, on the phone or by email when trying to gain knowledge for auditing eligibility of expenditure. On average, asking a colleague by email is the least popular with only 11% of the respondents indicating that they would often ask a colleague by email, 22% will ask at a meeting and 33% will ask over the phone.

Although having the Unit in two geographical locations may initially appear to contribute to the relatively infrequent request to share knowledge at meetings, the raw data for this chart shows that this is not the case. This is because only one individual in Dublin and one in Tullamore indicated that they would ask a colleague at a meeting.

It is possible that this is a result of the fact that the audits are conducted on-site on clients' premises and auditors are seldom in the office at the same time. If this was the case, then it would be expected that communication by phone would be far more frequent than communication in person at a meeting and by email. However, communication by phone is only marginally higher and this is especially surprising because the individuals all have mobile phone devices in addition to the conventional desktop phones in the office.

The possible factor that can be linked to the relatively low frequency of communication by email is the provisions of the *Freedom of Information Act* that allows external parties to request information on any matter of interest. There has been a relative increase in the requests received by Public Sector organisations in the recent past. This has resulted in a general reluctance of public servants to communicate in writing except where necessary.

8.3.5 Organisational Culture

An assessment of the culture and physical environment of the ERDF Audit Unit is considered important in the development of a framework for KM because it encompasses the attitudes and factors that have the potential to affect its success. In particular, the inherent knowledge sharing culture in the Unit needs to be understood before the complexities associated with the sharing of tacit knowledge can be addressed.

In order to assess the cultural elements in the Unit, the respondents were asked questions in the area of trust, cooperation, confidence and barriers to effective communication. They were also asked to indicate their perception of the dedication of staff and the recognition by management of their knowledge.

The chart in Figure 8.13 shows the responses of the individuals in the Unit to the question of the existence of confidence and trust amongst staff.

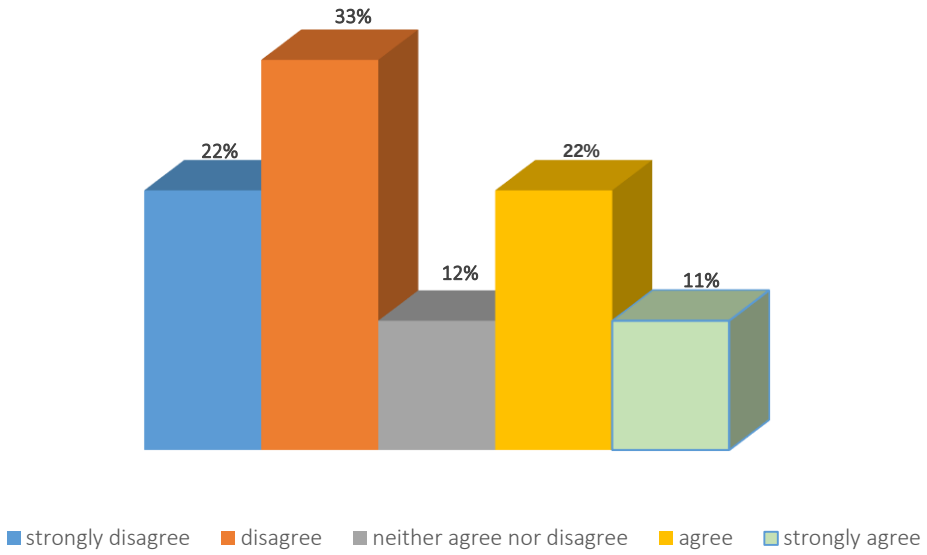


Figure 8.13: Confidence and Trust

55% of the respondents do not agree (22% strongly disagree and 33% disagree) that there is confidence and trust among staff in the Unit. The importance of trust was discussed in Section 3.4 as highlighted by Davenport and Prusak (1998) as well as Tiwana (2002). This is a strong factor that will be built into the KM framework. It could mean for example, that anonymity needs to be built into the KM system to remove the barriers posed by the lack of trust. It could also mean that an individual will be assigned to an analyst role as discussed in Section 2.7 in line with the suggestion of Zack (1999b). This individual will be responsible for reviewing and validating knowledge before it is published and made available for sharing.

The respondents were also asked to indicate their agreement regarding the existence of barriers to effective communication in the Unit and the responses are shown on the chart in Figure 8.14.

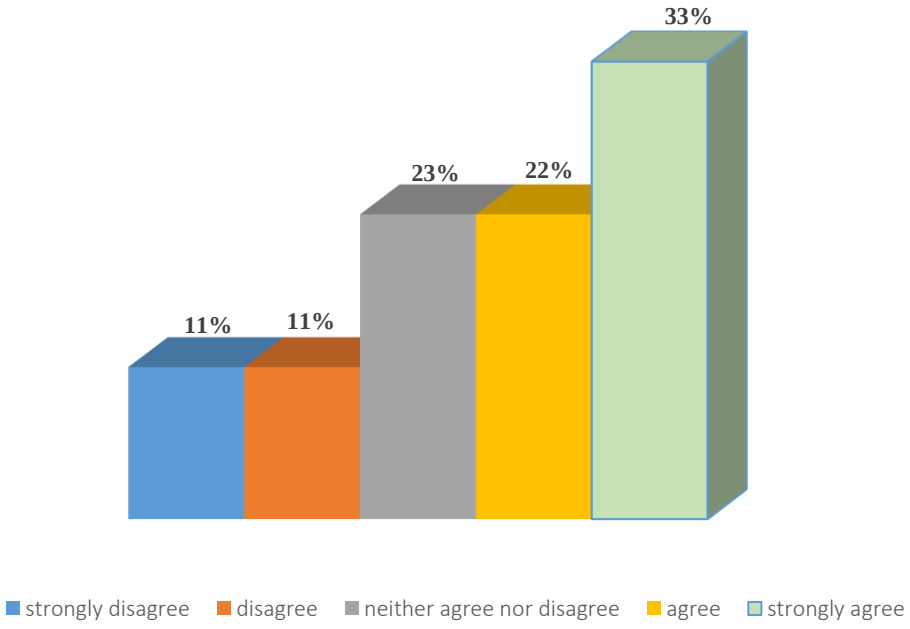


Figure 8.14: Barriers to Effective Communication

The chart shows that 55% of the respondents agree that there are barriers to effective communication in the Unit (33% strongly agree and 22% agree). This is in agreement with the *Communication* chart in Figure 8.8 which shows that communication in the Unit is highest between individuals on the same grade. Again, the barriers to effective communication in the Unit could be linked to the same factors identified earlier, i.e. the highly defined hierarchies suggested by Riege (2005), which typify Public Sector organisations. In particular, the possible contribution of the seating arrangement in the Unit as well as the location of the ERDF Audit Unit in Dublin as well as in Tullamore was explored during informal discussions with the individuals in the Unit and this will be discussed in greater details later on in this chapter.

Another question in this part of the questionnaire asked the respondents to indicate their level of agreement with the question of whether team-work and cooperation exists in the Unit. 44% of the respondents found it difficult to decide on whether to agree or disagree with this as shown on the chart in Figure 8.15.

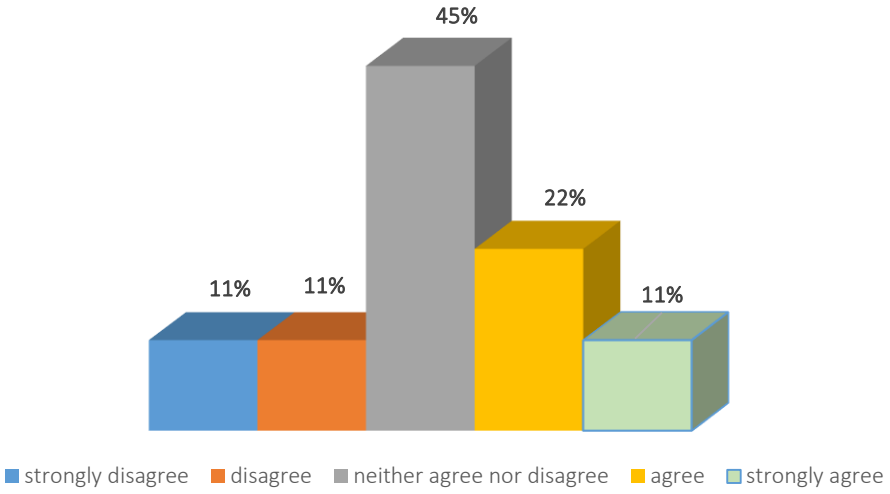


Figure 8.15: Team-work and Cooperation

The chart shows that there are 3 individuals (33% of the respondents) who agree that team-work and cooperation exists in the Unit. Even though there are only 2 other individuals who disagree on this, the majority are undecided. This is not surprising in light of the finding that 55% of the respondents agree that there are barriers to effective communication in the Unit as shown in Figure 8.14. Considering the *confidence and trust* chart in Figure 8.13, this is also not surprising as 55% of respondents disagree that there is confidence and trust among staff in the Unit.

Figure 8.16 shows the responses of the individuals to the question asking about the dedication of staff members to the Unit.

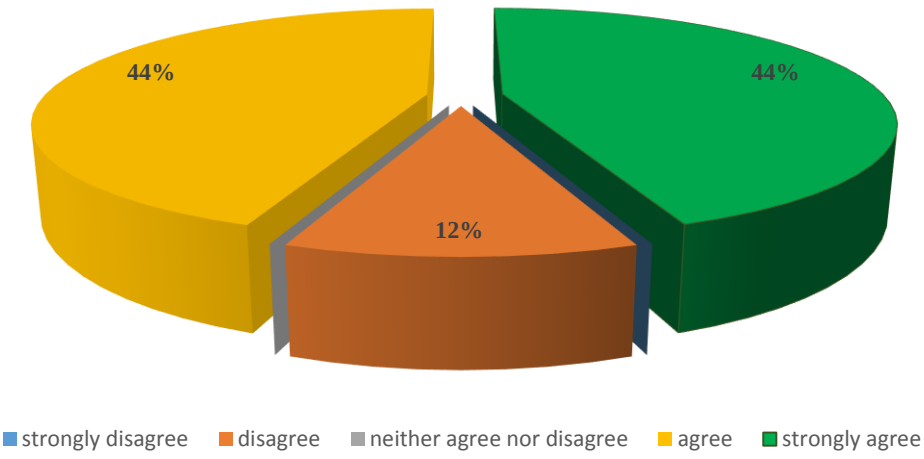


Figure 8.16: Dedication of Individuals to the Unit

88% of the respondents agree (44% strongly agree and 44% agree) that the individuals are dedicated to the Unit. Only one respondent indicated that the individuals in the Unit are not dedicated. It is interesting to note that the same respondent said that there is little cooperation and team-work in the Unit as shown in Figure 8.15.

The next chart in Figure 8.17 shows the average responses of the individuals to the question about their satisfaction levels in the area of their work tasks, salary, job security, work environment and relationship with colleagues.

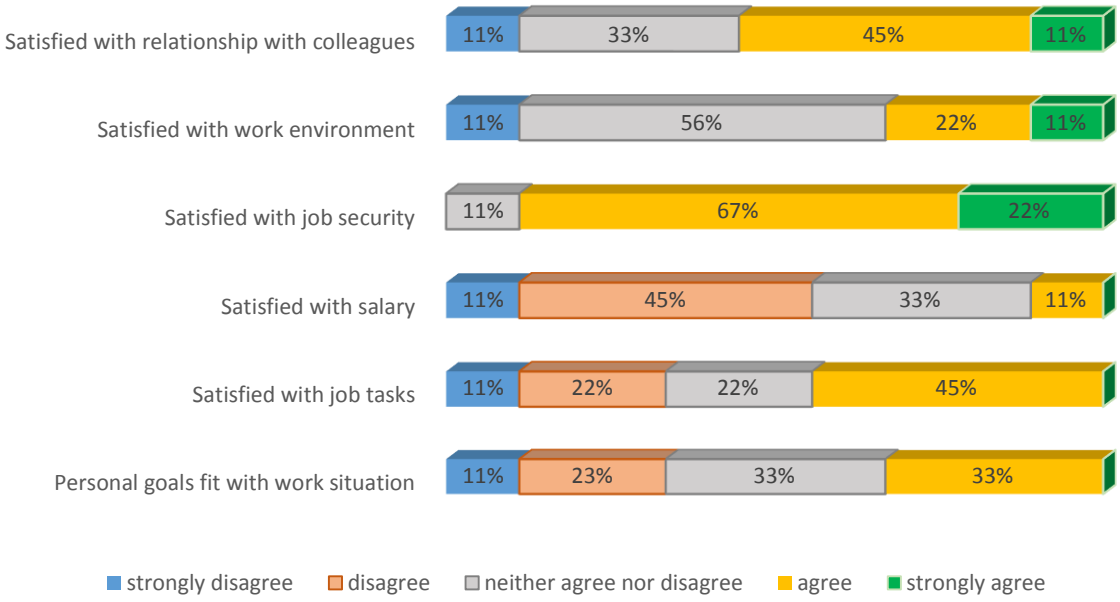


Figure 8.17: Satisfaction

The chart shows that 56% of the respondents are satisfied with their relationship with their colleagues (45% agree and 11% strongly agree). One of the respondents (11%) is not satisfied with their relationship with their colleagues.

The chart in Figure 8.13 shows that only 33% of the respondents (three individuals) agree that there is trust and confidence among staff in the Unit. The raw data shows that the three individuals that indicate that there is trust and confidence among staff are also included in the 56% that are satisfied with their relationship with their colleagues as shown in Figure 8.17.

It is however surprising to find that two individuals who are not managers indicated that there is a lack of trust and confidence among staff and at the same time, they are satisfied with the relationship they have with their colleagues. It raises the question of whether these

individuals will be willing to embrace changes that may be introduced to improve trust among staff in the Unit.

Also, it is not certain why 56% of the respondents are undecided regarding their satisfaction with the work environment in the Unit. Only 33% indicated that they are satisfied with the work environment and one respondent (11%) is not satisfied.

Section 3.4 discussed the importance of job security in KM as noted by Stenmark (2001) and Skyrme (2008). As expected in a Public Sector organisation, 8 out of the 9 respondents are satisfied with the job security. However, only one respondent is satisfied with their salary.

The responses in the area of alignment of personal goals with work situation shows an equal split between those who agree, those who are undecided and those who disagree (33% each).

From the charts in Figure 8.15 and Figure 8.16, it is noted that the same respondent indicated that there is little cooperation in the Unit and that members of the Unit are not dedicated. It appears that the responses from this particular respondent are significantly different from the responses of others in this section of the questionnaire. While the average response from others ranges is either *agree* or *strongly agree*, this individual's responses are either *disagree* or *strongly disagree.*

From the raw data of the responses to question 1 in this section, it is also interesting to find that two of the respondents who said that the importance of individuals' knowledge in not recognised also indicated dissatisfaction with the tasks required of them in their job. In addition, neither of these individuals are managers. Where such perceptions exist among staff, it suggests an increased need for a demonstration of managerial support for the development of a knowledge sharing culture as discussed in Section 3.4 and this will be considered in the framework for KM in ERDF Audit.

The next question in this section relates to the respondents' general perception of learning and knowledge sharing. Figure 8.18 depicts their answers when asked to indicate agreement with some examples of learning and knowledge sharing attitudes.

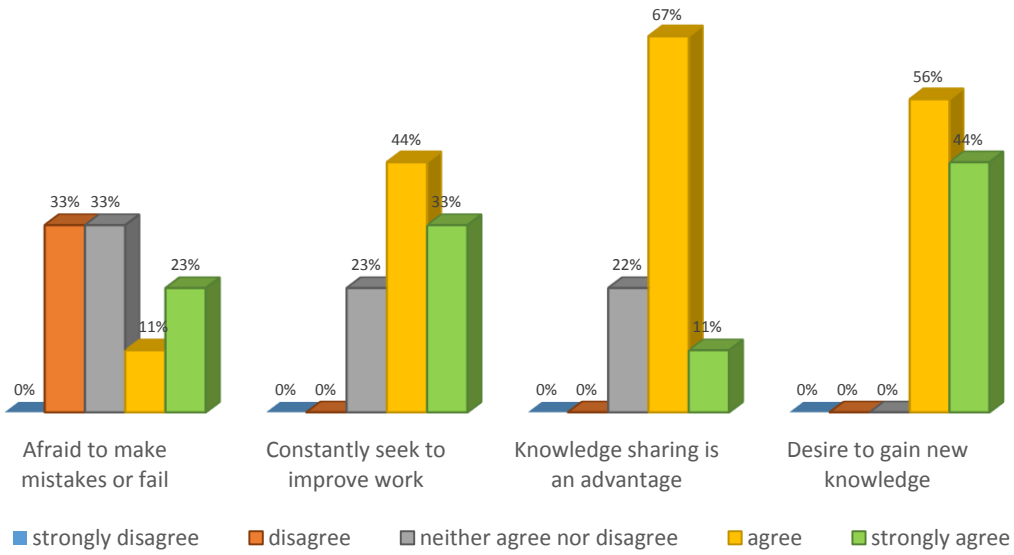


Figure 8.18: Attitude to Knowledge and Learning

The chart shows that all the respondents desire to gain new knowledge. It also shows that 78% of the respondents see knowledge sharing as an advantage and constantly seek to improve their work and the remaining 22% were undecided. It is notable that none of the respondents see knowledge sharing as a disadvantage and none of them indicated that they do not constantly seek to improve their work. This shows a positive attitude towards learning and knowledge sharing in the Unit. However, it is contrary to the results in Figure 8.12 which shows that knowledge sharing does not necessarily take place during meetings.

In response to the question regarding fear of making mistakes, it notable that 34% of the respondents indicated that they are afraid to make mistakes and another 33% are not sure whether they are afraid or not. The raw data for this chart shows that two out of the three individuals who are afraid to make mistakes are auditors. In addition, another two out of the three individuals that are not afraid to make mistakes are managers. This makes it difficult to decide whether the fear of making mistakes arises from a real or perceived punishment by management. However, it was noted in Section 3.4 that environments in which there is a fear of failure tend to discourage employees from applying new ideas.

Riege (2005) notes that highlighting mistakes and failures as learning experiences may encourage individuals to look for new ways of doing things. It is noted that the two individuals (22% strongly agree) who feel strongly about the fear of making mistakes also feel strongly about their desire to gain new knowledge and their search for ways to improve their work. This again, raises the question of the real or perceived consequence of failure in

the Unit in light of the attitude of management to mistakes. Tiwana (2000) also argues that the power of mistakes should not be undervalued. And this will be included in the framework for KM in ERDF Audit.

The final question in this part of the questionnaire relates to the attitudes towards random discussions as well as the resources that could facilitate these random discussions in the Unit. The responses are charted in Figure 8.19.

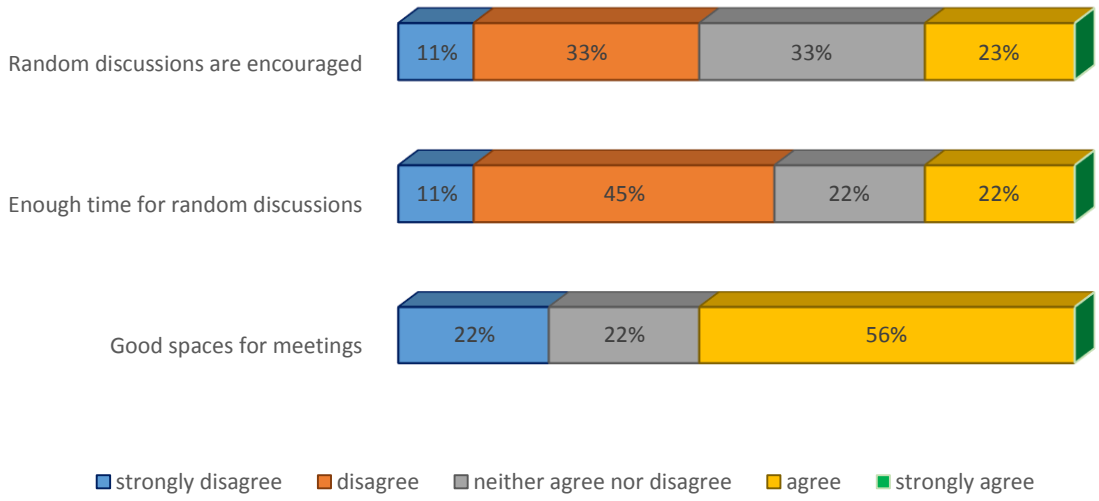


Figure 8.19: Attitudes and Resources that Support Random Discussions

From the suggestion of Davenport and Prusak (1998) that random and informal discussions may foster social relationships between colleagues and may lead to the transfer of knowledge, it is notable that 56% of the respondents acknowledge that good meeting spaces have been provided. The chart shows however, that only 22% of the respondents agree that there is enough time for random discussions and 23% agree that these discussions are encouraged in the Unit.

This suggests that the provision of meeting spaces for discussions is not by itself likely to result in staff engaging in random discussions. There is still the need for such discussions to be encouraged as discussed in Section 3.4 by managerial direction with an attitude of long-term commitment and support for the process of developing a knowledge sharing culture in the organisation. This will be included in the framework for KM in ERDF Audit.

8.3.6 Motivation

Three examples of incentives that may encourage knowledge sharing in the Unit were selected and the respondents were asked to indicate their level of agreement or disagreement with the introduction of these incentives. The chart in Figure 8.20 shows the average responses.

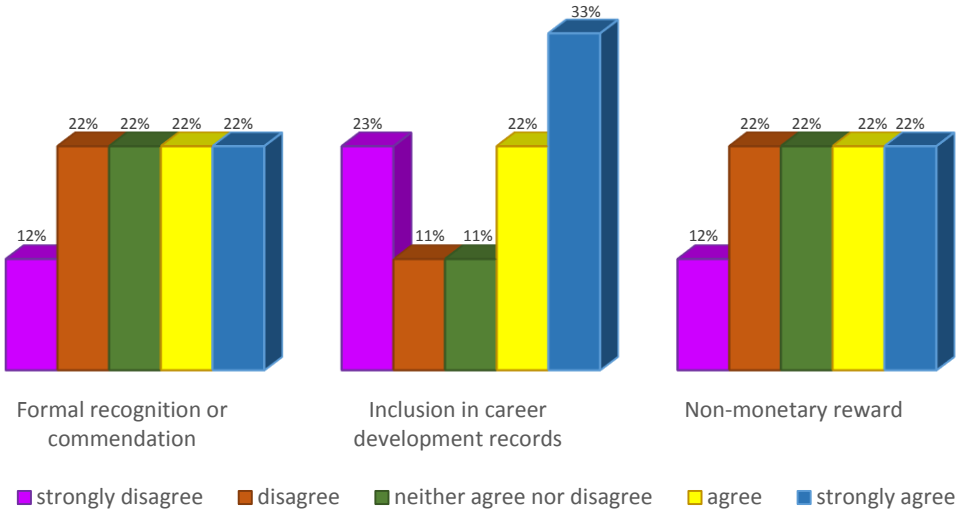


Figure 8.20: Incentives

Regarding the introduction of formal recognition or commendation and non-monetary rewards as an incentive to encourage KM in the Unit, 34% of respondents disagree compared to 44% who agree. Although the difference between the two groups of respondents is marginal, it indicates that these incentives have the potential to encourage knowledge management in the Unit.

Gurteen (1999) notes that the real answer to the issue of motivation is to help people see for themselves that knowledge sharing is in their personal interest and that the old paradigm that "knowledge is power" needs to be changed to "sharing knowledge is power".

Also, the chart shows that 55% of the respondents agree that the inclusion of knowledge sharing activities in career development records will encourage knowledge sharing in the unit. This relatively high percentage suggests a focus on career development and is mirrored in the education chart in Figure 8.3 which shows that 89% of the respondents have a professional qualification.

A fourth category of incentives tagged 'Other Incentives' was included in the questionnaire. The respondents were asked to indicate their level of agreement or disagreement with the

introduction of this category of incentives to encourage knowledge sharing in the Unit. Five out of the nine respondents answered this question.

In addition, the respondents were asked to provide details of what the 'other incentives' could be. Two out of the five individuals who answered the question provided details of what the other incentives could possibly be. One suggested '*general commendations to the unit over targets*' and the other suggested incentives such as '*managers' respect and support and a reflection of knowledge arising from audits in the Unit's standard documents'*. These incentives will be included in the framework for KM in ERDF Audit.

8.3.7 Knowledge Management in the ERDF Audit Unit

The questions in this section are set against a backdrop of an assumption that the respondents have been given the responsibility for KM in the Unit. Some examples of activities that could potentially support KM were selected, based on prior informal discussions with the respondents at different times before the questionnaire was administered. The respondents were asked to indicate their agreement as to whether these activities should be pursued in order to encourage knowledge sharing in the Unit.

The chart in Figure 8.21 shows the average of the responses to the first question.

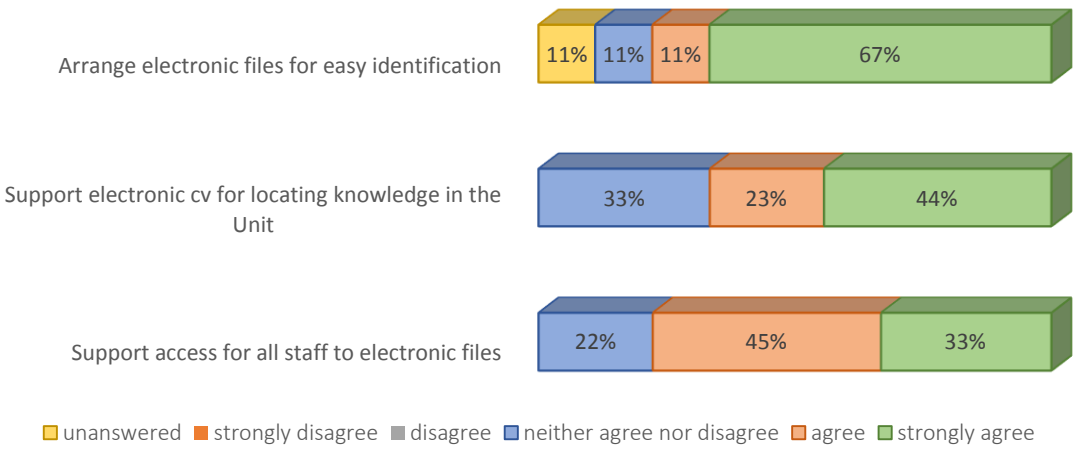


Figure 8.21: Changes to Electronic Files to Encourage Knowledge Sharing

78% of the respondents agree (67% strongly agree and 11% agree) that arranging electronic files into groups that are easy to identify is an activity that should be pursued for encouraging knowledge sharing in the unit. This is not surprising because the existing arrangement in the Unit is such that files are saved on a network location to which everyone has access, as described in Section 6.6. It is also generally expected that a KM system will build some form

of organisation into its contents, for example, organising files by topic, by author, by dates, etc. It is however surprising to see that one of the respondents did not answer this part of the questionnaire.

On the issue of using electronic CV as a means of identifying the knowledge producers in relation to a particular subject, 67% of the respondents agree (44% strongly agree and 23% agree) that they would pursue this activity if they were responsible for KM in the Unit. As discussed in Section 2.7, this is particularly useful with interactive KM applications described by Zack (1999b) where the interaction is between individuals, one being an expert, and is structured around a discrete subject.

From informal discussions with the staff in the Unit, it appears that individuals know those who are knowledgeable in certain subject areas. This is also indicated in the *knowledge gap* chart in Figure 8.9 where all the individuals know who to ask when testing the eligibility of expenditure.

However, the *colleagues' awareness* chart in Figure 8.6 indicates that none of the respondents agree that their colleagues are aware of their knowledge from personal contacts and only 44% agree that their colleagues are aware of their knowledge from education as well as from previous work experience. This further highlights the importance of incorporating an electronic CV in the framework for KM in ERDF Audit.

Also, some examples of changes that could be made in the area of communication were selected and the respondents were asked to indicate their agreement to the pursuit of these activities as a means of encouraging knowledge sharing it the Unit.

The average responses across each activity are charted in Figure 8.22. When the 'strongly agree' series alone is considered, the chart shows that *increasing the frequency of planned meetings* is the activity that has the highest level of agreement (67%). The *barriers to knowledge sharing* chart in Figure 8.24 also shows that 44% of the respondents indicated that the lack of sufficient time to share knowledge is often a barrier to knowledge sharing while the remaining 56% indicated that it is sometimes a barrier.

It is therefore not surprising that 67% of the respondents strongly agree that increasing the frequency of planned meetings should be pursued in order to encourage knowledge sharing in the Unit.

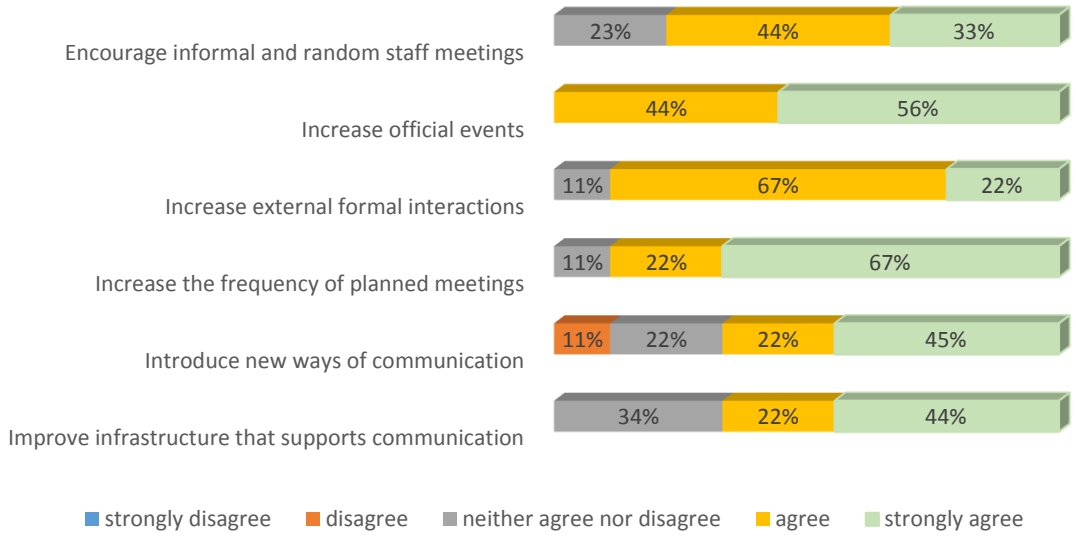


Figure 8.22: Communication Activities to Encourage Knowledge Sharing

The chart in Figure 8.22 also shows that when the responses in the 'strongly agree' and the 'agree' series are combined, all the respondents agree that increasing official events, such as courses, seminars, etc. is an activity that should be pursued for encouraging knowledge sharing in the Unit. The ranking of the other activities by percentage of respondents that indicated 'strongly agree' or 'agree' is shown in Table 8.1.

Activity	% Of Respondents That Indicated 'Strongly Agree' Or 'Agree'	Rank
Increase official events	100%	1
Increase external formal interactions	89%	2
Increase frequency of planned meetings	89%	2
Encourage informal and random staff meetings	77%	3
Introduce new ways of communication	66%	4
Improve infrastructure that supports communication	66%	4

Table 8.1: Communication Activities to Encourage Knowledge Sharing

Even though 56% of the respondents agree that there are good spaces for meetings as shown on the chart in Figure 8.19, Table 8.1 shows that an improvement in the infrastructure that supports communication will be beneficial. Although ranked 4th, the improvement of infrastructure such as meeting rooms and information technology tools that could support communication is an activity that 66% of the respondents believe should be pursued in order to encourage knowledge sharing in the Unit.

In another part of this question, two activities relating to culture change were presented to the respondents and they were asked to indicate their level of agreement with pursuing these activities in order to encourage knowledge sharing in the Unit. Figure 8.23 shows the average responses of the individuals.

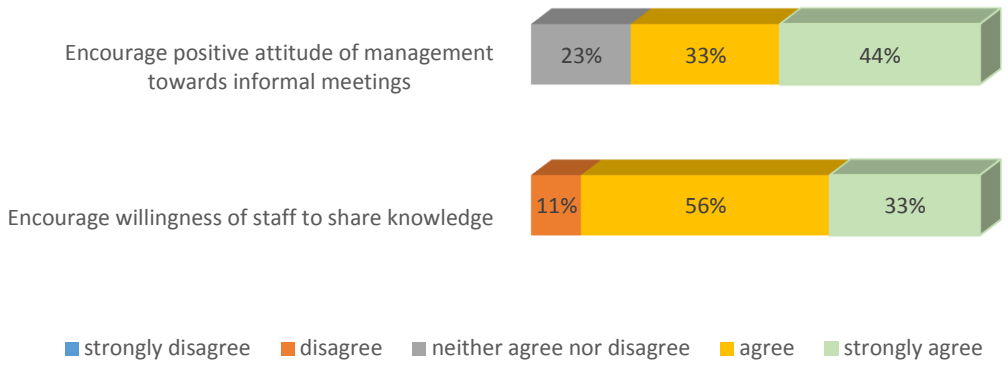


Figure 8.23: Changes in Culture to Encourage Knowledge Sharing

77% of the respondents agree (44% strongly agree and 33% agree) that a positive attitude on the part of management, towards informal meetings should be adopted as a way of encouraging knowledge sharing in the Unit. This is considered important because, as identified earlier in Figure 8.19, only 22% of the respondents agree that random discussions are encouraged in the Unit. This indicates that an improvement in the attitude of management may encourage informal meetings, which as highlighted in Section 3.4, have the potential to foster social relationships between colleagues and may lead to knowledge sharing, according to Davenport and Prusak (1998).

Also regarding the encouragement of a positive attitude of management towards informal meetings, it is noteworthy that two of the three managers who responded to this question indicated that they ‘strongly agree’ while the third manager indicated ‘neither agree nor disagree’. This suggests awareness among managers of the potential benefits of a positive

attitude of management towards informal meetings and will be included in the framework for KM in ERDF Audit.

The second part of this question relates to the willingness of staff to share knowledge. The chart in Figure 8.23 shows that 89% of the respondents agree that encouraging willingness to share knowledge on the part of staff is an activity worth pursuing. This is considered particularly important because despite the 66% of respondents who often or always participate in informal meetings as shown in Figure 8.11 and the 56% who acknowledge that there are good meeting spaces provided, only 11% indicated that they will always ask their colleagues to share knowledge at such meetings. This simply highlights the importance of the willingness to share knowledge as a key factor to the success of any KM system and will be noted in the framework for KM in ERDF Audit.

From Figure 8.18, it was established that there is a positive attitude towards knowledge sharing and learning. However, a positive attitude and willingness to share knowledge alone do not automatically result in knowledge sharing.

There may be times when the individuals are genuinely willing to share knowledge but are faced with barriers that make it difficult to share knowledge. Following initial discussions with the individuals in the Unit, some examples of possible barriers to knowledge sharing were selected and the respondents were asked to indicate how often they think those barriers would occur if there was a policy relating to knowledge sharing in the unit. Their responses are charted in Figure 8.24.

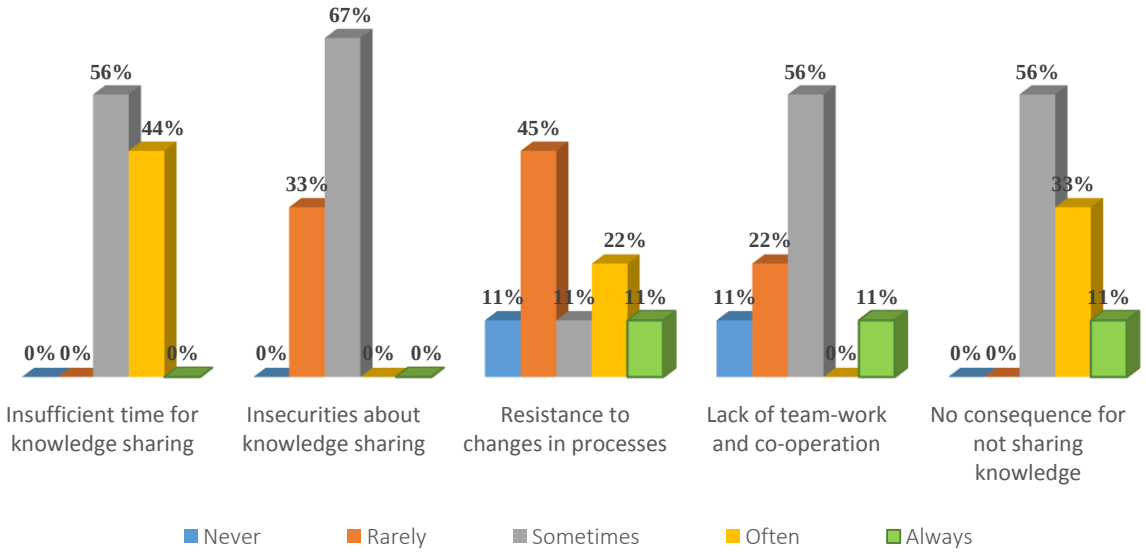


Figure 8.24: Barriers to Knowledge Sharing

It is noted that for both the barrier of insufficient time and insecurities about knowledge sharing, while no respondent indicated that they will always occur, equally no respondent indicated that they will never occur.

44% of the respondents indicated that a lack of sufficient time for knowledge sharing will often be the case while the remaining 56% indicated that this will sometimes occur. This will be considered in the framework for KM in ERDF Audit.

A review of the raw data for this chart shows that the same respondent indicated that resistance to change, lack of teamwork and the absence of consequences will always occur as barriers to knowledge sharing in the Unit.

It is interesting to find that, out of the five examples of potential barriers to effective knowledge sharing, insufficient time and the absence of consequences for not sharing knowledge are considered to occur often by 44% of the respondents, compared with 33% for resistance to change, 11% for lack of teamwork and cooperation and none for insecurities about sharing knowledge.

It is also notable that a total of 56% (11% never and 45% rarely) of the respondents indicated that resistance to change in processes will not be a barrier to knowledge sharing. This is an indication that the individuals are likely to embrace the changes in processes that may result from the introduction of a KM system.

8.4 Analysis of Knowledge Elicitation Interviews

In line with the project aims outlined in Section 1.3 interviews were used to establish the current state of knowledge sharing and collaboration in the Unit. This section highlights only a summary of the items arising during the discussions that are considered to be important for the framework for KM in ERDF Audit.

The first observation from the interviews is that there is a gap in the organisation of the documents containing explicit knowledge for use in the testing of eligibility of expenditure in an ERDF Audit. Two out of the three interview candidates referred to the use of the 'Clarification to National Eligibility Rules' document. As mentioned in Section 6.5, the document was prepared by the 'National Eligibility Rules Group' to ensure consistency in the application of the National Eligibility rules outlined in Circular 16/2008. The Clarification

document was prepared in order to clarify the interpretation of rule 1, 2, 7 and 14 in Circular 16/2008.

Although the Clarification to National Eligibility Rules is saved on the shared network drive, it is not currently placed in the same location as the National Eligibility Rules Circular 16/2008 and other eligibility testing reference documents as shown on the list of audit documents highlighted in Figure 8.2

The chart in Figure 8.21 shows that 78% of the respondents agree that arranging electronic files into groups that are easy to identify is an activity that should be pursued for encouraging knowledge sharing in the unit. While it is likely that the other individuals in the Unit are aware of this document and make use of it, organising the electronic folders into easily identifiable groups and placing this document in the 'Eligibility of Expenditure' will effectively draw attention to the document and make it easily accessible.

Another observation from the interviews relates to knowledge from external sources which is not documented or distributed to staff in the Unit. The interview candidate noted that while it is usual practice in the Unit to include updates to circulars, regulatory documents and other guidance notes in a shared folder called 'Audit Pack', it is often the case that a staff in the unit may receive some information in an email and it may not be considered 'important' enough to warrant the circulation of the email to all staff at the time. In some cases, it may even be that the information is not in the form of a document that may be saved on the shared drive. For example, where an auditor asks an external party about the best practice treatment for a certain type of expenditure and then receives the response by email, it is not likely that this response will be recorded and saved in the shared folder.

Although the auditor may share this knowledge if asked by a colleague, the issue is that their colleagues may not know that they have such knowledge. Section 8.3 highlights the indication of 66% of the questionnaire respondents that the introduction of an electronic CV to encourage knowledge sharing in the Unit is an activity they would pursue. However, the suggestion of Reige (2005) highlighted in Section 3.4 regarding the failure of organisations to reach their knowledge sharing goals will be considered. An electronic CV is more likely to be effective when it is embedded into the Unit's processes and there is visible managerial leadership in this regard.

In addition, it is observed that the responses to the questions on 'information flow' in Section E of the questionnaire show that 100% of the respondents agree that an improvement in the

distribution of information from external sources is an activity that they would pursue if given responsibility for knowledge management in the Unit. Details of these responses are in Section E of Appendix B.

The interview candidates also highlighted issues relating to the spread of knowledge. The current position in the unit regarding the visibility of knowledge is such that each individual is knowledgeable about the part of the ERDF audit which concerns them. For example, one respondent gave the example of situations in which they asked a manager for the correct treatment of a certain type of expenditure and was told to detail the situation in the audit working papers and gather as much supporting documents as possible.

The audit file was subsequently submitted to the manager for review, during which the manager dealt with the expenditure in question appropriately. In this particular instance, the auditor later revisited the query and got an understanding of the manager's approach to the expenditure item. The issue here is that, if the auditor did not revisit the query, knowledge of the correct approach would not have been acquired since the manager would not have documented this or shared it with anyone except when asked. This highlights the need to emphasise discipline of systems thinking described by Senge (1990) as discussed in Chapter 4.

The interviews highlighted the knowledge exchange path within the Unit and it was easy to identify the knowledge producers within the Unit with the three-card trick.

Zack (1999b) suggests that the integrative class of knowledge management applications require roles such as editors, integrators and analyst. Section 3.2 also discusses the suggestion of Davenport and Prusak (1998) on the need for knowledge roles as an enabler of knowledge management. In line with these suggestions, one of the knowledge producers identified during the interviews will be asked to review the knowledge library for completeness and refinement as required.

Also, the interviews identified the following as the main sources of explicit knowledge in the Unit:

- Audit Files (electronic and manual, contains planning section, eligibility working papers, exception listing, draft report, final report, audit manager's review sheet)
- Emails
- ACR

- Circulars and Explanation Documents
- Internet files
- EC Directives
- Audit registers

These will be initially used to populate the knowledge library on the KM system and will be expanded as the individuals in the Unit develop new thoughts and ideas over time. It is also expected that the knowledge base in the KM system will evolve over time to adapt to changes in the ERDF audit processes.

In response to the question of how documents are managed and shared with colleagues, the interview respondents explained the use of the file share and emails and also highlighted the existence of many versions of a single document. They expressed support for any application or process that was capable of ensuring version control and easy location of up-to-date information when required. This will also be incorporated into the framework for KM in ERDF Audit.

Finally, as part of the discussions, the interview candidates noted that there were no incentives or rewards of any form for any effort to share their knowledge. They explained that while they were happy to answer their colleagues' questions as far as possible and also point them in the right direction for information they require, they would rarely initiate these kind of situations. They simply did not see why they needed to "announce" to colleagues that they were in a position to provide information regarding any subject and would only share their knowledge if asked.

Overall, the interviews provided additional insight into the Unit, an opportunity to discuss the survey questions in further details and also provided input for the framework development.

As mentioned earlier, there were many issues arising from the interviews and only some have been analysed in this section. The *'framework'* section in the next chapter presents a more comprehensive conclusion from the analysis of both the questionnaire responses and the interviews.

8.5 Conclusion

The chapter explained the process and the steps involved in the collation of responses to the knowledge audit questionnaire. It noted the response rate as well as the mode of returning the

questionnaires. Then it described the process of recording the responses for review and analysis.

This chapter also provided an in-depth analysis of the questionnaire responses. The demographic data section was the first to be analysed, followed by the personal knowledge profile section. This was done in order to provide some background information about the ERDF Audit Unit which were considered to be important to the understanding of the analysis of the rest of the questionnaire. It was however noted in the analysis that the demographic data section was not completed in full by some of the respondents.

The remaining 5 sections were also analysed in this chapter, in addition to a brief analysis of the issues raised during the interviews and discussions with individuals in the Unit. The foregoing analysis as well as the conclusions that can be drawn from the review of literature in previous chapters will be combined to develop a framework for KM in ERDF Audit in the next chapter.

9 KNOWLEDGE MANAGEMENT FRAMEWORK

9.1 Introduction

This chapter consolidates the conclusions that can be drawn from previous chapters. It presents a comprehensive set of rules, conditions and factors that constitute a framework for KM that is particularly applicable to ERDF Audit.

In order to set the scene for the KM framework, this chapter revisits the review of literature in the area of KM, KM frameworks and the Public Sector and highlights the salient points that pertain to ERDF Audit.

The KM framework which highlights the results of the work done on this research project up to this point is then presented. This framework is set in the context of ERDF Audit as it applies to the ERDF Audit Unit in the DPER. It combines the points raised from the review of literature with the conclusions arising from the analysis of the knowledge audit exercise in order to identify the elements of the framework for KM in ERDF audit.

9.2 Existing Research

This section highlights some of the major points raised in existing literature that are considered to be particularly applicable to the development of a KM framework for ERDF audit.

9.2.1 Knowledge Management

This literature review carried out earlier in this research includes discussions around the concepts of data, information, knowledge and wisdom. From the explanation of Davenport and Prusak (1998) on the ways in which data can be transformed into information, the data gathered in relation to the audit of eligibility of expenditure can be transformed into information by contextualisation and condensation.

Contextualisation refers to knowing the purpose for which data is gathered and this is applied in the process of testing the eligibility of expenditure during the audit of an ERDF project. For example, data such as the amount of an expenditure item is not merely stated on the audit working papers, but is recorded in relation to the total amount of expenditure items tested, the total amount of expenditure being declared by the operation for co-funding, etc.

Condensation refers to the process of making data available in a more concise, user friendly form. This is also applied in the process of testing the eligibility of expenditure. For example, the organisation of the electronic folder depicted in Figure 6.2 indicates a Microsoft Word document named *5.0 Eligibility Summary Schedule*. This document provides a concise summary of the more elaborate findings, recommendations and conclusions arising from the audit of eligibility of expenditure.

After processing audit data and transforming it into information, it is then enriched, deepened and broadened through two of the four processes (conversation and comparison) described by Davenport and Prusak (1998).

The process of *conversation* arises when the perspectives of others regarding a piece of information are considered. One of the ways in which this occurs in the audit of eligibility of expenditure is the review of an audit file by a manager. It is not unusual to find that an item of expenditure that an auditor may have initially identified as ineligible is reviewed by a manager and reclassified as eligible, based on the manager's experience. Another way in which conversation occurs is in the contradictory process described in Section 6.4.

The process of *comparison* comes into play in the organisation of information from several audits into groups based on logical relationships that can facilitate a comparison across different projects audited. Although the *Annual Control Report (ACR)* discussed in Section 6.3 includes an appendix that contains a summarised list of audit exceptions, these exceptions are only those considered major enough to draw the attention of the European Commission to. Consequently, there is no single document or file on which a complete list of findings from several audits can be found. It is planned as part of this research, to create this list for all audits carried out in the reference year 2012, for inclusion in the knowledge library on the KM system.

Another point raised in this section of the literature review relates to tacit and explicit knowledge as identified by Nonaka (1994). As mentioned earlier, much of the work done during an audit requires the interpretation and application of rules and regulations which are tacit in nature. However, much of the interpretation and application of these rules to different situations have already been explicated. They are recorded in different audit reports and annual control reports and as noted earlier, a comprehensive document will be created to hold the contents of all these reports for inclusion in the knowledge library. This implies that the integrative class of KM applications described by Zack (1999b) is applicable to ERDF Audit.

This is especially so because for integrative KM applications, the focus is on explicit knowledge and the repository is the primary medium for knowledge exchange. As noted in Table 2.3, the individuals in the ERDF Audit Unit will refine and build on their collective knowledge, more or less like maintaining a best practice database.

Finally, the technology element of KM, described by Alavi and Leidner (2001) as an important enabler of KM by is considered relevant to the framework for ERDF Audit. As highlighted in Chapter 6, there is currently no coordinated approach to KM in the ERDF Audit Unit. However, with the recent launch of SharePoint as a department-wide collaboration tool, this research will incorporate the development of a team site on SharePoint. This will be discussed in greater details in Chapter 10.

9.2.2 Knowledge Management Framework

This section focuses on the KM framework approaches reviewed, outlining the benefits of adopting a framework for KM and outlines the factors that could affect KM in ERDF Audit.

Firstly, the KM framework depicted in Figure 3.2 gives an indication of the different knowledge constructs that typically constitute a KM framework. As noted by Gupta and McDaniel (2002), the different phases of the framework, though presented as being linear, are actually interrelated, with one phase requiring input from another and with an overlap of activities across phases in ERDF Audit.

Bouthillier and Shearer (2002) stressed the need to first of all discover the internal knowledge within an organisation, especially where the organisation is geographically dispersed as is the case in the ERDF Audit Unit. In addition to being situated in two geographical locations (Dublin and Tullamore), the auditors in the ERDF Audit Unit are often out of the office on fieldwork at clients' sites which could be located anywhere in the country. Considering the knowledge creation theory of Nonaka (1994), the *combination* process of converting one or more forms of explicit knowledge to another form of explicit knowledge is one of the predominant processes in the ERDF Audit Unit. Knowledge synthesis is used to combine different sources of knowledge into context as shown in Table 2.2.

The storage and retrieval phase, according to Alavi and Leidner (2001) relates to the processes and procedures. The existing process of storing knowledge in the Unit was discussed in Chapter 6 and as highlighted in Section 1, the use of emails and file shares are the main channels of collaboration. The storage of multiple copies of a document as well as

the resulting lack of coordinated version control has been identified as an issue that a framework for KM could address.

As will be seen later in this chapter, there is little by way of transfer of tacit knowledge among staff during informal discussions which was suggested by Alavi and Leidner (2001). Part of the reasons for this may be that staff are not usually in the office at the same time, since they are often out on fieldwork. The use of IT infrastructure for knowledge transfer between individuals in the Unit will be the focus of the team site that will be created on SharePoint.

Since there are relatively few individuals in the Unit and everyone is fully occupied with their tasks as auditors, the suggestion of Davenport and Prusak (1998) regarding organisation roles as an enabler of knowledge application may not be attractive unless motivation is provided for an individual to take up this additional work. The issue of motivation was visited in the questionnaire and will be discussed in greater detail later in this chapter.

9.3 Framework for Knowledge Management in ERDF Audit

This section presents the components of a framework for KM, as a combination of the salient findings from the knowledge audit analysis in the previous chapter and the results from the review of literature summarised in Section 9.2. Some of the findings from the questionnaire responses corroborate the suggestions from existing research but there are also some findings that do not match the expectations based on existing literature.

Figure 9.1 shows a summary of the existing KM situation in the Unit in addition to some important components of the framework for KM in ERDF that emerged from the review of literature and the knowledge audit exercise.

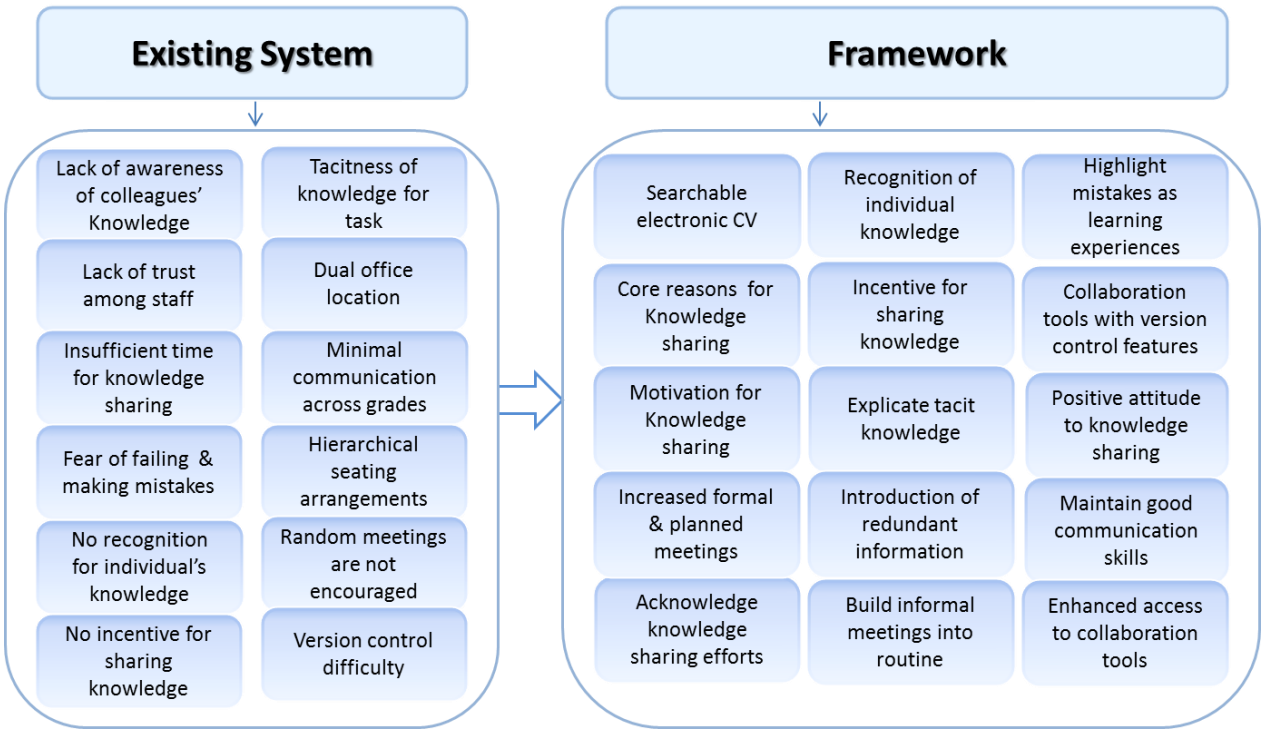


Figure 9.1: Knowledge Management Framework

In addition to explaining the current position and KM gaps in ERDF Audit, the suggested approaches to addressing the position are also detailed below and these are not arranged in any particular order. Also, although each component is separately linked to the people related, process related or technology related element of KM, there is no clear distinction since all three are interrelated and often occur side by side in the real world.

9.3.1 Knowledge Management Framework - People

The questionnaire analysis shows that even though the respondents consider their knowledge from education, work experience and personal contacts to be useful for ERDF audit work, there appears to be a gap in other individuals' awareness of these elements of their knowledge.

Framework Component	**As – Is**	**Approach and actions to address the situation**
Awareness of colleagues' knowledge	Individuals are unaware of colleagues' knowledge from education, work experience and personal contacts	Develop and deploy searchable electronic CVs to identify individuals that possess knowledge in a specific subject area

A searchable electronic CV is considered to be a potential platform for addressing this gap, especially since the questionnaire and interview responses also suggest that the respondents would introduce this if given the responsibility for KM in ERDF audit.

This is particularly useful once the individuals have populated the *'ask me about'* field on the KM system (discussed later in this chapter) with details of the topics on which they are knowledgeable, a general search on the system with that topic as part of the keyword will return the individual as part of the results. For example, after returning from a seminar such as 'ERDF Audit Findings 2007-2013: The Irish Experience so far …' an auditor will be expected to update their profile with something like *'ERDF Audit Findings 2007-2013'* in the *'ask me about'* section on the KM system.

Another finding from the knowledge audit analysis is that social relationships exist between individuals in the form of random and informal meetings. However, even though Davenport and Prusak (1998) suggest that these relationships may lead to the transfer of knowledge, the knowledge audit shows that this is not the case in the ERDF Audit Unit.

There could be many plausible reasons for this lack of knowledge transfer, and a further analysis of the questionnaire responses shows that one of the reasons for this could be a lack of trust.

Framework Component	**As – Is**	**Approach and actions to address the situation**
Trust	Social relationships exist but these seldom result in knowledge transfer. There is a lack of trust among staff in the Unit	Emphasise core reasons for sharing knowledge and introduce enough motivation for individuals to share knowledge notwithstanding the lack of trust.

Tiwana (2002) pointed out that individuals have a strong propensity to hoard knowledge due to the limitations of human nature. Individuals tend to want to keep whatever benefits that may arise as a result of their knowledge to themselves alone. Ghosh (2004) notes that individuals may be willing to share this knowledge only if they are assured that it will be received into trustworthy hands that will not take credit without acknowledging the source of the knowledge and if there is a good chance of reciprocity.

According to Riege (2005), an organisation needs to emphasise core reasons for knowledge sharing. While it is acknowledged that trust is not one of the easiest things to build in a group, it is possible to build motivation into the KM framework such that individuals have enough reason to share knowledge, whether or not they trust the other members of the group and even if it appears that it may not be reciprocated.

Although the knowledge audit identifies the existence of good meeting spaces for random discussions, the individuals in the Unit have highlighted that having enough time to engage in random meetings that may lead to knowledge sharing is rare.

Framework Component	As – Is	Approach and actions to address the situation
Time	There are good meeting spaces but not enough time for random meetings.	Increase formal and planned meetings

The nature of the auditors' work is such that the time spent in the office is used for concluding the working papers for recently concluded audit fieldwork, responding to audit managers' review queries and preparing for the next audit fieldwork. This leaves little room for 'side discussions' or indeed, random meetings in which knowledge is shared.

A potential approach to addressing this is to make the most of planned and formal meetings by increasing their frequency and maximising participation of staff. This approach was also highlighted by the respondents in the knowledge audit.

In relation to knowledge sharing and learning in the Unit, the knowledge audit found that while there is a general positive attitude towards knowledge sharing and learning, there are issues surrounding the fear of failing or making mistakes.

Framework Component	As – Is	Approach and actions to address the situation
Attitude to knowledge sharing and learning and fear of making mistakes	General positive attitude towards knowledge sharing and learning. Fear of failing or making mistakes.	Maintain the positive attitude towards knowledge sharing but encourage management to praise the efforts of staff who look for new ways of doing things and highlight mistakes as learning experiences.

Although the knowledge audit does not provide information on whether the fear of making mistakes is a result of real or perceived punishment by management, highlighting mistakes as learning experiences rather than highlighting them as reason for punitive consequences is a suggestion by Riege (2005) for addressing this type of situation and encouraging individuals to look for new ways of doing things.

Also, it was gathered from the informal discussions with the individuals in the Unit that there is very little by way of incentives for sharing knowledge. In their responses to the knowledge audit questionnaire, individuals highlighted the lack of recognition of the importance of people's knowledge. In another section of the knowledge audit questionnaire, the results

showed that staff identified formal recognition or commendation, inclusion of knowledge sharing efforts in career development records and other non-monetary rewards as potential forms of motivation for knowledge sharing.

Framework Component	As – Is	Approach and actions to address the situation
Motivation and managerial direction	The importance of individuals' knowledge is not recognised and there is no apparent incentive for sharing knowledge	Introduce incentives such as formal recognition and inclusion of knowledge sharing efforts in career development records and other non-monetary rewards to motivate staff to share knowledge.

The role of management in the process of knowledge sharing is emphasised by Nonaka (1994). Davenport and Prusak (1998) also note that it will be almost impossible to experience a change in practices that can result in knowledge sharing where there is no managerial direction with an attitude of long-term commitment and support for the process of developing a knowledge sharing culture.

9.3.2 Knowledge Management Framework - Process

Analysis of the knowledge audit found that on one hand, some audit activities require explicit knowledge and procedures have been documented for them. For example, there is a documented procedure for the selection of an audit sample. On the other hand, it was found that tacit knowledge is required for some audit activities and a relatively longer time is spent on these. For example, the preparation of a summary for the audit report requires experience and the ability to determine the applicable regulation or guideline in support of an audit decision. Although the regulations and guidelines are in explicit forms, the real tacit task is in their interpretation and application to a particular audit finding. The complexities involved in explicating tacit knowledge makes it unattractive compared to the easier process of disseminating explicit knowledge.

Framework Component	As – Is	Approach and actions to address the situation
Dominance of tacit knowledge	There are considerable explicit procedures for tasks that require explicit knowledge but not for tasks that require tacit knowledge	Create a single document that explicates tacit knowledge arising from audits (audit findings, recommendations, client responses and conclusions)

A potential approach for explicating this knowledge is to create a list of findings from several audits and the corresponding comments, recommendation and applicable legislation or guideline which will serve as reference library. When an auditor comes across a finding

during an audit assignment, they will be able to search this document for similar audit findings and then determine the applicable comment, recommendation and applicable legislation. A consequence of this may be that auditors and managers spend less time searching for an existing audit with a similar finding since all the existing findings will be in the single document. Another consequence may be uniformity in the treatment of similar audit findings.

Communication skills, according to Riege (2005) are considered important as they determine the ability of an employee to share knowledge. The questionnaire analysis shows that both oral and written communication skills are not likely to be a barrier to effective KM in ERDF Audit.

However, it was also found that communication is highest between colleagues at the same grade with individuals engaging in less communication with colleagues at a higher grade or those at a lower grade. In addition, the results from the knowledge audit show that there are barriers to effective communication, despite the good communication skills of the staff.

Spatial arrangements of work areas was identified by Riege (2005) as one of the factors that may affect the formation of trust-based relationships and can potentially limit the level of communication that will occur within a group. This is linked to the hierarchies that typify Public Sector organisations as suggested by Riege (2005) as the seating arrangements in the Unit are designed along lines of hierarchy and management seniority. Managers have individual offices while the auditors are clustered. While the clustered seating arrangement for auditors has the potential of supporting communication and knowledge sharing, the use of separate offices by managers is a potential barrier to effective communication across the different grades.

Framework Component	**As – Is**	**Approach and actions to address the situation**
Organisation structure	Individuals have good oral and written communication skills but there is only minimal communication across grades. Seating arrangements along the lines of hierarchies and management seniority.	Maintain the good communication skills and introduce redundant information to address lack of communication across grades.

While it is desirable to collapse the hierarchies in order to foster communication across grades, it is acknowledged that this is beyond the scope of ERDF audit since the grades are determined in the wider Public Sector setting. However, the introduction of redundant

information suggested by Nonaka *et al.* (2000) will be adopted as a potential approach to ensuring that knowledge is available to all individuals, regardless of their grade.

In addition to revealing that random discussions are not encouraged by management, the knowledge audit also highlighted the need for a positive attitude of management towards informal meetings as a way of encouraging knowledge sharing. It is understandable that management does not encourage random meetings when the volume of work in the Unit is compared with the few hands available to do get it done.

Framework Component	**As – Is**	**Approach and actions to address the situation**
Attitude to informal meetings.	Random meetings are not encouraged by management	Developing a positive attitude of management towards informal meetings and build them into the Unit's routine.

Notwithstanding this however, the suggestion of Davenport and Prusak (1998) that these random discussions have the potential to encourage knowledge sharing is a major factor that management ought to consider. The results of the knowledge audit also point to an awareness of the managers of the potential benefits of a positive attitude towards informal meetings. Even though difficult to quantify, knowledge sharing may lead to improvement in work processes and efficiencies that will outweigh the time spent in these random discussions. Consideration should therefore be given to embedding these informal meetings into the Unit's routine.

9.3.3 Knowledge Management Framework - Technology

Another point raised from discussions with the staff is the issue with document management and version control. Documents and files are usually managed on a shared folder and emailed between individuals. This results in the existence of different versions of the same document and difficulty in identifying the most up-to-date one or the individual who updated the document.

Framework Component	**As – Is**	**Approach and actions to address the situation**
Document management and version control	Updated copies of files and documents are saved on the shared folder and emailed between staff, resulting in difficulty of tracking and controlling versions	Explore version control features of collaboration tool and maximise the use of notification and alerts.

The version control facilities within the collaboration tool will be explored to address this issue and the use of the shared folder will be restricted to archiving. In addition, the use of emails for sharing documents will be expected to reduce as a result of the document management, notification and alert features of the collaboration tool.

The ERDF Audit Unit has two offices, one is located in Dublin and the other in Tullamore. The suggestion of Milton (2011) is that the local focus which is often perceived as a barrier to knowledge sharing can be converted to a network focus. Accordingly, the IT advancements and the recent launch of collaboration tools in the DPER may suggest that geographical distance should not be a barrier to communication. However, the argument of Davenport and Prusak (1998) that face to face meetings are often the best way to get knowledge is evidenced in the relatively low levels of communication and knowledge transfer in the Unit.

In addition to the two geographic locations of the Unit, it is unusual to find all the auditors in the office at the same time because they are often out on audit assignments at the offices of the co-financing beneficiaries. Although the auditors are equipped with mobile smartphones, these have largely been used more as communication devices than for collaboration purposes.

Framework Component	**As – Is**	**Approach and actions to address the situation**
Geographical location and use of mobile IT devices	The ERDF Audit Unit has two offices in separate geographical locations and auditors are seldom in the office at the same time.	Enable access to collaboration tools from existing mobile devices.

It is essential that access to the collaboration tools should be enabled on the devices and the individuals encouraged to use them accordingly.

9.4 Conclusion

This chapter combined the results of the analysis of the knowledge audit and interview responses with salient points in the literature review chapters and presented a set of rules, conditions and factors that are required for KM in ERDF Audit.

It was noted that in some cases, the conclusions from the analysis of the knowledge audit corroborate the conclusions from the review of literature and these are included in the framework.

The elements of the framework were presented as people, process or technology related components, in line with the components of KM identified in section 2.4. The next chapter considers the use of a KM tool that for the purpose of modelling the elements of this framework as far as possible.

10 KNOWLEDGE MANAGEMENT APPLICATION

10.1 Introduction

Earlier discussions around the components of KM identified IT infrastructure as a necessity for providing a seamless pipeline for the flow of knowledge in an organisation (Zack, 1999a) and an important enabler of KM, (Alavi and Leidner, 2001).

As a next step to the framework for KM in ERDF Audit that was presented in the previous chapter, this research project models the chosen process of testing eligibility of expenditure on a collaboration tool. The components of the framework were first discussed with the individuals in the ERDF Audit Unit and they were later encouraged to explore the application as a tool for knowledge sharing, collaboration and learning. A brainstorming session was then organised and the individuals were asked for their impression of the framework and the collaboration system using a *plus, minus, interesting (PMI)* activity.

This chapter provides details of this modelling starting with a brief description of the collaboration tool that was selected and the reasons for its selection. It also describes the process of developing a team site for ERDF Audit, the steps involved in collating the existing tacit knowledge, explicating some of the tacit knowledge in the Unit and organising these on the site. The chapter concludes with an account of the activities of the users on the site and their feedback from the PMI activity.

10.2 Choice of KM Application

As mentioned earlier, the DPER recently implemented SharePoint, which has been selected for use in this research project. SharePoint is a Microsoft Web application platform that is commonly associated with intranet, content management and document management. This section explains the reasons for its selection.

10.2.1 Literature Review

As discussed in Section 9.2, the data gathered in relation to the audit of expenditure needs to be transformed into information, which is further transformed into knowledge embedded in documents and processes (Davenport and Prusak, 1998). SharePoint offers an integration of data, documents and processes to provide composite applications without the need for codes.

In addition to supporting the sharing of explicit knowledge through its document management features, SharePoint is also a platform for explicating and sharing tacit knowledge. The *'blog', 'follow', 'share with'* and other features support the conversion of knowledge from one form to another, described by the modes of knowledge creation (Nonaka, 1994) in Section 2.3.

Finally, in the KM framework described by Alavi and Leidner (2001), knowledge storage and retrieval involves the use of tools to support organization memory as well as to speed up the individual's access to knowledge. SharePoint provides content management for documents and work items that need to be stored, found, updated, archived and maintained for collaboration.

10.2.2 Framework for Knowledge Management

From the framework for KM in ERDF Audit that was developed in the previous chapter, it was suggested that the development of a searchable electronic CV could address the situation in ERDF Audit where colleagues are not aware of the knowledge of an individual.

SharePoint offers search features based on keywords, refinement and content analysis that enable users to look for information and returns an indication of content, people or sites that are relevant to the search.

Another element of the framework for KM in ERDF Audit is the availability of considerable amounts of explicit knowledge. SharePoint being a Web based application provides the capacity to handle vast amounts of information. In addition, the framework highlights the creation of a document to warehouse all the findings from ERDF audits as a knowledge base for reference by auditors. SharePoint provides insights that can enable knowledge from any part of the Unit to be surfaced inside useful contexts thereby providing information that can improve effectiveness.

Document version control is another element identified in the framework and SharePoint provides document management features to ensure that only the latest version of a document is *live.* It has a *'check out'* facility that controls the editing of documents and it also tracks the versions and authors of documents with the capability to retrieve old or archived versions when required.

Finally, the framework identified the need for access to the collaboration tool from different locations. SharePoint is Web based and supports collaboration across different devices from different locations.

10.2.3 Other Considerations

In addition to the having features that support collaboration, SharePoint was also selected because the DPER has only recently implemented it. The implication of this is that a department-wide awareness of collaboration using SharePoint was already created and this has received considerable attention and support with information and training sessions organised by the IT Unit in the Department.

Also, random discussions with staff of the ERDF Audit Unit revealed that they would be more inclined to use the Department's *'official'* collaboration tool than a separate KM application specially designed for the Unit, especially because it is being promoted and highly recommended by senior management.

In addition, the development of a team site on SharePoint can be achieved quickly at no extra cost. With unreserved management support for the process, it has a better chance of being successful at achieving the goal of collaboration and knowledge sharing. It is expected that other team sites will be created by other Units in the Department and thus provide potential for an even wider scope of collaboration with other Units.

Finally, the look and feel of the system is not very different from some of the existing applications that the users are familiar with. This reduces the cognitive load on the users by reducing the amount of new features that a user of a new system usually needs to familiarise themselves with.

10.3 Organisation of the Knowledge Library

The aim of the activities in this section was to collect and organise the explicit knowledge already existing within the Unit. The knowledge gathered was organised into a knowledge library that was placed on the team site either as document placed in folders or as hyperlinks to the relevant document.

The documents on the site are arranged in a tree-like structure that is similar to the current structure on the file share in order to maintain the *look and feel* that the users are familiar with. In addition, the shared vocabulary that was developed during the interviews and

discussions noted in Section 8.4 were used to label the folders and the hyperlinks. For example, the *root directory* for the folders is labelled "H Drive" and the hyperlink to the Department of Finance Circular 16 of 2008 is labelled as "1608".

There are two main documents containing a considerable amount of knowledge. The first is the Microsoft Excel spread sheet document called the "register" outlined on Table 6.3. As described earlier in Chapter 6, this document contains information about all the 73 operations audited in the 2012 reference year.

The second is a Microsoft Excel document called "findings". The framework for KM in ERDF Audit outlined in Chapter 9 highlights the need for a single document that explicates the tacit knowledge arising from audits. These knowledge elements are mainly audit findings including a reference to the relevant section of the regulation, the recommendations of the Audit Authority regarding the finding, the PBB's responses and the final conclusions indicating the action to be taken.

This document is set up as a matrix and was created by collating all the knowledge elements above that impact on the eligibility of expenditure from the 73 audits carried out in 2012 reference year. Each row on the matrix contains knowledge relating to each finding while the columns are as shown in Table 10.1.

Column Header	Description
Reference	Serial number
Operation	Name of the operation
Audit Finding	Details of the audit finding
Regulation	Reference to applicable section of the regulation
Recommendation	Recommendation of the ERDF Audit Authority
Project Response	Response of the PBB
ERDF AA Conclusion	Conclusions of the ERDF Audit Authority
Auditor	Name of the auditor
Audit Folder	Hyperlink to the electronic audit folder

Table 10.1: Findings Matrix

10.4 Initial Reactions

This section presents the details of the activities of the users of the team site, the brainstorming session and an evaluation of the PMI activity.

10.4.1 Audience

As expected, the individuals in the Unit were very aware of this research project following their participation in informal discussions, the knowledge audit questionnaire and the interviews. Consequently, the process of explaining the framework for KM in ERDF Audit and the use of the SharePoint team site to them was quite straightforward.

Firstly, informal discussions regarding the progress of this research were initiated and the individuals were hinted of the completion of the framework for KM in ERDF Audit. This sparked curiosity and it was agreed that the framework will be distributed by email. Then the elements of the framework for KM in ERDF Audit developed in the previous chapter were combined into a single table and emailed to all the individuals in the Unit, with an update on the development of the team site on SharePoint.

Since SharePoint was implemented as a department-wide tool, each member of staff already had a user profile created by default. The individuals were then encouraged to update their user profiles on the team site and to include details of their knowledge areas in relation to the testing of eligibility of expenditure in line with the "electronic CV" element of the framework. They were also asked to explore the team site with a view to providing an assessment of it based on their first impressions and their understanding of the framework for KM in ERDF Audit.

10.4.2 Activities on SharePoint

As mentioned earlier, the look and feel of the site is the same as that on some of the other systems that are currently in use in the Department. For example, the DPER logo, the arrangement of Divisions, Units, etc. are all similar to those on the existing systems. Figure 10.1 is a screen shot of the homepage on SharePoint.

Although some users were certainly more active than others, all the individuals in the Unit showed at least some activity on the site. The activities that the users engaged in include uploading of files, creation of documents, updating of files, updating of their individual profiles, blog posts, etc. In order to protect the privacy of the users, only a few screen shots with no personal information have been included in this section.

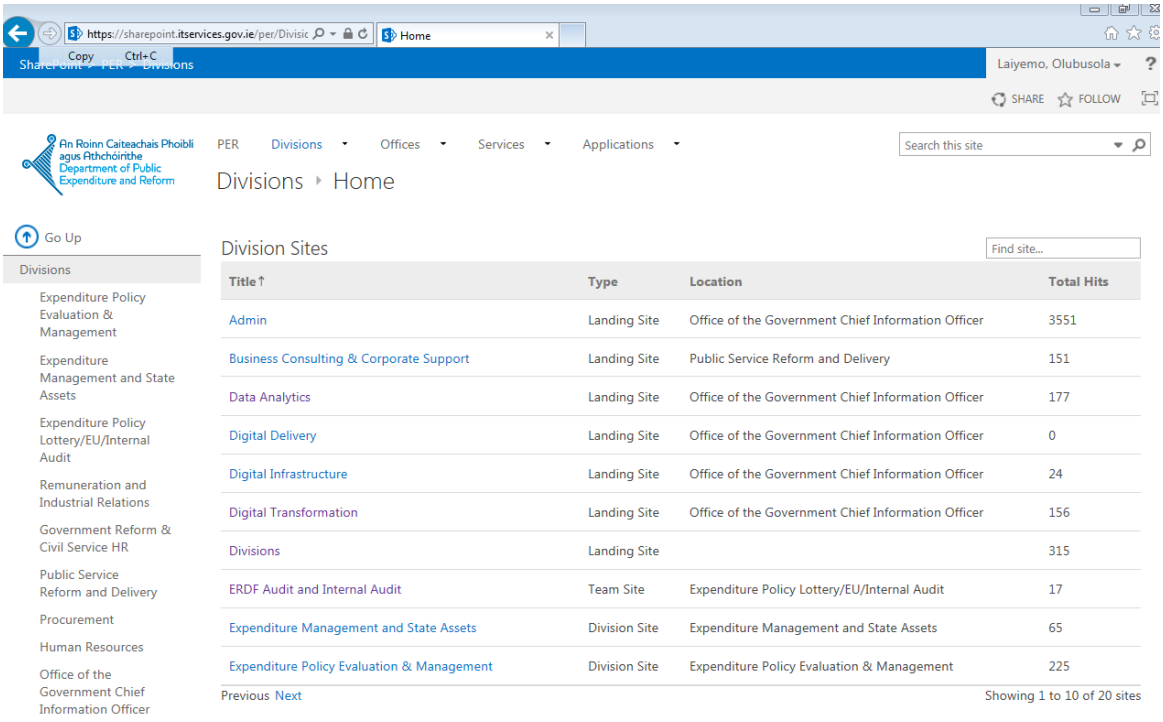


Figure 10.1: SharePoint Homepage

Figure 10.2 shows a screen shot of the organisation of electronic folders on the team site as well as a calendar entry by one of the users.

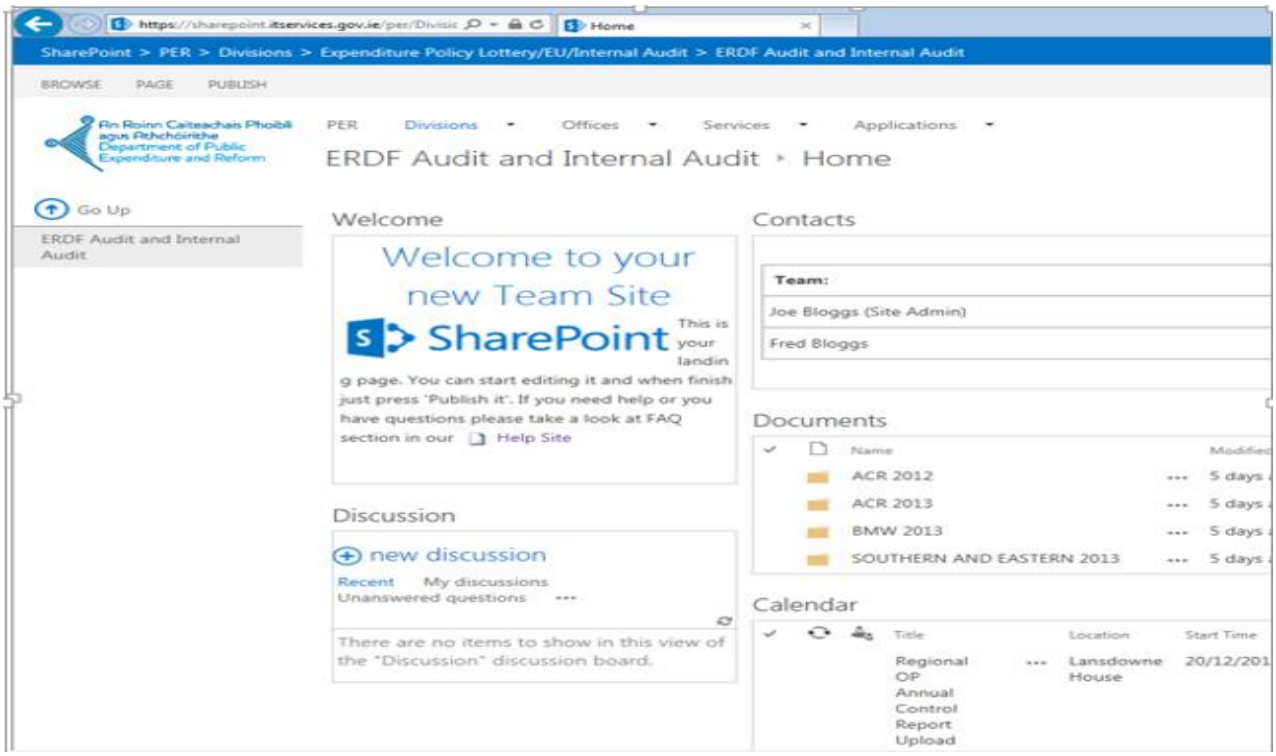


Figure 10.2: Organisation of Electronic Folders

Also, Figure 10.3 shows a file that was uploaded to the team site by one of the users.

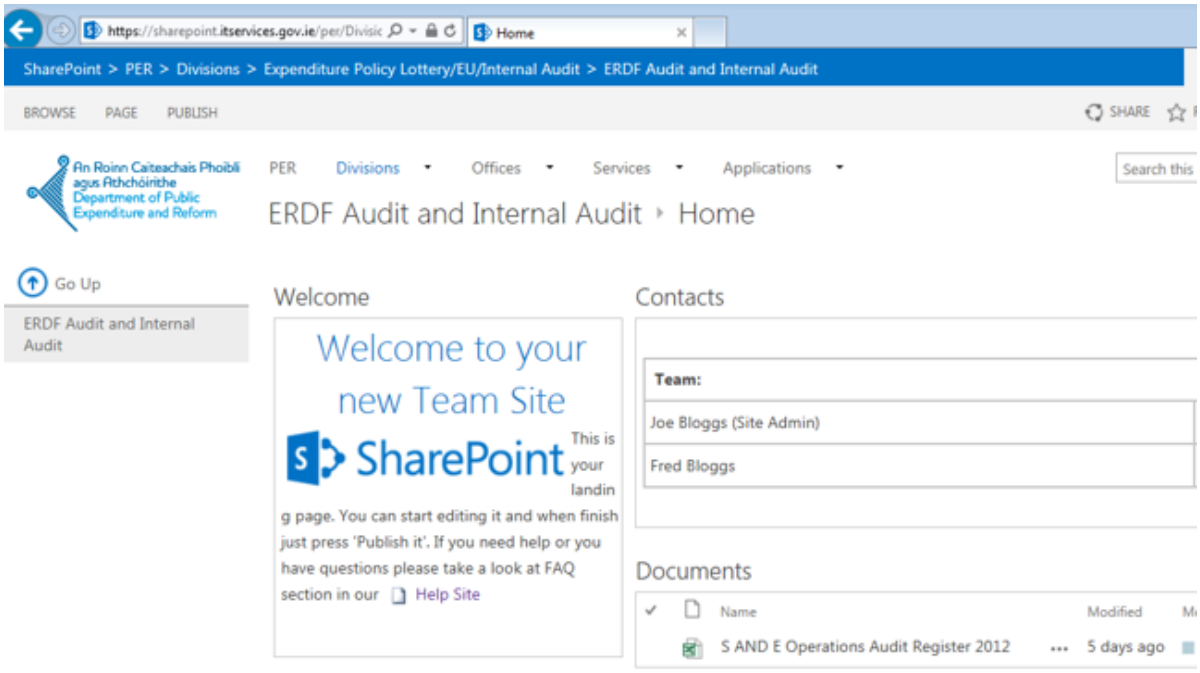


Figure 10.3: Uploaded File

Figure 10.4 is an example of a document that has been opened for updating by one of the users. SharePoint has facilities to lock this document for editing until the current user does a *check in* of the document on the site.

Figure 10.4: Document Updated on Team Site

The final screen shot in this section is the personal profile screen shown in Figure 10.5. As mentioned earlier, SharePoint has facilities that allow a user to edit their personal profile to include information on their area of knowledge about which other users may contact them.

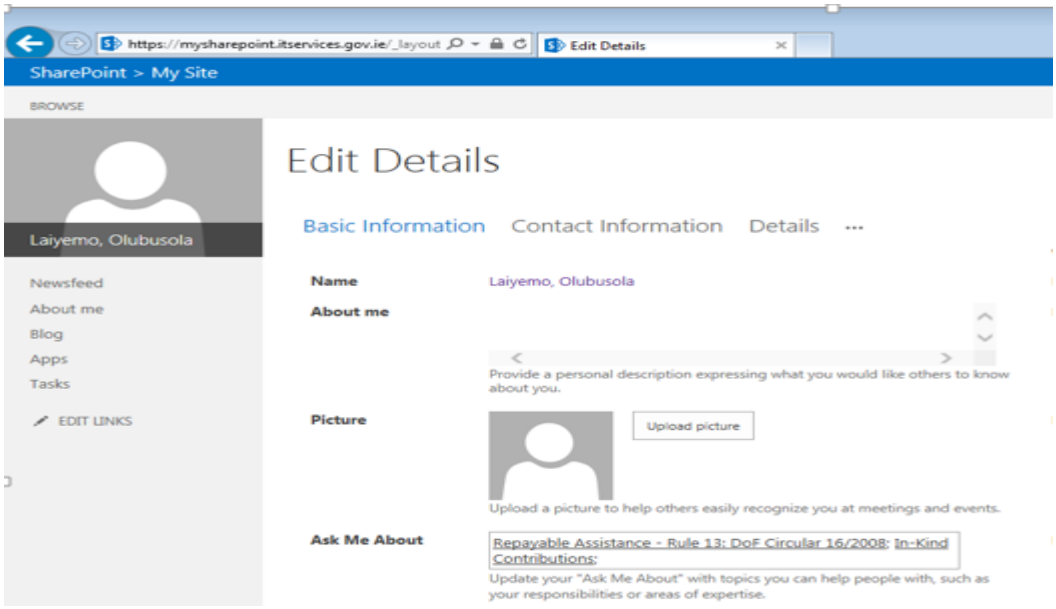


Figure 10.5: Personal Profile Page

10.4.3 Brainstorming Activity – Plus, Minus, Interesting (PMI)

This section provides information on the brainstorming sessions that were organised with the users. As discussed earlier, the users were asked to review the framework for KM in ERDF Audit which was sent to them by email. Then some time was allowed to enable the users have some hands-on experience with documents, folders, blogs and other features of SharePoint on the Unit's team site. There were already 73 hits on the team site at the time when the users were asked to provide an indication of their first impressions and initial reactions to the framework and the team site for KM in ERDF Audit during a brainstorming exercise.

In order to get as much information as possible from this exercise, it was decided to use the *plus, minus, interesting* (PMI) activity that was developed by De Bono (2006). This approach was selected and considered to be particularly useful because it encourages participants to view an idea from more than one perspective in a creative and non-traditional manner, without overanalysing it.

In addition, considering that the exercise was carried out at a busy time of the year when the auditors were working hard to conclude their schedule of audits, the prospect of a 3 to 5 minute exercise was welcome and the individuals were willing to participate in the activity.

They were seated in a room in a semi-formal setting and the PMI activity and its goals were explained to them. They were asked to try to close themselves off to opinions they disagreed with and that once they think an idea, they could not "un-think" it. They were also reassured of absolute confidentiality with the outcome of the exercise.

It was stressed that the focus of the exercise was the framework and the team site for KM in ERDF Audit and they were reminded they were not being tested or appraised as individuals or as a group. The three 1-minute rounds were explained to them and they were informed that they would be prompted when each round was to end and the next one to begin.

They were all given ruled sheets and pencils and were first asked to write down the positive things about the framework for KM in ERDF Audit and the team site in 1 minute as shown on the picture of the whiteboard in Figure 10.6.

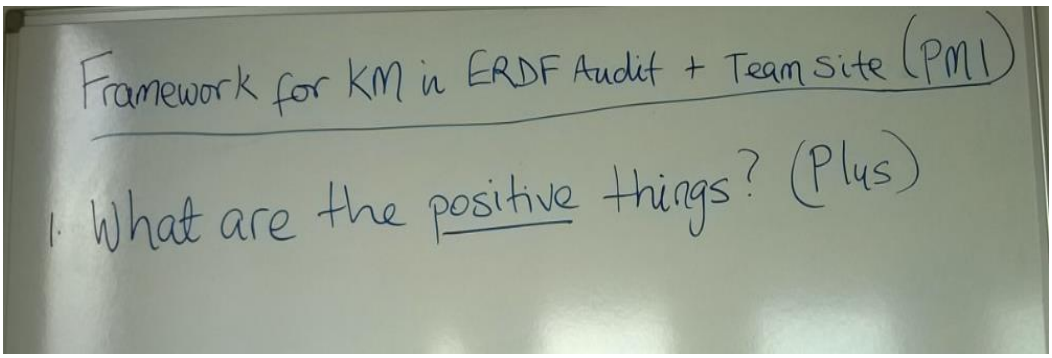


Figure 10.6: PMI Exercise - Plus

At the end of 1 minute, they were asked to stop. Next, they were asked to write down the negative things about the framework for KM in ERDF Audit and the team site in 1 minute as shown in Figure 10.7.

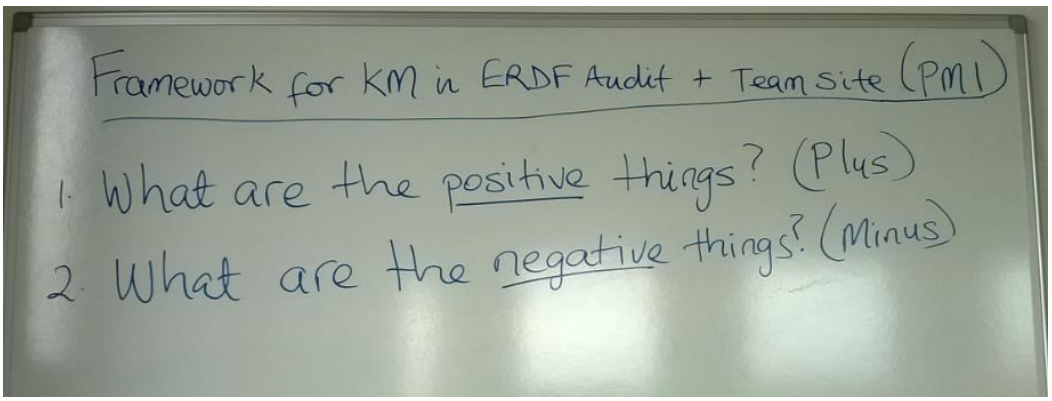


Figure 10.7: PMI Exercise - Minus

At the end of another minute, they were asked to stop and the final step in the PMI exercise was written on the whiteboard as shown in Figure 10.8

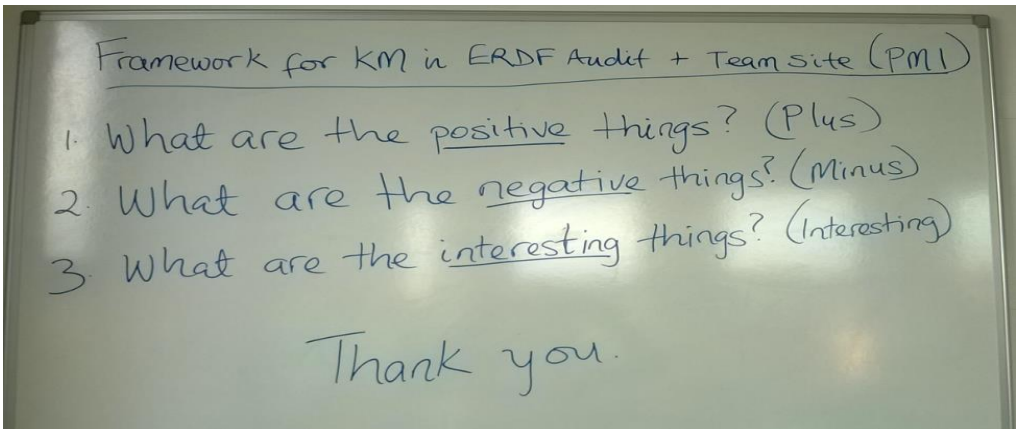


Figure 10.8: PMI Exercise - Interesting

The completed PMI sheets shown in Appendix D were then collected from the participants. These are analysed in the next section.

10.5 Evaluation

This section provides an analysis of the strengths, weaknesses, opportunities and threats (SWOT) of the framework for KM in ERDF Audit and the accompanying team site based on the results from the PMI activity carried out in the previous section. The PMI sheets are presented as manuscripts in Appendix D but a summary of the users' initial reactions are shown in Table 10.2.

Participant	PMI	Summary
1	Plus	Framework creates awareness of the important issues to be addressed
		Cool way of working with files
		Easier to understand than I thought
		Tracking of author and time of update on documents is super
	Minus	Another one of those applications you have to use whether you like it or not
		The recommendations in the framework are too many
		Why should you be encouraged to blog at work?
	Interesting	What about FOI?

Participant	PMI	Summary
2	Plus	This framework is really applicable – reflects what is needed in this Unit
		I consider access from my mobile phone a plus
		Easy to use so far and similar to the H drive
		One can almost cut and paste from the H drive to SharePoint
		Plenty of valuable information on the *findings* document
	Minus	Not everyone provided details of their knowledge areas on SharePoint
		Not all the points in the framework can be applied, e.g. positive attitude of management
	Interesting	It will be a good idea to replicate this in other work areas of the Unit
		It will also be nice to see this type of framework applied in other Units in the Department – like a department KM framework sort of thing
		It must be possible to earn annual appraisal points for sharing knowledge or even for number of blog posts, etc.
3	Plus	The *findings* document saves time spent searching for information in previous audits
		No need to be too organised – the search engine does it for you
		Puts all the information I need for section 5 in one place
	Minus	This is effectively an additional layer of application – it doesn't replace the H drive or email or internet for me
		Having incentives for sharing knowledge suggests consequence for not sharing knowledge, which I think is not good
	Interesting	It will be interesting to know the reaction of managers to the contents of the framework
		I will be looking out for when informal discussions will become part of the normal routine in the Unit

Table 10.2: PMI Summary

Overall, the comments of the participants prove to be insightful and are considered to be constructive. For example it is interesting to find that participant number 2 is eager to suggest the conversion of knowledge sharing efforts to annual performance appraisal points, even though this was not raised when the opportunity was presented in Section D of the knowledge audit questionnaire. Also, this is evidence that the PMI exercise indeed achieved the aim of encouraging the participants to *think outside the box*.

10.5.1 SWOT Analysis - Strengths

The points written down by the participants in the *plus* column express their optimism and a general embrace of the framework and the team site. From the viewpoint of strengths in a SWOT analysis, the *plus* comments of the participants indicate that the framework for KM in ERDF Audit and the team site were well accepted by the individuals in the Unit. For

example, it is evident from the points of the first and second participants that the framework has helped to identify the important considerations for successful KM in the Unit.

Also, as expected, comments about version control, the availability of knowledge from previous audits in one document, retention of the look and feel of existing applications, etc. are in the *plus* column.

In addition, that the thought of replicating the framework and the team site in other work areas of the Unit is a positive sign that the participant understands the benefits and can even conceive a wider scope of application.

10.5.2 SWOT Analysis - Weaknesses

The *minus* comments in the PMI exercise indicate the weaknesses of the framework for KM in ERDF Audit and the team site for the purpose of a SWOT analysis. It is notable that none of the participants consider the framework to be a waste of time. The comment of participant numbers 1 and 3 about the team site being an additional application being introduced are not seen as being against the use of the team site for collaboration. Instead, they are regarded as normal reactions that are generally expected when a new system is introduced and these tend to fade out with the passing of time.

10.5.3 SWOT Analysis - Opportunities

The opportunities in this SWOT analysis can be found in all the categories of the participants' comments. For example, participant number 2 commented that the team site is similar to the H drive which is the network drive currently in use and that one could almost copy from the H drive to the team site. This can be seen as an opportunity to quickly migrate most, if not all the documents on the current H drive to the team site. Especially since this will also address the comment of participant number 3 that the team site does not replace the H drive.

Also, the comment of participant number 1 about blogging at work can be seen as an opportunity to expatiate on the potential benefits of using a blog and indeed, some of the other features of SharePoint for collaboration work as it appears that this participant sees blogging from a social point of view. This is also an opportunity for management to demonstrate support for random discussions in line with the element of the framework for KM in the Unit, albeit online and not person-to-person.

10.5.4 SWOT Analysis - Threats

The comment of participant number 1 on the issue of FOI (Freedom of Information Act) can pose a significant threat to the extent of usage of the team site. As mentioned in chapter 4, the provisions of the FOI Act gives members of the public the right to obtain access to detailed official information in the Department in line with public interest. While there is a presumption that the team site will be used for work purposes only and that materials on the site will be of a professional standard, there is an element of caution in what public servants in general, are willing to put down in writing. This is especially so with features such as blogging that is available on SharePoint.

One way to address this threat is to reiterate the importance of professionalism, accountability, transparency and the other core values of public service.

10.6 Conclusion

This chapter presented SharePoint as the selected KM tool and explained the reason for its selection. It described the steps involved in the modelling of the knowledge elements of the testing of eligibility of expenditure in ERDF Audit on SharePoint, incorporating the relevant elements of the framework developed in the previous chapter.

The chapter also provided details of the activities involved in the development of the main knowledge documents and the set-up of the team site, including the nomenclature of the files and the hyperlinks in line with shared vocabulary and the existing file share structure.

Furthermore, the chapter describes the brainstorming session held with the users of the system and expatiates on their initial reaction to the framework for KM in ERDF Audit as well as to the use of the team site for knowledge sharing, collaboration and learning.

Finally, a SWOT analysis of their initial reactions was done and it is noted that overall, the participants wrote down more items in the *plus* column than in the *minus* and *interesting* columns, 12, 7 and 6 respectively. At this point, it would appear that the framework for KM in ERDF Audit has resulted in some favourable outcomes. The overall conclusion from the work carried out in this research is summarised in the following chapter.

11 CONLCUSION AND FUTURE WORK

11.1 Introduction

This chapter provides a summary of the findings and conclusions that can be drawn from the work carried out in this research. It revisits the aim and objectives of the project, outlining the approach adopted in realising them in the course of carrying out the research.

The learning points encountered in the project are also presented in this chapter, along with suggestions for future work in this research area.

11.2 Conclusions

11.2.1 Research Aims and Objectives

This research set out to develop a framework for KM in a section within a Civil Service Government Department. This section is a Unit that carries out audits of ERDF co-funded operations.

The KM framework was developed using the results from a combination of research methods and activities including a critical review of literature, a knowledge audit and interviews. A KM application tool was subsequently selected, based on the framework, the conclusions from literature review and other considerations and this was presented to the individuals in the ERDF Audit Unit. Then a core ERDF Audit process was selected and modelled on the KM application and individuals in the ERDF Audit Unit were asked to record their initial reactions to the framework and the use of the KM application. Their initial reactions were analysed and it was possible to draw some positive conclusions from them.

11.2.2 Research Overview

This section provides an overview of the research with an explanation of its organisation into chapters and the relationship between the different parts of the project as shown in Figure 11.1.

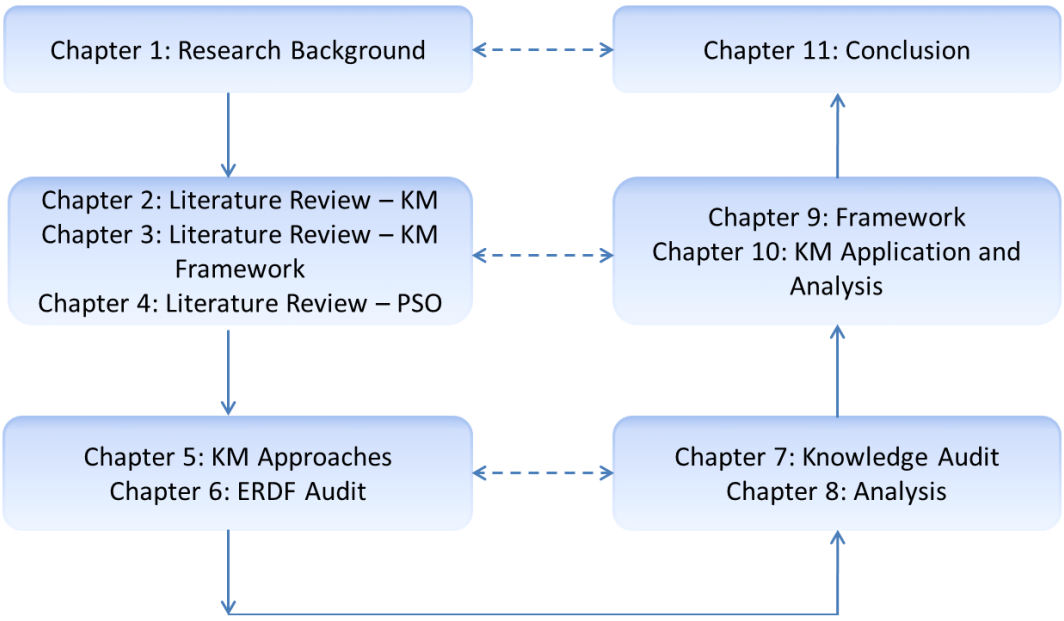


Figure 11.1: Research Overview

The first chapter provided the background and description of the research, outlining the objectives and the research methods for the design, implementation and evaluation of the experiment.

One of the research methods identified in Chapter one is a critical review of literature and this was covered in the next three chapters. Initial conclusions were drawn based on the review of literature in the area of KM, KM framework and the Public Sector in these three chapters.

A review of different knowledge audit approaches from existing literature was done in chapter five in line with the design and implementation approach outlined in chapter one. This was followed in chapter six by a detailed description of the ERDF Audit Unit, the organisation on which the experiment of this research was carried out.

Having established a suitable knowledge audit approach in relation to the current position of the ERDF Audit Unit, chapters seven and eight detailed the knowledge audit questionnaire and the analysis of the responses respectively.

Based on the conclusions drawn from preceding chapters, a framework for KM was developed in chapter nine and a technology layer for the framework was detailed in chapter ten. The initial reactions of the individuals in the ERDF Audit Unit was analysed. The analysis is based on their trial of the KM framework as modelled on collaboration tool and the outcome is summarised in Section 11.2.3.

11.2.3 Findings and Learning points

Although there are several conclusions and learning points that have resulted from this research, these section summarises only a few important ones.

The findings from literature review is that knowledge sharing and collaboration cannot be effective in an environment where there is a lack of trust and the individuals are not willing to share knowledge. Although the framework developed in this research identified the need to emphasise the core reasons for knowledge sharing, the analysis of the initial reactions of the users still confirms the need for trust and a willingness to share knowledge.

In addition, the conclusion from literature review and from the knowledge audit is that it cannot be assumed that people will always do what they are expected to do. This highlights the need for an organisational culture where there are incentives for knowledge sharing and where positive attitudes towards all forms of knowledge sharing are visible. It was also seen that an organisational culture that highlights mistakes as learning experiences rather than seeing them as reasons for unpleasant consequences have the potential to foster knowledge sharing. These points also emerged from the experiment as elements of the framework for KM in the Unit.

Furthermore, the importance of organisational structure as a factor in the levels of communication and knowledge sharing was highlighted in this research. The well-defined hierarchical structures that are typically found in Public Sector organisation settings has the potential to stifle knowledge sharing. In addition, some peculiarities of Public Sector organisations, such as job security contribute to the inflexibility of the mental models that are generally not uncommon among public servants.

Another salient conclusion from this research is the need to explicate knowledge as much as possible. Without this, it will be impossible to tap into the full potential of the knowledge embedded in ERDF audit processes or in the minds of the individuals in the Unit.

11.3 Future Work

It is acknowledged that the audit of ERDF co-funded operations is a highly specialised task and this research focused on the audit of only one of the Structural Funds of the EU in Ireland. Future work on this research could be designed to focus on the audit of operations that are co-funded by other EU Structural Funds in other Government Departments in Ireland.

In addition, the target organisation for this research is a Unit within a Civil Service Government Department in Ireland. Future work may involve a research into the knowledge sharing practices that exist in similar establishments outside the country. For example, a future research could carry out a comparison of the knowledge sharing practices in Ireland with those in the United Kingdom.

It was also noted in earlier chapters that this research focused on only one of ten sections in the audit of an ERDF co-funded operation. An area for future work on this research is to iterate the work done in this research in order to take account of the other nine sections and model the entire audit process on the KM collaboration tool. Finally, future work in this area should allow extensive use of more features of the collaboration tool and may incorporate a follow-up questionnaire for a more in-depth analysis of the initial reactions of the users of the system.

APPENDIX A: Knowledge Audit Questionnaire

My name is Busola Laiyemo. I am currently working on a dissertation required for an M.Sc. in Computer Science at Dublin Institute of Technology. I am conducting a research into the development of a framework for knowledge management in European Regional Development Funds (ERDF) audit. As part of this research, I need to carry out a survey in relation to the audit of Eligibility of Expenditure and I would be very grateful if you could take some time to complete this questionnaire. It would take about 10 minutes to complete.

Please note that your answers will be treated with confidentiality. Neither Dublin Institute of Technology nor any other third party will identify your personal details, nor will it be possible to identify you in any way in the report I will publish as part of my M.Sc. dissertation.

I would like to personally thank you for your time in taking part in this survey.

Please answer the following in relation to ERDF Audit of eligibility of transactions (tick as appropriate).

Section A: Work Analysis

1. Try to allocate your work time for a typical ERDF audit assignment (audit of eligibility of expenditure)	
	Percentage Time
i) Audit sample selection	%
ii) Setting up electronic working papers (e.g. client details, sample details, etc.)	%
iii) Review of supporting documents (e.g. invoices, bank statements, etc.)	%
iv) Review of circulars and guidelines	%
v) Discussion with clients	%
vi) Documenting details of review on working papers (e.g. W/P 5.1 rule 1 to 17)	%
vii) Preparing a summary for the Audit Report Appendix	%
Total	**100%**

2. How often do you communicate with the following co-workers? (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always)						
		1	2	3	4	5
i	Co-worker on the same level (e.g. auditor to auditor)					
ii	Co-worker at higher level (e.g. auditor to manager)					
iii	Co-worker at a lower level (e.g. manager to auditor)					

3. How often do the following arise during the ERDF audit (audit of eligibility of expenditure)? (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always)						
		1	2	3	4	5
i	You are not sure about WHAT to do (e.g. unsure about the steps to take when reviewing an invoice)					
ii	You are not sure about HOW to do something (e.g. unsure about the best-practice approach)					
iii	You are not sure about WHO to ask for help (e.g. which colleague has the relevant experience to give you initial information / guideline)					
iv	You are not sure about WHERE to find relevant information (e.g. circular, website or external sources)					

Section B: Knowledge and Information Sources

1. How often do you use the following knowledge resources in your audit of eligibility of expenditure? (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always)						
		1	2	3	4	5
i	Electronic working papers from previous audits conducted by you (e.g. manager's review comments, audit reports, etc.)					
ii	Electronic working papers from colleagues' audits (e.g. colleagues' files on the network drive)					
iii	Circulars on eligibility rules (e.g. Circular 16/2008)					
iv	European Commission regulations (e.g. Commission Regulation (EC) No 1828/2006)					
v	Electronic files on the internet (e.g. MA and IB websites)					

2. How often do you participate in the following social interactions at work? (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always)						
		1	2	3	4	5
i	Formal, planned meetings with colleagues					
ii	Informal meetings with colleagues (tea breaks, 10 minute discussions, etc.)					
iii	External formal interactions (e.g. other units, clients, Managing Authorities, etc.)					
iv	External informal interactions (friends outside the unit, etc.)					
v	Official events (courses, seminars, etc.)					

3. When trying to gain knowledge for auditing eligibility of expenditure, how often would you do the following? (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always)						
		1	2	3	4	5
i	Ask colleagues at a meeting					
ii	Ask a colleague on the phone					
iii	Ask a colleague by email					

Section C: Organisational Culture

1. To what extent do you agree with the following statements about the ERDF Audit Unit? (1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)						
		1	2	3	4	5
i	The importance of the knowledge of individuals is recognised					
ii	Individuals are dedicated to the Unit					
iii	Team-work and co-operation exist among staff					
iv	Confidence and trust exist among staff					
v	There are barriers to effective communication among staff					

2. To what extent do you agree with the following statements? (1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)						
		1	2	3	4	5
i	My personal goals fit well with my current work situation					
ii	I am satisfied with the tasks required of me in my job					
iii	I am satisfied with my pay (salary)					
iv	I am satisfied with the job security in the Unit					
v	I am satisfied with the work environment in the Unit					
vi	I am satisfied with the relationship I have with my colleagues					

3. To what extent do you agree with the following statements? (1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)						
		1	2	3	4	5
i	I am afraid to make a mistake or fail at my work					
ii	I am constantly seeking to improve my work practices					
iii	I consider sharing my knowledge with colleagues as an advantage					
iv	I have a personal desire to learn more and gain new knowledge					

4. To what extent do you agree with the following statements about your work environment? (1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)						
		1	2	3	4	5
i	There are good meeting spaces for formal or informal meetings					
ii	There is enough time for open and random discussions					
iii	Open and random communications are recognised and encouraged					

Section D: Motivation

1. To what extent to do you agree with giving these incentives for encouraging knowledge sharing

	in the ERDF Audit Unit? **(1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)**					
		1	**2**	**3**	**4**	**5**
i	Formal recognition / commendation					
ii	Inclusion in performance review for career development records					
iii	Non-monetary reward for time spent on sharing knowledge (e.g. time off in lieu)					
iv	Other incentives (please describe)					

Section E: Knowledge Management in the ERDF Audit Unit

	1. If you were in charge of the knowledge resources in the unit, to what extent do you agree that the following should be pursued? **(1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)**					
		1	**2**	**3**	**4**	**5**
Communication						
i	I would improve infrastructure that could support communication (e.g. meeting rooms, Information Technology, etc.)					
ii	I would introduce new ways of communication (e.g. video-conferencing, skyping, blogging, etc.)					
iii	I would increase the frequency of planned meetings					
iv	I would increase external formal interactions (other units, clients, MA, IB, etc.)					
v	I would increase official events (e.g. courses, seminars, etc.)					
vi	I would encourage informal and random meetings among staff (e.g. coffee morning for ERDF Audit Unit staff only)					
Information Flow						
i	I would increase the free flow of information (e.g. copy all unit staff on certain email communications, etc.)					
ii	I would improve the distribution of information from external sources among staff					
Electronic Files						
i	I would support access for all staff to electronic business files (a type of corporate Google)					
ii	I would develop an electronic cv to aid staff in searching and locating appropriate knowledge, skills, experience, etc.					

iii	I would arrange electronic files into groups that are easy to identify					
Change of Culture						
i	I would try to change the attitude of staff so that they will be more willing to share their knowledge					
ii	I would try to change the attitude of management to informal meetings so that staff will feel free to share knowledge					
People						
i	I would improve on-the-job training					
ii	I would introduce new methods for the transfer of experience from the more experienced staff to less experienced staff					
iii	I would introduce new methods of obtaining knowledge from outside the unit (e.g. other units, Managing Authorities, etc.)					

2. If there was a company policy relating to knowledge sharing in the unit, how often do you think the following would occur?

(1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always)

		1	2	3	4	5
i	Lack of time for staff to share their knowledge					
ii	Lack of willingness of staff to share important knowledge due to fear of giving away knowledge					
iii	Lack of willingness of staff to change the way they work when new processes are introduced					
iv	Failure of management to give incentives / rewards to staff for sharing knowledge					
v	Lack of team-work and co-operation among staff					
vi	Failure of staff to share knowledge if there is no consequence for it.					

Section F: Personal Knowledge Profile

1. What is your level of education?

	(Tick all relevant boxes)	
		Tick (✓)
i	Second Level	
ii	Third Level	
iii	Professional	
iv	Others (please specify)	

2. What is your level of skill in the following areas?

(1 = basic, 2 = somewhat proficient, 3 = proficient, 4 = advanced, 5 = expert)

		1	2	3	4	5
i	Basic computer skills (e.g. emails, printing, document management etc.)					
ii	Microsoft Office (e.g. Word, Excel, PowerPoint etc.)					
iii	Interpretation and application of Eligibility Rules					
iv	Written communication skills (e.g. documentation of audit finding, report writing etc.)					
v	Oral communication skills (e.g. discussing with clients)					
vi	Searching for information on the internet					

3. To what extent do you agree with the following statements?

(1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)

		1	2	3	4	5
Knowledge from Education						
i	The knowledge gained from your education is useful for your work in the audit eligibility of expenditure					
ii	The knowledge gained from your education could be useful for the work of other colleagues in the audit of eligibility of expenditure					
Work Experience to Date						
i	Your professional experience is useful for your work in the audit eligibility of expenditure					
ii	Your professional experience could be useful for the work of other colleagues in the audit of eligibility of expenditure					
Personal Professional Contacts						
i	Your personal business networking is useful for your work in the audit eligibility of expenditure					

ii	Your personal business networking could be useful for the work of other colleagues in the audit of eligibility of expenditure					

4. To what extent do you agree with the following statements? **(1 = strongly disagree, 2 = disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = strongly agree)**						
		1	**2**	**3**	**4**	**5**
i	Your colleagues are aware of your entire educational achievements					
ii	Your colleagues are aware of your entire professional experience					
iii	Your colleagues are aware of your personal business contacts					

Section G: Demographic Data

Tick the relevant box

(NOTE: Please feel free to skip any question you do not wish to answer.)

1. What is your grade at work?		
		Tick (✓)
i	Clerical Officer	
ii	Executive Officer	
iii	Administrative Officer	
iv	Higher Executive Officer	
v	Assistant Principal	
vi	Principal Officer	

2. What is your age bracket?		
		Tick (✓)
i	30 years or less	
ii	31 – 40 years	
iii	41 – 50 years	
iv	51 – 60 years	
v	Over 60 years	

3. What is your gender?		
		Tick (✓)
i	Male	
ii	Female	

4. How many years of work experience do you have in the ERDF Audit Unit?		
		Tick (✓)
i	5 years or less	
ii	6 – 10 years	
iii	Over 10 years	

5. How many years of work experience do you have altogether (include experience from first job to date)?		
		Tick (✓)
i	10 years or less	
ii	11 – 20 years	
iii	21 – 30 years	
iv	31 – 40 years	
v	Over 40 years	

Once again, thank you for taking part in this survey.

APPENDIX B: Anonymised Knowledge Audit Questionnaire Responses

	Respondents	1	2	3	4	5	6	7	8	9
	Section A: Work Analysis									
1	**Try to allocate your work time for a typical ERDF audit assignment (audit of eligibility of expenditure)**									
i	Audit sample selection	5	5	5	5	0	10	5	5	5
ii	Setting up electronic working papers (e.g. client details, sample details, etc.)	5	10	20	5	0	15	5	10	5
iii	Review of supporting documents (e.g. invoices, bank statements, etc.)	15	25	20	10	25	20	30	25	30
iv	Review of circulars and guidelines	10	10	10	5	10	10	30	5	10
v	Discussion with clients	20	35	25	20	20	5	10	20	15
vi	Documenting details of review on working papers (e.g. W/P 5.1 rule 1 to 17)	25	10	10	45	20	25	10	15	15
vii	Preparing a summary for the Audit Report Appendix	20	5	10	10	25	15	10	20	20
	Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

	Respondents	1	2	3	4	5	6	7	8	9
2	**How often do you communicate with the following co-workers?**									
i	Co-worker on the same level (e.g. auditor to auditor)	4	3	5	2	4	4	5	4	3
ii	Co-worker at higher level (e.g. auditor to manager)	4	2	2	2	4	4	5	3	4
iii	Co-worker at a lower level (e.g. manager to auditor)	2	1	3	5	5	4	5	1	1

	Respondents	1	2	3	4	5	6	7	8	9
3	**How often do the following arise during the ERDF audit (audit of eligibility of expenditure)?**									
i	You are not sure about WHAT to do (e.g. unsure about the steps to take when reviewing an invoice)	2	1	2	2	3	3	1	1	2
ii	You are not sure about HOW to do something (e.g. unsure about the best-practice approach)	1	2	2	2	2	4	1	2	3
iii	You are not sure about WHO to ask for help (e.g. which colleague has the relevant experience to give you initial information / guideline)	1	2	1	2	2	2	1	1	1
iv	You are not sure about WHERE to find relevant information (e.g. circular, website or external sources)	2	2	1	1	2	3	1	2	2

	Respondents	1	2	3	4	5	6	7	8	9
	Section B: Knowledge and Information Sources									
1	**How useful are the following knowledge resources in your audit of eligibility of expenditure?**									
i	Electronic working papers from previous audits conducted by you (e.g. manager's review comments, audit reports, etc.)	3	2	4	2	4	4	5	3	4
ii	Electronic working papers from colleagues' audits (e.g. colleagues' files on the network drive)	3	2	4	2	4	4	4	3	3
iii	Circulars on eligibility rules (e.g. Circular 16/2008)	5	4	5	5	3	5	5	4	5
iv	European Commission regulations (e.g. Commission Regulation (EC) No 1828/2006)	2	4	5	1	4	4	5	2	2
v	Electronic files on the internet (e.g. MA and IB websites)	3	3	5	2	2	4	3	3	3

	Respondents	1	2	3	4	5	6	7	8	9
2	**How often do you participate in the following social interactions at work?**									
i	Formal, planned meetings with colleagues	5	5	1	3	4	4	5	5	2
ii	Informal meetings with colleagues (tea breaks, 10 minute discussions, etc.)	5	2	3	4	4	4	3	5	5
iii	External formal interactions (e.g. other units, clients, Managing Authorities, etc.)	5	3	3	3	3	3	3	5	2
iv	External informal interactions (friends outside the unit, etc.)	5	3	3	3	2	3	5	5	1
v	Official events (courses, seminars, etc.)	5	4	2	3	3	4	3	5	3

	Respondents	1	2	3	4	5	6	7	8	9
3	**When trying to gain knowledge for auditing eligibility of expenditure, how often would you do the following?**									
i	Ask colleagues at a meeting	1	3	2	2	4	5	3	1	3
ii	Ask a colleague on the phone	2	3	2	2	4	4	3	2	5
iii	Ask a colleague by email	2	3	2	2	4	3	3	2	3

	Respondents	1	2	3	4	5	6	7	8	9
	Section C: Organisational Culture									
1	**To what extent do you agree with the following statements about the ERDF Audit Unit?**									
i	The importance of the knowledge of individuals is recognised	2	2	1	4	3	4	3	3	4
ii	Individuals are dedicated to the Unit	4	2	4	5	4	5	5	4	5
iii	Team-work and co-operation exist among staff	4	2	1	4	3	5	3	3	3
iv	Confidence and trust exist among staff	2	1	1	4	4	5	3	2	2
v	There are barriers to effective communication among staff	4	5	1	3	4	2	3	5	5

	Respondents	1	2	3	4	5	6	7	8	9
2	**To what extent do you agree with the following statements?**									
i	My personal goals fit well with my current work situation	4	2	1	4	4	3	3	2	3
ii	I am satisfied with the tasks required of me in my job	3	2	1	4	4	4	3	2	4
iii	I am satisfied with my pay (salary)	3	2	1	3	4	2	3	2	2
iv	I am satisfied with the job security in the Unit	4	3	4	4	5	4	4	4	5
v	I am satisfied with the work environment in the Unit	4	1	3	4	3	5	3	3	3
vi	I am satisfied with the relationship I have with my colleagues	4	1	3	4	4	5	3	3	4

	Respondents	1	2	3	4	5	6	7	8	9
3	**To what extent do you agree with the following statements?**									
i	I am afraid to make a mistake or fail at my work	3	3	2	2	2	4	5	3	5
ii	I am constantly seeking to improve my work practices	4	3	5	4	4	4	5	3	5
iii	I consider sharing my knowledge with colleagues as an advantage	4	4	4	4	4	3	5	4	3
iv	I have a personal desire to learn more and gain new knowledge	4	5	4	4	4	4	5	5	5

	Respondents	1	2	3	4	5	6	7	8	9
4	**To what extent do you agree with the following statements about your work environment?**									
i	There are good meeting spaces for formal or informal meetings	4	1	1	4	3	4	3	4	4
ii	There is enough time for open and random discussions	2	2	1	2	3	4	3	2	4
iii	Open and random communications are recognised and encouraged	2	2	1	4	3	4	3	2	3

	Respondents	1	2	3	4	5	6	7	8	9
	Section D: Motivation									
1	**To what extent to do you agree with giving these incentives for encouraging knowledge sharing in the ERDF Audit Unit?**									
i	Formal recognition / commendation	3	2	5	4	5	3	1	2	4
ii	Inclusion in performance review for career development records	3	1	5	4	5	4	1	2	5
iii	Non-monetary reward for time spent on sharing knowledge (e.g. time off in lieu)	3	2	5	4	3	4	1	2	5
iv	Other incentives (please describe)	5*	0	5**	0	3	3	1	0	0

* Manager's respect and support, verbal acknowledgement of the hard work and time that goes into an audit would be helpful. Knowledge arising from audits being reviewed and reflected in our standard documentation / procedures at regular intervals would be a huge encouragement and this would support knowledge sharing within the unit. This could also give rise to discussion on particular issues.

** General commendations to the unit over targets

	Respondents	1	2	3	4	5	6	7	8	9
	Section E: Knowledge Management in the ERDF Audit Unit									
1	**If you were in charge of the knowledge resources in the unit, to what extent would you pursue the following?**									
	Communication									
i	I would improve infrastructure that could support communication (e.g. meeting rooms, Information Technology, etc.)	5	5	5	4	3	4	3	3	5
ii	I would introduce new ways of communication (e.g. video-conferencing, skyping, blogging, etc.)	5	5	5	4	2	3	3	4	5
iii	I would increase the frequency of planned meetings	5	5	5	4	5	4	3	5	5
iv	I would increase external formal interactions (other units, clients, MA, IB, etc.)	4	5	5	4	4	4	3	4	4
v	I would increase official events (e.g. courses, seminars, etc.)	5	5	5	4	4	4	4	5	5
vi	I would encourage informal and random meetings among staff (e.g. coffee morning for ERDF Audit Unit staff only)	3	5	5	4	5	4	3	4	4

	Respondents	1	2	3	4	5	6	7	8	9
	Information Flow									
i	I would increase the free flow of information (e.g. copy all unit staff on certain email communications, etc.)	4	5	5	3	5	4	5	5	4
ii	I would improve the distribution of information from external sources among staff	4	5	5	4	5	4	5	5	4

	Respondents	1	2	3	4	5	6	7	8	9
	Section E: Knowledge Management in the ERDF Audit Unit *(continued)*									
	Electronic Files									
i	I would support access for all staff to electronic business files (a type of corporate Google)	4	5	4	5	4	3	3	5	4
ii	I would develop an electronic cv to aid staff in searching and locating appropriate knowledge, skills, experience, etc.	5	5	4	4	3	3	3	5	5
iii	I would arrange electronic files into groups that are easy to identify	5	5	0	5	4	5	3	5	5

	Respondents	1	2	3	4	5	6	7	8	9
	Change of Culture									
i	I would try to change the attitude of staff so that they will be more willing to share their knowledge	4	5	2	4	5	5	4	4	4
ii	I would try to change the attitude of management to informal meetings so that staff will feel free to share knowledge	3	5	4	3	5	5	4	4	5

	Respondents	1	2	3	4	5	6	7	8	9
	People									
i	I would improve on-the-job training	5	5	4	4	5	4	5	5	5
ii	I would introduce new methods for the transfer of experience from the more experienced staff to less experienced staff	5	5	1	4	5	4	5	5	5
iii	I would introduce new methods of obtaining knowledge from outside the unit (e.g. other units, Managing Authorities, etc.)	5	5	3	4	5	4	5	4	4

	Respondents	1	2	3	4	5	6	7	8	9
2	**If there was a company policy relating to knowledge sharing in the unit, how often do you think the following would occur?**									
i	Lack of time for staff to share their knowledge	4	4	3	4	3	4	3	3	3
ii	Lack of willingness of staff to share important knowledge due to fear of giving away knowledge	3	3	2	2	3	2	3	3	3
iii	Lack of willingness of staff to change the way they work when new processes are introduced	2	3	1	4	2	2	4	2	5
iv	Failure of management to give incentives / rewards to staff for sharing knowledge	4	5	4	3	4	2	3	3	4
v	Lack of team-work and co-operation among staff	3	3	2	2	3	1	3	3	5
vi	Failure of staff to share knowledge if there is no consequence for it.	4	4	4	3	3	3	3	3	5

	Respondents	1	2	3	4	5	6	7	8	9
	Section F: Personal Knowledge Profile									
1	**What is your level of education?**									
i	Second Level	1	1	1	1	1	1	1	1	1
ii	Third Level	1	1	1	1	1	1	1	1	1
iii	Professional	1	1	1	1	1	0	1	1	1
iv	Others (please specify)	0	0	0	0	0	0	0	0	0

	Respondents	1	2	3	4	5	6	7	8	9
2	**What is your level of skill in the following areas?**									
i	Basic computer skills (e.g. emails, printing, document management etc.)	5	5	4	4	4	4	5	5	5
ii	Microsoft Office (e.g. Word, Excel, PowerPoint etc.)	4	5	4	4	4	4	5	4	5
iii	Interpretation and application of Eligibility Rules	4	5	5	4	4	3	5	5	4
iv	Written communication skills (e.g. documentation of audit finding, report writing etc.)	5	4	4	4	4	4	5	5	5
v	Oral communication skills (e.g. discussing with clients)	5	5	5	4	4	4	5	5	4
vi	Searching for information on the internet	5	5	5	4	3	3	5	5	5

	Respondents	1	2	3	4	5	6	7	8	9
3	**To what extent do you agree with the following statements?**									
	Knowledge from Education									
i	The knowledge gained from your education is useful for your work in the audit eligibility of expenditure	4	3	4	4	2	3	3	3	5
ii	The knowledge gained from your education could be useful for the work of other colleagues in the audit of eligibility of expenditure	4	3	4	4	2	3	3	3	5

	Respondents	1	2	3	4	5	6	7	8	9
	Work Experience to Date									
i	Your professional experience is useful for your work in the audit eligibility of expenditure	4	3	1	4	5	2	3	4	4
ii	Your professional experience could be useful for the work of other colleagues in the audit of eligibility of expenditure	4	3	1	4	5	2	3	4	4

	Respondents	1	2	3	4	5	6	7	8	9
	Section F: Personal Knowledge Profile *(continued)*									
	Personal Professional Contacts									
i	Your personal business networking is useful for your work in the audit eligibility of expenditure	3	5	3	3	2	2	1	3	2
ii	Your personal business networking could be useful for the work of other colleagues in the audit of eligibility of expenditure	3	5	3	3	2	2	1	3	2

	Respondents	1	2	3	4	5	6	7	8	9
4	**To what extent do you agree with the following statements?**									
i	Your colleagues are aware of your entire educational achievements	5	2	3	2	4	2	3	4	4
ii	Your colleagues are aware of your entire professional experience	4	2	5	4	3	2	3	4	2
iii	Your colleagues are aware of your personal business contacts	2	1	1	2	2	2	3	3	3

	Respondents	1	2	3	4	5	6	7	8	9
	Section G: Demographic Data									
1	**What is your grade at work?**									
i	Clerical Officer	0	0	0	0	0	0	0	0	0
ii	Executive Officer	0	0	0	0	0	0	0	0	0
iii	Administrative Officer	0	0	0	0	0	0	0	0	1
iv	Higher Executive Officer	1	1	1	0	0	0	1	1	0
v	Assistant Principal	0	0	0	1	1	1	0	0	0
vi	Principal Officer	0	0	0	0	0	0	0	0	0

	Respondents	1	2	3	4	5	6	7	8	9
2	**What is your age bracket?**									
i	30 years or less	0	0	0	0	0	0	0	0	0
ii	31 – 40 years	0	0	0	0	0	0	1	0	1
iii	41 – 50 years	0	0	0	1	1	0	0	0	0
iv	51 – 60 years	0	0	0	0	0	1	0	0	0
v	Over 60 years	0	0	0	0	0	0	0	0	0

	Respondents	1	2	3	4	5	6	7	8	9
3	**What is your gender?**									
i	Male	0	0	0	1	1	1	1	0	0
ii	Female	0	0	0	0	0	0	0	0	1

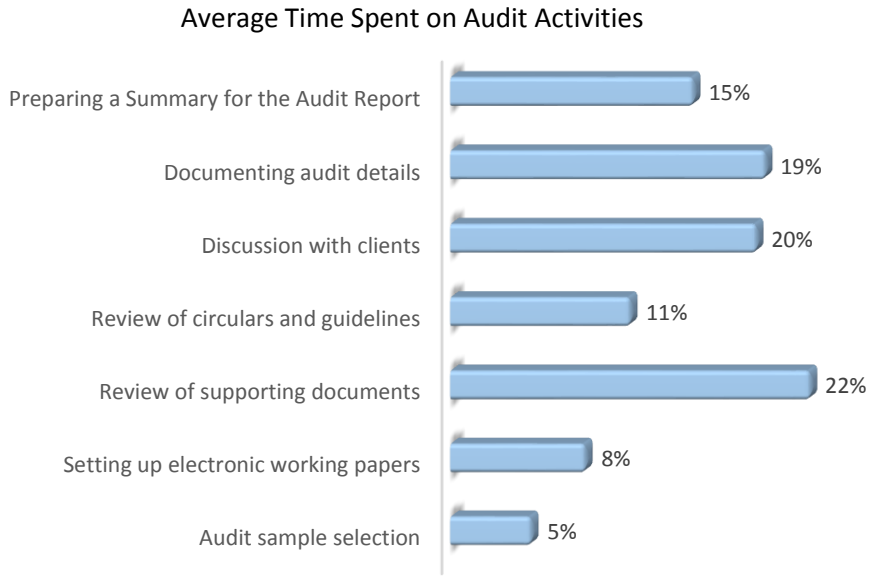
	Respondents	1	2	3	4	5	6	7	8	9
4	**How many years of work experience do you have in the ERDF Audit Unit?**									
i	5 years or less	0	0	0	0	0	1	0	0	1
ii	6 – 10 years	0	0	0	1	1	0	1	0	0
iii	Over 10 years	0	0	0	0	0	0	0	0	0

	Respondents	1	2	3	4	5	6	7	8	9
	Section G: Demographic Data *(continued)*									
5	**How many years of work experience do you have altogether (include experience from first job to date)?**									
i	10 years or less	0	0	0	0	0	0	0	0	0
ii	11 – 20 years	1	1	1	0	0	0	1	1	1
iii	21 – 30 years	0	0	0	1	1	0	0	0	0
iv	31 – 40 years	0	0	0	0	0	1	0	0	0
vi	Over 40 years	0	0	0	0	0	0	0	0	0

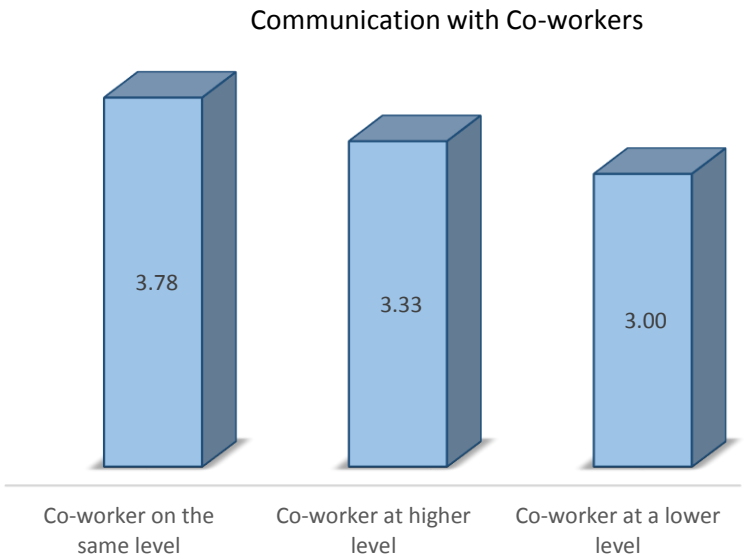
APPENDIX C: Analysis of Knowledge Audit

Section A: Work Analysis

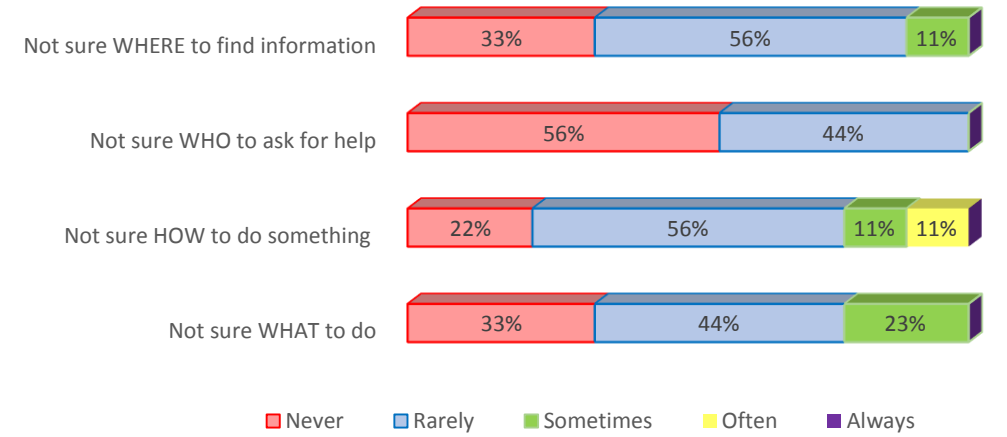
1. Try to allocate your work time for a typical ERDF audit assignment (audit of eligibility of expenditure)



2. How often do you communicate with the following co-workers?

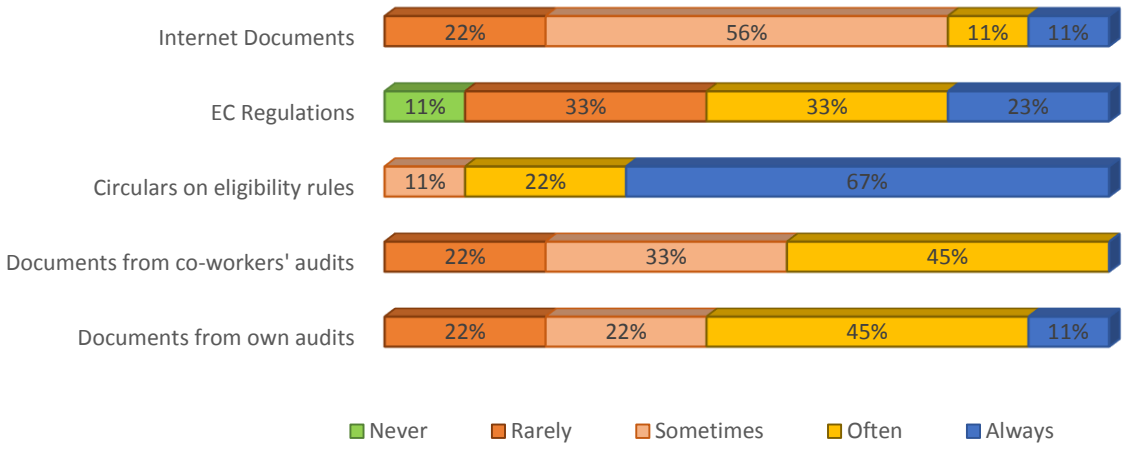


3. How often do the following arise during the ERDF audit (audit of eligibility of expenditure)?

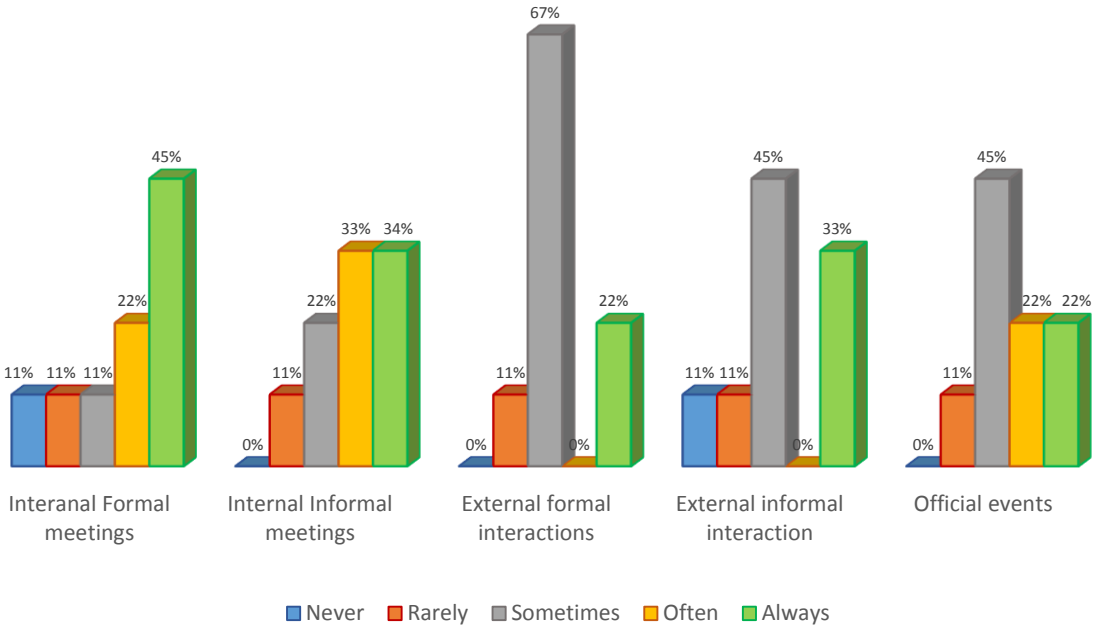


Section B: Knowledge and Information Sources

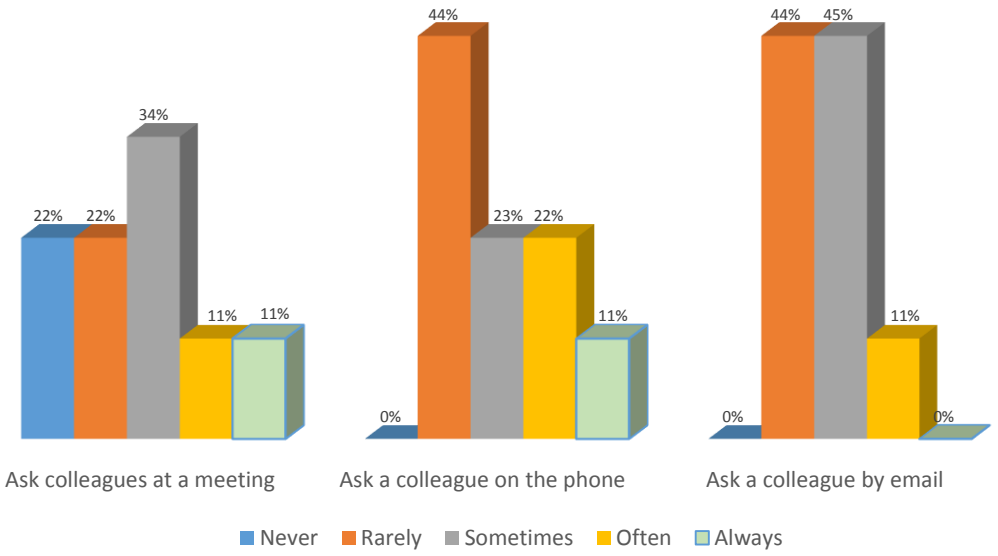
1. How often do you use the following knowledge resources in your audit of eligibility of expenditure?



2. How often do you participate in the following social interactions at work?

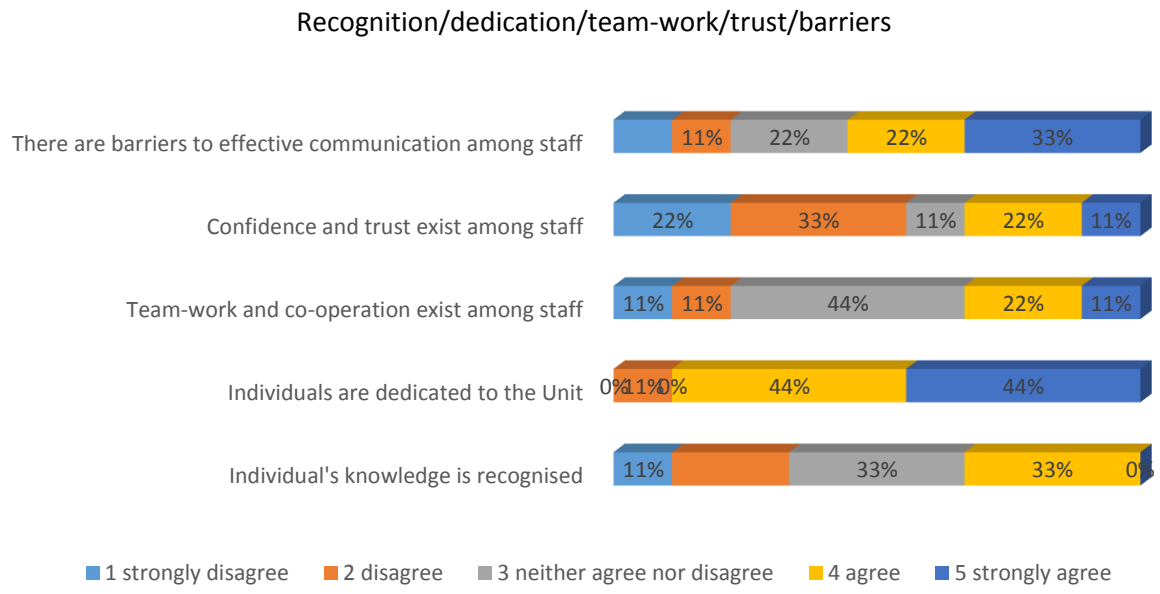


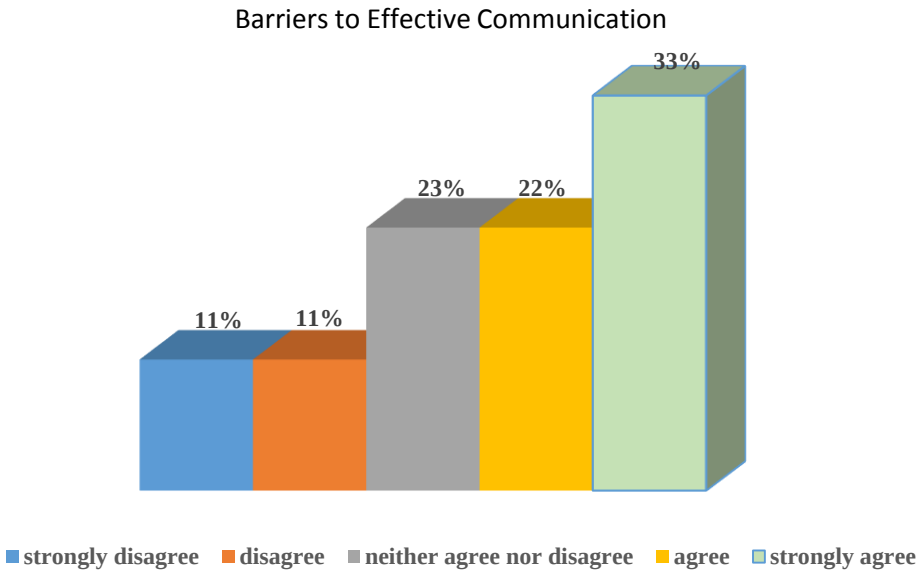
3. When trying to gain knowledge for auditing eligibility of expenditure, how often would you do the following?

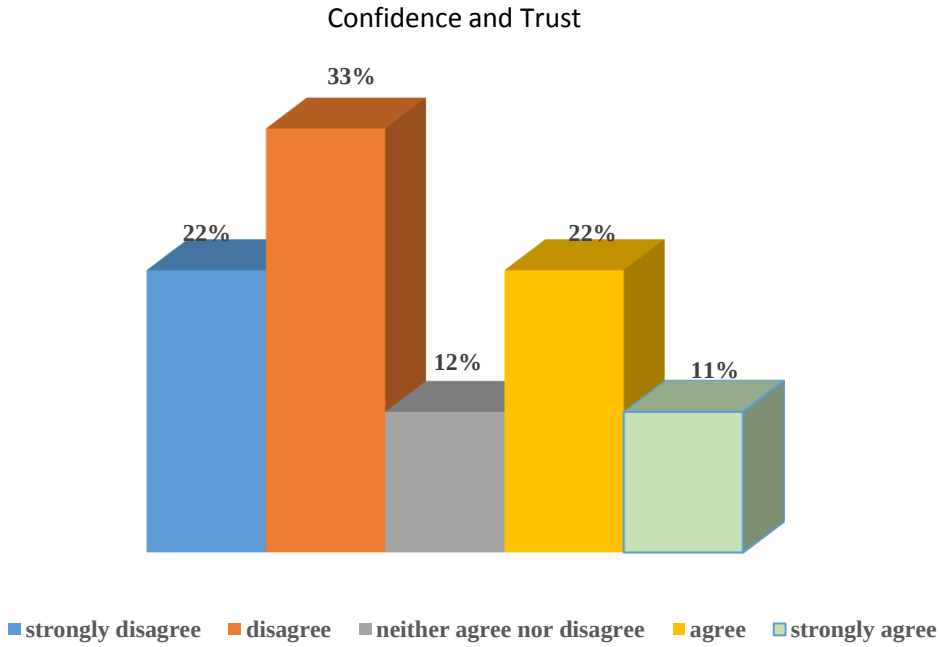


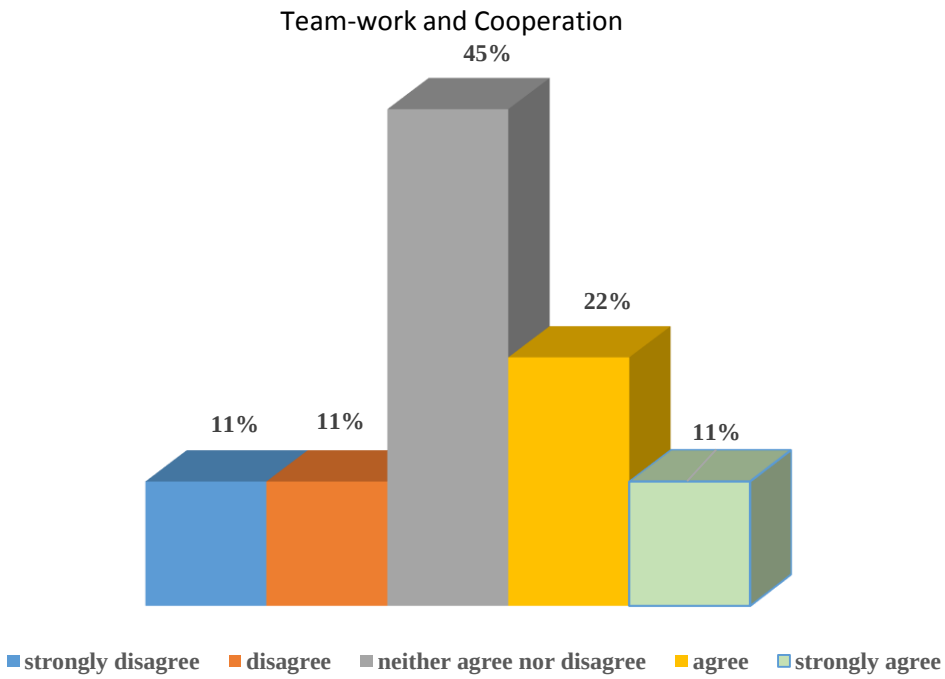
Section C: Organisational Culture

1. To what extent do you agree with the following statements about the ERDF Audit Unit?

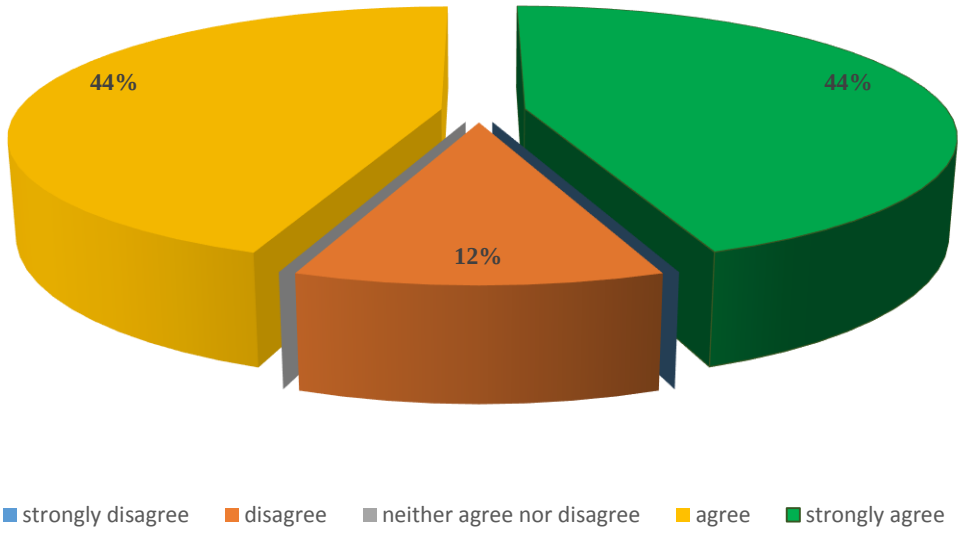




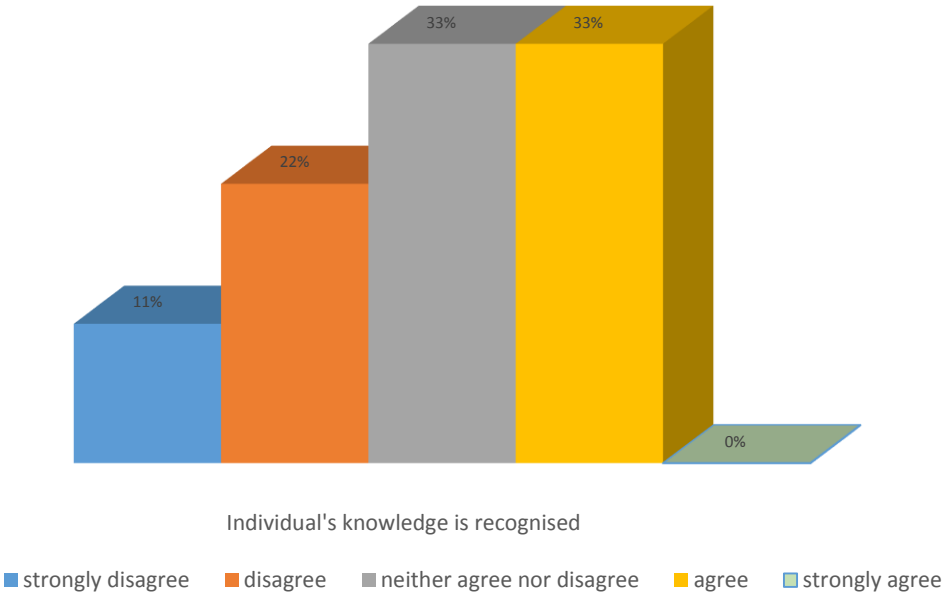

Confidence and Trust
33%
22%
22%
12%
11%
strongly disagree
disagree
neither agree nor disagree
agree
strongly agree


Team-work and Cooperation
45%
22%
11%
11%
11%
strongly disagree
disagree
neither agree nor disagree
agree
strongly agree

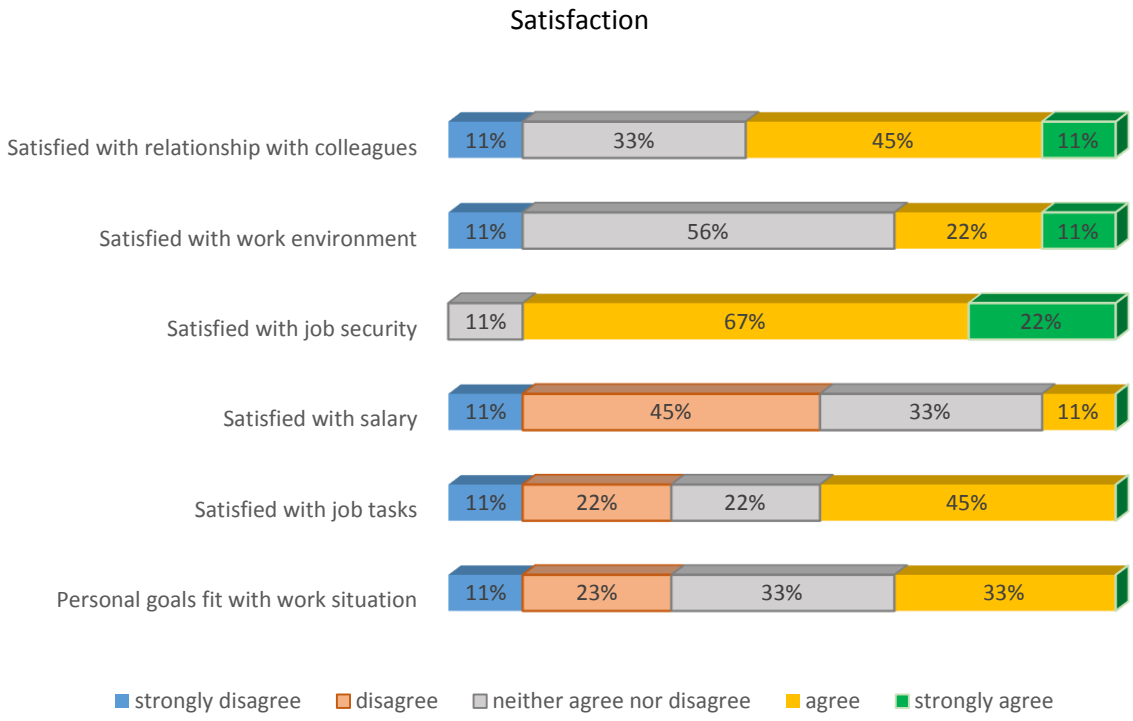
Dedication of Individuals to the Unit



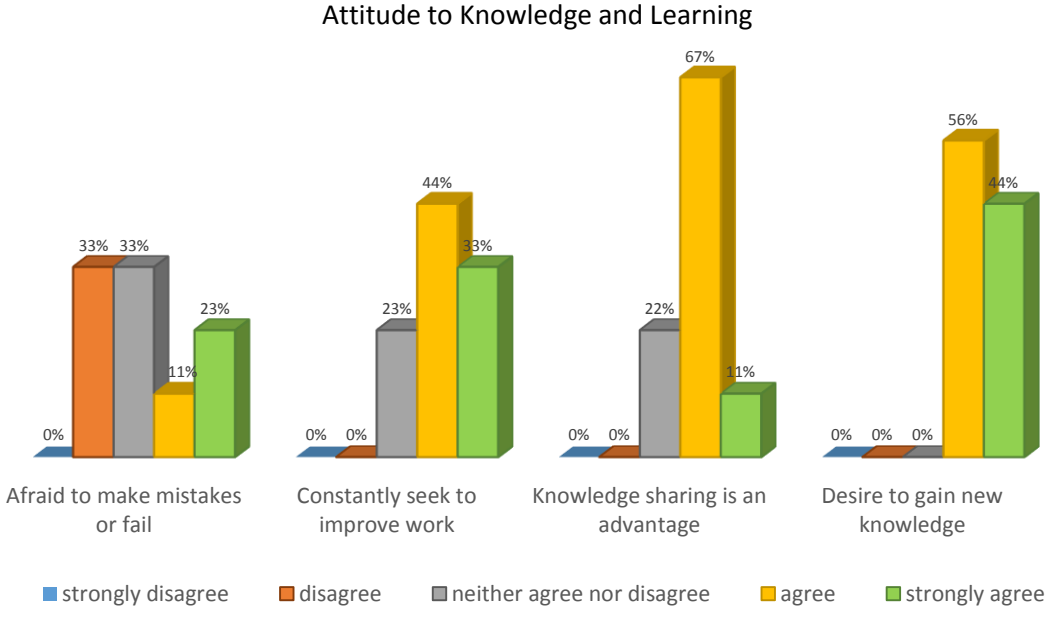
Recognition of Individual's Knowledge



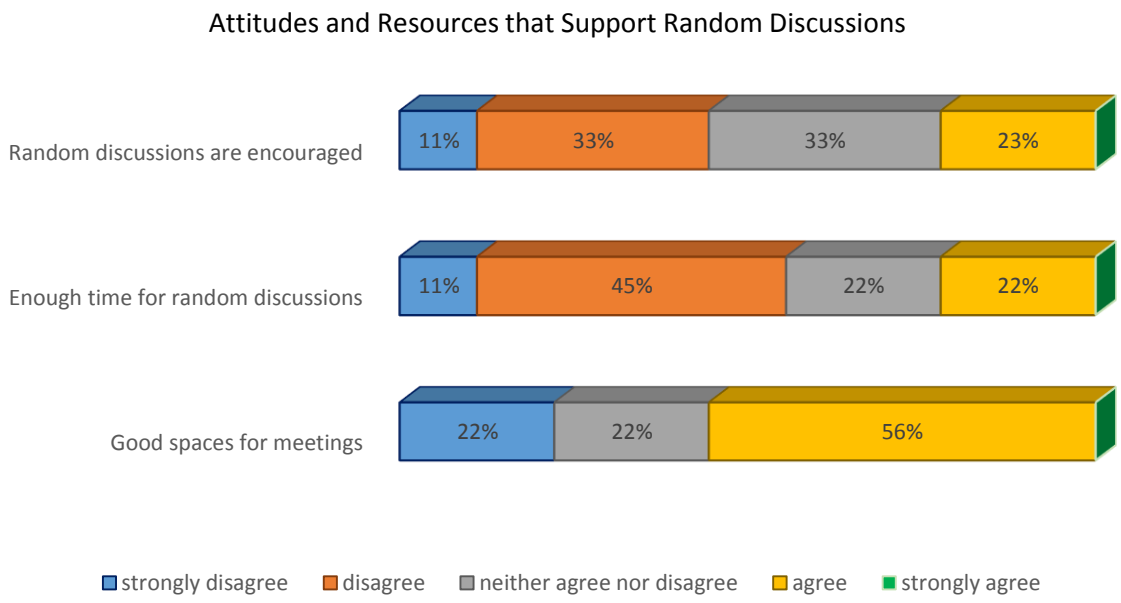
2. To what extent do you agree with the following statements?



3. To what extent do you agree with the following statements?

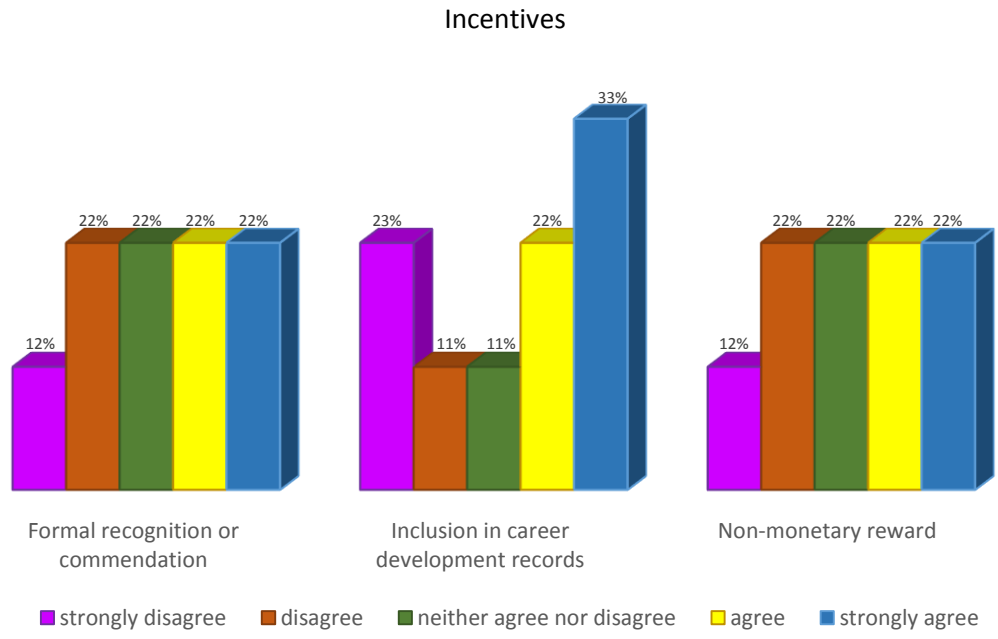


4. To what extent do you agree with the following statements about your work environment?



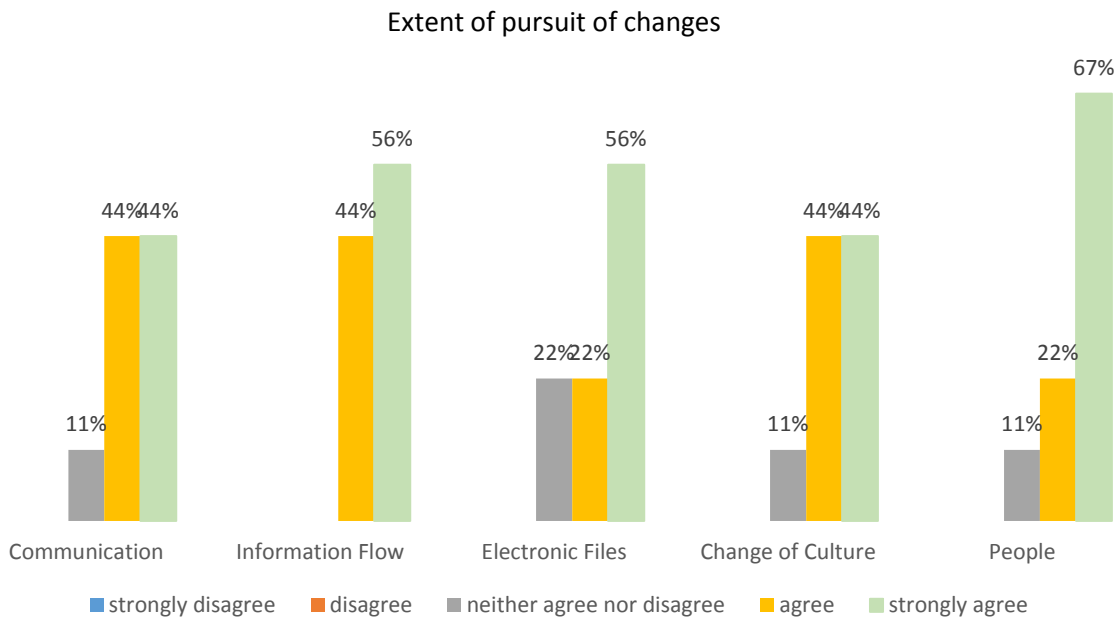
Section D: Motivation

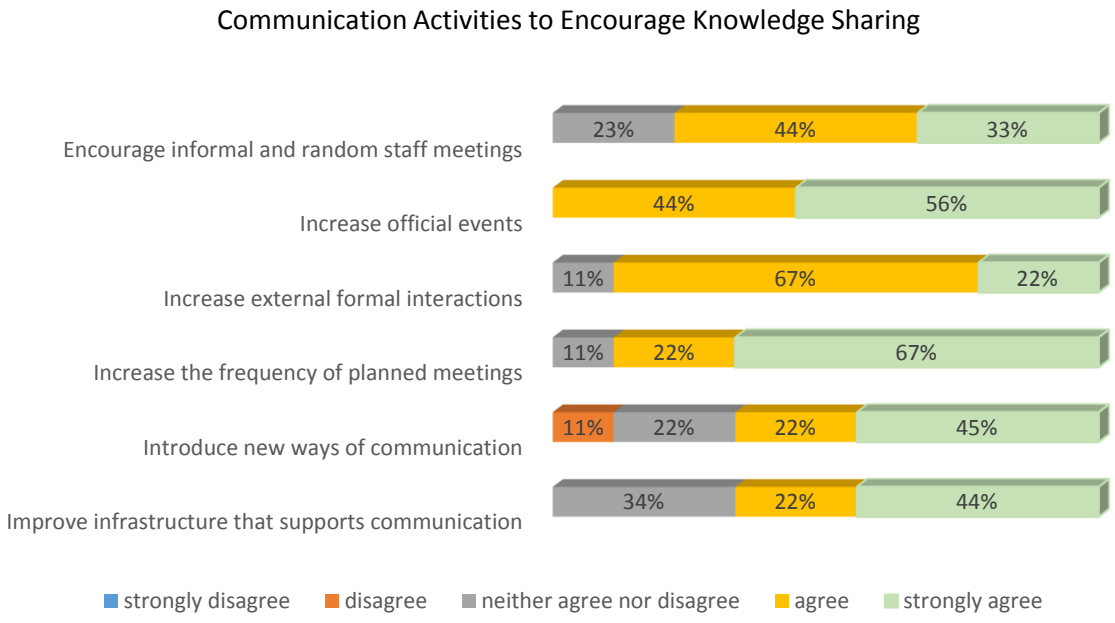
1. To what extent to do you agree with giving these incentives for encouraging knowledge sharing in the ERDF Audit Unit?



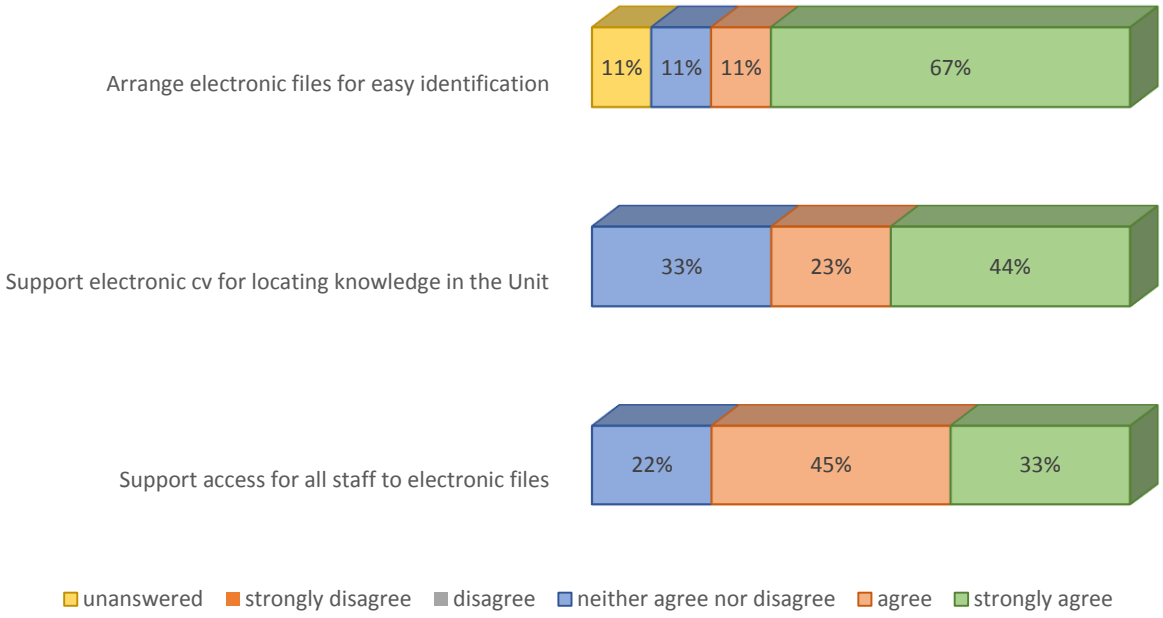
Section E: Knowledge Management in the ERDF Audit Unit

1. If you were in charge of the knowledge resources in the unit, to what extent do you agree that the following should be pursued?

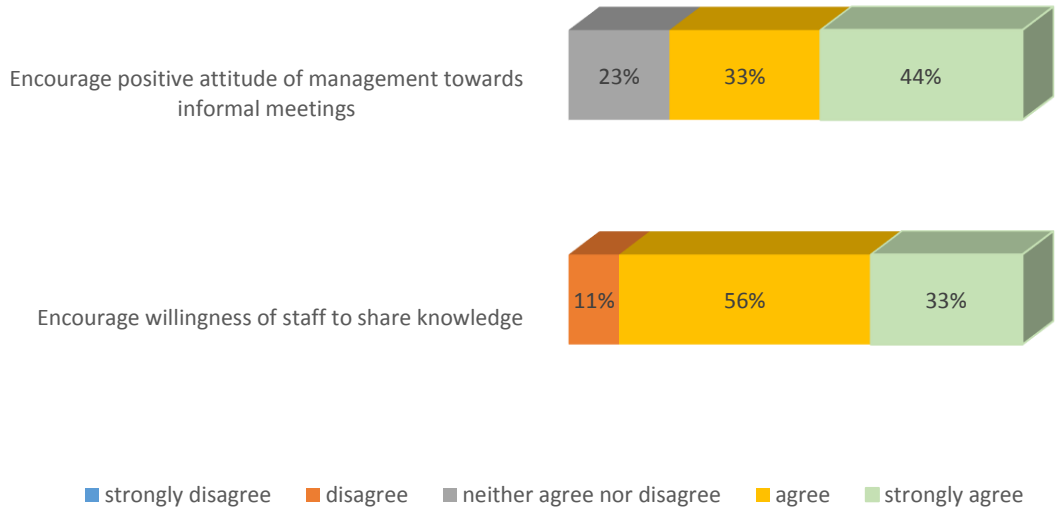




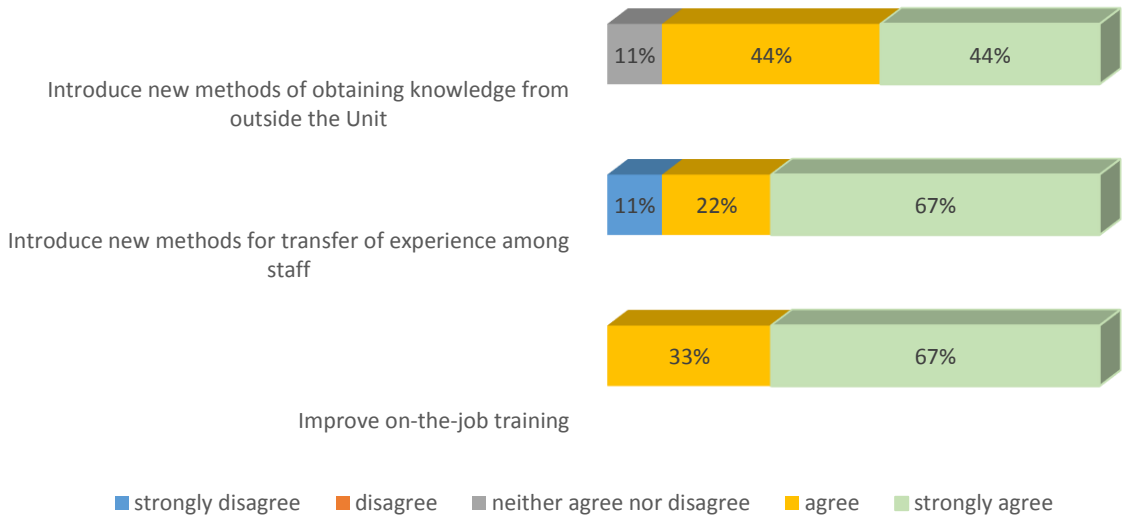
Changes to Electronic Files to Encourage Knowledge Sharing



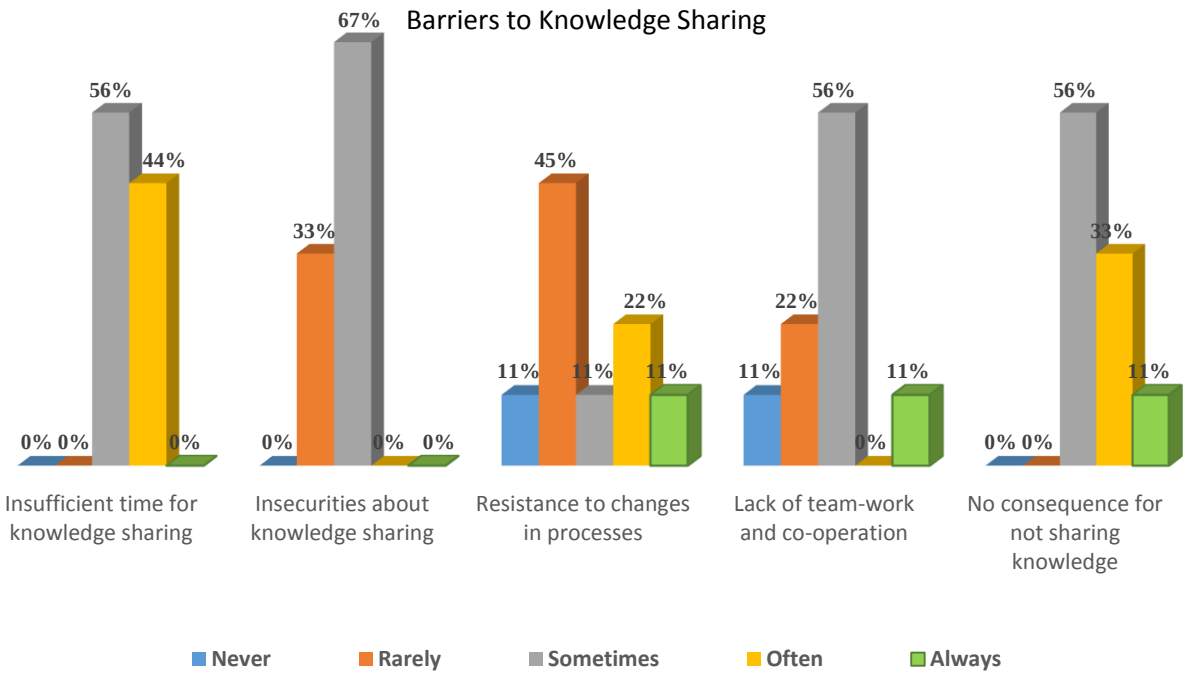
Changes in Culture to Encourage Knowledge Sharing



People

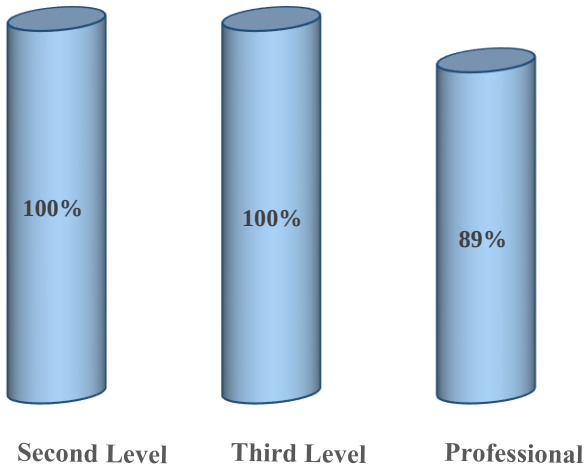


2. If there was a company policy relating to knowledge sharing in the unit, how often do you think the following would occur?

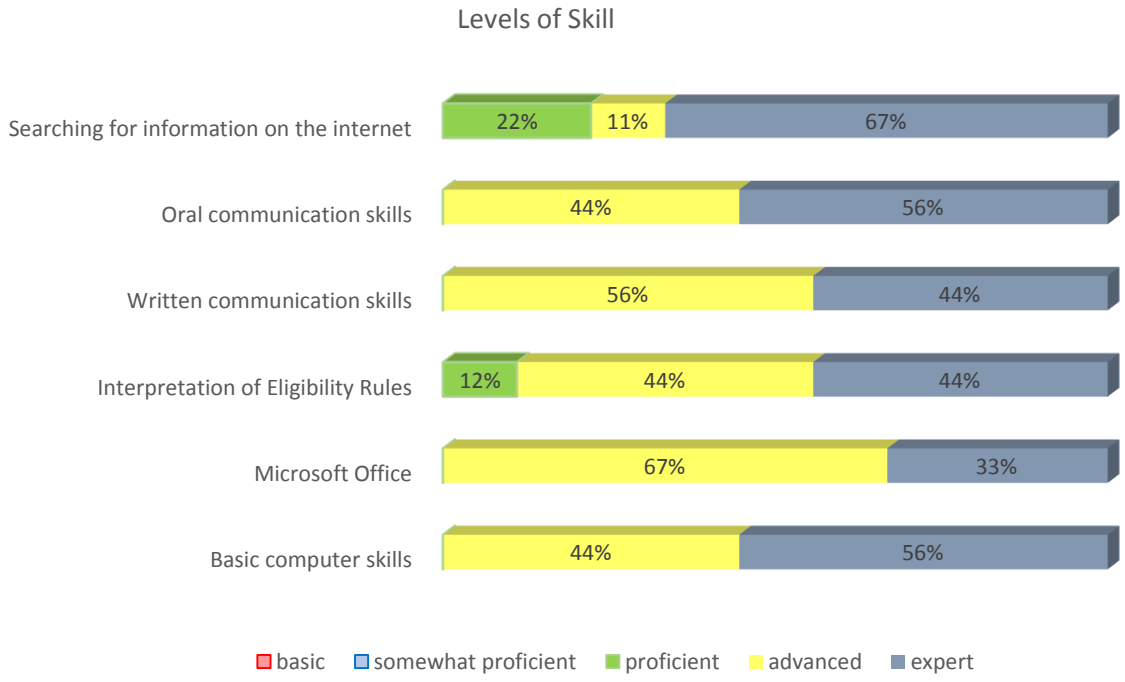


Section F: Personal Knowledge Profile

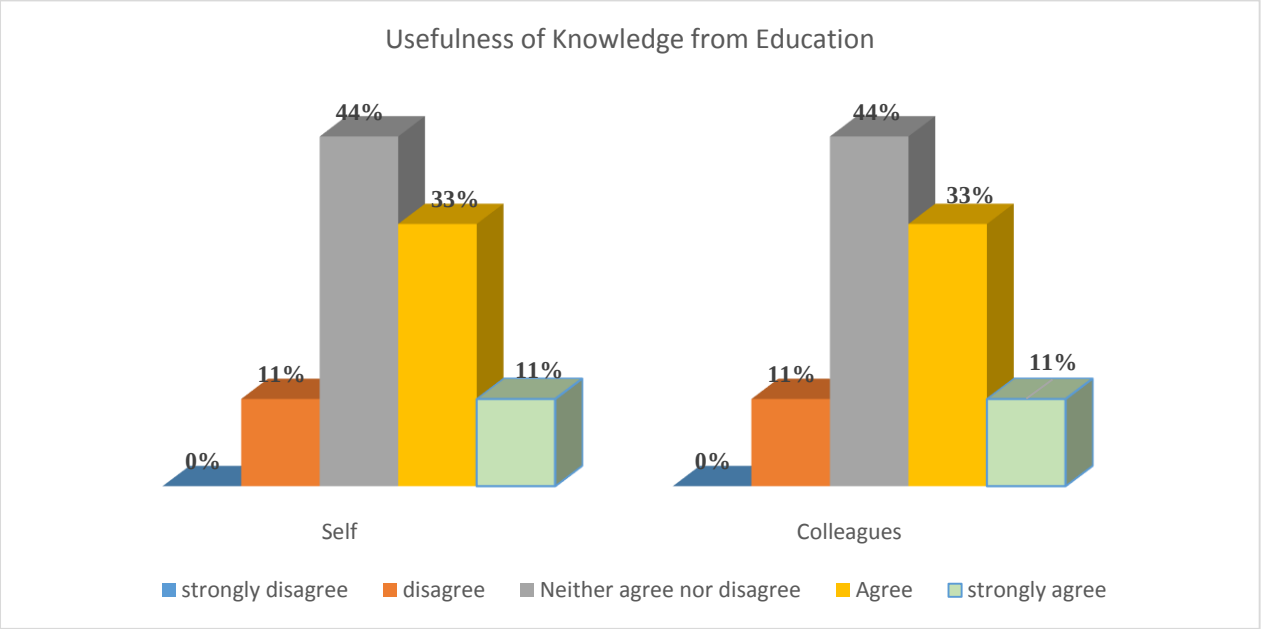
1. What is your level of education?

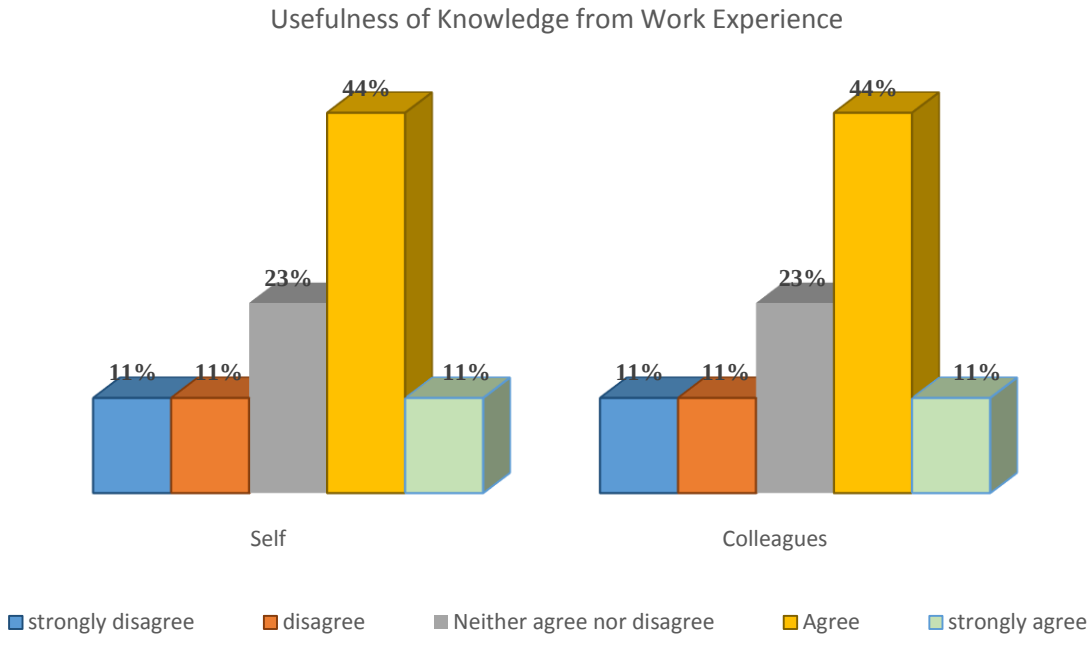


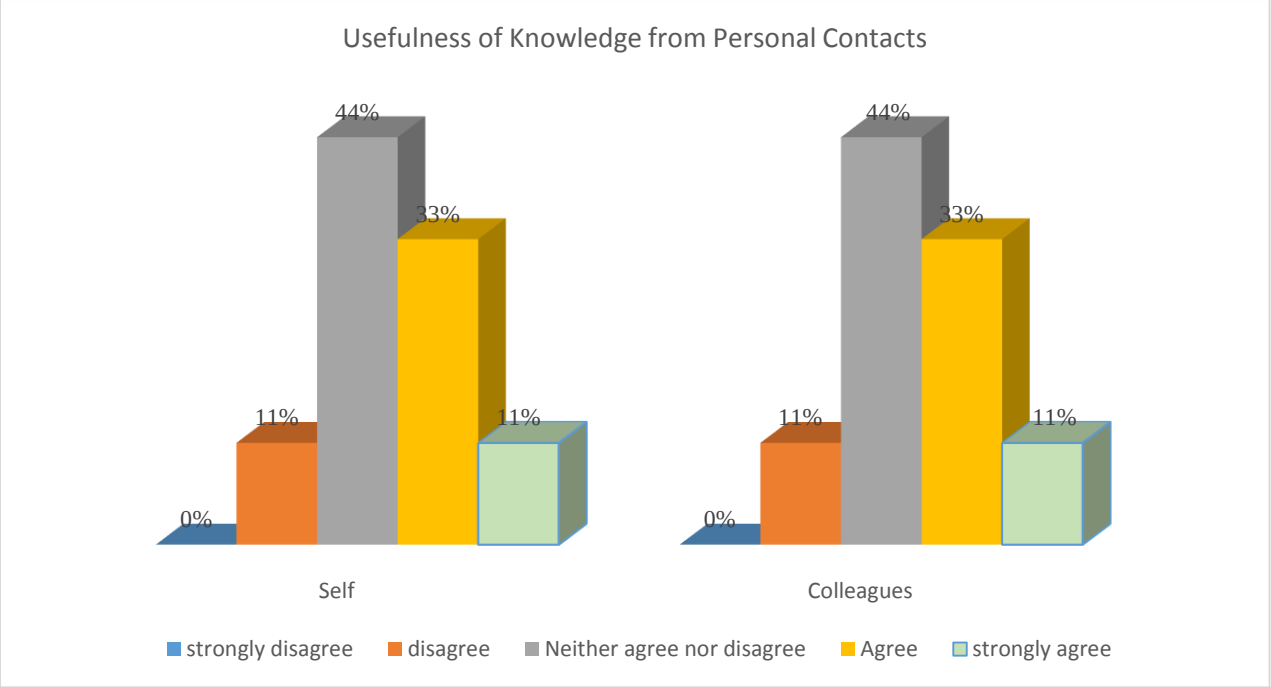
2. What is your level of skill in the following areas?



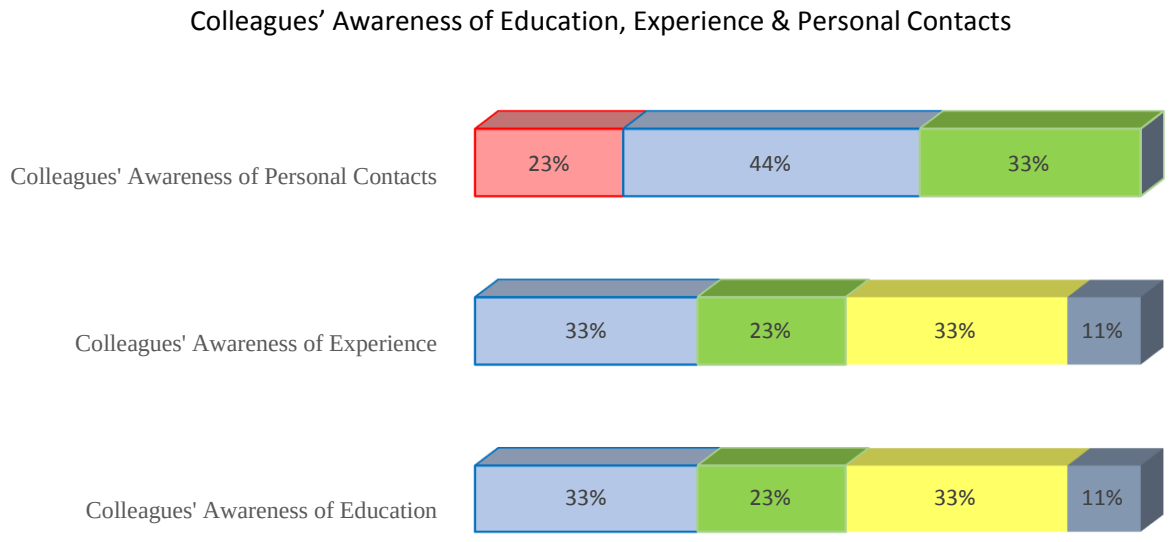
3. To what extent do you agree with the following statements?





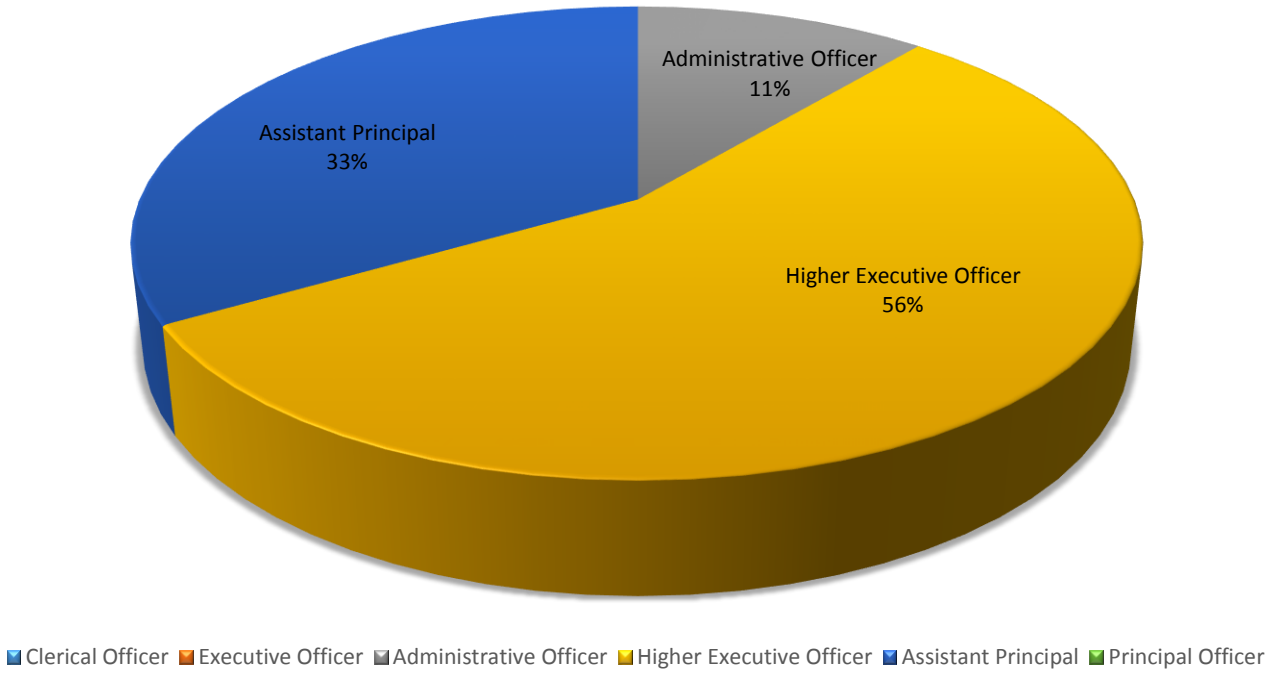


4. To what extent do you agree with the following statements?

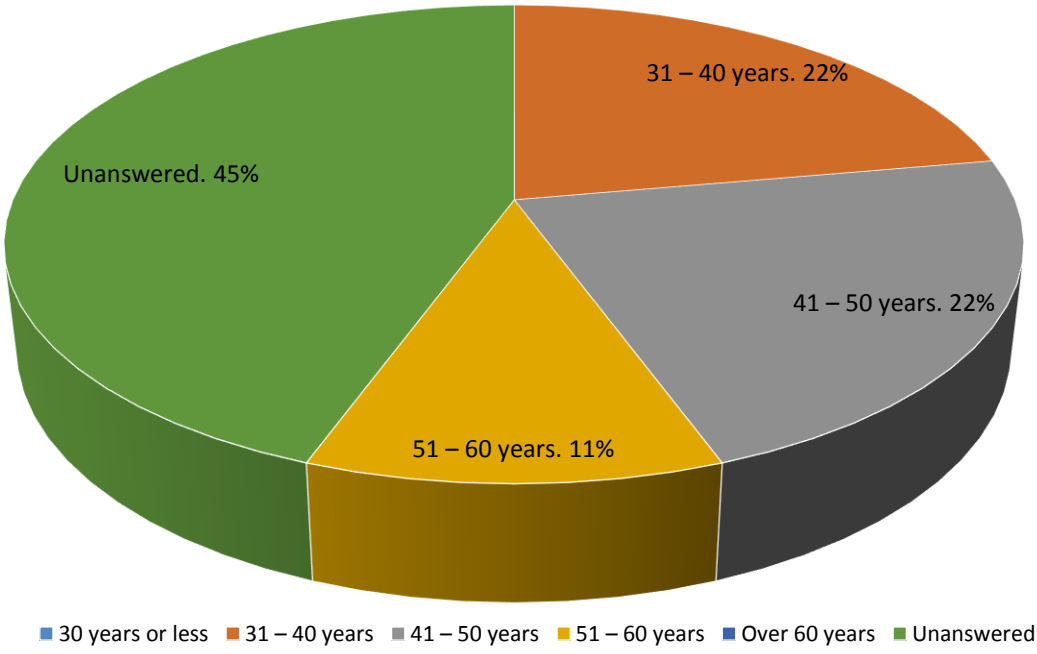


Section G: Demographic Data

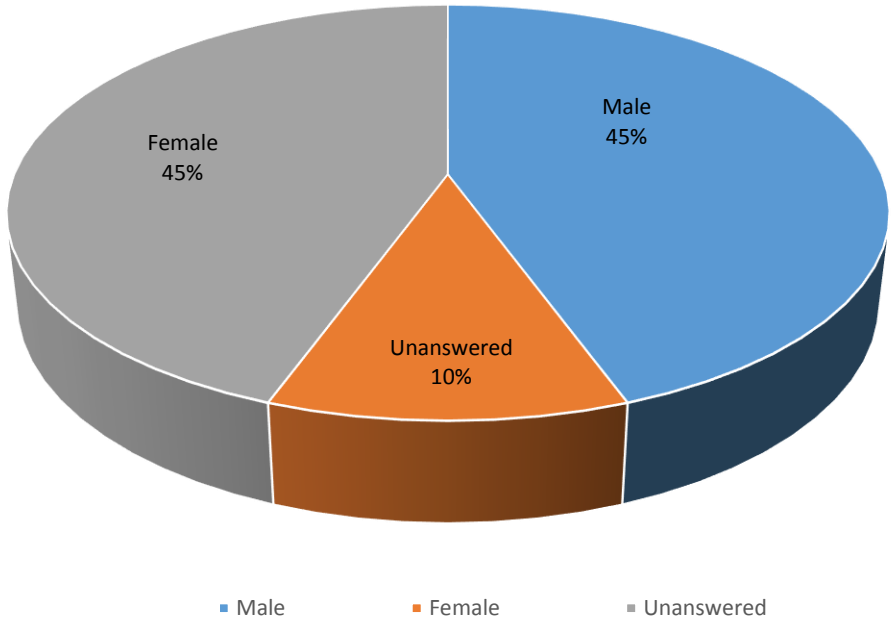
1. What is your grade at work?



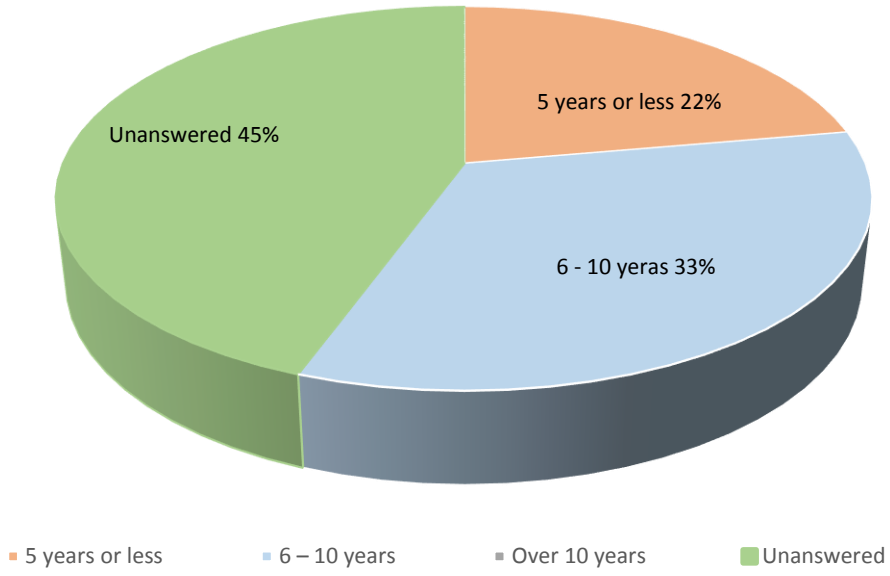
2. What is your age bracket?



3. What is your gender?

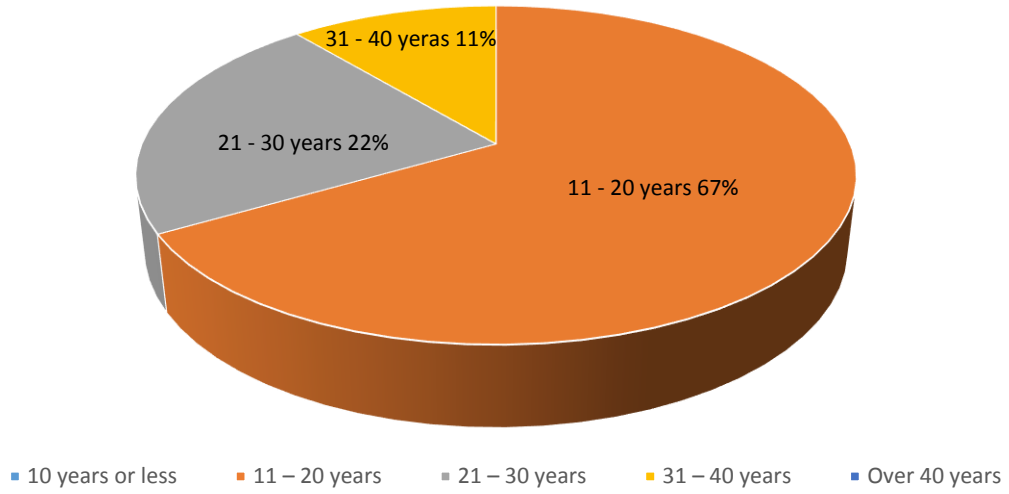


4. How many years of work experience do you have in the ERDF Audit Unit?

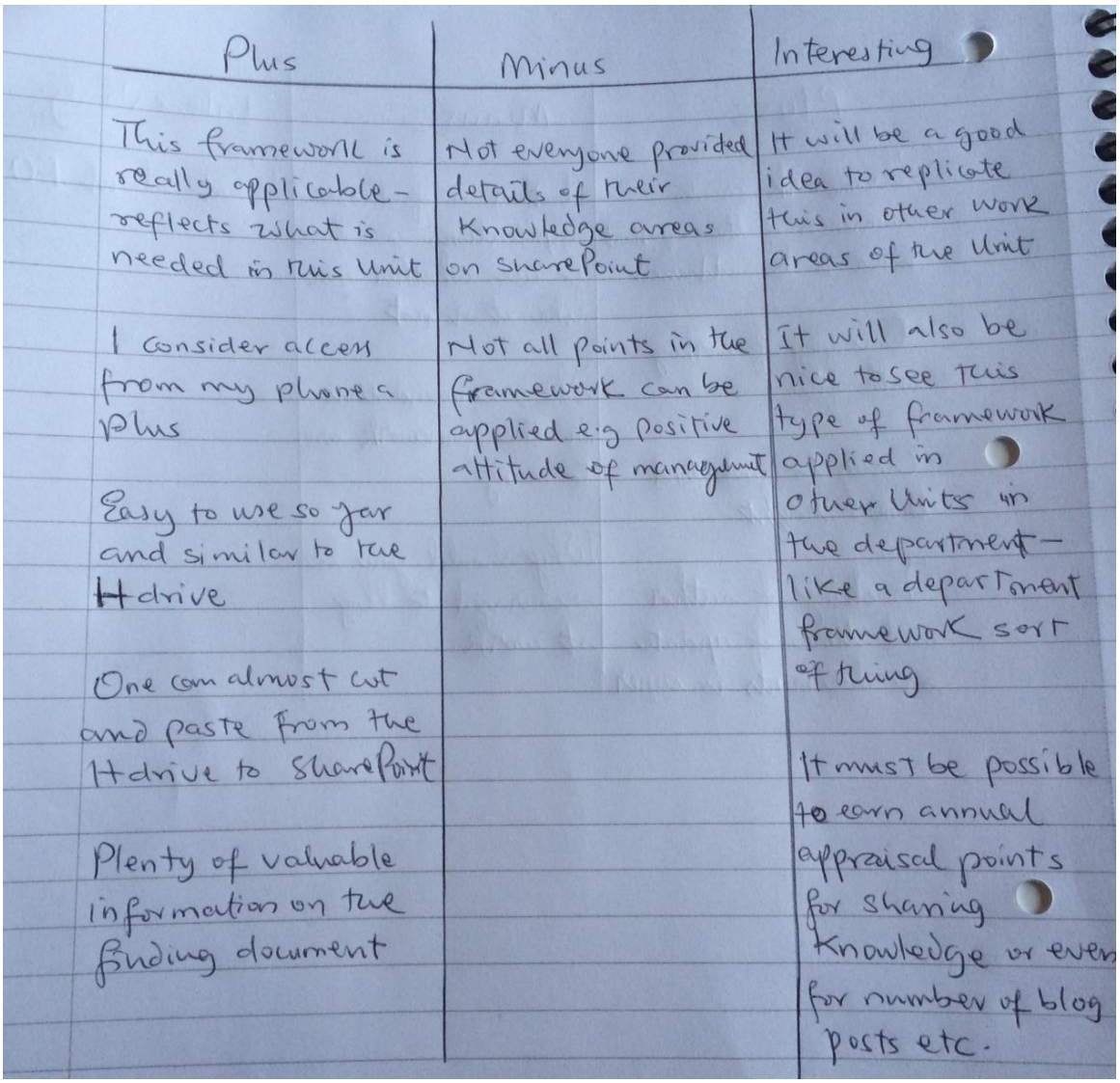


5. How many years of work experience do you have altogether (include experience from first job

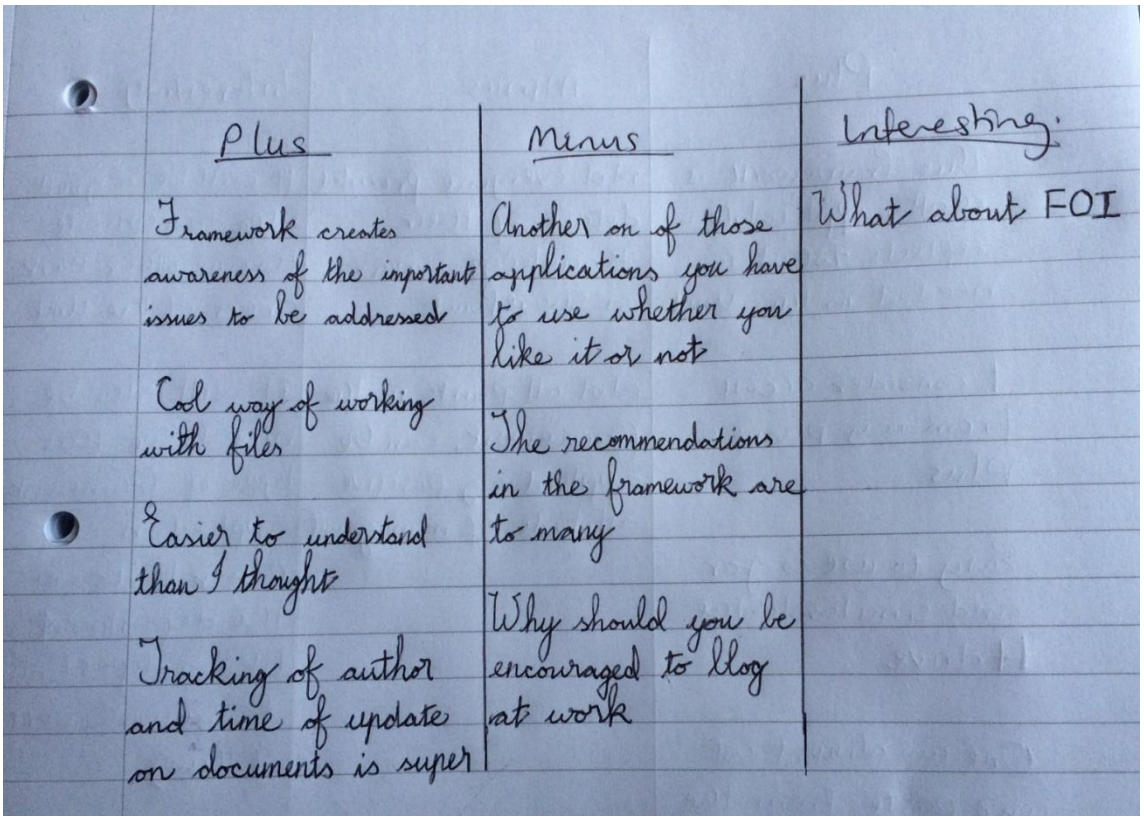
to date)?


31 - 40 yeras 11%
21 - 30 years 22%
11 - 20 years 67%
10 years or less
11 – 20 years
21 – 30 years
31 – 40 years
Over 40 years

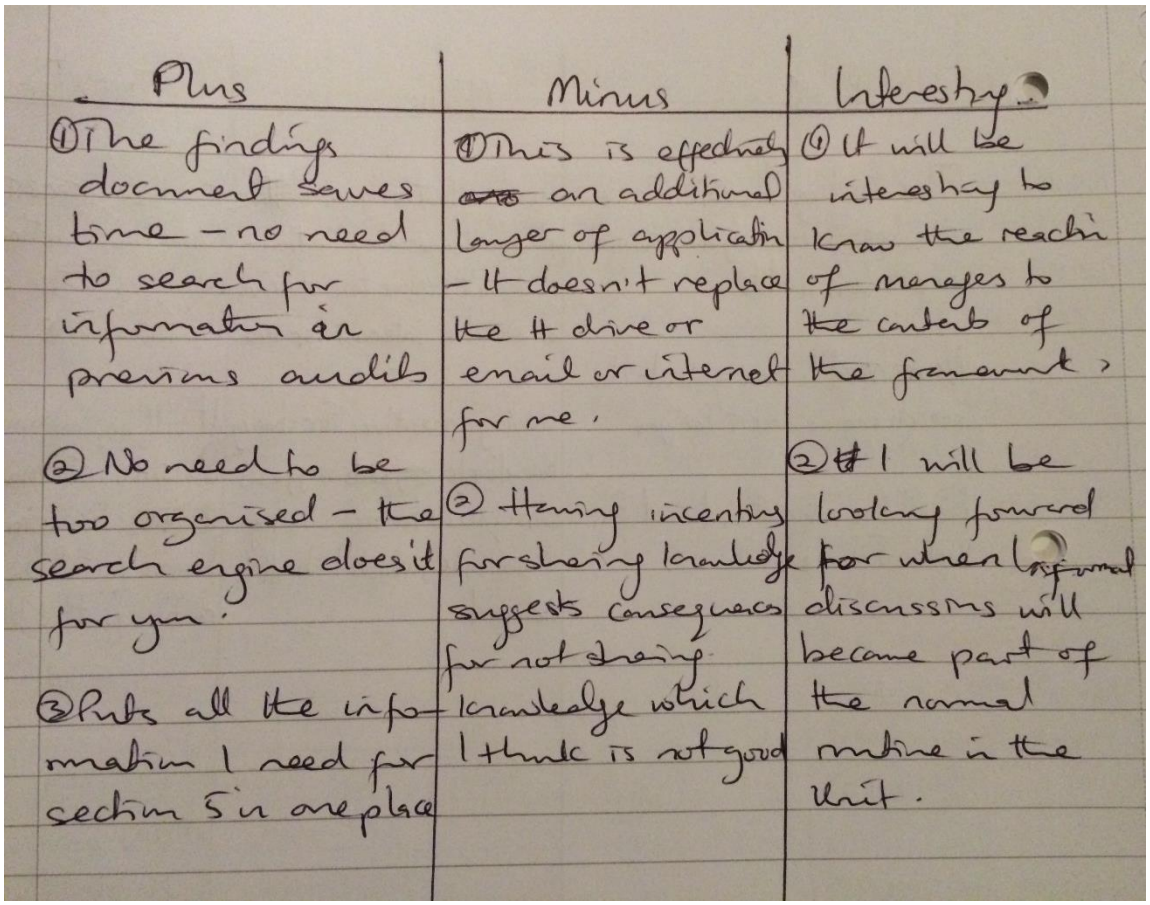
APPENDIX D: Notes of the PMI Participants



Plus	Minus	Interesting
This framework is really applicable - reflects what is needed in this Unit	Not everyone provided details of their Knowledge areas on SharePoint	It will be a good idea to replicate this in other work areas of the Unit
I consider access from my phone a plus	Not all points in the framework can be applied e.g positive attitude of management	It will also be nice to see this type of framework applied in other Units in the department - like a department framework sort of thing
Easy to use so far and similar to the H drive		
One can almost cut and paste from the H drive to SharePoint		It must be possible to earn annual appraisal points for sharing Knowledge or even for number of blog posts etc.
Plenty of valuable information on the finding document		



Plus	Minus	Interesting:
Framework creates awareness of the important issues to be addressed	Another on of those applications you have to use whether you like it or not	What about FOI
Cool way of working with files	The recommendations in the framework are to many	
Easier to understand than I thought	Why should you be encouraged to blog at work	
Tracking of author and time of update on documents is super		



Plus	Minus	Interesting
① The findings document saves time – no need to search for information in previous audits	① This is effectively ~~an~~ an additional layer of application – it doesn't replace the H drive or email or internet for me.	① It will be interesting to know the reaction of managers to the contents of the framework.
② No need to be too organised – the search engine does it for you.	② Having incentive for sharing knowledge suggests consequences for not sharing knowledge which I think is not good	② H I will be looking forward for when informal discussions will became part of the normal routine in the Unit.
③ Puts all the information I need for section 5 in one place		

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