An Exploration of the Perception and Practices of Knowledge Management in Irish Small and Medium Sized Enterprises

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Abstract

This study explores the phenomenon of knowledge management (KM) and specifically how it is used by Irish small and medium sized enterprises (SMEs). SMEs in Ireland employ 70% of the total work force, accounting for €42 billion of trade, making them vital to the country from an economic and social point of view. SMEs rely on the knowledge and experience of their owners and employees and intellectual property rather than physical or financial capital to be successful.

An extensive literature review indicates that KM is a subject area that is rapidly evolving and dynamic. Both the practice and the research into KM in SMEs lag behind that of large organizations and research into the current state of KM as an academic field is fragmented. The current literature indicates that there are research gaps in the areas of knowledge creation, retention and utilization in relation to KM and this has generally been attributed to a lack of resources and understanding of the benefits of KM systems in the SMEs.

This research work asks what are the main knowledge management tools and practices adopted by the Irish SMEs and what the effect these processes have on the performance of the companies. Six subjects were interviewed at length using the qualitative paradigm following a phenomenological approach allowing for a context rich investigation of the themes revealed by the theoretical framework devised from literature review. The collection of artefacts and the reviewing of reflective journals kept by the interview participants coupled with the extensive interviews adds to the understating of the topic from an Irish SME perspective.

The study highlights that the need and benefit for Irish SME's to implement KM systems from a perspective of competitive advantage, growth and efficiencies for companies. It was found that in an Irish context the owners or senior managers are the main driving force for the KM process. It is implied that there is a need to promote a champion or driver for knowledge management as well as educating the employees of its importance to ensure the future of the company. The research also finds that while some characteristics of SMEs such as the lack of resources can present a barrier to formal KM adoption, their flexibility, flatter organization and the technologies available in recent years are showing more adoption of KM practices in the Irish SMEs. In particular the advent of cloud computing has made it easier for organizations to develop their own systems and practices for KM.

This work indicates that further research is needed into KM in SMEs and based on the outcomes of the reflective journals there are strong indications that action research would be beneficial. The financial benefits to the Irish economy would indicate that a large scale investigation into the use and adoption of web 2.0 for the benefit of SMEs should be considered.

Declaration

Submission of Thesis and Dissertation

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Material submitted for award

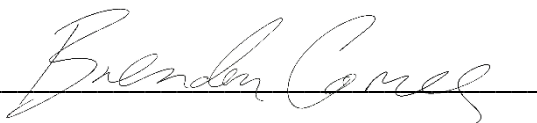(a) I declare that the work has been composed by myself.

(b) I declare that all verbatim extracts contained in the thesis have been distinguished by quotation marks and the sources of information specifically acknowledged.

(c) My thesis will be included in electronic format in the College Institutional Repository TRAP (thesis reports and projects)

(d) I declare that no material contained in the thesis has been used in any other submission for an academic award.

MSc in Management

Signature of research student: _____

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Table of contents

Figures

Abbreviations

CSO   Central Statistics office

EU   European Union

GVA   Gross value added

ICT   Information and communications technology

ISME   Irish SME Association

KM   Knowledge Management

NGO   Non-governmental organizations

OECD   Organisation for Economic Co-operation and Development

SaaS   Software as a service

SME   Small and Medium Sized Enterprise

Chapter 1   Introduction

1.1   Background and Motivation

This dissertation will look at the phenomenon of knowledge management (KM) and specifically how it is used by small and medium sized enterprises (SME) in Ireland. Based on the European Union (EU) definition of SMEs they account for 99% of all active companies in the Union (Muller, Julius, Herr, Koch, Peycheva and McKiernan., 2017). SMEs in Ireland employ 70% of the total work force accounting for €42 billion of trade according to the Central Statistics Office (2014). This makes them vital to the country from an economic and social point of view.

Knowledge is an important factor in achieving competitive advantage in large companies as well as SMEs. SMEs in particular rely on the knowledge and experience of their owners and employees and intellectual property rather than physical or financial capital to be successful. The processing and transfer of knowledge within an SME can provide a competitive advantage (Dotsika and Patrick, 2013). Both the practice and the research into knowledge management (KM) in SMEs lags behind that of large organizations (Cerchione, Esposito and Spadaro, 2016; Durst and Runar Edvardsson, 2012) . Given the importance of the SME to the global economy (OECD, 2017) there is a need for research to be carried out that is specific to SMEs. Cerchione, Esposito and Spadaro (2016) infer that from a scientific point of view the study of KM is a relatively new field of study in relation to SMEs.

Research into the current state of KM as an academic field in relation to SMEs is fragmented (Cerchione, Esposito and Spadaro, 2016; Massaro, Handley, Bagnoli and Dumay, 2016; Durst and Runar Edvardsson, 2012). There is no standard definition as to what KM is (Jennex, Smolnik and Croasdell, 2009) and how it should be

handled as a field of research but it is suggested that it should be accepted as a subject area that is rapidly evolving and dynamic (Call, 2005).

Key themes in the literature include the importance of tacit versus explicit knowledge (Takeuchi, 2007) and the necessity to convert the knowledge held in employees or owners minds to knowledge that can be recorded in databases and easily transferred for utilization. The ability of an organization to translate tacit knowledge into explicit knowledge is what makes knowledge a valuable commodity for the organization. The research indicates that it is the structure of SMEs that make them more prone to the use of tacit knowledge (Wong and Aspinwall, 2005). However Cerchione and Esposito (2017) suggest that it is a lack of specific plans or formal strategies for KM that makes how knowledge is retained and transferred in SMEs different to that of larger organizations.

The view that knowledge management processes involves the creation, retention and utilization of knowledge is considered important (Massaro *et al.*, 2016; Heisig, 2009; Jennex, Smolnik and Croasdell, 2009). However, a review of the current literature indicates that there are research gaps in the areas of knowledge creation, retention and utilization in relation to KM and knowledge practices in SMEs. This has generally been attributed to a lack of resources and understanding of the benefits of KM systems in the SMEs (Chen, Hsiao and Chu, 2014; Kim, Lee, Chun and Benbasat, 2014).

With a research gap identified the aim of this dissertation was to determine which KM tools and practices are being adopted by Irish SMEs and how knowledge is created, stored, transferred and utilized. The research will also investigate the perceptions of KM practices, the extent of adoption and specific strategies for the adoption of KM tools and practices within Irish SMEs. Specifically, the research will ask "What are the main knowledge management tools and practices adopted by the Irish small and medium sized enterprises and what is the impact these processes have on the performance of the companies'" The goal is to gain a greater

understanding of the factors that affect the adoption of KM practices and the impact this has on the performance of an enterprise. The work is focused on Irish SMEs due to their importance to the Irish economy.

1.2 Outline of the Thesis

The dissertation is divided into seven chapters. Firstly, this chapter gives a brief background to the study along with the motivation for undertaking it.

The second chapter presents a detailed literature review taking account the most recent and relevant findings from academics and practitioners in the field of knowledge management. The review of the literature focuses more on studies that have looked specifically into SMEs. This is in part to understand the difference, if any, in the practices and adoption of KM in SMEs vs. larger organizations and also to identify the research gaps that are specific to SMEs. A theoretical framework based on the review and the research gaps identified sets the stage for the research question of this dissertation.

Chapter three presents the research question to be studied in this work. This is followed by chapter four which outlines the methods and methodology indicating how the research question will be answered. This work utilizes an epistemological approach with an interpretivist ideology which justifies the use of the qualitative paradigm following a phenomenological approach. Due to the perceptions and interpretations of individuals of the 'lived experiences' in the SME sector, such a qualitative approach is deemed to be more useful in elucidating rich contextual data.

A thematic analysis of the interview transcripts, artefacts and reflective journals was conducted and the findings of this analysis are presented in chapter five. The findings are presented according to the main KM processes.

Chapter six discusses the key findings that have been brought out in the course of this study. The discussion also focuses on placing these findings within the context of the broader literature in the field of KM. The chapter ends with a look into the implications the findings have on the research and practice of KM particularly in SMEs.

The overall conclusion of this dissertation is given in chapter seven drawing together the findings in relation to the research questions and literature. Suggestions for future research are also presented

Chapter 2 Literature Review

2.1 Literature Review Introduction

The literature review consists of an investigation into what is the definition of an SME in a global, European and Irish context. The review analyses the importance of the sector from an economic and social point of view and looks at the specific character of Irish SMEs. This is followed by an exploration of what is meant by knowledge and knowledge management. KM is reviewed from the aspect of KM practices and tools and how they specifically relate to SMEs. The effectiveness of KM is investigated and the review concludes with an indication of the gaps in current research.

2.2 Small to Medium Sized Enterprises

2.2.1 Defining the SME

As part of the reading into the topic of KM and SMEs it is important to have an idea of how the SME is defined in different parts of the world. The literature drawn upon in this study has been sourced from all over the world and one of the difficulties in KM research is that there is no standard definition for SMEs .This is acknowledged by the OECD (2017) and they take a broad view of the definition to try to fit with the requirements of all the member countries. According to Massaro et al. (2016) one of the difficulties with collating data in relation to the literature on KM and SME's is that the definition of what an SME is changes based on geographic location or business sector.

Since the goal of this work is an investigation into the Irish SME sector it is appropriate to use the European Union (EU) definition. It takes into account the

number of employees, turnover and balance sheets of organisations to see where they fit.

Company Category	Employees	Turnover	Balance sheet total
Micro	< 10	< €2 million	< €2 million
Small	< 50	< €10 million	< €10 million
Medium – sized	<250	< €50 million	< €43 million

Figure 1 EU Definition of SME (European Union, 2003) Commission Recommendation of 6 May 2003 concerning the definition of micro, small, and medium-sized enterprises. (2003/361/EC), Official Journal of the European Union, L 124/36, 20 May 2003

2.2.2 The Importance of the SME

The importance of the SME sector is acknowledged by both the European commission (Muller *et al.*, 2017) and OECD (2017) from a worldwide and EU perspective. The figures collated by the OECD and European commission indicate just how significant the role of the SME is to overall global economies.

From the EU perspective 99% or 23 million companies in the EU are classified as SMEs (Muller *et al.*, 2017) and they account for 67% of employment across the union. This represents 90 million people employed and €3.9 trillion in value added trade.

	Micro	Small	Medium	SME	Large	Total
Number of enterprises						
In thousands	22,232	1,392	225	23,849	45	23,894
In % of total enterprise population	93.0 %	5.8 %	0.9 %	99.8 %	0.2 %	100.0 %
Number of persons employed						
In thousands	41,669	27,982	23,398	93,049	46,665	139,7141
In % of total employment	29.8 %	20.0 %	16.7 %	66.6 %	33.4 %	100.0 %
Value added						
In EUR Trillion	1,482	1,260	1,288	4,030	3,065	7,095
In % of total value added	20.9 %	17.8 %	18.2 %	56.8 %	43.2 %	100.0 %

Source: Eurostat, National Statistical Offices, and DIW Econ
Note: Date as of 30 June 2017. Totals may differ from sum of components due to rounding.

Figure 2 SMEs and large enterprises: number of enterprises, employment, and value (European Union, 2003)

2.2.3 The Character of the Irish SME

The Irish definition of SMEs varies slightly from the EU description in that it only focuses on the numbers employed; micro is less than 10 employees, small is 10 to 49 and medium is 50 to 249 employees. The importance of SMEs in Ireland is significant from an economic and social point of view. According to the Irish Central Statistics Office (CSO Ireland, 2017) 99.8% of active enterprises in Ireland are considered to be SMEs representing a large cross section of business areas. The Irish Small and Medium Enterprise Association (ISME) represents over ten thousand Irish companies covering 104 sectors in diverse areas of business, from accountancy to funeral directors (ISME, 2017).

As a sector of the Irish business economy SMEs employ 7 out of every 10 people (Central Statistics Office, 2014). SMEs in Ireland account for 46.2% of the country's gross value added (GVA) measurement, which in 2012 accounted for €42 billon (Central Statistics Office, 2014). Since the economic crash of 2008 the SME sector

has been an essential contributor to the economic and employment recovery in Ireland (Lawless, McCann and McIndoe Calder, 2012).

2.3   Knowledge Management

Knowledge management is a broad academic topic and spans a range of academic fields from psychology, business, and management to engineering and information and communication technology (ICT). As part of the creation of a citations classic Serenko and Dumay (2015) conducted an extensive investigation into the literature on knowledge management. This indicated that articles covered in academic journals included communities of practice, information technology, KM strategy, knowledge innovation, knowledge as a process, managing competitive advantage, organizational culture, problem solving and scientometrics. One of the difficulties in both the study of KM and its implementation in practice is not having a clear understanding of what knowledge management is; its very definition varies from field to field and company to company. While various definitions exist in academics as well as in companies, it is noted that it is more important to realize the continually changing and evolving nature of the field and practice (Call, 2005; Mcadam and Mccreedy, 1999). For the sake of clarity in this dissertation, the definition of knowledge management offered will be a synthesis of those various definitions offered in the literature, to that end knowledge management is a process of the creation, storage, organization and utilizing of knowledge to achieve the goals of the SME and improve its performance.

2.3.1 Knowledge Management in SMEs

Knowledge in an organization is a valuable commodity. Again the nature of knowledge makes clear definitions and practices difficult. Takeuchi (2007) and Nonaka (1994) differentiate knowledge into explicit – that which is formal, documented, structured and usually associated with knowledge that is processed,

stored or transferred electronically – and tacit, which is knowledge that is not easily visible or expressed and often resides in people's minds as perception, insights, and experiences making it difficult to communicate it with others (Takeuchi, 2007).

SMEs rely on the knowledge and experience of their owners and employees and intellectual property rather than physical or financial capital to be successful. The processing and transfer of knowledge within an SME can provide competitive advantage (Dotsika and Patrick, 2013). The management structure in SMEs tends to be relatively flat in nature meaning that much of the key decisions in an organization are taken by a few people and the decision-making process is a relatively direct procedure. In flatter organizations the knowledge is retained by few people (Wong and Aspinwall, 2005) at a senior level which means that there is reduced need to formalize knowledge management processes. The prevalence of mainly tacit knowledge in SMEs coupled with more informal methods of knowledge sharing can lead to problems of knowledge retention (Wong and Radcliffe, 2000).

Most of the research in KM has focused on larger companies (Hughes, O 'Regan and Sims, 2009) and the SME sector has been neglected in the research (Matlay, 2000). This has generally been attributed to a lack of resources (Chen, Hsiao and Chu, 2014; Kim *et al.*, 2014) in the sector. Larger companies have more time and money and a greater perceived benefit in understanding the implications of KM and tend to adopt more formal KM strategies. SMEs should not just be seen as smaller versions of larger companies as they would have different communication channels, place emphasis of different types of knowledge and using the same policies may result in smaller firms being unable to act on or implement KM strategies (Cerchione and Esposito, 2017; Durst and Runar Edvardsson, 2012).

2.3.2 Knowledge Management Processes in SMEs

The consensus among researchers is that while some understanding of KM in SMEs exists, such understanding and research is fragmented (Cerchione, Esposito and

Spadaro, 2016; Massaro *et al.*, 2016; Durst and Runar Edvardsson, 2012). Knowledge management perception, implementation and transfer are among the most researched topics while those on knowledge creation, identification, retention and utilization in the context of SMEs are poorly researched (Wee and Chua, 2013; Durst and Runar Edvardsson, 2012; Argote and Miron-Spektor, 2011). It was also noted that while there is research focusing on specific KM tools and practices an overview of the systems used in SMEs is lacking (Cerchione, Esposito and Spadaro, 2016). Figure 3 summarizes the KM processes and sub-processes as defined in literature.

Knowledge Management Sub-Processes		Knowledge Management Processes From Different Researchers							
		Alavi and Leidner (2001)	Currie (2003)	Wong and Aspinwall (2004)	Nonaka and Takechi (1995)	Ruggles (1997)	Jackson (1999)	Angus *et al.* (1998)	Wensley (2000)
Knowledge Creation and Acquisition	Gathering						X	X	
	Generation					X			X
	Creation	X	X	X	X				
	Acquisition		X						
	Capture		X						
Knowledge Organization and Retention	Organizing			X				X	
	Refining							X	X
	Codification					X			X
	Storage/ Retrieval	X					X		
	Incorporate				X				
Knowledge Dissemination	Transfer	X				X			
	Transmission								X
	Sharing		X	X					
	Disseminate				X		X	X	
	Communication						X		
Knowledge Utilization	Application	X							
	Use		X	X					

Figure 3 Summary of KM processes and sub processes (Supyuenyong, Islam and Kulkarni, 2009)

2.3.2.1 Knowledge Creation and Identification

Knowledge is inherent in an organization and is created by the normal operations of the enterprise. The idea of knowledge creation is more about capturing the knowledge that is already present (Alawneh, Abuali and Almarabeh, 2009). The organization needs to understand and exploit the knowledge that it has developed

through the experiences of the company. The key stakeholders need to retain the knowledge that is held in an informal manner.

Several key areas have been identified by researchers that require attention for knowledge creation in organizations. These include problem solving and design rationale, details of financial resources and budgeting, understanding internal and external risk factors and details of company specific markets (Nonaka, 1994; Nonaka and von Krogh, 2009). Argote and Miron-Spektor (2011) agree with this assertion and suggest that the importance of the creation and identification of knowledge as part of organizational learning allows a company to identify what has had a positive or negative impact on the business. In the case of SMEs it is critically important to identify and reduce practices that have a negative impact on the organization to improve its competitive advantage.

2.3.2.2 Knowledge Retention

Once knowledge is identified or created it is important for the organization to retain it. Argote (2011) suggests there is some research to try and understand if knowledge retention within an organization comes from a persistent revisiting of knowledge in a company or if it is a cumulative understanding built over time. Consideration is given as to what happens to knowledge over time. Does it last to be reused or diminish over time within the organization (Argote and Ingram, 2000).

Kim, Lee, Chun and Benbasat (2014) looks at how technology has helped in the documentation of organizational knowledge and this ties to the ideas of Argote and Miron-Spektor (2011) and the positive effects technology has had in organizations. While these researchers have looked into the knowledge retention in organizations in general, the ideas are not tied specifically to the SME sectors. A review by Durst (2012) indicated that there is very limited research in the area of knowledge retention and storage in the case of SMEs. The flat nature of SMEs and the lack of formal KM processes is again highlighted by Durst and Gueldenberg (2010) in

relating the importance of retaining key personnel during succession to prevent knowledge attrition.

2.3.2.3 *Knowledge Transfer*

As part of the KM process once the ideas or knowledge have been created, they need to be transferred. This is the actual exchange of knowledge between several actors in an organization. The exchange of knowledge once identified can be done through social interactions, formal meetings, workshops, recorded best practice, job rotation and learning by doing and other methods that allow once tacit knowledge be converted to explicit knowledge (Cerchione and Esposito, 2017; Fink and Ploder, 2009).

Since knowledge in SMEs is more likely to be tacit Cyril Eze, Guan Gan Goh, Yih Goh, and Ling Tan (2013) suggest the importance of social interactions to build trust as a means of transferring knowledge and thereby making it explicit and easier to transfer. When discussing knowledge transfer or distribution Fink and Ploder (2009) don't differentiate between tacit and explicit knowledge but stress the importance of a knowledge sharing culture and the importance of using tools and technology to facilitate the sharing. The importance of this process in SMEs is highlighted once again due to the smaller nature of the organizations and the capacity to lose knowledge easily that is not transferred.

2.3.2.4 *Knowledge Utilization*

Having collected and retained knowledge it is essential that the company develops a means of using the knowledge. Phipps and Prieto (2012) strongly suggest that gathering knowledge is worthless unless creative efforts are made to put it to work for the individual and the firm. Knowledge needs to be exploited for the benefit of the company. Similarly Wee and Chua (2013) suggest that knowledge needs to be repackaged for subsequent reuse by the organization. The purpose of knowledge

held by the organization is to allow it to learn from its past successes and mistakes. The retained knowledge can be used to reduce organization duplications and generate greater efficiencies. The ability of the SME to absorb and utilize knowledge is a critical success factor in knowledge management (Tangaraja, Rasdi, Samah and Ismail, 2016).

2.3.3 Knowledge Management Tools

Taxonomy of KM-Tools.

KM-Phase	Tools	
Knowlede Creation	Data Mining	Crowdsourcing Systems
	Data Visualization	Mash-up
	Expert Systems	Prediction and Idea
	Social Data Mining	Markets
	Text Mining	Syndication Systems
	Collaborative Filtering	Trust and Reputation Systems
Knowledge Storage	Business Process Management Systems	Databases
		Data Management Systems
	Configuration Management Systems	Data Warehouse
	Content Management Systems	Document Management Systems
	Product Data Management Systems	Decision Support Systems
	Product Lifecycle Management Systems	
	ERP Systems	
KnowledgeTransfer	Cloud Computing	Audio conference/Video conference
	Learning Management Systems	Blogs
	Peer-to-Peer Resource Sharing	Chat
	Podcasting/Videocasting	Conversational Technologies
	Social Media	E-mail
	Wiki	

Figure 4 Taxonomy of KM-Tools.(Cerchione and Esposito, 2017)

An effective knowledge management system should integrate people, processes and technology within the organizational structure (Fink and Ploder, 2009). While devising their taxonomy of KM tools Cerchione and Esposito (2017) investigated the various methods that organizations use for the three key areas of the knowledge

management process and they indicated the technological tools that aid creation, storage and transfer of knowledge. These are summarized in Figure 3. In this instance it is mostly ICT or digital based technology for the retention and storage while a mixture of interpersonal systems and ICT is used for the creation of knowledge. Durst and Runar Edvardsson (2012) indicate that it is the lack of formal tools and processes which are impeding knowledge sharing in SMEs. This means that companies are overly reliant on the sharing of tacit knowledge and fail to benefit from the advantages formal knowledge management tools would provide such as employee retention, customer satisfaction, company efficiencies and innovations.

The growth of cloud-based data storage solutions and the increased prevalence of software as a service (SAAS) has seen the costs associated with knowledge management tools significantly reduced (Wee and Chua, 2013) removing one of the barriers to the adoption of these systems for SMEs. Cerchione and Esposito (2017) share this view and indicate that the availability of inexpensive knowledge management systems is creating opportunities for SMEs. It was suggested by Riege (2005) that there were eight technology based barriers related to ICT, system integration and a general lack of resources and understanding of how this technology could benefit the companies. The thirteen years since that paper was published has seen the removal of many of these barriers as these systems become cheaper and easier to implement but Centobelli, Cerchione and Esposito, (2018) indicate that there is a mismatch between companies adopting new technology and their ability to implement knowledge management systems suggesting that it is not enough to just have access to these systems there must be a means of implementing them effectively.
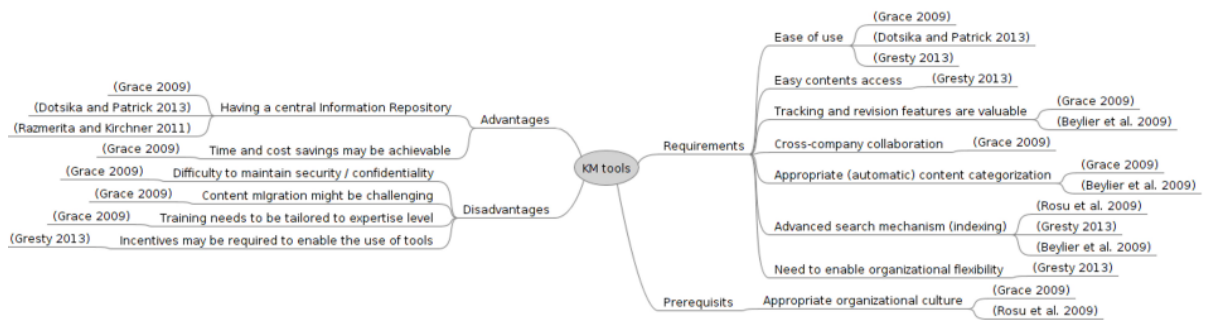
Figure 5 KM Tool Scope (Kramer, Wirth, Jamous, Klingner, Becker, Friedrich and Schneider 2017)

2.3.4 Effectiveness of KM

It has been widely suggested that knowledge sharing is positively correlated to innovation and organizational performance. Specifically Wang and Wang (2012) found that the sharing of explicit knowledge positively correlated to financial performance and the speed of innovation while sharing tacit knowledge had more effects on the quality of innovation and operation. Furthermore Rašula, Vukšić and Štemberger, (2012) contend that the capture, sharing and use of knowledge enhances a firms performance. However Alegre, Sengupta and Lapiedra (2013) also suggest that improved performance was due to incendiary results of knowledge sharing practices such as the type of KM methods implemented. It is inferred by Alegre, Sengupta and Lapiedra (2013) that while the implementation of KM practices is necessary to enhance a firms performance it is not sufficient; rather than simply implementing KM solutions, it is necessary for firms to have dynamic KM capabilities and adapt or create new KM practices as they are required.

2.4 Literature Review Conclusion and Research Gaps

The literature reveals how the different definitions of what an SME is around the world has somewhat obscured research into the area of KM in this sector and how this has hampered research into the uses of KM process's and tools. It highlights the

importance of the SME sector from a global, European and Irish perspective. From an Irish perspective it accounts for 99.7% of all active enterprises and employs 7 out of 10 people (Central Statistics Office, 2014). It is noted that the prevalence of SMEs in Ireland was a key factor in the recovery in the years since the economic crash of 2008 (Lawless, McCann and McIndoe Calder, 2012). From a social and economic point of view the role of the Irish SME is very important which indicates why this sector deserves special attention for research.

Reviewing the relevant papers shows that the field of knowledge management covers a broad span of academic fields including psychology, management, engineering ICT and business. There is a clear indication that one of the difficulties in studying the field of KM is that the definition changes from one academic area to another. There is however a consensus in the literature that there is a need to understand that the field of study is changing and evolving. Distinctions are made between explicit knowledge that can be easily documented, stored and utilised and tacit knowledge that is mostly retained inside people's minds and is less easy to access and use.

SMEs cannot just be viewed as scaled down versions of larger organizations and more specific research is needed that is relevant to SMEs. Companies in this sector rely heavily on the knowledge of the owners and employees to be successful rather than availability of capital and other tangible resources. The ability of the employees and owners in SMEs to use and transfer knowledge allows for a competitive advantage. The KM process requires the ability to transfer knowledge from tacit to explicit so that it can be shared. The nature of SMEs suggests that most internal knowledge is tacit, so the KM process must be followed so that it can be utilised for the benefit of the organization. The current prevalence of inexpensive and easier to use ICT and software systems has made it more cost effective for smaller companies to try and implement the use of formal KM tools. The implementation of formal KM systems in SMEs can be correlated with organizational efficiencies and innovation.

It is found that some areas in relation to KM and SMEs are comparatively well researched. The areas of knowledge perception, implementation and transfer get most of the attention while the KM processes of creation, retention and utilization are lacking in detailed investigation. There are gaps in the research when it comes to KM tools and practices in SMEs; which tools and practices are currently in use by SMEs, what is the prevalence of adoption of these practices, do SMEs perceive any benefit in adopting these practices or have plans in place for the adoption of KM practices and what factors would hamper the adoption of KM practices in SMEs. Specifically, in an Irish context there is very limited data on KM in the SMEs, and in the context of how essential SMEs are to the economy this is an area that requires further research.

2.5   Theoretical Framework
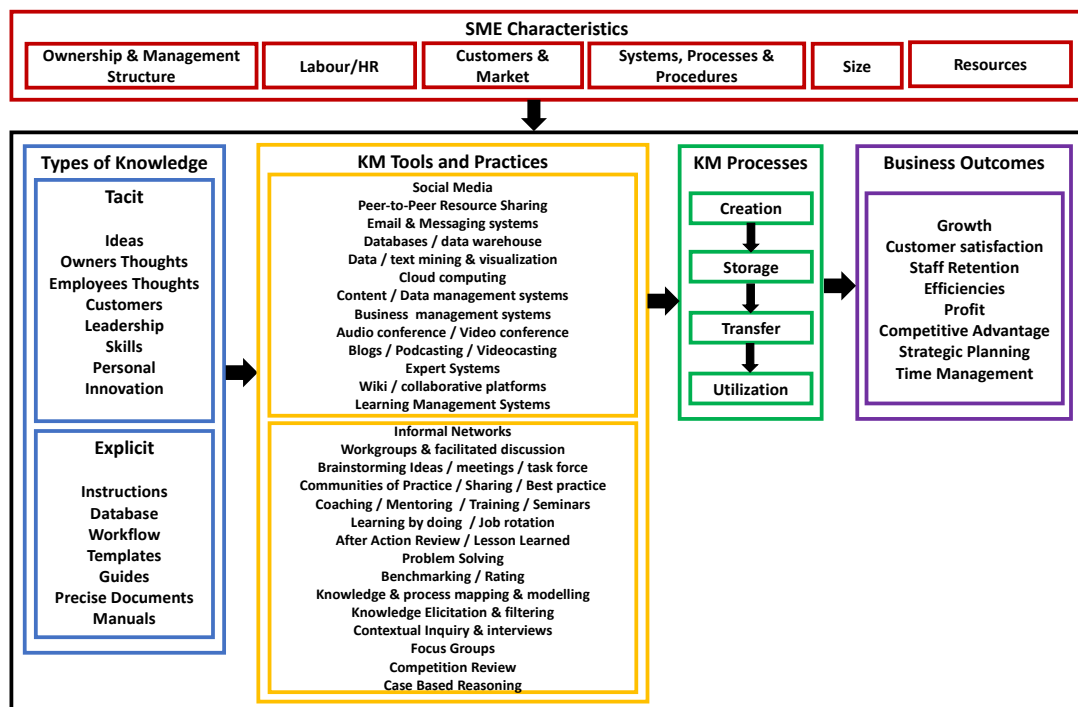
Figure 6 Theoretical framework based on the literature review

Based on the review of the literature in the area of knowledge management in SMEs, a theoretical framework is drawn up to represent the relationship between SME characteristics, types of knowledge, KM tools and practices, KM processes and business outcomes.

Chapter 3   Research Question

The aim of the research project will be to investigate the knowledge management practices of the Irish SME sector from the perspective of their perception and practices and to try and establish a link to the performance of the companies. KM can be seen as an integral component of the Irish SME and the literature suggests that it is being underutilized in companies.

The specific research question that will be investigated in this work is: "What are the main knowledge management tools and practices adopted by the Irish small and medium sized enterprises and what is the impact these processes have on the performance of the companies'"

The research question will be further broken down into subordinate questions and examined empirically:

- *Identify the main KM tools and practices in the Irish SME sector*
- *Identify the reasons the companies have for adopting the formal or informal KM processes and any barriers to adoption*
- *Identify the perceptions of the Irish SME sector towards KM practices*
- *Identify the importance of KM on the performance of SMEs*

As an objective it is hoped that the various subordinate questions will give rise to some practical guidance or advice that could be utilized by SMEs or by other KM practitioners along with offering insights into other avenues for further research. The results of the study will useful for decision makers in SMEs in developing knowledge management strategies. It is intended that the research would be valid in most of the business sectors covered by Irish SMEs.

Chapter 4 Research Methodology

4.1 Introduction

This chapter outlines the research philosophy and justifies why an epistemological approach with an interpretivist ideology would be the most beneficial in helping answer the research question. It outlines the process that was used to select the most suitable methodology for the research as well as the justification for the choice of a qualitative paradigm using a phenomenological approach. It goes on to describe the selection of the research sample, what data is collected and how it is analysed. There is a discussion around reliability and validity, ethical considerations and limitations of the research methodology applied.

4.2 Research Philosophy

The methodologies and methods chosen to try to answer a research question are not random and consideration must be given to the philosophical starting point for the research (Bryman and Bell, 2015). Quinlan, Zikmund, Babin, Carr, and Griffin (2015) and Saunders, Lewis and Thornhill, (2015) suggest that a research philosophy offers a framework to investigate different methodologies to help answer the research question and that it allows for the development of knowledge and an understanding of what that knowledge means. They also suggest that investigating the various philosophical assumptions that underpin research can allow a researcher to develop novel and creative methodologies.

Dobson (2002) argues that understanding the philosophical positions for research empowers the researcher to confidently choose their methods and methodology and furthermore believes that this allows for a more coherent approach for a consistent, rational and logical path through the research process. This stance is echoed by Saunders, Lewis and Thornhill, (2015) when they suggest that the

philosophical choices made in the pursuit of research allows for the decisions made as part of the process to be defended.

The areas of philosophy that are of most concern in relation to research are ontology and epistemology. The choice of philosophical position can be somewhat influenced by how the researcher views the world (Bryman and Bell, 2015). Ontological philosophy concerns itself with the 'nature of reality' while epistemology is concerned with 'acceptable knowledge in a field of study' (Saunders, Lewis and Thornhill, 2015).

Ontology is concerned with what constitutes reality. To adopt an ontological approach the researcher is concerned with the facts of reality and how things can be measured in relation to the natural sciences. The researcher must take a position in relation to their perception of how things work or really are as measured through the senses (Scotland, 2012). Epistemological assumptions are used to try to determine how knowledge is created, acquired and communicated and asks if the social world can be studied using the same principles as the natural sciences (Quinlan et al., 2015).

The main ideologies that fall under ontology and epistemology are positivism and interpretivism. A positivistic approach involves the researcher believing in a single objective reality and that this reality can be measured using natural sciences in a logical and rational manner, generally positivism involves statistical and mathematical methods (Carson, Gilmore, Perry and Gronhaug, 2001). Interpretivism does not require the same rigid natural sciences as the positivistic stance as it is adopts the view that that there are multiple realities and they are socially constructed as opposed to the objective stance of positivism(Quinlan et al., 2015).

Saunders, Lewis and Thornhill (2015) encourage a level of pragmatism when it comes to adopting a research philosophy and that there is no one best approach to adopt. They suggest that the research question should determine the philosophical

stance as the application of and ontological or epistemological, interpretivist or positivist ideology may change depending on what knowledge is being uncovered. Furthermore, Tashakkori and Teddlie (2010) suggest a pragmatic approach is appealing as it encourages a researcher to investigate a topic from many stances and approaches and suggests that the underpinning philosophy should be what the researcher deems to be appropriate and appealing.

Considering the research question outlined in chapter 3 it has been determined that an epistemological approach with an interpretivist ideology would be the most beneficial in helping answer the research question. This stance is supported as the field of KM lacks definition among academics and practitioners so from an epistemological point of view there is no one objective reality. From the literature review it was determined that KM practices and processes have no clear parameters and it would appear that among individuals in SMEs it can be a very personalized process so to gather themes and feelings around the subject of KM an interpretivist ideology is required. Much of the information required to answer the research question would require context rich conversations to help elucidate the themes in KM so the natural sciences methods required for an ontological stance would be less appropriate.

4.3   Selection of Research Method

Fundamental concerns as to how the research question can be answered indicates whether the paradigm of a quantitative or qualitative approach should be used (Pereira Heath and Tynan, 2010). It would appear from the literature that there is no consistent methodology used for collecting data in relation to KM. This is understandable as the topic itself is considered to be relatively new from a scientific research point of view (Cerchione, Esposito and Spadaro, 2016) and for example when Wong and Aspinwall (2005) carried out their research they indicated that they had trouble getting responses to questions on the basis that the people surveyed did not understand the concept of KM.

A quantitative approach to the research questions was considered for this study as it would be possible to define each of the subordinate questions as a practical social theory and develop a research hypothesis for the theory. Using statistical methods, these hypotheses can be supported or disproved. Donate and Guadamillas (2011) argue that there is a need for more quantitative research in the field of KM and that while there has been a significant increase in quantitative research in this area most of it tends to be of a qualitative nature. On the other hand, there is a concern that if a quantitative approach were adopted key aspects of information could not be gathered and the opportunity to ask questions would be too narrow. In some of the cases involving quantitative research the conclusions drawn through questionnaires or surveys suggested that the results had limited value as in many cases the people did not understand the questions (Wong and Aspinwall, 2005) or only partially answered for one question when the survey asked for multiple examples of KM practices (Chen, Hsiao and Chu, 2014).

In similar studies carried out by Wee and Chua (2013), Massa and Testa (2011) and McAdam and Reid (2001) a qualitative approach was adopted because in each case it was felt that this allowed for the collection of rich contextual data that might not have been possible to gather through quantitative means. The flexibility offered by semi-structured interviews (Cameron and Price, 2009) would allow for more complex ideas to be explored during the interview.

Having considered the findings in other papers and the epistemological, interpretivist and deductive philosophical position of the researcher it was decided that due to the perceptions and interpretations of individuals of the 'lived experiences' in the SME sector that a qualitative approach using a phenomenology research design was deemed to be most suitable.

4.3.1 Phenomenological Approach

Creswell (2013) and Moustakas (1994) indicate that the use of a phenomenological approach should be considered when trying to understand the common lived experiences of the research participants and the investigator is trying to understand the phenomenon or subject matter based on its common structures, individual components and manifestations. Descriptive or hermeneutical phenomenology involves looking at the personal experiences of the participants and is an interpretation of their understanding of the phenomena being investigated (Padilla-Díaz, 2015). Alase (2017) indicates the role phenomenological research is to understand and amplify the 'lived experiences' of the study participants and help to contextualize the phenomena in question.

Sanders (1982) posits that the phenomenological approach is useful for the investigation of phenomena in organisations. Furthermore they suggest fundamental components of the research design should consist of establishing the limits of who and what is to be investigated, the collection of data and the phenomenological analysis of the data.

4.3.2 Sample Details and Selection

Quinlan et al., (2015) indicated that the study should involve individuals who are relevant to the research area and this means for the phenomenological approach selecting participants that own or work in SMEs, the sample must be able to represent elements of the phenomena being explored (Bryman and Bell, 2015). To ensure this owners or employees of SMEs have been identified as a primary source of information because in most SMEs the management structure is relatively flat all stakeholders have a good overview of the operations of the company. The population sample is drawn from companies that are members of ISME so should fit the criteria of being an SME. This represents a non-probability purposeful sample. The sample population was further reduced by limiting the research to companies

with less than 20 employees as the span of control of the key stakeholders will be reduced and the information gained would be more beneficial than asking stakeholders in larger organizations. At the time of selection the participants had characteristics that suited the study, namely that they owned or worked in an SME (Padilla-Díaz, 2015).

4.3.3 Research Design Overview
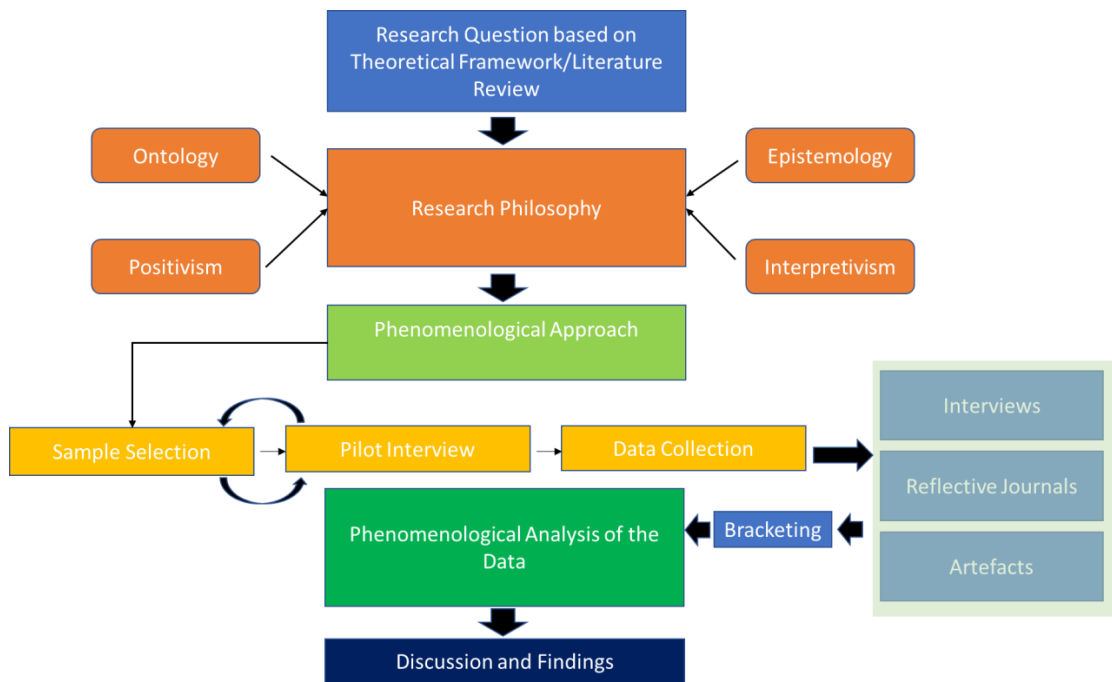
Figure 7 Research design overview

Figure 7 serves as a general overview of the study research design. This design is outlined in greater detail in the various sections of this chapter. The research question is considered in view of the philosophical choices available. An epistemological, interpretivist and deductive philosophical position leads to a phenomenological approach to the research. The sample population is chosen based on the ability to provide insight into the research questions. To test the suitability of the sample population and the data collection methods a pilot interview is considered. The feedback from the pilot interview allows for alterations

to be made to the data collection methods. The primary data is collected using in-depth interviews, reflective journals and artefacts. This is analysed based on the phenomenological approach.

4.4 Data Collection Methods

Padilla-Díaz (2015) and Bryman and Bell (2015) consider the profound interview to be the most appropriate means of collecting data for the phenomenological approach. They suggest that an open or semi-structured interview technique allows the participants to express their understanding of the phenomena in detail. The participants will be asked to indicate a suitable place for the interview so they feel comfortable to speak freely. Beavan (2014) outlines an approach to the interview that requires the researcher to consider their own views and have a critical dialogue with themselves on of the subject matter and consider any bias they might bring to the process. Husserl, the father of the phenomenological approach called this aspect of self-reflection 'bracketing' and considered it important to include this as it allows the researcher to investigate the reality of the subject matter to be viewed from the participants point of view and exclude the preconceptions that the researcher might bring to the process.

To help to add validity and reliability to the data gathered during the interview process the phenomenological approach also allows for the collection of supplementary material (Pietkiewicz and Smith (2014). In the case of this study the interview subjects have been asked to keep a reflective journal for a week and to indicate when they could have or should have used KM tools and practices and what the perceived benefits were of using KM. The researcher has also asked the subjects for artifacts that indicate the use or lack of use of KM tools and practices. These artifacts have taken the form of PC screen grabs, emails and other physical documentation that demonstrates the use of KM tools and practices.

4.4.1 Reflective Statement

As the phenomenological approach is interpretive and participant oriented Alase, (2017) and Gearing (2004) indicate a need for the researcher to reflect on their own bias in relation to the subject matter so that it can be 'bracketed' out of the analysis and to that end the author has considered their own views. The researcher owns and operates an SME that employs 11 people. The company has utilized various formal and informal KM tools and practices for the last 18 years and it is the researcher's perceptions of the benefits and short comings of these various systems that have inspired this research project. The utilization of these systems in their own company means that the researcher is approaching the research interviews and data collection with some personal bias, so the production of the reflective statement ensures that this bias is considered when progressing with the data collection and analysis.

4.4.2 Interview Schedule

Phenomenological Attitude	Researcher Approach	Interview Structure	Method	Example Question
Phenomenological Reduction (Epoché)	Acceptance of Natural Attitude of Participants	Contextualization (Eliciting the Lifeworld in Natural Attitude)	Descriptive/Narrative Context Questions	"Tell me about becoming ill," or "Tell me how you came to be at the satellite unit."
	Reflexive Critical Dialogue With Self	Apprehending the Phenomenon (Modes of Appearing in Natural Attitude)	Descriptive and Structural Questions of Modes of Appearing	"Tell me about your typical day at the satellite unit,"or "Tell me what you do to get ready for dialysis."
	Active Listening	Clarifying the Phenomenon (Meaning Through Imaginative Variation)	Imaginative Variation: Varying of Structure Questions	"Describe how the unit experience would change if a doctor was present at all times."

Figure 8 A structure of phenomenological interviewing (Beavan, 2014)

Smith and Osborn (2009) offer some techniques for conducting a semi-structured interview. They suggest that the researcher develops a rapport with the participant. The order of the questions are is important and it is worth following the

respondents views and concerns as it can often provide information that was not considered. Furthermore Creswell (2013) offers the guidance that it is beneficial, in the case of phenomenological research, that the interviewer spends a few minutes describing the phenomena in question as it can allow for a richer response from the participants.

The interview schedule involves considering the broad area of the study the identification of the main KM tools and practices used by the participants, investigating if these systems are formal or informal and any perceived barrier to the adoption of KM systems and what are the perceived benefits of KM tools and practices. Appropriate questions based on the subordinate research questions were developed to help probe details from the subjects

Having considered the above broad topic questions are developed and presented in a logical order to try to address the subject matter. The order of the questions was considered to be important due to some of the confusion in relation to what are KM tools and practices (Wong and Aspinwall, 2005). It was determined that asking the more general questions at the start of the interview would allow for a greater understanding of the topic by the participants (Smith and Osborn, 2009). This system of funnelling allows the researcher to get a general sense of the participants' views before asking the more specific and probing questions on the topic. The interviews are recorded and transcribed to allow for coding and analysis.

4.4.3 Pilot Interview

It is suggested by Saunders, Lewis and Thornhill (2015) and Bryman and Bell (2015) that to ensure that the interview questions can be understood clearly and answered by the respondents a pilot interview should be considered.

The pilot interview was conducted on the 29th of June 2018 in the workplace of the subject. A series of questions based on the theoretical framework outlined in chapter 2 were used to probe the participants understanding of knowledge

management tools and processes. The questions were not pre-set as the phenomenological approach is best served by allowing for context rich answers (Warren and Karner 2010) and if the questions were two formulaic it was feared that some emerging themes might not be uncovered. The pilot interview indicated that some of the questions used were overly academic and unclear for the participant and required an excessive amount of explanation by the interviewer. To ensure that the research objectives were reflected fully in the questions asked they were altered and restated. The need to use a more simplified language was noted so that this could be incorporated into the data collection process for the study.

On refection it was determined from the pilot interview that the language used to ask the questions needed to be less formal and free flowing to put the participants at ease. It was also found that it would have been beneficial to have a copy of the theoretical framework available as the researcher could have, at a glance, determined if the themes indicated in the literature review where being covered by the respondents. This could also have guided the conversation where required. The pilot interview did indicate that anyone that fit the sample population criteria could be considered for interview as, regardless of the participants' position in the organisation, they were able to give insights into the knowledge management processes and systems being used.

The completion of the pilot interview also gave an indication of willingness by the participants to compile a reflective journal and helped establish what kind of artefacts could be collected from them. The testing of the interview and data collection process can lend validity and reliability to the qualitative research process (Bryman and Bell, 2015).

4.4.4 Interview Process

Having identified possible interview participants they were all individually contacted by phone to discuss the interviews and what the process would involve.

The informal phone call was followed by an email that contained the participant information sheet and consent to participate forms. This was sent to the subjects to give them time to consider participation and allow them to understand their rights in relation to the study. All interviews took place in July 2018 and were undertaken in locations chosen by the participants. This allowed them to be in an environment where they felt they could answer questions freely.

Before the interviews started the researcher took some time to discuss the study and the consent form. This discussion also served as an introduction to the topic and to put the participants at ease. Having considered some of the findings of the pilot interview an informal tone was adopted for the interviews and with only a few probing questions and minimal guidance the subjects discussed freely the topic of knowledge management as it related to them and their organization. The theoretical framework was briefly consulted during each of the interviews to see if there was correlation between the interviews and the findings in the literature. The interviews took between 35 and 60 minutes and were conversational in nature and were recorded for future transcription.

4.5 Phenomenological Analysis of the Data

Having completed the semi structured interviews and transcribed the recordings there was a large amount of mostly descriptive data. Following the guidance of Warren and Karner (2010), Smith and Osborn (2009) and Moustakas (1994) the manuscripts were read three times and bracketed analytical notes where made to establish themes that were common to all interviews. Since qualitative research is somewhat interpretive in nature Warren and Karner (2010) indicate the importance of trying to categorize the findings to allow conclusions to be reached. Identifying the patterns or themes in the research allows for open coding that forms the basis of the analysis and conclusions.
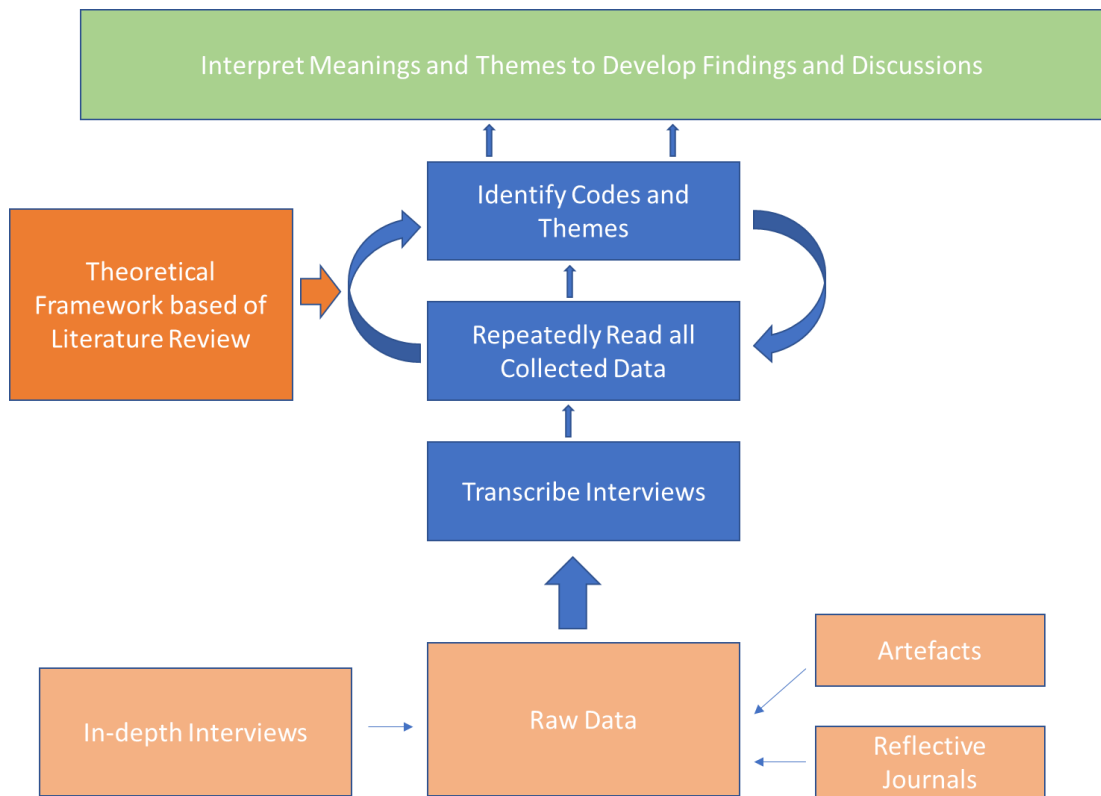
Figure 9 Stages of phenomenological analysis adapted from Creswell (2013)

Sanders (1982) and Creswell, (2013) give guidance on the four stages of phenomenological analysis. Stage one is the descriptive stage where the narratives are used to help identify the human experience of the subject involving their unique outlook. The second stage is finding the themes that emerge in the narratives and similarities between the various participant subjects. In the case of this study some themes have been already identified through the therotical framewrok devised from the litrature review. The third phase is to reflect on the emergent themes in a subjective manner and to understand the lived experiences and the final stage is to distil the essences of the subjective reflections. The codification of these themes indicates whether similar KM tools, practices and systems are used in the SMEs represented and what are the perceived benefits of these systems.

The reflective journals and other artefacts provided by the interview participants were read and parallels drawn to the themes found during the codification of the transcribed interviews. Correlations and variations between what is stated as KM process and tools were noted and discussed in full in the analysis and findings chapter.

4.6 Reliability and Validity within the Phenomenological Approach

Creswell (2013) stresses the importance of good quality research and believes that this begins with the correct selection of research participants and that the researcher should be aware of any biases or preconceived ideas that they are bringing to the project. The characteristics of the participants have been defined in the sample selecting section and this process ensures the correct selection of participants. Biases on the part of the researcher should be bracketed. Yin (2009) suggests four elements that can be used to evaluate the quality of qualitative research. First is reliability, as in if a different researcher was to carry out the same study would they reach the same conclusions. This can be difficult with the interpretivist phenomenological approach as the subjects can have different views on the same phenomena but with the use of bracketing and rigorous documentation of the methodology and methods used it should be possible for many researchers to reach the same conclusions or at least find the same themes emerging in the data. To aid with the emerging themes a theoretical frame work based on the literature review was devised. If another researcher reviewed the same literature it would be reasonable that they would find the same themes. Secondly Yin (2009) speaks of a construct validity and asks if the operational definition of a variable can be seen in the theoretical framework. Similar themes and concepts have emerged when the operational definition was uncovered in the research process. According to Yin (2009) this would indicate a high degree of construct validity.

The internal validity test is not relevant to the research project as Yin (2009) indicates that it is not a suitable test for exploratory or purely descriptive studies. As this is a descriptive study this test was not applied.

The final test concerns external validity and is used to determine if the findings of research have been over generalised. Yin (2009) suggests that this type of qualitative research is not supposed to be representative of a larger research project but instead is used to offer guidance to other avenues of research that in the future could be used in a more general manner. The themes uncovered in the interviews marry with similar findings in cases studies conducted by Wee and Chua (2013), Yew Wong (2005), and Hutchinson and Quintas (2008) so this would suggest a high degree of external validity.

4.7   Limitations of Research Methodology

In using the qualitative paradigm there are a number of limitations to be considered. The phenomenological approach requires far reaching in-depht interviews that provide large quanties of raw data for analysis. This is not a limitation in general but specific to this study there was a concern that time constraints would mean that the sample size for interviews whould have to be curtailed to allow time to process the findings. This concern is echoed by Elo and Kyngäs, (2008) and the reduction in sample size means that it can be harder to draw generalisations that can be applied to the wider population. A further limitation is that there is a concern that the subjects will not be familiar with the phenomenon of knowledge management and there may not be a commom lexicon for the ideas or themes that are to be uncovered. Atieno, (2009) has a concern that ambiguities can arise when language is used as words can have different meanings to people with only a slight change in the context.

4.8   Ethical Considerations

One of the key considerations in this research would be that of privacy and confidentiality, the information gathered looks into the business practices of the organisation and can be considered to be sensitive in nature as it would be of value to competitors or customers. In the case of interviewing employees, consideration also needs to be given to ensure that their participation is voluntary, and participation or lack thereof would not cause harm to them within their organisation.

A cover letter explaining the process will be presented and a request to consent to being voluntarily interviewed will be sought. It will be made clear to participants that at any stage they can stop their participation and all information relating to them will be returned or destroyed. There will also be a guideline indication of how long the process should take. Care would also be taken not to present questions in a leading manner that would influence the outcome or elicit a desired answer. The reasons for the research will be clearly outlined to the participants and awareness will be made that all information will be kept strictly confidential and identifying details removed prior to publication.

It will be the researcher's intention to preserve the anonymity for all the interview details and company names and other identifiable information will not be used. Steps will be taken to secure the research and the raw data to protect any sensitive information and access limited to only those who need it for the project. On completion of the thesis a copy will be made available should they choose to see the results of the study or benefit from any of the insights gathered. The ethical guidelines and procedures for research involving human participants issued to students of NCI have also been consulted to ensure compliance (National College of Ireland, 2013).

Chapter 5   Findings and Analysis

5.1   Background of Participants

Name:	Sex	Age	Industry:	Position:	Management Experience	No of Employees:
Participant 1	Male	39	Hospitality	Owner/MD	Yes	10
Participant 2	Female	40	Engineering	Office Administrator	Yes	12
Participant 3	Female	43	Print Management	Account Manager	Yes	8
Participant 4	Female	33	Research and Development	Project Manager	Yes	9
Participant 5	Female	41	Construction	Financial Controller	Yes	11
Participant 6	Male	50	Graphic Design	Owner	Yes	2

Figure 10 Details of participants

A total of six interviews were completed and all the subjects own or work in SMEs and these six individuals represent a cross section of the Irish SME sector. The participants interviewed all fulfilled the criteria for inclusion as outlined in the methodology section as they own or work in companies that display some or all the characteristics of SMEs as found in the literature.

Participant one (P1) is the owner and managing director of a company that has two aspects to the business. One aspect is the management of a sports facility and a café on behalf of the municipality and the other aspect is contract grounds keeping. The company has been in operation since 2013. In addition to its 10 employees they also engage the services of sub-contractors on an ad-hoc basis.

The second participant (P2) is an administrator in a life safety systems company. They oversee the day-to-day administration of the business from order processing, payments, invoicing and dealing with front line customer queries. The organisation has 12 direct employees and also utilizes sub-contractors. The company was established in 1983 and has transitioned in that period from a mostly paper based operation to one that relies heavily on IT infrastructure.

Participant three (P3) is employed in a print management company with eight employees and works as an account manager. The company manages the printing and distribution of annual reports, brochures, magazines, and leaflets. This involves the collection and processing of large quantities of data. The organisation has been in business for 24 years. Similar to other companies involved in this research the company out-sources aspects of its business and sees this as a prudent use of resources. This participant has also been employed in an international non-governmental organisation (NGO) at a senior level and was able to offer interesting comparisons as to how knowledge is managed in small firms verses larger multinational entities.

The fourth participant (P4) is a project manager in a research and development engineering company. They lead a team of 4 people and the firm has a total of 9 employees. The business is involved in product development for the semiconductor industry and the items being developed are related to the PhD of the participant. The firm has been operational since 2010. As the industry that the company operates in is fast paced and constantly changing it is regularly conducting exercises in idea generation and this has given the researcher insights into knowledge creation and utilization in a very structured environment.

Participant five (P5) is the financial controller of a construction company that has been in operation for 12 years. While their stated position in the firm is financial controller they indicate that the small nature of many SMEs means that it is rare for any one individual in an organisation to be left to a singular role and as such they have a hand in all aspects of the business. They highlight the need for flexibility within SMEs which is echoed by many of the other participants. Their position in the organisation means that they work directly with the managing director to monitor data such as costs, profits and other variables essential to the success of the concern and indicated that the data presented is only useful if it is accurate and can be mined to provide insights into the operation of the company.

The sixth participant (P6) is the owner of a graphic design company that has been trading since 1997. They are a graphic designer and they specialise in the production and sale of promotional material. They have seen their industry transition in the last 20 years from one that relied heavily on many different support industries such as designers, plate makers and printers to one where they can take the entirety of the service they provide and use cloud based systems to deal with each aspect of the business right up to the printing process. This heavy reliance on cloud based systems caused the loss of vast quantities of data due to a technical issue and gave the researcher insight into how a company can cope with the failure of its KM systems.

It was found that in the companies represented by the participants the organisation structure is relatively flat and in most cases the participants were either the owner or reported directly to the owner or a senior manager. This allowed for insights into the individual SMEs that the researcher believes would not have been gained if larger SMEs were the subject of the study.

5.1.1 Sample Saturation

Having based the semi structured interviews on the theoretical framework (figure 6) devised from the literature review it was possible to determine if the participants had mentioned that various themes, tools and processes that are evident from the literature. While the sample size of six participants could be considered small Crouch and McKenzie, (2006) offer advice that there is merit in a small sample as the researcher is looking for depth in the responses. Bowen, (2008) indicates the importance of explaining how sample saturation was reached to justify the ending of the naturalistic inquiry process. Having seen similar themes in the discussions with all the participants it was determined that due to the time restraints of the project that it would be more beneficial to fully explore the collected data from six participants than to carry on finding more interview subjects.

5.1.2 Knowledge Management Artefacts

Having discussed knowledge management with the various participants during the interview process the researcher collected artefacts that indicated the use of knowledge management systems or processes from most of the participants. These artefacts took the form of paper documents such as the process checklist provided by participant one, and screen grabs of the business management system utilised by the second subject. The third participant offered the researcher a tour of their company's data archive, which took the form of a physical document library. The researcher was allowed to take photographs that showed the general layout of the archive but no specific information as it was considered confidential to the business.

The fourth subject shared a non-completed version of one of the Google sheet documents that is used for project management, knowledge creation, storage and transfer. Similar to the third participant they indicated that they couldn't share specific information as it was confidential and the researcher felt for the purpose of this work the amount of information shared was sufficient. Participant five offered samples of paper-based to do lists and showed the process of transferring the pertinent knowledge from to do lists into electronic data saved in various customer files in the business management system. This transfer of paper to do lists into the electronic format within the database is how this subject felt they were contributing to the knowledge management creation of the organisation. The sixth interview subject took the researcher through the process of handling a job on the customer relations system of the company from the enquiry process, product design, product design acceptance and production of the finished article it vividly illustrated the codification of tacit knowledge to explicit knowledge. They offered screen grabs of the various stages of the process and indicated that the system was useful, and the organisation and its current form couldn't exist without the data management structures it had in place.

The artefacts collected or viewed as part of the interview process matched up with the views of the various subject's knowledge management processes or systems that they discussed at length during the interview process. The viewing of these artefacts lends validity to the assertions made by the subjects about their individual or company knowledge management processes and practices as the physical evidence shared is in line with what was discussed.

5.2 Indications of Themes in the Interview Process
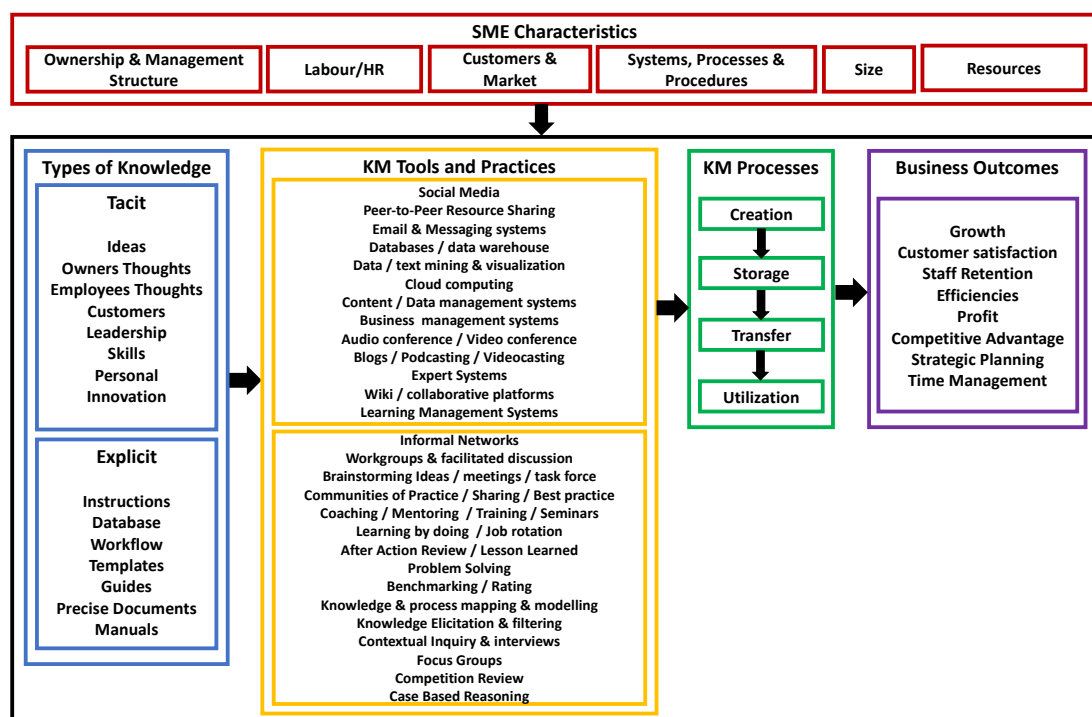
Figure 11 Theoretical framework

The six participants were all asked open ended questions that were based on the theoretical framework derived from the literature review (Figure 9). All participants company's displayed the characteristics of SMEs and identified incidents in their organisation related to the knowledge management processes of creation, storage, transfer and utilisation. The coding of the interviews and reflective journals were based again on the framework by considering broader categories of SME

characteristics, types of knowledge, KM tools and practices, KM processes and business outcomes as per the theoretical framework. Visual representations or networks of the emergent themes are constructed within the broader themes of the KM processes. These maps enabled the understanding of the relationship between the various themes and sub themes. Where appropriate these maps along with tables offer a summary of the findings relative to the participants in the relevant section.

5.3   Knowledge Identification and Creation

5.3.1   Who Creates the Knowledge?

			Participants					
			1	2	3	4	5	6
Types of Knowledge	Tacit	Ideas	•	•	•	•	•	•
		Owners Thoughts	•	•	•	•	•	•
		Employees Thoughts	•		•	•	•	
		Customers	•	•		•	•	
		Leadership	•	•	•	•	•	•
		Skills	•			•		
		Personal	•	•	•	•	•	•
		Innovation		•		•		•
	Excplict	Instructions	•	•	•	•	•	
		Database		•	•		•	•
		Workflow	•	•	•	•		
		Templates	•	•		•		•
		Guides		•		•	•	
		Precise Documents	•	•		•		
		Manuals	•	•	•	•	•	•

Figure 12 Tacit and explicit knowledge as identified by the participants in relation to KM processes in their businesses

It was uncovered that all participants believed that it was the responsibility of each person in the organisation to help to create knowledge, but they also identified that there is normally a singular driving force in the company to formally create knowledge so that it can be stored, transferred and ultimately utilised. In the case

of owners it was felt that this role fell to them and in the other cases the participants suggested it was always the owner of the company that strived to push the importance of the collecting knowledge for future strategic benefit. The understanding of tacit verse explicit knowledge played a part here as companies struggle to codify tacit knowledge to make it explicit. Figure 11 summarises the tacit and explicit forms of knowledge as identified by the participants as they went through the KM processes.

The size of the organisation appears to be a factor in this creation process and the relativity flat nature of Irish SMEs usually means the owners or managing directors take a particular interest in knowledge creation.

In relation to the role of knowledge creation participant 1 opined that:

> *Knowledge creation is everyone's job, and you know, when you're transferring the knowledge across to everyone, everyone kind of knows there's the serious part of this.. (P1)*

The second participant had the view that without the guidance of the managing director the process of knowledge creation was often:

> *piecemeal and reactionary…It seems like you're in a fire-fight and then you're not thinking ahead..(P2'*

and it was the strategic view of the managing director that tried to instil the importance of the generating knowledge in the business from past experiences to help guide future endeavours of the organisation. This was somewhat echoed by participant 3 when they outlined that the director was heavily involved in knowledge capture in the organisation and its retention for future use In each case this involved that shifting of tacit to explicit knowledge:

> *the Boss, goes through the list of all the live jobs on his piece of paper and he will check it against the system. So, it will be quickly spotted if you*

haven't updated the electronic system. ….in other words, every job is in there. The reason why he wants to check, obviously the Director, it's his company (P3)

The fifth participant reiterated that in a small business because roles have to be more flexible due to the nature of the organisation that each employee must make an effort to help with knowledge creation and inferred that it's different in SMEs than larger companies:

Everyone has a role, in knowledge creation, but it's driven from management as they see the value of the knowledge management due to the nature of a small business, you are going to be more involved in decisions than if you were in a larger organization, you would have a very specific role (P5)

The lack of clearly delineated roles in SMEs makes it difficult to ensure knowledge created is properly being captured and recorded. The business owners believe that knowledge management is everybody's responsibility and the employees believe this should be driven by the owners. Participant four suggested that in larger organisations, since roles are more clearly defined there tends to be more formal structures in place for the capture, storage and utilisation of knowledge:

….in a larger organization, everything tends to be a form has to be filled out and the form is passed on to the next person to do their bit that's inputted into a knowledge management system. And the information is there. Whereas in a smaller organization, I think a lot of it is achieved orally through conversation with somebody, whether that's over the phone or face to face. (P4'

One interesting counterpoint to knowledge creation being driven from a management or owner level is the fourth participants view that knowledge creation is driven entirely at a project level in the company with very little interaction with

senior management, but they did suggest that this could be down to the nature of the company and that the entire role of the project team is the development of new ideas into saleable products.

5.3.2 How Important is the Knowledge Creation?

All participants agreed that the knowledge creation was important for the growth and sustenance of the business. This was either due to the necessity of the knowledge for the creation of products and services offered by the company, including the tacit skillsets provided by the company's employees or from the perspective of improving the efficiency of the business's operations. Knowledge creation for many of the participants interviewed was seen as a by-product of running the business and while it seems to have allowed for the generation of systems that allow for easier work processes it was mostly the owners or strategic leaders that could readily identify the more tangible benefits.

Participant one indicated that the creation of knowledge meant that systems could be generated to ensure that works are completed in a systematic manner and allows for a formalisation of processes that would otherwise be haphazard. They offered the view that:

> *Templates are generated for most of the organisation because of the diversity of the work and it's easier to try and prescribe how things should be done rather than starting each system from new… (P1)*

This view came from years of experience trying to capture the systems that are needed to make sure that the business runs efficiently and this sentiment was echoed by the second participant when they suggested that knowledge creation was required to help the business develop over time:

> *the need was there because of the growth and I think in terms of knowledge management systems that helped the company to grow. (P2)*

This view was mirrored by the sixth participant who suggested that it was the ability of companies like his to create knowledge that has led to the generation of databases for the graphic design industry and in a broader context that this captured knowledge is now shared across the industry. Collectively they have a database of 80,000 products which now allow Irish SMEs to compete on a global scale.

The third participant suggested that for their company a collective pool of knowledge has meant that gaps in the skills of co-workers as well as their strengths can be found. This created knowledge has allowed the firm to stretch the boundaries of the business and take on work because they are more aware of the knowledge within the organisation which can help secure work for the company:

> *…you have more skills maybe than your colleague, but you're trained to do everything and you're also a go to person if you've got a specific skill and if this is known, the company can generate work based on these skills, even if its outside the normal scope of the business and again this is down to the flexibly of small firms and gives competitive advantage. (P3)*

On the more extreme end of the spectrum, Participant four's company's entire business model is based on the ability of the company to create knowledge and understand a means of using this innovation to drive sales and profits for the organisation. To this end they believed that without the ability to create and capture knowledge, turning tacit knowledge to explicit knowledge their organisation would not exist.

All participants indicated that the knowledge creation or idea generation process resulted in some form of formal documentation such as procedures, spreadsheets, guidelines or internal "how to" guides. The hope seemed to be that ultimately these created resources get collected in a central location for the benefit of the entire company. Figure 11 summarises the tools and practise employed in the participants businesses in relation to knowledge identification and creation.

			Participants					
			1	2	3	4	5	6
Knowledge Identification / Creation	**Tools**	Social Data Mining	•	•	•	•	•	•
		Data Visualization				•		
		Expert Systems		•	•	•	•	
		E-mail	•	•	•	•	•	•
		Wiki		•				
		Cloud Computing	•	•	•	•	•	•
		Text Mining			•		•	•
		Collaborative Filtering	•	•		•		
		Audio conference/Video conference		•	•	•	•	•
		Trust and Reputation Systems	•	•	•	•	•	•
	Pratices	Brainstorming Ideas	•	•	•	•	•	•
		Competition Review		•	•	•	•	•
		Knowledge Elicitation	•			•		
		Interview	•	•	•	•	•	•
		Benchmarking		•	•		•	•
		Knowledge Filtering		•		•		
		Rating			•	•		

Figure 13 Tools and practices used by the participants to identify and create knowledge

5.4 Knowledge Storage and Retention

			Participants					
			1	2	3	4	5	6
Knowledge Storage / Retention	**Tools**	Content Management Systems		•	•		•	•
		Cloud Computing	•	•	•	•	•	•
		E-mail	•	•	•	•	•	
		Product Data Management Systems		•	•		•	•
		Product Lifecycle Management Systems		•			•	
		Databases Data Management Systems		•	•		•	•
		Data Warehouse	•	•	•	•	•	•
		Document Management Systems	•	•	•	•	•	
	Pratices	Casual Mapping	•	•		•		
		Knowledge Mapping		•	•	•	•	•
		Knowledge Modelling						
		Problem Solving	•	•		•	•	•
		Process Mapping		•	•	•	•	
		After Action Review	•	•	•	•	•	•
		Best Practice	•	•	•		•	
		Contextual Inquiry	•		•	•		
		Lesson Learned	•	•	•	•	•	•

Figure 14 Tools and practices used by participants to retain and store knowledge within the company
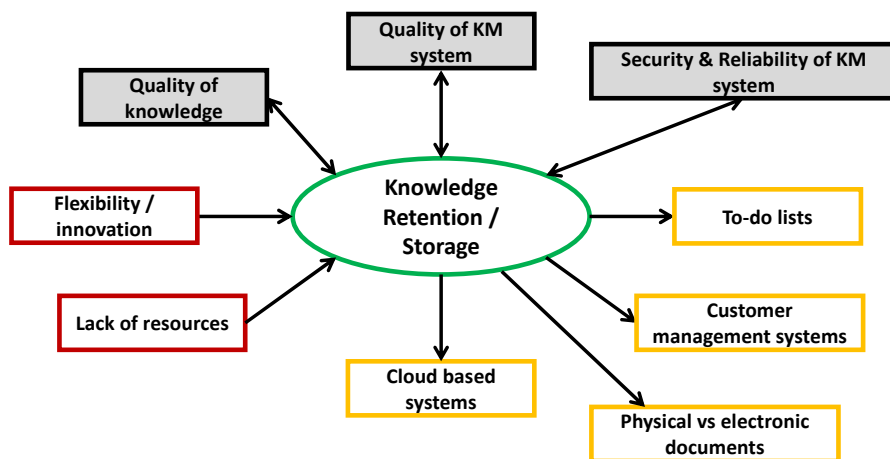
Figure 15 Map of knowledge storage findings

One of the characteristics of Irish SMEs confirmed during the interview process is a lack of resources and the ability of the participants to be flexible and innovative with the resources available to them. To that end each company represented indicated that they are all trying to use, where possible, free or cost effective applications for data management. Figure 12 summarises the various tools and practices that have been used by the participants to retain and store knowledge within the company. Most indicated that the advent of low cost cloud computing solutions have allowed for easier retention and storage of generated knowledge.

Participant four indicated that communication of nearly all their ideas and processes to each other is using free applications such as 'google docs' and that this system was not mandated by the company but that it was found to be the most beneficial method of collecting ideas in a central location for discussion:

> ….me and a colleague of mine who would work most closely together, so we have a shared google sheet thing where we tracked everything, so that kind of means that if one of us is gone, they just need to open up the sheet and see what's been going on in terms of ideas or projects….(P4)

Participant five mentioned the importance of using the most basic methods to try to capture knowledge for retention and indicated the benefits of a simple "to do" list in a note pad. They suggested that even if all employees did this simple process, it would help retain and store knowledge as any of the important information could then be processed further and input into the company's content management system. They indicated as did participant six that sometimes the desire to capture and retain all knowledge can result in an overload and the generation of additional work that could have been easily avoided:

> ..using the cloud based systems means that nearly every note, idea or comment I jot down is recorded somewhere and sometimes I look at all this information and I'm not sure why I'm keeping half of it, but it doesn't take up much space but sometimes it gives me a feeling of information overload..(P6)

Three of the participants indicated that their companies' had databases or customer management systems that were specifically used to store company data and were fundamental to the operation of the business. A routine concern that was common to all the companies is that some knowledge was not getting captured and that despite the efforts at having a dedicated knowledge management system the information is still only accessible if it is entered correctly and could be accessed in an efficient manner:

> …..we wanted that information to be more accessible to everybody. So any employee could walk in and do an invoice or process an order, it hasn't quite worked out that way. … this management software, brilliant way of the future thing, you know, there's obviously going to be hiccups. There's going to be a process of finding our feet with it, … but I think we're in a better place certainly from the paper and you know from the electronic one where we're looking in all different places and nothing's joined up where

we are better there. There's still problems. Maybe they'll always be problems. (P2)

Participant two outlined that the shortcomings of their 20 year old paper-based system and the subsequent electronic system were found to be that while the data was retained it was not possible to easily access it for future use. This data or knowledge therefore sat in the electronic files or in the paper-based system in a manner that had no immediate use and future strategic benefit to the organisation and did not help with competitive advantage or business growth. This was acknowledged as a shortcoming of the knowledge storage system.

Participant three by contrast outlined a system that had been in use in their organisation in a similar period that involves the correct archiving of all knowledge for previous clients and projects undertaken and the managing director devised a categorisation system that allowed employees in the organisation search for information and use it for the benefit of the company. They indicated that one major shortcoming of the document archive was that it was all physical paper-based knowledge so that if something was to happen the physical archive 30 years of knowledge would be lost and they posited that it would be a relatively straightforward process to digitise the archive and make it useful in a modern sense:

......everything's on paper. Okay. Now to me, because I've worked in digitisation, I find that as a liability because, you know, it could, if it's gone, it's gone. There is also um, knowledge in people's heads, which is something I'm also against because I believe in processes, so we've got some assets and at the same time there's some compromises with those as well.

The liability of losing data that is not stored properly or where backups were not thought of was echoed by the sixth participant whose cloud-based solution, failed

one evening and started to be over written because a new PC was added to the network.

5.5 Knowledge Sharing and Transfer

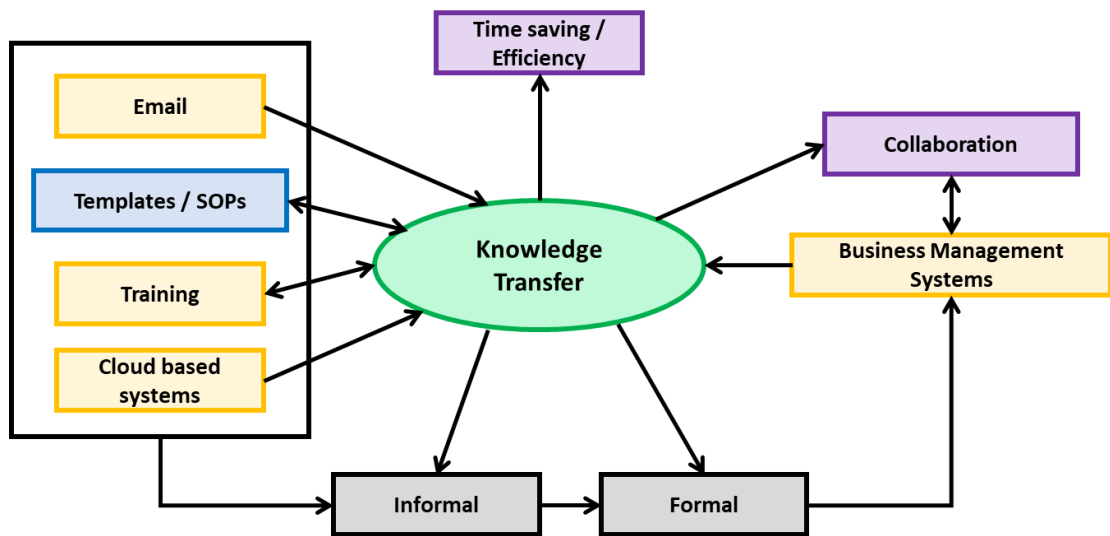|			Participants					
			1	2	3	4	5	6
Knowledge Transfer / Utilization	Tools	Audio conference/Video conference		•	•	•	•	
		Chat	•	•	•	•	•	•
		Conversational Technologies		•		•		•
		E-mail	•	•	•	•	•	
		Cloud Computing	•		•	•	•	
		Learning Management Systems		•	•			
		Peer-to-Peer Resource Sharing	•	•	•	•	•	•
		Podcasting/Videocasting			•	•		•
		Social Media						
		Wiki		•	•	•		•
	Pratices	Case Based Reasoning		•		•		
		Coaching/Mentoring	•	•	•	•	•	
		Communities of Practice/Sharing	•		•	•	•	•
		Focus Groups				•		
		Job Rotation	•	•	•		•	•
		Learning by doing	•	•	•	•	•	•
		Project Teams Training		•	•	•		•
		Work Groups		•		•	•	
		Facilitated Discussion	•	•		•	•	•
		Meeting/Task Force	•	•	•	•		
		Informal Networks	•	•	•	•	•	
		Seminars		•				

Figure 17 Map of knowledge transfer findings

Knowledge management systems whether formal or informal were seen by the participants as something that improved the efficiency of the company when it came to transferring the knowledge among employees. This was true whether it was simple checklists for employees carrying out jobs or tasks, collaborative shared documents and cloud templates that allowed for immediate audit and transfer of knowledge or more comprehensive business systems that integrated all parts of the business.

The first interview participant explained a system of knowledge sharing or transfer which involved the production of templates for key aspects of work that needed to be carried out on a daily basis. These templates were devised by looking at the knowledge that had been retained about various aspects of the business and distilled into checklists for various parts of the work and the completion of these checklists were fundamental to the role of some of the employees. This meant that some knowledge could be easily passed to new employees with minimal training resulting in efficiencies for the business. The interview subject spoke of the development of these checklists coming from a place of frustration in the business,

as they believed that some aspects of the work that was carried out was fundamental and easily understood but this turned out not to be the case and it made more sense for the business owner to try and share knowledge and cut down on the workload of the employees:

I always think that things are common sense, but they're only common sense to me, um, and um, something like the training you think, well if I tell somebody something they're going to pick it up, but over time you realise that people don't pick it up, or they don't pick it up as quick or they pick it up in a different way. So doing out the template and having that process or procedure there, people have a clear, or should have a clear understanding after reading that, after being told, …(P1)

Most of the participants used either detailed business management systems or cloud based systems which could take the knowledge from the creation stage, through to storage, transfer and ultimately utilization. They all mentioned cloud based data management systems such as MS SharePoint, office 365 or google drives. While these systems seem to be less fully integrated with all aspects of the business, they allowed for collaboration on documents and sharing of knowledge among the employees. As the fourth interview subject pointed out they relied heavily on Google sheets to map out project plans. They also assigned specific workloads amongst the team and this google document was freely available to all members of the team. Any changes or edits made to the documents were easily audited so at any given time a team member knew what knowledge they had access to and what knowledge had recently been shared.

Two participants spoke of similar business management systems used in their organisations to take projects from inception to completion and this knowledge is also shareable and transferable within the organisation or between engineers as required.

This fourth subject also highlighted concerns they had in relation to the overuse of emails as a knowledge management; or knowledge transfer tool within a team because they believed over time mailboxes get filled with information that is useful but because users don't tend to structure subject lines content gets lost amongst other non-relevant knowledge.

…when we do share with the customers that's a little bit more like, okay, the ones we share with email is almost a disaster because it's all in emails and then you're trying to find, did I send them that and you go and search to I send them back. Whereas those who have a proper system that's similar to drop box or Gdocs for example, they've got nice folders in and dates (P4)

This again underscores the need for more formalized systems where the knowledge stored is easily accessible and transferred.
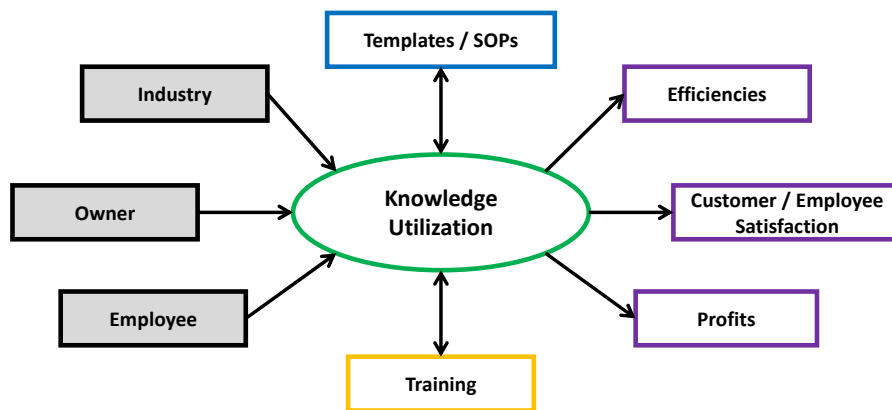
5.6 Knowledge Utilization

Figure 18 Map of knowledge utilization findings

With participants that are owners or senior managers in a business the desire to utilise the created knowledge in the organisation is more evident. These managers

are keen to make sure that the any knowledge generated can be used in a practical manner to grow the business or provide efficiencies.

> *….(knowledge) could be structured more……there definitely are recurring questions in the business so rather than having to ask for information each time it's required it could be stored and shared from a central location…(P5)*

Most participants emphasized the utilization of available knowledge to improve the efficiency of the business and day to day operations. Participants one and five talked about how created knowledge in the organisation is used to develop templates, checklists, and "how to" guides for their companies. The translation of created knowledge into these processes means that the knowledge can be used to help train staff or help existing staff make sure the work is completed in a systematic manner that benefits the organisation. Apart from the generation of operating procedures, the use of digital business management systems such as those used by participant two, functions as a form of audit between the company operations, engineers and customers, as the jobs, work completion and billing can be verified within the system.

Participants also highlighted the advantages of centralized systems and indicated that staff use the acquired knowledge on past projects available in their databases or archives to generate efficiencies in current projects. This means that the business can be more efficient in dealing with client needs, and also empowers the staff because they have a ready supply of information that can be used without constantly referring to their supervisors. This in turn generated a competitive advantage for the organizations by helping reduce costs.

The second participant suggested that since their business management system now makes the information available electronically it can be used to generate future revenues for the company. In another area of overlap between the two participants using bespoke content management systems utilized knowledge to track what specific skills or training employees or co-workers had. This knowledge

allowed them to utilise the best person for each task or in the case of the life safety systems industry which engineers would be best positioned to train other staff in the completion of complex tasks.

Beyond the companies themselves, the knowledge databases generated seems to be of use to the industry as a whole. On the one hand there is the generation of databases that can be shared across the industry allowing the Irish SMEs in that industry to be competitive on a global scale as indicated by participant six.

> *…..and we are now seeing enquires from all over Europe, in the wake of Brexit we are finding that companies that had normally conducted business in the UK are looking for the security of working with eurozone companies and the database we have is allowing us to compete…(P6)*

The documentation of the specific skills of employees also helps develop communities of practice in the industry. Participant two felt that in their industry of life safety systems, in the wake of recent high profile fires in London and poor construction practices in Ireland that the development of these communities would become more important as skills are pooled and a wider knowledge base can be accessed.

> *…the retention and sharing of knowledge and expertise in our industry is essential to help in putting an end to poor building practices that have led to the controversy in the likes of Longboat Quay and the Priory hall apartments and the disaster at the Glenfield apartments in London… (P2)*

5.7 Perceptions of Knowledge Management

		Participants					
		1	2	3	4	5	6
Business Outcomes	Growth	•	•	•	•	•	•
	Customber statisfaction	•	•	•		•	
	Staff Retention	•	•			•	
	Effiencies	•	•	•	•	•	•
	Profit	•				•	•
	Competitive Advantage	•	•			•	•
	Strategic Planning	•	•		•	•	•
	Time Management	•	•	•	•	•	•

Figure 19 Perceived business outcomes of using knowledge management

The study respondents were asked at the start of the interview to offer what they understood by knowledge management. All respondents seemed to have a similar understanding of knowledge management and this was tied to the findings of the literature review. Because all subjects were invited to read a brief of what the authors research entailed they had been somewhat primed as to the general subject matter of the questions and it was found that one respondent offered an almost academic definition of the phenomenon of knowledge management:

> …it is the process of capturing, distributing, and effectively using knowledge for the benefit of the business.(P5)

In the course of the interview all the subjects were able to describe the processes that are used to create, store, transfer and utilise knowledge in their organisations. This suggests that they are all aware of knowledge management within the company. The language used to discuss knowledge management changed and words like 'information', 'knowledge' and 'data' were used interchangeably by the participants. Each time an effort was made to get clarity as to their understanding and it was clear that in each case that all companies had some semblance of KM processes but did not always view these as knowledge management as it is

understood by this study. The owners of the businesses seemed to have a clearer understanding of knowledge management as they could easily equate it to business growth, efficiency and profits.

Participants two, three and five are all working in organisations that have invested in systems that are used to formally collect knowledge in the company and have seen a transition from more haphazard approaches to KM to formalised systems. Two are using software systems that have been specifically designed for this process and the third has an actual physical library. This indicates that the organisations have identified the importance of trying to retain knowledge in the company. Two of the participants mentioned how managers within the organisation have a means of auditing the retention of useful information so we can conclude that at the owner or management level the knowledge in the company is seen as an asset.

As an owner of the company participant one perceived knowledge management as important as they have a vested interest in their own small business which may not be as true for the employees.

> *And of course the other thing is, as somebody said to me a number of years back, the other person who is the employee doesn't think about your business 24 hours a day like you do. So once they get out of here at 5 o'clock, they switch off and do their own thing and they've their own life. So that expectation can't be always there for, you know, it's just the reality. (P1)*

They saw KM as adding value to the business and each time they make an effort to put a process in place based on the knowledge that they have acquired working in industry it saves time and effort which frees them up to consider other aspects of the company.

Participant two reiterated the advantages they see with the adoption of knowledge management policies. They drew a comparison to the period in the company's history when there was not a strong ethos of knowledge management. They suggested that before they were at least trying to systematically capture knowledge in the organisation it was a stressful environment to work in and that the frustration of engineers, clients and customers not getting answers to questions was often directed at administration staff because the perception was that all data was being sent centrally back to the office. At the same time the participant also pointed out the need for proper implementation and use of such system to be effective and subjects that worked in large multinationals or NGO's mentioned how in bigger organisations the process was easier at times because it was more prescribed from the top down.

> *…So we started looking at management programs. That was a double edged thing because it's a very new thing in the world and we have to try and work it out from scratch for a small business which may be like this huge multinational corporations. (P2)*

With formal structures in place the absence of correct information on the system is seen as a failure on the part of the system users as a whole instead of one individual as all staff now have a role in data gathering.

5.8   Reflective Journals Findings

As a means of gaining deeper insight into the knowledge management practices and processes of the interview participants they were all invited to keep a reflective journal to document their perceptions of their own knowledge management process and to indicate when KM tools or processes were used or would be have been useful. As outlined in the methodology section the purpose of the reflective journal was to see if what the interviewees discussed as part of the interview was the same as their processes or actions as they go about their daily work. Of the six

subjects invited to keep journals three participants submitted journals for contemplation. The participants indicated as part of their reflective journals, that in the wake of the interview with the researcher, that they were far more aware of the knowledge management process in their organisations and felt that this may have had an impact on the reflective journals. This was not the researcher's goal in requesting the journals be kept but it has led to the suggestion that some action research would be suitable in this field.

Participants one and four, in correlation with the findings of the interview chose to use a cloud-based application as a means of keeping the reflective journal. One used Microsoft One Note and the other the Google Docs application and they shared these online with the researcher. Participant two found it easier to jot their thoughts down in a physical notepad and sent a summary of these by email and again this preferred work flow was in correlation with the discussion in the interview.

The journals themselves were basically an occasional logging of times and dates where they feel they have used a knowledge management process or practice in their work. They all commented that keeping the reflective journal made them more mindful of trying to generate knowledge in the business and to that end some of the items that ended up as part of their reflective journal then became more formalized in their organisations.

Over the course of the journal keeping they posited numerous times on areas of the business, that they feel routine processes could have been put in place or previously should have been in place. All respondents indicated that taking a more hands on approach to knowledge creation, storage and sharing would decrease their daily workload and make it possible to generate more ideas.

After four days of keeping the reflective journal participant one contacted the researcher to voice their concerns that the reflective journal was not really indicating times when they could or could not have used a knowledge management

process to improve their work but instead suggested that the experience of keeping the reflective journal was making them focus on the processes within the business, this was a sentiment shared by the other participants to the extent that no one kept the journal for the full duration of the experiment.

One participant mentioned several times that they felt knowledge was missing from the company system and it fell to them to input this data that would later be used by all employees. They noted that some of the information that was missing is data that should have been inputted by other members of staff and they were curious why this has not happened and speculated that this was one of the major failings of the system in which the company had invested. The information held within their management software is only as useful as the data that is provided by the employees of the company.

5.9   Summary of Findings

In the course of analysing the participants' interviews, artefacts and reflective journals, it was possible to gain some insights into the perception and application of knowledge management in Irish SMEs. The participants identified incidents in their organisations of knowledge creation, storage and utilisation and from this it was possible to identify the KM tools and practices adopted by the Irish SME sector. These tools and practices are a mixture of inexpensive cloud-based technologies and bespoke KM systems. Furthermore it was found that most of the knowledge created in the SMEs is tacit and they struggle to codify this and make it explicit and usable. The flat structure of the SMEs does aid in the transfer of knowledge as it facilitates more direct communication, while a lack of resources and identification of the knowledge within the business are found to be barriers to implementation of KM processes. The research indicates that KM in an organisation is mainly driven by the owner or senior manager and they see the benefits of having KM systems in place. The next section further discusses main findings in this research work in

relation to their relevance within the existing research as well as what implications this has to the practice of KM in SMEs.

Chapter 6   Discussion

This chapter sets out to bring together the findings of the research undertaken and how that relates to the relevant research outlined in the literature review. The objective of this study was to investigate the knowledge management practices of the Irish SME sector and to try and establish a link to the performance of the companies. In total six interviews were conducted. The views of the participants and the actions of the companies they work in aligned with the details revealed in the literature review and offered insights and perspectives that were novel and have given rise to items that are worth additional research from an Irish SME perspective.

It was interesting to note that the six participants all owned or worked in SMEs and that as part of the interview process they were asked to indicate how many people were directly employed by the companies that they are engaged with, the companies represented by this sample directly employ 52 people and in many cases these companies support spinoffs into other industries and engage sub-contractors generating more value add to the Irish economy. From this perspective it is easy to see why Muller *et al.,* (2017) highlights the importance of the SME from a European economic perspective.

6.1   Need for a Champion for the Adoption of Knowledge Management in SMEs

From this study we see that Irish SMEs are aware of the importance of creating or capturing knowledge within the organisations. It is the owner or the managing director of the organisation that sets the tone for the knowledge management practices in the business. They see the importance of knowledge management to their company and tend to be the force that establishes or at least tries to establish

formal and semi-formal knowledge management processes and practices. The owners or senior management are also more aware of the strategic direction of the company and how the company's knowledge can be used to drive towards this. It is seen that employees within an organisation are also aware of the importance of knowledge management and most tend to think that the role of knowledge management or knowledge creation in an organisation falls to all employees. They are also aware that when knowledge management systems are used their personal work flow becomes easier as the acquisition of knowledge seems to help define roles within the small business. This is seen as important and one of the characteristics confirmed by the study is the relatively flat structure of Irish SMEs and that there needs to be a level of flexibility in the businesses. This means sometimes individual roles are hard to define and can lead to confusion as to whose job it is to capture, store and transfer knowledge so it can be utilised for the benefit of the organisation.

It is essential then that within the SME that there is a champion if the establishment of a formal knowledge management process is required. With even a single person within an organisation taking on the role of explaining the importance of knowledge creation, particularly in small businesses, everyone in the company gets more involved in the knowledge management process. Zieba, Bolisani and Scarso (2016) highlight the importance of the senior executives' role in knowledge management in the company and go so far as to suggest that this role is so important that it should become an aspect of the education of these people so that they are aware of the importance of knowledge management in small businesses.

Wong and Aspinwall (2005) agree that the role of the employee is essential for knowledge creation but it could be suggested that they are only doing this at the behest of the owners of the organisation. Knowledge is held at the owner level within a business and it is not essential to formalize KM processes as owners can easily share their knowledge when required therefore companies do not need a knowledge management champion. It also could be argued that considering the

findings of Wee and Chua (2013) there is an over dependence on the owner to drive knowledge management in an organisation and this can leave the company vulnerable if the owner decides to sell the business or retire as the tacit knowledge held is rarely processed to be seen as an asset. Given the importance of SMEs to the Irish economy it would be better to try to keep these companies going into the future regardless of the owner.

6.2 Aids and Barriers to Knowledge Management Adoption in SMEs

It is apparent from this study that companies are struggling to convert tacit knowledge to explicit knowledge. This difficulty is highlighted in the literature and has been well researched (Nakano, Muniz and Dias Batista, 2013; Venkitachalam and Busch, 2012; Bloodgood and Chilton, 2012; Nonaka and von Krogh, 2009; Lee and Cheung, 2009; Eraut, 2000; Al-Mutawah). In SMEs the flat nature of the organisational structure and ease of social interaction of the staff means that knowledge remains tacit because it is passed, as required, from one member of staff to another. In smaller businesses the lack of resources or an inability to identify the strategic benefit of trying to codify their information means that the knowledge remains tacit and does not become part of the formal knowledge of the organisation. The people transferring the knowledge to each other have access to the information they need at the time of the transaction and in smaller businesses retaining this information as part of the formal process for the future benefit of somebody who may not have been party to the transaction is not immediately obvious. O'Connor and Kelly (2017) reiterate that limited resources and a lack of KM strategy remain barriers for SMEs and this is echoed in the study.

The knowledge management process in SMEs is aided by the work environment. It is assisted by a sense of trust between the staff who feel that everybody in an organisation benefits when knowledge is available. Generally, in larger

organisations which have a more hierarchical structure guidance passed down through the chain of command tends to be adopted because of how it is mandated to the staff. This is not seen in the flat structure of SMEs; however this flat structure is actually one of the advantages of the smaller business as it allows for flexibility within the organisation. It allows the employees to directly communicate their ideas on how the knowledge management is being carried out in the company. The flat structure of Irish SMEs also enables direct communication between all levels so that when a need for a formal knowledge management system is identified it is easier to adopt.

Nonaka and von Krogh (2009) discuss how social interactions are vital for the process of converting tacit to explicit knowledge and without these interactions knowledge cannot be shared highlighting the benefit of the openness of the flat structure in SMEs. One of the barriers to knowledge management adoption is according to Alawneh, Abuali and Almarabeh (2009) that companies are not aware of what knowledge is already present waiting to be exploited in the organisation. This is one of the barriers identified in this this research work. Many SMEs, despite being aware of the benefit of adopting a knowledge management strategy, are at a loss as to what is a good starting point to implement one.

6.3 Availability of Inexpensive easy to use Technology Promotes the Adoption of Knowledge Management Systems in SMEs

The study has found that the use of technology, be it a simple method of transferring post-it notes from one monitor to another, or a fully integrated business management system technology is aiding the knowledge management processes in Irish SMEs.

The lack of resources available to small businesses has seen them be inventive in the use of free or low-cost applications such as Google documents Microsoft SharePoint and other cloud-based products. SMEs are utilising these products to create, store, transfer and ultimately use knowledge that they have managed to convert from tacit to explicit in the organisation (Orenga-Roglá and Chalmeta, 2017; Dotsika and Patrick, 2013). The reduction in cost of these products, their ease of use and almost universal availability is seeing a rise in formal or semi-formal knowledge management systems in smaller organisations. Larger organisations have got a head start in constructing knowledge management systems and Sultan (2013) suggests these were once seen solely as the preserve of well-endowed large organisations in the form of IT infrastructure, and data management systems. The costs of owning and operating these, is however for the most part outside of the practical cost constraints of small businesses. Many cloud based applications do work along the same principles and allow for data storage on a cloud-based system that is then accessible to all people in the organisation on devices such as smart phones as well as desk-based PCs. Rai, Sahoo and Mehfuz (2015) and Sultan (2011) argue that companies like Microsoft, Adobe and Rackspace have seen this as a viable market and are developing guides to enable small business to implement cloud solutions at low costs. This knowledge transfer mechanism is inexpensive and is likely to see a growth in knowledge sharing in small businesses, as well as making it possible for staff to codify tacit knowledge it is easier to share and utilize. These cloud solutions tend to have a better support service than bespoke systems as they are interested in capturing a much wider community beyond the SMEs. The embracing technology by SMEs is allowing them to benefit from knowledge already held within their organisation and ultimately this retention of knowledge is giving a competitive advantage. In some cases, this even allows SMEs to compete with multinational corporations that have been using knowledge management infrastructure for decades.

As reflected in the literature, with the increased availability of these cloud-based applications it is likely that they will contribute to an increase in formal knowledge

management systems in small organisations(Sultan, 2013). Fink and Ploder (2009) believe that the availability of technology is not enough to establish knowledge management systems but that these technologies need to integrate easily with people and processes to become fully actualized. We see in this work, that the use of technology in Irish SMEs is being driven by individuals so there would be an element of self-selection of the technology that best suits the needs of the organisation. The self-selection of technology also means that unnecessary complexity and functionality is not introduced into the knowledge management systems and allows for easier adoption, this is a view that is shared by Tapissier, Mantelet and Aoussat, (2018) A lack of financial resources or technical know-how is no longer the barrier that Riege (2005) was concerned about and as indicated by Cerchione and Esposito (2017) inexpensive technology is generating knowledge management opportunities for SMEs.

6.4   The Importance of Knowledge Management in SMEs

A theme that appears repeatedly in the literature review and is echoed in the findings of this study in relation to Irish SMEs is that people are aware of how important knowledge management is to an organisation. SMEs are by nature very knowledge driven, their profits are driven less by mass production abilities and more by their unique ideas and services or customer and supplier databases (Dotsika and Patrick, 2013) Large companies for instance have an enormous amount of research around organisational learning (Argote and Fahrenkopf, 2016; Khadir-Poggi and Keating, 2015; Rašula, Vukšić and Štemberger, 2012; Oluikpe, 2012; Argote, 2011; McAdam and Reid, 2001) the transition of tacit knowledge to explicit knowledge for use within the organisation, similar research in SMEs is lacking but the benefit of such systems is apparent whether the organisation is a small company with 10 employees or large multinational with tens of thousands of employees.

A naïve expectation would be that the knowledge held by one employee in an SME is a very valuable resource and the loss of one member of staff to a competitor, if they have not transferred their knowledge to be retained within the organisation is a major loss of tacit knowledge to the SME. In the case of a larger organization the consequence of knowledge loss after the loss of one member of staff in the organisation is comparatively small yet the multinational corporation makes more of an effort to retain the knowledge of all employees within the organisation with formal knowledge management systems. There is evidence from the study conducted that the companies involved see KM as something that adds value to the organisation with increased profits and better efficiencies and staff retention. The lower the value the company has the greater that this increase in value will appear. This is why KM is so important to smaller companies as the relative return on the investment can be greater than in larger businesses.

Durst and Gueldenberg (2010) believes that to make SMEs attractive to outsiders there must be a means of preventing knowledge attrition and Wee and Chua (2013) go further and suggest that knowledge management is essential to help companies survive, grow and be competitive. This view is supported in the Irish context by the suggestion that the adoption of formal KM systems is actually helping Irish companies to grow. Wang and Wang (2012) hold the view that there is a correlation to financial growth in companies that adopt KM systems but Alegre, Sengupta and Lapiedra (2013) indicate that it is not merely the use of formal KM systems that drive this growth there also needs to be a desire to use the acquired knowledge in an imaginative manner, in the Irish context this is seen where companies have encouraged the use of individual KM systems. This individual use of KM systems is empowering staff and making them more committed to the individual organisations as they are taking ownership of the process (Argote, 2011) and Dayan, Heisig and Matos (2017) suggest that this is helping to drive strategic planning in organisations and creating advantages in general for the business.

6.5 Implications for Practice

This study and the research outlined in the literature review indicate that the owner or managing director of the SME bears most of the burden for driving the knowledge management process within a small business. There could be a concern that if this is falling to a single individual the value of having formal knowledge management systems in place is not shared by all people within an organisation. One of the practical implications of this research would suggest the importance of the owners of businesses making sure that the culture of knowledge creation and retention remains throughout the organisation as this asset is of great value to the company. Should the owner or senior manager of the organisation be the only person driving KM practices there would be issues in relation to succession planning for the company should that person pass away or decide to try and sell the business. If it is one person driving the KM process and they move on this represents a significant loss to the company. From the practical point of view if the knowledge management champion is no longer part of the organisation it could cause the closure of the company.

The prevalence of tacit knowledge in SMEs that is shared through conversations, open work environments and sociability means that verbal knowledge transfer tends to be the mainstay of many of these organisations. The practical implications of this is that while knowledge is shared it remains tacit and not codified so that it can be stored, transferred and utilised. One of the implications of this research is to suggest that the tacit transferring of knowledge somehow be documented to allow the conversion of that knowledge to explicit knowledge. This could be achieved through documenting conversations, the development of internal wikis, formal meetings with the exchange of ideas, or developing small-scale communities of practice within the organisation so that they are no longer relying on knowledge retained by one or a small number of individuals.

The literature indicates that where small businesses are not adopting knowledge management technology it is due to the costs associated with these products. This suggests something of a lag in the extant literature as the prevalence now of cloud-based infrastructure and technology is making these products inexpensive and accessible for SMEs of any size. The implication of the availability of these powerful tools and cloud-based products means that with only a small amount of training or the ability to watch YouTube videos most staff in SMEs could adopt technology that could be implemented in almost any organisation and aid with the knowledge management process. This study would suggest that the companies that are inventive in the use of inexpensive and available cloud-based applications and technology are seeing a greater return on investment than SMEs that are investing in bespoke knowledge management systems. The implication here is that the flexible nature of SMEs means that it is sensible to try and make available products fit around the processes and procedures that are already in place rather than starting from scratch with a whole new system.

6.6   Implications for Research

It is apparent from the study undertaken that there is a rise in the use of cloud-based technology and SaaS. The development and prevalence of web-based technologies is out pacing research into the field of Knowledge management leaving new research gaps in this area. The flexibility of SMEs sees them adopting this technology to develop their own KM systems. The speed in development of these technologies means that there is very little literature that addresses the use of emerging technologies such as cloud computing by SMEs. It is therefore suggested that research is needed in this specific area. One of the research gaps identified in the literature review is that KM research findings from larger organisations were commonly applied to SMEs and this was not a good fit due to the unique characteristics of SMEs. Chiefly the lack of resources held by SMEs was

seen as a barrier to the adoption of KM systems. With the emergence of Web 2.0, this assumption may not hold true and past research could be revisited.

6.7 Limitations of the Study

The hope when adopting a phenomenological approach to a qualitative study is that there will be a possibility to draw generalisations from the study when it is complete. While there is merit to the study that was conducted here it does suffer from several limitations that means generalisations cannot be formed from its findings. The qualitative paradigm using a phenomenological approach required the researcher to conduct long interviews to try and uncover themes and ideas amongst the thoughts and opinions of the subjects. One of the main limitations was the short timeframe available for the collection and interpretation of raw data.

The sample population was any participant that owned or worked in an Irish SME and due to time constraints, the researcher interviewed any participant fulfilling the sample characteristics that volunteered. It could be argued that the sample population was potentially too broad and that more insight could have been gained by identifying an industry in the SME sector and this would have allowed for generalisations in relation to a particular sector to be drawn from the research.

This study occupied itself with Irish SMEs only but based on some of the findings in the literature review, there are indications that cultural and societal differences affect how SMEs operate in other parts of the world. In this study KM in SMEs were studied in the Irish context in isolation, and specific cultural factors were not considered. This limits the possible extension of the studies' findings to a global scale and some cross-country comparisons might have been beneficial.

The study also relies on the participants' perceptions and memories during the interview. This can lead to some bias based on recent events and inaccuracies in

recollection. This was mitigated somewhat by the viewing artefacts and the use of reflective journals to reinforce the interviews.

While every effort was taken to 'bracket' the personal views and opinions of the researcher they do own and operate an SME and one of the limitations of qualitative studies is that the biased opinion and judgment of what is seen as important information can be included in the research but alternatively the insight that is provided by understanding how SMEs operate means that more beneficial information might have been elucidated.

Chapter 7   Conclusions

The aim of the research project was to investigate the knowledge management practices of the Irish SME sector from the perspective of their perception and practices to see if there is a link to the performance of the companies. The extant literature (Cerchione and Esposito, 2017; Centobelli, Cerchione and Esposito, 2017; Cerchione, Esposito and Spadaro, 2016; Lawless, McCann and McIndoe Calder, 2012; Wang, Walker and Redmond, 2007; Handzic, 2006; Wong and Aspinwall, 2005; Salojärvi *et al.*, 2005) in relation to SMEs suggested that KM is being underutilized in Irish companies. Specifically, the research asked; What are the main knowledge management tools and practices adopted by the Irish small and medium sized enterprises and what is the impact these processes have on the performance of the companies. To investigate this question an epistemological approach with an interpretivist ideology was adopted and qualitative paradigm using a phenomenological approach was used to conduct and codify profound interviews, collect artefacts and reflective journals. The semi structured interviews, journals and artefacts along with the extensive literature review have contributed to the conclusions drawn in this chapter and each of the subordinate questions is concluded in turn.

It is clear from the study conducted that Irish SMEs are starting to embrace easily accessible, free or low-cost web-based tools to aid with knowledge management. The rise in popularity of systems such as Google Docs, Sheets and Drive along with systems such as Dropbox and Microsoft OneDrive are allowing Irish SMEs to put systems in place that help to create, store, transfer and utilize knowledge in a manner that was formerly just the preserve of larger organisations. It is not clear from the literature that the benefit of these emerging technologies has been investigated yet perhaps because the technology is relatively new and the area of knowledge management in SMEs is comparatively under-researched (Kramer *et al.*, 2017; Phaphoom *et al.*, 2015; Dotsika and Patrick, 2013; Riege, 2005)

There is no one particular application or software suite that is being universally adopted by SMEs and at this stage they seem to be using products that fit best with the organisations goals and developing their own means of capturing and using knowledge.

In terms of KM practices this is for the most part being driven by the business owner or other senior stakeholders. They are formalising systems in their companies and encouraging staff to formally document tacit knowledge and codify it so that it becomes explicit knowledge that can be shared in the organisation. In SMEs it is primarily the retention of tacit knowledge and this is causing SMEs to document aspects of the business that might be utilized in the future.

In this study there are several companies that have been trading for over 20 years and as the technology has progressed the organisations have moved from primarily paper-based documentation to digital or electronic means of recording knowledge and information in the company. When the owners review the informal systems that are in place and see the emerging benefits of trying to adopt formal knowledge management systems they push for this within their companies. The older companies tend to be the ones that try and use bespoke content management systems to create, classify, store transfer and utilise the decades of knowledge held within the organisation. It is these older companies that are more aware of the asset that knowledge held within the organisation can become. It is suspected that as the companies go from start-up to maturity that the knowledge held is seen as more valuable. The age of the company and the awareness of the owners of the KM assets suggest that these people are more likely to purchase relativity expensive business management systems as these systems are viewed as an asset to the business. These systems are used to try to mimic the existing paper-based processes but formalise them in a digital ecosystem. There could also be an element of owners of these more mature companies looking at their own exit strategies from the organisation through the sale of the company. If the owner is the key driver of KM in the organisation and they want to retire or sell the business

the knowledge that they hold is not an asset unless it can be transferred along with the business. It is clear that the maturity of the company and the owners' awareness for the need to implement some form of succession planning is also a driving factor for the adoption of knowledge management systems. By contrast the companies that are newer are finding it easier to use inexpensive or free software and applications to manage the systems they have in place also indicates a leaning towards the formalization of knowledge management systems. Part of this might relate to the age profile of the owners and a familiarity with technology and a willingness to try to bend what is available to their needs rather that invest tens of thousands of euro in bespoke systems.

The over-dependence on the senior stakeholders in an organisation to drive knowledge management in the company is a barrier to its adoption and it is difficult to see how this can be changed (Wee and Chua, 2013). In relation to SMEs it is primarily the owners that benefit most from the growth in the business, so it can be hard to instil in all employees the benefits of KM. With the rise of the use of SaaS and other products companies are almost accidently adopting informal knowledge management systems to a certain extent but these informal systems are not being fully utilized.

There is a clear need and benefit for Irish SMEs to put in place formal knowledge management systems, which benefit the business from a growth and continuity perspective. There is also a benefit to employees in the organisations as it helps to define roles and functions in organisations and can help deal with some of the frustrations caused by the lack of resources or general smallness of SMEs. The flexibility of these companies means that they can invest small sums of money and develop KM systems and processes that help secure growth and future development in the business.

7.1 Recommendations for Future Research

Based on the feedback received from the three participants that kept reflective journals during the research process there is an indication that some well-designed action research could be conducted to see the full benefit of the introduction of formal knowledge management systems. A case study company could be found that currently has limited or no KM systems in place and set a base line to allow for measurement of business growth. The staff could be educated in both the use and benefits of KM and formal creation, storage, transfer and utilization of knowledge. From this case study generalisations could be drawn as to the effectiveness of the introduction of knowledge management systems.

The rise in the prevalence of inexpensive or free to use software and applications developed by companies like Adobe, Microsoft and Google seems to be making KM systems more accessible to small businesses, research into how these systems are being used could provide valuable insights and this could be conducted as a broader quantitative study into the KM habits of SMEs.

Due to the enormous contribution that SMEs make to the Irish economy it would be recommended that a programme of government-backed education initiatives or subsidies be investigated to see if they can encourage more SMEs to adopt formal knowledge management systems. A cost benefit analysis could be conducted to see if this would be a viable investment.

Reference

Al-Mutawah, K., Lee, V. and Cheung, Y. (2009) 'A new multi-agent system framework for tacit knowledge management in manufacturing supply chains'. *Journal of Intelligent Manufacturing*, 20(5): pp. 593–610.

Alase, A. (2017) 'The interpretative phenomenological analysis (IPA): a guide to a good qualitative research approach'. *International Journal of Education and Literacy Studies*, 5(2): pp. 2202–9478.

Alawneh, A., Abuali, A. and Almarabeh, T. (2009) 'The role of knowledge management in enhancing the competitiveness of small and medium-sized enterprises (SMEs)'. *Communications of the IBIMA*, 10(13): pp. 98–109.

Alegre, J., Sengupta, K. and Lapiedra, R. (2013) 'Knowledge management and innovation performance in a high-tech SMEs industry'. *International Small Business Journal*, 31(4): pp. 454–470.

Argote, L. (2011) 'Organizational learning research: past, present and future'. *Management Learning*, 4(42): pp. 439 –446.

Argote, L. and Fahrenkopf, E. (2016) 'Knowledge transfer in organizations: the roles of members, tasks, tools, and networks'. *Organizational Behavior and Human Decision Processes*, 136: pp. 146–159.

Argote, L. and Ingram, P. (2000) 'Knowledge transfer: a basis for competitive advantage in firms'. *Organizational Behavior and Human Decision Processes*, 82(1): pp. 150–169.

Argote, L. and Miron-Spektor, E. (2011) 'Organizational learning: from experience to knowledge'. *Organization Science*, 22(5): pp. 1123–1137.

Atieno, O. (2009) 'An analysis of the strengths and limitation of qualitative and quantitative research paradigms'. *Problems of Education in the 21st Century*, 13: pp. 13–18.

Beavan, M. (2014) 'A method of phenomenological interviewing'. *Qualitative Health Research*, 24(1): pp. 136–144.

Bloodgood, J. and Chilton, M. (2012) 'Performance implications of matching adaption and innovation cognitive style with explicit and tacit knowledge resources'. *Knowledge Management Research and Practice*, 10(2): pp. 106–117.

Bowen, G. (2008) 'Naturalistic inquiry and the saturation concept: a research note'. *Qualitative Research*, 8(1): pp. 137–152.

Bryman, A. and Bell, E. (2015) *Business research methods*. 4th ed. Oxford: Cengage Learning.

Cameron, S. and Price, D. (2009) *Business research methods : a practical approach*. 1st ed. London: Chartered Institute of Personnel and Development.

Carson, D., Gilmore, A., Perry, C. and Gronhaug, K. (2001) *Qualitative Marketing Research*. 1st ed. London: Sage Publications.

Centobelli, P., Cerchione, R. and Esposito, E. (2018) 'How to deal with knowledge management misalignment: a taxonomy based on a 3D fuzzy methodology'. *Journal of Knowledge Management*, 22(3): pp. 538–566.

Central Statistics Office (2014) *Business in Ireland* [Online] Available at: http://www.cso.ie/en/media/csoie/releasespublications/documents/multisectoral/2012/businessinireland2012.pdf [Accessed 28 October 2017].

Cerchione, R. and Esposito, E. (2017) 'Using knowledge management systems: A taxonomy of SME strategies'. *International Journal of Information Management*, 37(1): pp. 1551–1562.

Cerchione, R., Esposito, E. and Spadaro, M. (2016) 'A literature review on knowledge management in SMEs'. *Knowledge Management Research and Practice*. *Nature Publishing Group*, 14(2): pp. 169–177.

Chen, C., Hsiao, Y. and Chu, M. (2014) 'Transfer mechanisms and knowledge transfer: the cooperative competency perspective'. *Journal of Business Research*, 67(12): pp. 2531–2541.

Creswell, J. (2013) *Qualitative inquiry and research design : choosing among five approaches*. 3rd ed. Los Angeles: Sage Publications.

Crouch, M. and McKenzie, H. (2006) 'The logic of small samples in interview-based qualitative research'. *Social Science Information*, 45(4): pp. 483–499.

CSO Ireland (2017) *Business in Ireland - CSO - Central Statistics Office*, *Statistical Yearbook of Ireland 2017* [Online] Available at: https://www.cso.ie/en/releasesandpublications/ep/psyi/psyi2017/bus/businessinireland/#d.en.136470 [Accessed 4 August 2018].

Cyril Eze, U., Guan Gan Goh, G., Yih Goh, C. and Ling Tan, T. (2013) 'Perspectives of SMEs on knowledge sharing'. *Vine*, 43(2): pp. 210–236.

Dayan, R., Heisig, P. and Matos, F. (2017) 'Knowledge management as a factor for the formulation and implementation of organization strategy'. *Journal of Knowledge Management*, 21(2): pp. 308–329.

Call, D. (2005) 'Knowledge management – not rocket science', *Journal of Knowledge Management*, 9(2): pp. 19–30.

Dobson, P. (2002) 'The philosophy of critical realism - an opportunity for information systems research'. *Kluwer Academic Publishers*, 3(2): pp. 199-210.

Donate, M. J. and Guadamillas, F. (2011) 'Organizational factors to support knowledge management and innovation', *Journal of Knowledge Management* (ed.) Martín-de Castro, G. 15(6): pp. 890–914.

Dotsika, F. and Patrick, K. (2013) 'Collaborative KM for SMEs: A framework evaluation study'. *Information Technology and People*, 26(4): pp. 368–382.

Durst, S. and Gueldenberg, S. (2010) 'What makes SMEs attractive to external successors?'. *Emerald Group Publishing Limited*, 40(2): pp. 108–135.

Durst, S. and Runar Edvardsson, I. (2012) 'Knowledge management in SMEs: a literature review'. *Journal of Knowledge Management*, 16(6): pp. 879–903.

Elo, S. and Kyngäs, H. (2008) 'The qualitative content analysis process'. *Journal of Advanced Nursing*, 62(1): pp. 107–115.

Eraut, M. (2000) 'Non-formal learning and tacit knowledge in professional work'. *The British Journal of Educational Psychology*, 70: pp. 36-113.

European Union (2003) *Commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises* [Online] Available at: http://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:32003H0361&from=EN [Accessed 13 January 2018].

Fink, K. and Ploder, C. (2009) 'Balanced system for knowledge process management in SMEs'. *Journal of Enterprise Information Management*, 22(1/2): pp. 36–50.

Gearing, R. (2004) 'Bracketing in research: a typology'. *Qualitative Health Research*, 14(10): pp. 1429–1452.

Giorgi, A. (2012) 'The descriptive phenomenological psychological method'. *Journal of Phenomenological Psychology* , (43): pp. 3–12.

Heisig, P. (2009) 'Harmonisation of knowledge management – comparing 160 KM frameworks around the globe'. *Journal of Knowledge Management*, 13(4): pp. 4–31.

Hughes, T., O 'Regan, N. and Sims, M. (2009) 'The effectiveness of knowledge networks: an investigation of manufacturing SMEs'. *Education and Training*, 51(8/9): pp. 665–681.

Hutchinson, V. and Quintas, P. (2008) 'Do SMEs do knowledge management?: or simply manage what they know?', *International Small Business Journal*, 26(2): pp. 131–154.

ISME (2017) *About ISME* [Online] Available at: https://isme.ie/about/about-isme [Accessed 30 October 2017].

Jennex, M., Smolnik, S. and Croasdell, D. (2009) 'Towards a consensus knowledge management success definition'. *Vine*, 39(2): pp. 174–188.

Khadir-Poggi, Y. and Keating, M. (2015) 'Intellectual capital, knowledge management, knowledge economies and innovation: the case of small asset management firms in Ireland'. *International Journal of Knowledge and Learning*, 10(2): pp. 147–163.

Kim, T., Lee, J., Chun, J. and Benbasat, I. (2014) 'Understanding the effect of knowledge management strategies on knowledge management performance: a contingency perspective'. *Information & Management*, 51(4): pp. 398–416.

Kramer, F., Wirth, M., Jamous, N., Klingner, S., Becker, M., Friedrich, J. and Schneider, M. (2017) 'Computer-Supported Knowledge Management in SME-A Combined Qualitative Analysis', 2017 *50th Hawaii International Conference on System Sciences*. Waikoloa, Hawaii, 4-7 January 2017, pp. 4567–4576.

Lawless, M., McCann, F. and McIndoe Calder, T. (2012) 'SMEs in Ireland: stylised facts from the real economy and credit market.'*Central Bank of Ireland*, January issue.

Massa, S. and Testa, S. (2011) 'Knowledge domain and innovation behaviour'. *Vine*, 41(4): pp. 483–504.

Massaro, M., Handley, K., Bagnoli, C. and Dumay, J. (2016) 'Knowledge management in small and medium enterprises: a structured literature review'. *Journal of Knowledge Management*, 20(2): pp. 258–291.

Matlay, H. (2000) 'Organisational learning in small learning organisations: an empirical overview'. *Education and Training*, 42(4): pp. 202–211.

Mcadam, R. and Mccreedy, S. (1999) 'The Learning Organization: A critical review of knowledge management models'. *Journal of Knowledge Management*, 6(1): pp. 91–101.

McAdam, R. and Reid, R. (2001) 'SME and large organisation perceptions of knowledge management: comparisions and contrasts', *Journal of Knowledge Management*, 5(3), pp. 231–241.

Moustakas, C. E. (1994) *Phenomenological research methods*. Thousands Oaks, CA: Sage Publications.

Muller, P., Juluis, J., Herr, D., Koch, L., Peycheva, V. and McKiernan, S. (2017) *Annual Report on European SMEs 2016/2017: focus on self employment* [Online] Available at: https://publications.europa.eu/en/publication-detail/-/publication/0b7b64b6-ca80-11e7-8e69-01aa75ed71a1/language-en/format-PDF [Accessed 22 January 2018].

Nakano, D., Muniz, J. and Dias Batista, E. (2013) 'Engaging environments: tacit knowledge sharing on the shop floor'. *Journal of Knowledge Management*, 17(2): pp. 290–306.

Nonaka, I. (1994) 'A dynamic theory of organizational knowledge creation'. *Organization Science*, 5(1): pp. 14–37.

Nonaka, I. and von Krogh, G. (2009) 'Perspective—tacit knowledge and knowledge conversion: controversy and advancement in organizational knowledge creation theory'. *Organization Science*, 20(3): pp. 635–652.

National College of Ireland (2013) Ethical guidelines and procedures for research involving human participants. Unpublished Guidelines. Dublin: National College of Ireland.

O'Connor, C. and Kelly, S. (2017) 'Facilitating knowledge management through filtered big data: SME competitiveness in an agri-food sector'. *Journal of Knowledge Management*, 21(1), pp: 156–179.

OECD (2017) *Small, medium, strong. Trends in SME performance and business conditions*. [Online] Available at: http://www.oecd-ilibrary.org/industry-and-services/small-medium-strong-trends-in-sme-performance-and-business-conditions_9789264275683-en [Accessed 13 January 2018].

Oluikpe, P. (2012) 'Developing a corporate knowledge management strategy'. *Journal of Knowledge Management*, 16(6): pp. 862–878.

Orenga-Roglá, S. and Chalmeta, R. (2017) 'Methodology for the implementation of knowledge management systems 2.0'. *Business & Information Systems Engineering*, pp. 1–19.

Padilla-Díaz, M. (2015) 'Phenomenology in educational qualitative research: philosophy as science or philosophical science?'. *International Journal of Educational Excellence*, 1(2): pp. 101–110.

Pereira Heath, T. and Tynan, C. (2010) 'Crafting a research proposal'. *The Marketing Review*, 10(2): pp. 147–168.

Phipps, S. and Prieto, L. (2012) 'Knowledge is power? An inquiry into knowledge management, Its effects on individual creativity, and the moderating role of an entrepreneurial mindset'. *Academy of Strategic Management Journal*, 11(1): pp. 43–58.

Pietkiewicz, I. and Smith, J. (2014) 'A practical guide to using Interpretative Phenomenological Analysis in qualitative research psychology'. *Czasopismo Psychologiczne Psychological Journal*, 20(1): pp. 7–14.

Quinlan, C., Zikmund, W., Babin, B., Carr, J. and Griffin, M. (2015) *Business research methods*. 1st ed. Andover: South-Western Cengage Learning.

Rai, R., Sahoo, G. and Mehfuz, S. (2015) 'Exploring the factors influencing the cloud computing adoption: a systematic study on cloud migration'. *Springer International Publishing*, 4(1): pp. 197.

Rašula, J., Vukšić, V. and Štemberger, M. (2012) 'The impact of knowledge management on organisational performance'. *Economic and Business Review*, 14(2): pp. 147-168.

Riege, A. (2005) 'Three-dozen knowledge-sharing barriers managers must consider'. *Journal of Knowledge Management*, 9(3): pp. 18–35.

Sanders, P. (1982) 'Phenomenology: a new way of viewing organizational research'. *Academy of Management Review*, 7(3): pp. 353–360.

Saunders, M., Lewis, P. and Thornhill, A. (2015) *Research methods for business students*. 7th ed. New York: Pearson Education.

Scotland, J. (2012) 'Exploring the philosophical underpinnings of research: relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms'. *English Language Teaching*, 5(9): pp. 9-16.

Serenko, A. and Dumay, J. (2015) 'Journal of knowledge management citation classics published in knowledge management journals. Part I: articles and their characteristics'. *Journal of Knowledge Management*, 19(3): pp. 401–431.

Smith, J. and Osborn, M. (2009) 'Interpretative phenomenological analysis', in Smith, J., Flowers, P. and Larkin, M. (ed.) *Interpretative phenomenological analysis: theory, method and research*. Los Angeles: Sage, pp. 53–80.

Sultan, N. (2013) 'Knowledge management in the age of cloud computing and Web 2.0: experiencing the power of disruptive innovations'. *International Journal of Information Management*, 33(1): pp. 160–165.

Sultan, N. (2011) 'Reaching for the "cloud": How SMEs can manage'. *International Journal of Information Management*, 31(3): pp. 272-278.

Supyuenyong, V., Islam, N. and Kulkarni, U. (2009) 'Influence of SME characteristics on knowledge management processes: the case study of enterprise resource planning service providers'. *Journal of Enterprise Information Management*, 22(1-2): pp. 63-80.

Takeuchi, H. (2007) 'The new dynamism of the knowledge-creating company', in Takeuchi, H. and Shibata, T. (eds.) *Japan, moving toward a more advanced knowledge economy. Advanced knowledge-creating companies.* Washington, DC: World Bank Institute, pp. 1–9.

Tangaraja, G., Rasdi, R., Samah, B. and Ismail, M. (2016) 'Knowledge sharing is knowledge transfer: a misconception in the literature'. *Journal of Knowledge Management*, 20(4): pp. 653–670.

Tapissier, E., Mantelet, F. and Aoussat, A. (2018) 'Choosing the right tools and practices to design a knowledge management system in a SME', 2018 *15th International Design Conference.* Dubrovnik, Croatia, 21-24 May 2018, pp. 1697–1708.

Tashakkori, A. and Teddlie, C. (eds.) (2010) *Handbook of mixed methods in social behavioural research*. 2nd ed. Thousand Oaks, CA: SAGE Publications.

Venkitachalam, K. and Busch, P. (2012) 'Tacit knowledge: review and possible research directions'. *Journal of Knowledge Management*, 16: pp. 357-372.

Wang, Z. and Wang, N. (2012) 'Knowledge sharing, innovation and firm performance'. *Expert Systems with Applications*, 39(10): pp. 8899–8908.

Warren, C. and Karner, T. (2010) *Discovering qualitative methods : field research, interviews, and analysis*. 2nd ed. Oxford: Oxford University Press.

Wee, J. and Chua, A. (2013) 'The peculiarities of knowledge management processes in SMEs: the case of Singapore'. *Journal of Knowledge Management*, 17(6): pp. 958–972.

Wong, K. and Aspinwall, E. (2005) 'An empirical study of the important factors for knowledge-management adoption in the SME sector'. *Journal of Knowledge Management*, 9(3): pp. 64–82.

Wong, W. and Radcliffe, D. (2000) 'The tacit nature of design knowledge'. *Technology Analysis and Strategic Management*, 12(4): pp. 493–512.

Yew Wong, K. (2005) 'Critical success factors for implementing knowledge management in small and medium enterprises'. *Industrial Management and Data Systems*, 105(3): pp. 261–279.

Yin, R. (2009) *Case study research : design and methods*. 4th ed. Los Angeles, CA: Sage Publications.

Zieba, M., Bolisani, E. and Scarso, E. (2016) 'Emergent approach to knowledge management by small companies: multiple case-study research'. *Journal of Knowledge Management*, 20(2): pp. 292–307.

Appendix

Participant Information Sheet

Title of Research Project

An exploration of the perception and practices of knowledge management in Irish small and medium sized enterprises.

Invitation to Participate

I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or if you would like more information. Take time to decide whether or not to take part.

Who I am and what this study is about

My name is Brendan Comey and I am currently completing a Master's degree in management in the National College of Ireland. As part of my course I am required to complete a research dissertation. I have chosen to investigate knowledge management tools and practices in small and medium sized businesses.

The aim of the research is to look at the phenomenon of knowledge management and specifically how it is used by small and medium sized enterprises (SME) in Ireland. SMEs in Ireland employ 70% of the total work force accounting for €42 billion of trade and this makes them vital to the country from an economic and social point of view. Both the practice and the research into knowledge management (KM) in SMEs lags behind that of large organizations and given the importance of the SME to the global economy there is a need for research to be carried out that is specific to SMEs.

What will participation involve?

Before we begin the process I will ask you to sign a "consent to participate" form, I will then ask a few questions in relation to knowledge management tools and practices in your business, I will enquire as to whether you have formal or informal

systems in place for the capture, processing and utilization of knowledge or information within your organization. I will make an audio recording of this interview and transcribe the details so that I can use the manuscript for data analysis. The interviews will take in between 30 and 45 minutes and I will come to a suitable location that is convenient for the participant.

If you are agreeable I would like you to keep a reflective journal or diary for 3 days to note when you have used KM tools or practices or when you have not used them but in retrospect would have considered them beneficial. It is also my hope to collect artifacts of KM processes or tools that you use in your business.

The results of the data collection will be used to form part of the findings and conclusions of my completed dissertation and anonymised versions of quotes or information might appear in the body of my dissertation.

Why have you been invited to take part?

At the time of selection, the you had characteristics that suited the study, namely that you own or work in an Irish SME.

Do you have to take part?

Participation is totally voluntary and you can refuse to participate, refuse to answer any question and you can withdraw from participation at any time with no consequences.

What are the possible risks and benefits of taking part?

Risks of involvement are minimal, the topics of conversation will all revolve around if and how knowledge management is used in your business. You will lose 30-45 minutes of your time to help me with my research and you are free to stop the process at any stage.

The benefit in taking part is that the conversation will allow you to reflect on KM in your own organisation and may offer you some insights as to what is working well and give you an opportunity to improve your processes and practices having discussed them at length.

My research project is of a relatively small scale and will focus only on Irish SMEs but I am happy to share any of the findings or conclusions reached as part of the project and this might be of benefit to your own business.

Will taking part be confidential?

All data collected will be anonymised and no personal or identifying information will be retained. The audio recording of the interview and the consent form will need to be retained until the exam board have awarded a grade for the project and after this time all information in relation to the interviews will be destroyed. The reflective journal and any artefacts collected will have any personal or identifiable information redacted to ensure anonymity and these will be destroyed on completion the dissertation.

Who should I contact if I need more information?

Researchers Details:

Brendan Comey

Email: x16124782@student.ncirl.ie

Academic Supervisor:

Fabian Armendariz

School of Business, National College of Ireland

Email: fabian.armendariz@ncirl.ie

Phone: 01 4498625

Consent to Participate

I_____ voluntarily agree to participate in this research study.

- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.

- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.

- I understand that participation involves an interview that will follow open ended questions in relation to knowledge management in small businesses and that I may be asked to keep a reflective journal/diary on my usage of knowledge management tools and practices for three days.

- I understand that I will not benefit directly from participating in this research.

- I agree to my interview being audio-recorded.

- I understand that all information I provide for this study will be treated confidentially.

- I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.

- I understand that disguised extracts from my interview may be quoted in the researcher's dissertation.

- I understand that signed consent forms and original audio recordings will be retained in a file in the researcher's office until the exam board confirms the results of their dissertation.

- I understand that a transcript of my interview in which all identifying information has been removed will be retained for two years.

- I understand that under freedom of information legalisation I am entitled to access the information I have provided at any time while it is in storage as specified above.

- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Researchers Details

Brendan Comey

Email: x16124782@student.ncirl.ie

Academic Supervisor:

Fabian Armendariz

School of Business, National College of Ireland

Email: fabian.armendariz@ncirl.ie

Phone: 01 4498625

Signature of research
participant:_____

Printed
Name:_____

Submission of Thesis to Norma Smurfit Library

Submission of Thesis to Norma Smurfit Library, National College of Ireland

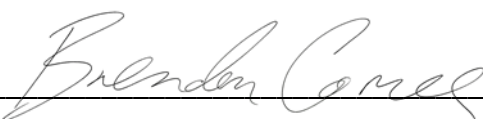Student name: **Brendan Comey**   Student number: **16124782**

School: National College of Ireland Course: MSc in Management

Degree to be awarded: **MSc in Management**

Title of Thesis: **An exploration of the perception and practices of knowledge management in Irish Small and Medium Sized enterprises**

One hard bound copy of your thesis will be lodged in the Norma Smurfit Library and will be available for consultation. The electronic copy will be accessible in TRAP (http://trap.ncirl.ie/), the National College of Ireland's Institutional Repository. In accordance with normal academic library practice all thesis lodged in the National College of Ireland Institutional Repository (TRAP) are made available on open access.

I agree to a hardbound copy of my thesis being available for consultation in the library. I also agree to an electronic copy of my thesis being made publicly available on the National College of Ireland's Institutional Repository TRAP.

_____

Signature of Candidate.

For completion by the School:

The aforementioned thesis was received by_____

Date: _____