The Impact of Company Size on Factors Influencing ERP Adoption in Ireland

Paul Lindopp

Master of Business Administration

National College of Ireland

Submitted to the National College of Ireland, September, 2015

i) Abstract

Enterprise Resource Planning (ERP) is broadly defined as a suite of integrated applications used by organisations to store, collect and interpret data. It has a modular set up and typically integrates the financial, sales & distribution, procurement and materials management activities of a business. ERP has been adopted by companies of all sizes and ERP implementations and has become a multi-billion dollar industry.

Its aim of the study is to investigate what impact, if any, company size has on the factors influencing Irish companies to adopt ERP.

The author adopts a case study methodology to interview people experienced in multi-ERP implementations across a wide variety of industries in Ireland. The interviews follow a case study protocol and were carried out in a conversational manner, structured around a set of pre-defined questions.

In each interview, the author presented factors influencing ERP adoptions to each interviewee. The author asked interviewees to give their opinion as to what impact each influencing factor has on a company's ERP adoption decision.

The findings of the study reveal that company size has a large bearing on the importance Irish companies give to factors influencing ERP adoption, with like-sized companies sharing similar influences. The study finds that small companies are mainly influenced by current considerations when adopting ERP, such as its overall cost and money saving potential. Large companies, in contrast, are influenced by factors such as growth and stakeholder perception, using ERP adoption as a basis to ensure future viability. The study also reveals that implementation decisions in small companies tend to be influenced by specific operational issues. In large companies, the decision to implement is normally part of a broader corporate strategic initiative.

ii) Declaration

Submission of Thesis and Dissertation

National College of Ireland
Research Students Declaration Form
(Thesis/Author Declaration Form)

Name: Paul Lindopp
Student Number: X13116291
Degree for which thesis is submitted: MBA (Part-time)

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.

Signature of research student:

_____

Date: _____

iii) Acknowledgements

There are a few people I would like to thank.

I would like give a special “Go raibh maith agat” to my Supervisor Prof. Jimmy Hill for his support and guidance, as well as all my college lecturers whose guidance and interactive style of teaching made my two years with NCI so interesting and rewarding.

My wife Helen and two children James and Daniel deserve a medal for putting up with me for the last two years. Love to you all and I promise to bring you away on holiday straight after I finish!

Thanks also to all of the participants who contributed to various projects I undertook over the last two years. A special shout out to Gavin Lawler for sharing his insights, knowledge and entrepreneurial expertise and letting me study his start up business over its first two years.

Lastly thanks to my fellow students for all the laughs and for helping make the MBA such an enjoyable and rewarding experience.

iv) Table of Contents

v) List of Appendices

1. Introduction

1.1 Background

Almost all companies in Ireland of a reasonable size now use some type of software system to record their various operational transactions. Companies tend to start out with one system, which is sometimes paper based and can end up dealing with a myriad of them. This can be either through acquiring various systems to perform different departmental tasks or merging with other companies operating on various systems. They then face the challenge of integrating these systems via middleware to a central hub, where all data can be consolidated and analysed. This can be a complex undertaking, particularly if companies grow to operate in various geographies with different operational rules and requirements.

ERP (Enterprise Resource Planning) systems offer an alternative solution to these complexities. Through ERP, companies can operate on a consolidated system offering finance and accounting, supply chain, inventory control to customer relationship management solutions.

ERP implementations are often seen to be significant and seemingly daunting undertakings. However, at some point in time, the business advantages of transitioning to ERP will begin to outweigh the advantages of keeping often archaic legacy systems.

This study seeks to examine, on reaching this point of time, the factors that influence companies to adopt ERP and assesses what impact company size has on these factors.

1.2 Research focus

This research focuses on examining the factors influencing ERP adoption by looking at companies of various sizes and exploring how they weight these factors in terms of importance. The justification of this study is that, while there is a vast volume of academic literature outlining the strategic reasoning behind ERP adoption, the author has not found any academic papers specifically exploring, from an Irish standpoint, whether company size plays any part on the factors influencing ERP adoption?

1.3 Research aim and objectives

The aim of the study is to establish an understanding of companies' motivations in adopting ERP. Through this, the study seeks to identify how much of a role company size has on the factors influencing ERP adoption. The study's objective is to examine who the key people are who decide whether an ERP adoption will happen, how they arrive at a point in time where an ERP adoption is considered for their company, what influences their decision to adopt and whether company size has any part to play in how they rate these influences in terms of importance?

2. Literature review

2.1 ERP defined

Past literature has provided different definitions of ERP systems. Most definitions centre on the system integration aspects of ERP. For example, Rosemann (1999) defines an ERP system as a standard software package which includes integrated customisable business solutions for an organisations core processes (e.g. production planning and control, warehouse management) and its administrative processes (e.g. finance, human resource management etc.). Gable (1998) defines it as a comprehensive package software solution that looks to integrate the range of a business's functions and processes in order to give a holistic view of the business. Tarantilis et al (2008) defines ERP as a system that "integrates traditional accounting, manufacturing, sales, management, and other management products to offer an all-in-one solution that deals with all business management aspects of organizations". Akkermans et al (2003) also state that ERP can be defined from functional, technical, or a business perspective as providing strategic value encompassing the entire organisation.

According to Jacobs et al (2003) while ERP is often looked at solely relating to integrated IT systems, it should be also be looked at in terms of integrating a business concept with IT systems. This conceptual definition looks at the integration of organisational business processes with improved order management control, improved workflow, accurate information on inventory, better standardization of business and best practices. ERP as a system is about technological infrastructure designed to turn the required business functional capability into a reality. Jacobs et al (2003) further state that ERP is a core platform designed to leverage and support the processes used by an organisation. Ng et al (1999) summarised this by stating that an ERP system is the technological manifestation of the business concept.

2.2 History of ERP

Historically, ERP is seen as having evolved from the Material Requirement Planning (MRP) and Manufacturing Resource Planning (MRP II) systems of the 1970s and 1980s. The term Enterprise Resource Planning (ERP) was first coined in 1990 by The Gartner Group to describe the next generation of MRP II software (Akkermans et al., 2003). MRP and MRP II systems were designed to systemically link different aspects of process information within specific business types such as manufacturing (Jacobs et al., 2003). In 1992, SAP (a German ERP company) released their R/3 product. SAP's R/3 set up allowed its system to run on a variety of computer platforms such as UNIX and Windows NT. It also allowed third party companies to develop software to integrate with it. Through SAP, ERPs ability to move from a single minicomputer set up such as IBM AS-400 towards multiple small computer distributions was seen as attractive to companies, mainly due to the relatively low hardware costs when compared to its predecessors. This helped ERP grow in popularity throughout the 1990's (Jacob, 2007).

Another major factor in the growth of ERP software adoption during the late 1990's was the year 2000 (or Y2K) problem. Both large companies, as well as small to medium-sized enterprises (SMEs), were quick to adopt new ERP offerings as one way of addressing Y2K fixes to legacy system software.

Consolidation within ERP is now an on-going process with the larger ERP companies acquiring businesses with compatible products to both save on development costs and enhance their offering to customer. Examples include Oracle acquiring Siebel in 2005, SAP acquisition of Ariba and Vistex and SAGE, who concentrated their product offerings to SME's (Jacob, 2007).

2.3 ERP adoption justification

Al-Mashari (2002), Willis & Willis-Brown (2002) and Dillard & Yuthas (2006) all note that most multinational companies are using ERP software packages

and many SMEs have now adopted or are en route to adopting them. ERP systems are being increasingly adopted by all sizes and types of companies, looking to both avoid technical obsolescence and create sustainable competitive advantages. According to Bacon (1992), selecting and effectively pursuing the right IT/ IS investments can be an important factor in sustaining corporate prosperity and viability. ERP systems can integrate all business processes and functions, enabling organisations to improve efficiency (Gunasegaram *et al*., 2006).

However, a common criticism is that companies do not give due consideration to business intangibles which produce long-term strategic and operational benefits when adopting ERP. Anandarajan et al (1999) sees ERP investment evaluation as very complex, and because IT has become more sophisticated over time, companies may never form a complete understanding of the full range of benefits and costs associated with it. Therefore, both the high degree of uncertainty and the level of investment associated with ERP adoption implies that project justification should assume great importance (Irani et al., 2002). The project justification process is a major concern for companies considering the development of any IT/IS infrastructure and may put their competitive advantage at risk. The adoption of new technology, especially ERP, can clearly be one of the most lengthy, expensive, and complex tasks that a company can undertake. According to Akkermans et al (2003), depending on the size of a company implementing an ERP project, an implementation can take anywhere between 12 and 30 months. Prahalad et al (2010) states that ERP provides a critical technological infrastructure to companies so a more important issue is not how long it will take but rather to understand:

a) ERP benefits.
b) ERP costs/constraints.
c) How can it be used to create strategic value?

2.4 ERP adoption Benefits

2.4.1 Introduction

The perceived benefits of ERP systems have a strong and positive impact on ERP adoption. Both Utecht et al (2004) and Ward (2006) see ERP benefitting organisations through integrating their operational processes to improve the flow of information, reduce costs, streamline business processes, increase product variety, establish links with business partners and reduce response times to customer needs. Companies that successfully implement integrative technologies have been viewed as highly competitive in the global market.

2.4.2 Integration of functional areas and locations

Utecht et al (2004) observes that an important aspect of an ERP system is its ability to improve the information flow across multiple business functions and sites which can often be in different geographical locations. Furthermore, ERP systems have the ability to take language translation into consideration, facilitating more effective communication between sites situated in different countries.

2.4.3 Opportunity for growth

Investing in ERP can extend the reach of an enterprise's process capital by integrating activities and information flows across function units, geographical units and extended partners (Sambamurthy et al., 2003). This can create growth options for future investments in web based e-commerce and other e-supply chain functionality which cannot be considered by companies with more archaic system architectures (Taudes et al., 2000).

2.4.4 Improving customer relations

ERP systems are designed to have the ability to be linked to suppliers and business partners, which reduces problems related to the activities between buyers and suppliers, as well as business partners in the supply chain (Beheshti at al., 2014). Markelevich & Bell (2006) see ERP as a platform for electronic business applications allowing companies to reduce their inventory costs and to better manage their supply chains and customer relationships.

2.4.5 Effective decision making

Utecht et al (2014) look at ERP in terms of improving the integration of information or data across the functional areas of a business. This is vital to effective decision making and instrumental in gaining competitive advantage. Through ERP, enterprises can make accurate and timely information available for all operations in a company. This fosters more effective and visionary decision making within the organisation. Holsapple & Sena (2005) investigate the connections between ERP systems and decision support systems based on 53 companies adopting ERP systems and find that integrating operations and data is the most important ERP objective, mainly because system integration can lend support to the quick facilitation of informed decisions.

2.4.6 Cost reduction

Gefen & Ragowsky (2005) investigate the associations between the business characteristics of manufacturing companies and the benefits of ERP systems in 270 manufacturing organisations. They find that companies with an ERP system can reduce their cost of raw materials, which results in a higher margin on products. Sumner (2000) uses case studies to examine seven organisations, which have ERP project justification and risk factors identified by project managers. They find that along with inventory reduction and data integration, cost reduction is cited as one of the main reasons to start an ERP project.

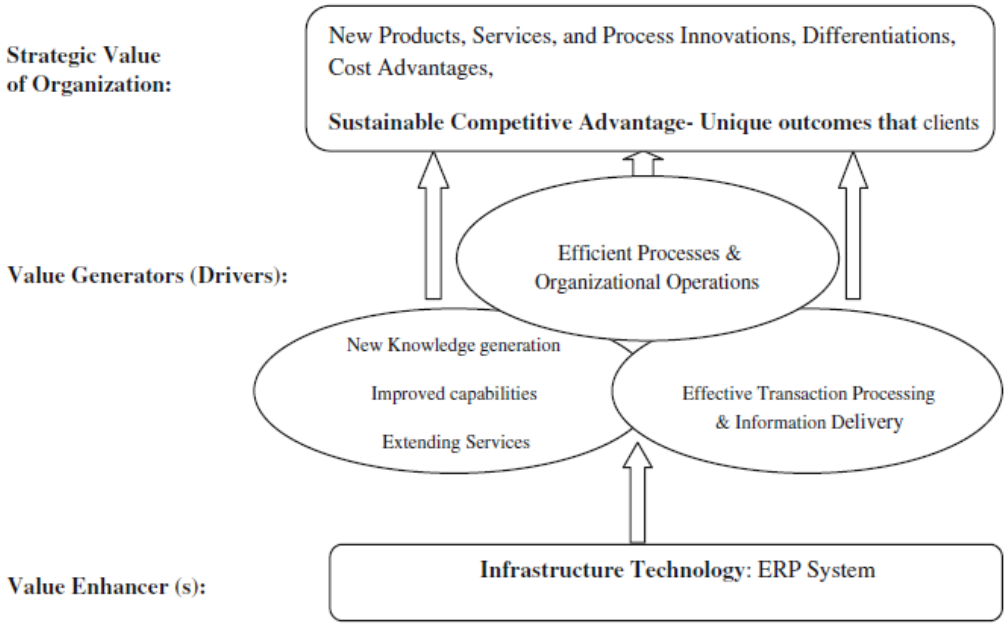
2.4.7 Information for strategic planning

Companies are spending large sums of money on information systems which are expected to have strategic values. ERP's contribution to an organisation's strategic value creation depends on many critical factors including its correct implementation and the effective management of its operational performance during its lifecycle (Dong, 2000)

Fung et al (2008) state that an ERP system, if planned, deployed, and implemented properly, acts as a value enhancer that empowers three value generators (operational and process efficiencies, information delivery and new knowledge creation) to contribute to strategic value creation in an organisation.

Nazemi et al (2012) look at this value generator concept and also reason that these three fundamental value generators are needed to create sustainable strategic value (see Figure 1).

Figure 1: Contribution of ERP to strategic Value creation in an organisation



Source: Nazemi et al (2012)

2.5 ERP adoption Challenges

2.5.1 Introduction

A number of authors have looked at the challenges associated with ERP adoption within companies. Buonanno et al (2005) state that the rate of ERP adoption is quite low among both micro (3%) and small companies (12%), but higher in medium-sized companies (47%). Significant differences are found to exist between small companies and medium companies regarding the objectives and constraints of ERP adoption and implementation.

There is also no guarantee that an ERP adoption will be successful. Rao (2000) estimates that 96.4% of ERP implementations end in failure. Similarly, Al-Mashari (2002) reports that 70% of ERP implementations do not achieve their expected benefits. Some of the challenges are listed as follows:

2.5.2 Resource allocation

Laukkanen et al (2007) state that resource base available to ERP implementation, such as budget, time, the number of staff on the implementation and their knowledge about ERP, can constrain an implementation's effectiveness. Likewise, Johansson and Sudzina (2008) examine ERP implementations in SMEs and find specific resource allocation issues associated with SME ERP implementations which large corporations do not have.

2.5.3 Cost

For a typical ERP project, Hitt et al *(2002)* determine the costs break down as follows:

- Software licensing 16%
- Hardware 14%
- Consulting 60%
- training and other internal staff costs 10%

Kai & Per (2009) contend that the complexity of ERP, its high costs other implementation problems can cause companies to re-examine their plans for acquiring and implementing enterprise-wide systems.

2.5.4 Consultancy and staff retention

One of the greatest risks in ERP projects is recruiting and retaining highly sought after IT professionals with specialised technical and application-specific skills. Compared with general IT employees, ERP specialists cost more to recruit and are harder to retain. ERP systems are very complex products with flat learning curves (Sumner, 2000). Thong (1999) contends that the value of an ERP system lies not so much in the product itself, but in using it in an efficient and effective manner. In order to be able to work effectively with an ERP package, users have to be trained and accumulate experience. Even though an ERP may be implemented promptly, what follows can be a long and painful process of and training re-engineering. The continued use of

consultants also causes a sharp rise in the maintenance, training and development budgets for the ERP project.

2.5.5 Re-engineering business processes

Integrating operations and data are reported to be an important factor in considering an ERP project and also an important justification for ERP adoption (Holsapple & Sena, 2005). Van Everdingen et al *(2000)* states that it is costly to configure and implement ERP systems due to the need to re-engineer entire business operations.

3. Research question

3.1 Research question

The author's research objective within this study is to investigate and draw conclusions as to whether company size affects the importance Irish companies place on factors influencing the decision to adopt ERP. There are a number of previous research studies on ERP adoption subject matter and the author looked to some of these as a guide in structuring this study. For example, Buonanno et al, (2005) in their study "Factors affecting ERP adoption", sought to identify ERP adoption reasons via a research questionnaire sent to 366 companies of varying sizes (see Table 1).

Table 1: Reasons for ERP adoption

	Measures adopted in the questionnaire
Technological and Operational drivers for ERP adoption	**What are the reasons for ERP adoption? (multiple response allowed)** ❑ Forced decision (by a controlling company) ❑ Euro issue ❑ Y2K issue ❑ Dissimilarity of procedures (i.e. rules on quality management) ❑ HW/SW obsolescence ❑ High cost of data distribution ❑ Data Redundancy and/or inconsistency ❑ Limited support to decisions ❑ Unsatisfying order management ❑ Logistics and Transportation issues ❑ Unsatisfying process integration ❑ CRM issues ❑ Over-dimensioning of stock ❑ Unsatisfying Time-to-Market ❑ Lack of flexibility ❑ Other reasons

Source: (Buonanno et al., 2005)

Some aspects of Buonanno et al (2005) research, such cost and process integration are looked at within this study. However, the author felt that a questionnaire approach would not engage interviewees fully and fail to evaluate the importance the interviewees would give to influencing factors.

Similarly, Markus (2000) identifies 26 reasons for the adoption of ERP and discusses them in terms of differences between large and small companies. He classifies these as either technology-oriented or process oriented reasons as illustrated in Table 2.

Table 2: Strategic reasoning for ERP adoption.

Technology Oriented Reasons for ERP adoption	*Process Oriented Reasons for ERP adoption*
Solve Y2K and similar problems.	Customer focus
Integrate applications cross-functionality.	Enhance functionality through collaboration with supplier and clients
Replace hardware to maintain interfaces.	Standardization of processes
Reduce software maintenance burden	Process optimization
Eliminate redundant data entry and concomitant errors and difficulty analyzing data.	Decision making tools
Improve IT architecture	Accommodate business growth
Ease technology capacity constraints	Acquire Multilanguage and multi-currency
Decrease computer operating costs	IT support
Consolidate multiple different systems of the same type (e.g., general ledger packages)	Improve informal and/or inefficient business processes.
	Clean up data and records through standardization
	Reduce business operating and administrative expenses.
	Reduce inventory carrying costs and stockouts.
	Eliminate delays and errors in filling customers' orders for merged businesses.
	Provide integrated IT support
	Standardize different numbering, naming, and coding schemes.
	Standardize procedures across different locations.
	Present a single face to the customer.

Source: (Markus, 2000)

The author also looked at aspects of the Markus (2000) study to structure this study. Some of the reasons underlined by Markus are used in this study as interview points. However, unlike both Markus (2000) and Buonanno et al (2005), the author did not focus this study solely on strategic ERP adoption reasons. Strategic reasoning looks beyond present influences and is concerned with the attainment of future strategic goals. Instead, this study seeks to examine the "here and now" influences which move a company to deciding on such a large and costly transformation to their IT structure.

The author sees some influences, such as growth, as strategic in nature. However, others such as leadership and stakeholders are more nuanced and lean more towards a company's culture and perception of itself. In addition, the author was interested in what influences ERP decisions within Irish companies, which previous studies have not concentrated on.

To examine the research question, the author uses a semi-structured interview method, with interviewees asked a standard set of questions applied across all interviews conducted. These questions can be summarised as follows:

a) Who in the company chooses ERP as a business solution?
b) Why did they choose it?
c) What influenced their choice?

The actual questions are dealt with in the Findings section of the study. Through the questionnaire-style interview structure, the study aims to make findings and conclusions, based on the interviewees' answers, on factors influencing ERP adoption and the importance of company size in these decisions.

4. Research method

4.1 Introduction

This chapter focuses on the methodological considerations of the study. It looks at the existing research philosophies and indicates what philosophies this study will follow. The research explores the importance of influencing factors to interviewees and looks at whether the size of the organisations they work in have a bearing on the importance of these influences. The methods of data collection are discussed, together with the study's ethical considerations and research limitations.

The study defines company size as either small or large. "Small companies", for the purpose of the study, are categorised using the three broad parameters for defining Small and Medium sized Enterprises (SME's), as defined by ISME (ISME, 2015).

These are as follows:

1. Micro enterprises are companies employing up to ten employees.
2. Small enterprises employ up to 50 employees.
3. Medium-sized enterprises have more than 50 but less than 250 employees.

The study categorises all other companies as "Large companies".

4.2 Research philosophy

The study gives consideration to the three main ways of thinking about research philosophy, namely ontology, epistemology, and axiology.

Ontology is concerned with the nature of social phenomena as entities and can be divided into objectivism and subjectivism. Objectivism represents the position that social entities exist in reality to social actors whereas subjectivism

holds that social phenomena are created from perceptions and the consequent actions of social actors (Saunders, et al., 2012).

Epistemology looks at what constitutes a level of acceptable knowledge in a field of study and contains three philosophical positions: positivism, realism and interpretivism (Saunders et al., 2012). Positivism adopts the stance of the natural scientist which is that only phenomena that one can observe will lead to the production of credible data or law like generalisations (Saunders et al., 2012). It has been noted that "as a philosophy, positivism is in accordance with the empiricist view that knowledge stems from human experience" (Collins, 2010). Realism states that whatever our senses show us as reality is the truth; objects exist independently of the human mind (Saunders et al., 2012). Interpretivism emphasises the difference between conducting research on people rather than objects (Saunders, et al., 2012). Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense-making as the situation emerges (Saunders et al., 2012).

If ontology and epistemology deal with truth, however, axiology is more about ethics and values. Axiology is what is valued or considered good. This is manifest in what the purposes or uses of the model are, and who (analyst, participant or facilitator) develops and uses the model (Mingers, 2003).

In terms of the ontology of this study, the author seeks to look at various cases of ERP implementations in both small and large companies, in an attempt to interpret and draws conclusions derived from the views of others on the subject matter. The author would concur from experience that from a post-decision phase, an ERP adoption methodology should follow a scientific, mechanical and objective pattern toward completion, which would merit an objective type of study. However, at the pre-adoption decision making stage, which is the focus of this study, this is not the case as decisions and what influences them are by their nature prone to the perception and sensitivities of parties undertaking them. Therefore the research adopts a subjective approach to this study.

The author firstly looked at the possibility of undertaking a positivist approach in terms of whether factors influencing an ERP system adoption could be quantified as distinct and measurable, for example in terms of project delivery timelines, available IT budget, company capitalisation and personnel size. However studies show that if you assume a positivist approach to your study, then it is your belief that you are independent of your research and your research can be purely objective. Independent means that you maintain minimal interaction with your research participants when carrying out your research (Wilson, 2012). The author, however, felt a more hands-on participative style of research was needed for a study of this type, as afforded by Interpretivism. Black (2006) argues that beyond subjectivity, the interpretive paradigm is one that thrives upon subtlety and it is one where hidden and important meaning is buried within superficially inconsequential inflections of voice, body language or situational details. Therefore, this study looks to adopt an interpretivist paradigm.

Axiology philosophy is particularly relevant to this study as the research conclusions will be based on the value the interviewees place on the various influencers of the ERP implementation decision.

4.3 Research method

The author examined whether quantitative and qualitative methods of research should be used to conduct this study. Literature reviews of IS decision-making processes point to a mainly qualitative methodology, citing IS decisions as being mainly subjective, but some also having quantitative attributes. For example, Shank and Govindarajan (1993) state that managers have employed various methods for evaluating the cost and benefits of IT/IS investment ranging from simple computational formula to very complex techniques that blend quantitative and qualitative analysis into one. Senn (1989) does see quantitative techniques as having been used mainly for capital investment decisions, but they do not necessarily capture the entire impact of new technology adoption. Myers (2009) sees ERP justification

difficulties linked to the intangible nature of the benefits promised by IT, such as improved communication and control, enhanced capabilities, and competitive advantage and likewise to costs that are difficult to quantify. Qualitative studies source participant observation, which can come from interviews and questionnaires, documents and texts, as well as the author's impressions and reactions.

The author therefore felt that this study, because of the diversity of companies and interviewees studied in terms of business models experience, coupled with exploration of influencing factors other than quantifiable costs, merited a qualitative research approach.

4.4 Data collection method

A questionnaire was firstly look at by the author to collect and analyse data. However, it was later decided on the basis of the return of richness of data, not to proceed with this method and instead opt for an interview methodology. Questionnaires work best with standardised questions that will be interpreted in the same way by all cases. A lack of interaction with the subject or the ability to probe the subject matter can lead to difficulty in questionnaire interpretation (Saunders et al., 2012). The author felt that if a questionnaire was used, the complexity of the questions posed may have affected the answers given and ultimately, the result of the study. In addition, the author also felt that a questionnaire would deliver a low response rate and also that those undertaking a questionnaire may not be the study's target audience. There also would be little or no contact between the author and the participants, which could also adversely affect response rates (Saunders et al., 2012).

The author decided that interviews would give a richer feedback of the issues involved in the decision making process. Through interviews, feedback is quicker and the author would be in more of a position to judge whether the subject was key to the decision making process and understood fully the factors therein.

Interviews can take three forms, structured, unstructured or semi structured. Whereas unstructured interviews are conducted in conjunction with the collection of observational data and structured interviews are used best to collect data to be analysed quantitatively, semi-structured interviews are often the sole data source for a qualitative research project and are usually scheduled in advance at a designated time and location outside of everyday events (Saunders et al., 2012). They are generally organised around a set of predetermined open-ended questions, with other questions emerging from the dialogue between interviewer and interviewees (DiCicco-Bloom et al., 2006).

The author decided to undertake a series of focused face-to-face semi-structured interviews, following Myers and Newman (2007) guidelines for conducting qualitative interviews. The primary focus of these interviews was to elicit views on the key factors influencing the decision to adopt ERP from experienced professionals who had worked with companies undertaking such adoptions.

The author selected participants to interview based on an iterative process known as purposeful sampling. Purposive sampling is a non-random technique that does not need underlying theories or a set number of informants. It allows the author choose a case because it illustrates some feature or process which the author has an interest in. Simply put, the author decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of experience or knowledge (Bernard, 2002).

The author applied purposive sampling to the research via case studies. According to Yin (2008), “a case study is an empirical inquiry which investigates a contemporary phenomenon within its real-life context: when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used”. Yin expands on this by writing that a major strength of case study data collection is the opportunity to use many different sources of evidence. Yin also states that the use of “multiple sources of evidence can allow the investigator to address a broader range of

historical, attitudinal and behavioural issues. It is good for asking why and how questions" (Yin, 2008). Furthermore, case-study research method is well suited for Information Systems (IS) research especially when organisational factors rather than technical issues are studied (Alavi and Carlson, 1992).

The interviews were based around specific printed questionnaires used in the following studies: "Factors affecting ERP system adoption: A comparative analysis between SMEs and large Companies" (Buonanno *et al*, 2005) and "The Enterprise Systems Experience-From Adoption to Success" (Markus, 2000). The author included some additional factors, namely "Stakeholders" and "other influences" which were not covered in these studies but which the author feels are important to the research question. All interviews were recorded and later transcribed.

4.5 Ethical considerations

During the interviews, the experience of the interviewees within companies involved in ERP implementations in Ireland was discussed. All interviewees were informed that the study would not disclose the names of any companies, people or parties discussed during the course of the interviews. While some interviewees expressed no objection to be mentioned by name, to avoid any ethical issues the author decided to keep all research participants anonymous. This was mainly down to two reasons. Firstly, the discussions looked at all aspects of implementations and touched on potentially sensitive areas such as project management difficulties and ERP failures. Secondly, some of the interviewees worked in competing organisations. The author instructed interviewees that no commercially sensitive information would be revealed within the study and informed them that all interview recordings would be destroyed immediately after their transcription.

4.6 Interview structure

The findings in this study are based on a qualitative methodology using seven semi-structure interviews with people who work in or with organisations within Ireland who have made decisions on ERP implementation. The details of the transcribed interviews are contained within the “Detailed Findings” section of the study. The author has paraphrased some aspects of these interviews but as they form a very important and integral part of this study, care was taken to try and keep them as close to the interviewees’ original wording as possible.

Participant interviewees were found through a combination of past and present work colleagues, with some colleagues personally interviewed and others recommending potential interviewees who have key experience in aspects of the ERP decision making process. All interviewees were contacted via an e-mail which outlined the research question and various other questions which they would be asked to discuss. Six of the interviews were conducted face to face and one via mobile phone. The interviewees come from varying backgrounds. Some are company owners /directors while others are consultant partners and project managers. Some work for Irish multinationals whilst others are involved in the SME area. Some work directly for the business deciding to adopt while others work for implementation partners.

All seven interviews were audio-recorded on a mobile phone device. The interview duration was normally 35 to 40 minutes. The interview questions were based around a specific printed questionnaire as formulated by Buonanno *et al* (2005) and Markus (2000). All interviewees were asked the same questions, which are outlined in Appendix 1.

4.7 List of interviewees

The interviewees varied in terms of their professional profiles. They all have vast experience (at least 10 years) in their respective areas of expertise, with some having worked within the business, on implementation teams or both. The author found them to be willing contributors and interested in the outcome of the research. For the purpose of the study, the interviewees are categorised in terms of the size of company they work with. The interviewees' profiles are outlined in more detail in Appendix 2 and are summarised as below:

Large companies

Initials	Position
PD	Head of ERP in an Irish Pharma wholesale company.
DF	Treasury manager with a large Irish food company.
DR	Senior ERP manager involved in IT strategies.
PT	Management partner with KPMG.

Small companies

Initials	Position
RV	ERP SAGE implementation manager.
DD	Owner of a hospitality consulting company.
GL	Owner of a toy and multimedia SME.

4.8 Availability of cases

Although the author contacted 20 potential interview parties, half either declined or did not respond to the invitation. The author assumes that some of

these non-responses were due to the interview invitation being sent in early August, when potential candidates were on holidays. This was proved correct as a further two interviewees took part in a phone interview in late August. However, these interviews were unfortunately not recorded so a detailed evaluation of the information was not possible. The author therefore decided not to include these two interviews.

Participation in the research was voluntary so the research was limited to participants that were willing to be interviewed. However, during the study, the author found all interviewees to be very eager and willing, which the author believes enhanced the answers given.

4.9 Scope and limitations

This was the first time the interviewer had completed a series of interviews for a dissertation. The author attempted not to guide the interviewees in their answers and allows interviewees to talk freely, intervening only to when needed to reiterate the question being posed. However, the nature of semi-structured in-depth interview means the author cannot rule out the possibility that, in some cases, unintentional unconscious signals to guide were given.

The author has worked in the ERP deployment environment for the last 20 years, in both a business and deployment capacity. This experience motivated the author to undertake this study to see whether any assumptions he had on ERP adoption influences matched this research's conclusions on the matter. The author has sought to keep any bias towards out of the study but acknowledges the possibility that, due to his inexperience in writing, some bias may exist.

The research initially sought to focus on the factors influencing ERP adoption from solely by interviewing clients (company owners or CFOs etc.) who would purchase ERP software. The client is the ultimate decision maker as they pay for the ERP implementation. However, many company owners or CFOs did

not respond to my email request. Those who did, however, were very open and honest within their responses. The author decided to expand his interviewee scope to also include ERP deployment experts and found that this interviewee group were much more responsive to interview requests. They also proved to be a good insight into ERP influences as the majority of them had worked in various roles on multiple ERP roll outs in. They also had experience within many diverse industries in companies of all sizes. As a result, they were able to impart knowledge on the influencing factors on ERP decisions within many organisations.

The author size feels that the sample size at seven participants could have been somewhat larger. However, with the depth of knowledge and the experience that all of the interviewees had, the author felt the interviews sufficiently represented a wide enough base from which to look at findings and conclusions. For example, five of the interviewees had been through at least four different ERP roll outs, mainly in a senior role within the business or as working as an implantation partner. The other two interviewees had, as business owners had over 15 years', experience of various IT systems within their enterprises and their impact.

The finalised criteria for assessing the interviewees were as follows:

- *That they own or owned a company or companies who had sought to implement ERP.*
- *They had managed multiple ERP projects in as part of a business or implementation team.*

5. Research Findings

5.1 Introduction

This chapter outlines the findings from the interviews conducted. The researcher firstly outlined the objective of the study to the interviewees, namely whether company size affects the importance Irish companies place on factors influencing the decision to adopt ERP. The researcher then asked the interviewees a series of questions on influencing factors, as outlined in Appendix 1. The interviewees' answers form the back-bone of the findings section from which the author draws conclusions on the research question.

5.2 Summary findings

The interview findings are summarised as below and the answers given under the question format outlined in the "research question" section of the study. These findings are as follows:

1. Who in the company chooses ERP as a business solution?

   According to the cases questioned, for small companies it is always the owner who decides on whether to adopt ERP. For large companies, it is normally the CEO or CFO.

2. Why did they choose it?

   There was a mixture of answers to this question, with no discernable pattern. For small companies, the interviewees cited greater visibility of information to improve decision making and the replacement of technically inadequate systems. Small companies also look to less fire-fighting and manual processes tying up resources as a reason to choose ERP.

   Large companies cite improved efficiencies and visibility as well as preparedness for future unforeseeable events. Large companies also look to greater visibility of information to improve decision making, as well as the reduction of regulatory and technology risks.

3. What influences their choice?

a) Implementation costs?

For small companies, all three interviewees felt cost is a critical factor. For large companies, all four interviewees felt this factor has a low influence on the adoption decision.

b) Competitive advantage?

This factor had mixed responses. For small companies, one interviewee said it is important, one disagreed and the other was unsure. The responses were similar for large companies, with one interviewee saying yes, one saying no and the other two unsure.

c) Implementation partners?

Smaller companies are more influenced by implementation partners than larger companies, with two interviewees saying they are a key influence and the other disagreeing. For larger companies, all four interviewees disagree with implementation partners being an important influence.

d) Projected growth rates of the company?

This question produced the starkest contrast between small and large companies with all three interviewees viewing growth rates as being unimportant for smaller companies and all four viewing it as being of major importance for larger ones.

e) Key stakeholders (Competitors, vendors, customers, parent company)?

Two interviewees working with small companies see key stakeholders as being an unimportant factor while one was undecided. With large

companies, two see this factor as an important influence, one did not and one was undecided.

f) Past employee ERP experience?

All seven interviewees see past employee ERP experience as a weak influencing factor.

5.3 Detailed findings

The detailed findings are also set out in a question and answer format and are selected from all interviewees' answers to the questions outlined in Appendix 1. The interviewees are grouped according to small and large companies.The interviewees' initials appear beside their respective answers. Where possible, the author quotes the interviewees' response when they are concise and directly answer the question asked. Otherwise, the author paraphrases the answers given by the interviewees to present the study's findings. The detailed findings are grouped in terms of company size.

Q1. Who are the main decision makers in ERP adoption?

Small companies

RV "The main decision comes from the CFO, CEO or owner. They are normally the sole decider of what to buy, and there'll usually be very little point trying to dissuade them".

DD "The publicans or restaurant owners are the main decision makers as they are the ones signing the cheques. They will do it in consultation with their accountants or book-keepers but they will have the ultimate say".

GL The owner and financial controller are the main decision makers on ERP adoption.

Large companies

PD "It tends to be the CFO or CEO. These are the two people who can see the value in it, either from a risk or an efficiency point of view and who will get an ERP on the agenda and follow it through".

DF "The key decision maker ultimately is the CEO, who has the final call on it. As part of the due diligence, there will be people involved from other parts of the business such as purchasing and finance. However, in terms of who makes the call on it, as with any big spend in any PLC, you will have the top executive team signing off on it".

DR "It depends on where the pain is. If the pain is at the board level to get any information out of the system in order to make any decision, they will instigate an investigation into why this is so. For example, it can be the IT department who say they are spending too much money on spreadsheets, access databases etc. IT may stress the point that the company will need to investigate whether it is better to implement an all-in-one package. The facilitator in this instance will probably still be the CEO, with IT suggesting that company processes could be run in a more efficient and economical manner through ERP".

PT "The CFO is the key decision maker. The CIO will have a part in the decision making and will be responsibility for looking at the project from an implementation strategy and maintenance. Ultimately through, this is a system that needs to manage the

financials across the business, so the Financial Director will have a key involvement”

Q2. How will they arrive at the point of deciding on ERP?

Small companies

DD Within the hospitality industry, costs tend to fluctuated a lot. Re-ordering stock traditionally tend historically to be done based solely on quantities, with little regard to prices charged. The person ordering the stock will often have scant regard for the costs of the products being reordered and would not consider any price changes made by the supplier since the last reordering point. Similarly overhead costs such as electricity are paid en masse for the group without comparing similar operating concerns for consumption rates or indeed comparing utility providers for the best rate. Owners will therefore look at this information and realise that major savings can be made by having more visibility on costs in order to be able to manage them efficiently.

GL “IT Systems are the last thing to be looked at, to the detriment of the company. The requirement came primarily on the basis of a rapid growth in sales. When our company started out, it had 30 accounts which had sales of 50 doors each. It was easy to account for this in a standalone system such as Excel. A year later, we had a business with 20,000 to 30,000 in orders per year, with an excess of 70,000 transactions in 13 months. Our SAGE system was implemented over 2 to 3 months and as up and running in April 2013. However, this system was not future-proofed. The company was much smaller when the system was implemented and to implement an upgrade to the system now would cost in excess of €40,000”.

Large companies

PD "Top management are constantly looking around for information on what other companies are doing to aid expansion and move them on to the next level. For example, the point of deciding on an ERP system can stem from the emergence of a strategy to implementing a shared service centre, where integrated systems are necessary to manage business divisions operating in different locations.

There can also be the realisation that the business cannot keep working with the current systems which represent a real risk to current and future operations. In my experience of one Irish wholesaler, information came from archaic systems which were constantly crashing. This uncertainty impacted on this business's ability to manage logistics and interface with its financial system. In this case, the risk of doing nothing and continuing with current systems informed the decision to look at an ERP solution".

DF "When the Irish hotelier company I worked for implemented ERP, the point of decision to do so stemmed from the hotel group expanding rapidly across geographies, using a disparate array of technologies such as standalone finance and purchasing systems to run the business. There was a feeling that they needed to implement something bigger and more robust.

In the Irish food company I worked for, it was again down to a company who expanded rapidly and aggressively. You had multiple businesses which are very large in scale across geographies. There was a feeling that these businesses needed to be brought together and the way to do that was through a standardised ERP system. The group wanted the ability to look at profitability and other KPIs across geographies. To get that granularity, ERP was needed. They were running multiple systems beforehand and many were DOS-based. The reporting

was very basic and was not something that you could roll out across geographies".

DR "With ERP within big companies, the main reason to implement ERP is in the integration of different modules which gives a company control over what is happening to different aspects of the business. There can be a situation where a lack of control undermines any validation needed within the company. Third party providers which specialise in ERP advice can come in and do a best fit exercise to access as to which ERP best suits a business. Smaller companies who cannot afford to do this will use the internet as well as personnel resources to establish what the best solution is. Companies will often use an RFP (Request for Proposal) process to educate themselves about what is available".

Companies will also get consultants in to analyse exactly what the strategic goals are within the company. For instance, if you want to have a group shared strategy with a shared group IT structure, ERP might be your best strategy".

PT "A change of strategy can feature as a motivation to adopt ERP. It will either be legacy or something else that changed within the businesses which enables them to take a look at ERP. Most organisations have got over the idea that they will adapt their practices to suit the way the ERP operates. Functional match of the ERP systems and costs involved are key information. The weighting of these depend on where you are in the economic cycle. In a recession, cost would have a high weighting in an ERP decision. In better times, cost comes right down in importance and functional match is the key weighting. Once you make a decision to implement ERP will not want to change it again if possible. The competence and capability of the implementation team put in front of you is important to the decision on whether or not to implement".

Q3. What are the initial pre-adoption expectations of ERP?

Small companies

DD "Financial decisions that companies are making are all reactive as they are waiting for two or three months to get Profit and Loss statements back from their accountants. They are paying their accountants quite a substantial amount of money and it is only after getting the figures that they can formulate decisions on the direction of the business.

All this data will be available already and it is just a matter of bringing this all together and giving it to them in a timely manner to make decisions that will be cost saving and profit enhancing. Owners will expect ERP to be cost effective and give them information to arrive at their decisions in a timely manner. Information on old systems can be fragmented and owners do not have it all together at a consolidated level showing how each level of their business is performing in a stated period of time. Before ERP, they are getting information for business periods three months old. If they had made a change to ERP three months ago, they would have potentially saved on three months of errors and the costs associated with them".

GL "The benefit for our company was initially the automation of its billing, procurement and cash collection which was urgently needed to keep the business viable. There is nothing from preventing a company from doing all of this on standalone system but with a certain volume of transactions, this becomes untenable. With an ERP system, personnel can now focus on business enhancing tasks such as profitability analysis and marketing, rather than operational transaction recording. The setting up of batch management within ERP also means that tracking numbers created on the web based POS system can be

now recorded in the ERP system, which aids accounting of any orders which have gone astray".

Large companies

PD "Two main benefits come to minds for implementing ERP, those being efficiencies and preparedness.

Efficiencies involve speedier information, less downtime and cost savings. It is reactive benefit in the sense that you can see that you will get efficiency such as tighter controls in terms of insight into what is going on in the various business that the organisation is running. In dispersed businesses you can bring them all together. If a problem is presented to management, they have a platform with ERP and can to react to it.

Preparedness is harder to quantify. It involves making a proactive decision to implement ERP to create contingency solutions for potential problems that have not yet come to light. For example, if some banking institutions had not implemented ERP they would have suffered even more financially during the crash. The information needed for urgent regulatory disclosures in the wake of the crash would have been much more difficult to find. If some multinational based in Ireland had not done it before Sarbanes Oxley (SOx) had been implemented, they would have been in trouble with regulators. ERP companies had a root and branch solution to SOx with minimal disturbance to the daily running through the installation of an ERP system".

DF "The executive teams in a large food company I currently work in were briefing external parties such as financial markets, with regards to the new ERP initiative the group was undertaking, a few years before it actually went live. It was something that was

widely known within the financial markets and when you listened to the broker coverage on this company, they regularly referred to this. This was not something done alone in the background to allow the business to operate in a more efficient manner such as getting a better analysis of profitability. It was a strategic initiative at a corporate level. You need a story in business and quite often ERP is that story. Most groups refer to their ERP implementation regularly in publications and pronouncements as it signals an intention to strengthen strategic goals".

DR "With smaller companies, there is much more emphasis on the fire fighting aspect of the decision making process. Within the hotel industry, implementing ERP is essential to companies getting efficiencies. For example, bringing payroll onto the system is crucial to saving on staff costs. With larger companies, expectations are more strategic and proactive".

PT "A key expectation of ERP is its ability to give better control and visibility over numbers and performance. The reduction of risk within the organisation is also of key importance. Visibility of performance is also crucial and allows a company the ability to report their figures real time. ERP also give a company the ability to have oversight and to put in more mature controls around finance in general which ultimately reduce your risk. A business will expect precise numbers earlier, which will enable it to react earlier. There is no point in having numbers in for an organisation a month behind an initiative. ERP controls will reduce your risk of audit exposure".

Q4. What influence has the following on the decision to adopt ERP?

a) ERP costs?

Small companies

RV “ERP cost is a big factor for smaller companies. Paying up front for a system can put companies off adopting ERP and instead they will often look for a series of down payments to be made on a system in order to pay for it. Consultancy companies will in many cases facilitate this as upfront payments minimise their bad debt risk, should the smaller company go out of business before the implementation is complete. Many small companies need an overhaul in where and how they actually do their business but they cannot get the cash to do this. For example, from my experience, they may need new premises far more than they need a new ERP system but have no money to do so and will try and use the ERP system to patch things up”.

DD “This influence of cost on an ERP implementation is relative to the cost of ignoring ERP. ERP is new in the hospitality industry and the cost of my system has not been an issue, particularly as much of the systems new customers are made via referrals from previous customers. In an industry where revenues are falling and costs increasing, the real cost looked at by pragmatic owners is the cost of not having the solution. However, the system offered by me has been tailored in response to price owners are willing to pay, based on research analysis”.

GL **“**Cost constraints are very high in terms of importance. Our company implemented one ERP system but now need another one as the initial solution was not future-proofed to deal with foreign exchange transactions being interfaced in from our web platforms. This was because of the cost of such an undertaking. The initial investment in ERP was less than €2000 but this future-proofing exercise will now cost €40000. This type of outlay is considered by us as too much in a business where there is still a degree of uncertainty on future earning potential and we see this money as best spent elsewhere”.

Large companies

PD “ERP costs are normally a limiting factory up until the point that they are making the decision. Companies will postpone the decision, saying that they cannot afford to do implementation until it comes to the point where they cannot afford not to do it. In my current company, over the years they said they could not afford to implement an ERP system and they now have a 20 year old system running a 2 billion EUR business! No one my experience has subsequently cancelled an ERP implementation once they made the decision to do it”.

DF “Company size is very important with regards to how the company looks at ERP costs. The hotel industry I worked in knew exactly what they wanted out of the system and ran a tight ship with regards to costs. All budget constraints were explored in detail prior to any ERP decision being made. It was a lot smaller and more defined business. If you look at the scale of the global food company I now work for, they have international aspects and a $2.6 billion US business with different plants, manufacturing facilities and distribution organisations. There were no real constraints with regard to its ERP implementation. This was ultimately a costly undertaking, with consultants being preferred over in house staff. In hindsight, it would have been much more cost efficient to have an in house team but that did not feature when the decision was being made. SAP went live 5 years ago in the US. They had to revisit the set up and the configuration for the European companies as it was initially US centric. Ultimately, there was a big focus internally to get the ERP system in. We had told the market that we are doing this and it has to be successful. There was a big emphasis on getting it done. Get it in, get it up and get it running and deal with the issues down the road. The market expects it in so it needs to be in, irrespective of cost”.

DR "For SME's, it is always about the money whereas in bigger companies, other factors come to the fore. However, the money is not the sole driver of decision making and producing a distinct cost benefit analysis to justify the decision is difficult".

PT "The weighting of cost depends on the industry. Within the public sector, it could be 40%. If you go to a modern, lean, efficient company, this figure could be 15%. Cost is an influencer in making the decision of your preferred ERP supplier. However, in relation to influencing decision as to whether or not to adopt ERP, cost does not have as big an influence"

b) Competitive advantage?

Small companies

DD "Competitive advantage has to be looked upon at as an influencing factor, particularly in an industry such as the pub trade in Ireland which is coping with declining revenues. Boosting revenue and controlling costs through ERP implementation can be passed onto the customer and free up resources to be spent on investment. Within the hospitality industry, an owner adopting ERP will expect increased revenues and decreased costs from the outset of an implementation. For example, if an owner has the ability to look at a weekday figures through ERP reporting and see that staff costs were 30% against turnover and look at a weekend and see that it is 22% of your turnover, you can revisit Saturday and examine whether you are understaffing. You can explore whether employing an extra hand on that night would result in an increase in turnover margin relative to staff costs. ERP means giving the owner that knowledge real-time rather than in three months' time. Getting information three months later, and only at a consolidated level, leaves owners unable to make immediate changes within the business where needed to improve financial results".

GL “Competitive advantage was not looked at as a primary deciding factor in our ERP implementation. The requirement to record transactions in a more efficient manner was a more immediate concern. Our business, only 13 months on, is still looking at transactional difficulties and will likely need to implement a new ERP system to deal with these”.

Large companies

PD “When the Irish bank I worked for decided to adopt ERP; it did look at competitive advantage as an influence on this decision, in terms of the future efficiencies it would bring to the company and also being prepared for unforeseeable future situations. A prime example where the bank seized competitive advantage over its rivals through ERP was the ability it gave the bank to suddenly change their year-end date and perform a shortened fiscal year. The flexibility that this gave the bank meant they could consolidate the first 9 months of their fiscal year and report a shortened year-end. This enabled the bank to finalise their accounts filings much earlier than usual. Account filings are a prerequisite to accessing capital markets and this ability was to prove vital during the financial crash in 2009 as accessing limited capital before other banks gave the bank a vital competitive advantage. In the HR space, the bank was able to implement a lot of compliance regulations in ERP quickly and with minimal costs. These regulations were introduced for financial services after the financial crises. Implementing these quickly was key to selling new lucrative financial products which the bank otherwise would have had to forego”.

DF “Competitive advantage post implementation is not part of the decision making agenda. Driving cost efficiencies as a competitive advantage through the system post implementation are looked at after initial stabilisation, most probably a couple of

years afterwards but does not typically influence the decision to adopt ERP up front".

DR "Typically, people want to "free up resources" and this is often what is seen as bringing competitive advantage. Freeing up resources is something that depends on the maturity phase of the company. Streamlining means that there are resources which you will no longer want. No-one ever mentions resources as part of the ERP adopting decision, but it is. Improved resources mean improved efficiency and improved competitive advantage".

c) Implementation partners?

Small companies

RV "Due to the often reactive nature of the decision making, the implementation partner will have an influence, particularly when the vendor's salesman promises the sun, moon and stars".

DD "Our ERP business has no competition at the moment in Ireland and our business is picked up mainly by referrals, so from our viewpoint an implementation partner's influence could be seen as strong. We do have one competitor who operates an online system but their solution covers only stocktaking but not the whole HR management end of things. They could not link their system to a biometric machine, which is what our ERP system can do".

GL This was not considered as an influence.

Large companies

PD "Companies decide on the ERP as a solution and then pick the partner. The partners do not tend to be an influencing factor on the actual ERP adoption decision. Their influence tends to be at

the tendering process in terms of competency and price. So no, implementation partners are not an influence in ERP adoption".

DF "Oracle pitched up as well when we were looking at ERP systems but the company had it in their minds to go with SAP because our direct competitors had SAP. The fact that other companies had SAP would have been a big influence at a strategic level. Implementation partners were not an influence on the decision to actually adopt an ERP system".

DR "Companies often ask for RFP responses from a variety of ERP implementers. Implementation companies, however, may often supply the best RFP only to be beaten at the last hurdle by larger competitors. This is because large client companies are often attracted by the size and resource base of an implementation partner and seek to minimise the risk of a failed implementation by getting the most established, though not necessarily the best company to implement the solution. However, implementation partners overall will not to be a factor in the decision to adopt ERP. The decision to adopt ERP will be made independently and well before choosing an implementation partner".

PT "It depends whether a company is looking for ERP and its implementation in an "all-in-one" solution or whether they look for the product and then an implementer. I consider the latter as the best solution. The implementation partner needs to be certified. I weight the implementer as second after a product's functionality fit. Product first, team second and then cost".

d) Growth rates?

Small companies

RV Future growth rates are not big on the agenda of smaller companies and most are looking for functionally which covers their business processes and brings the following benefits;

business efficiencies, tractability of products and visibility of numbers. Many smaller companies come to an implementer looking for a reactive solution which should have been installed 6 months previously. This is normally where the functionality of their present systems if indeed there is any system, is unable to cope with the business processes now being undertaken by the company.

DD "Business growth is low as an ERP adoption influence. Companies are looking to put in systems to cut out inefficiencies such as man hours spent doing paperwork. They also want something that is accessible to the owner via a laptop or tablet. The industry growth rate potential within hospitality is steady and in some aspects, declining so the competitive advantage has to be made through cost savings. Our company mainly deals with owners of multiple sites who need to compare these sites in terms of revenue and costs and want this data real-time and in a concise format. The "here and now" is more important than growth in the future".

GL "Business growth was not looked at when making the decision to implement our first ERP system. In hindsight, this was the wrong decision. Since then, our company has won large accounts in the UK and Ireland. If we had had the accounts locked in a few months back, I would have given the go-ahead to upgrade. The current system is falling down in its ability to handle multi-currency and multi websites. The company has three web interfaces with the public dealing in USD, EUR and GBP. The current system can only integrate the EUR currency element. Manual entry of USD and GBP transactions is needed, diverting company resources from undertaking more value added tasks. In hindsight, business growth should have given more thought when implementing our initial ERP".

Large companies

PD "Growth is one of the biggest influencing factors. From a scalability point of view, in a lot of cases, a company's current systems often limit them in terms of what services they can offer. For example, vendor managed inventory could be something a company may not be able to do in an older system. This may be fundamental factor in the vision a company sees for itself, so the inability to implement it will inhibit the company's growth prospects. Growth has to be constantly looked at and should be a big influencing factor in the ERP implementation decision".

DF "Ten years ago, the business I currently work for was small. In 2008, it amalgamated with other foreign entities to become a multinational. This implementation was seen as a key external indicator of the company's willingness to grow, extend and be transparent. These are factors that are critical to accessing capital markets and driving down funding costs. Through ERP, a company can also leverage its standard platform across any new acquisitions, which makes ERP attractive to growing companies".

DR For smaller SME's, ERP adoption is often more of a fire fighting exercise than an element of a company's growth strategy. However within larger companies the opposite is true. An ERP system is essential to enable a company be on a level playing field with competitors and allow it to plan for the future through having an IS structure that can grow with it.

PT Ideally, growth should have a big influence on a company's ERP adoption decision, with cost behind it in order of importance. It depends on the pace that a company is growing and how profitable it is. If it is growing fast, growth is a huge influence. A company's decision to implement should be primarily based on

it. The company should then look and see is there an ERP product to fit its business model, at a cost that's right.

e) Key stakeholders?

Small companies

RV "Smaller companies normally do not care what key stakeholders think of the systems they have installed but there are exceptions to this. For example, some companies dealing with customers or vendors will look at electronic data integration (EDI) compatibility, particularly in the retail space. Companies may look at a competitor's website functionality and ERP integration to influence a decision, when it gives competitive advantage such as the ability to order and process these orders automatically to the payment stage".

DD "Stakeholders have some impact on the ERP decision. From our point of view, referrals are very important so positive word-of-mouth comments from customers on the savings made through the ERP will influence other customers to adopt it".

GL Influencing factors are all internally based and external stakeholders are not a major influence.

Large companies

PD Stakeholders such as vendors, customers and shareholders were not a big influence. Competitors more so but again not high compared to all the other factors discussed here.

DF Stakeholders have a very important influence on the decision to adopt ERP, particularly if competitors are investing in ERP. Perception in the marketplace as to what direction a business is going and how much it is are investing in itself is key to

convincing customers to deal with it and goes a long way to securing market share.

DR "Stakeholders have a definite influence. For example, if a pharma supplier is looking for a customer who has the most up to date environment, they will not go for a client without an ERP system. There is a certain risk of doing business with companies using archaic systems. In an area where competition is fierce, having a well organised ERP system can give companies a distinct competitive advantage".

f) Employee experience?

Small companies

RV "Past employee ERP experience is not a big Influencing factor. If there is sole decider, such as the CEO and he wants a particular ERP system because he's worked with it before he will normally get it, irrespective of whether the company needs it or not. Past employees' experience will not be looked at, even where it could be invaluable".

DD Employee experience does not influence the decision to implement ERP. The employee often performs similar tasks on a non ERP system which they will now be doing on a new platform instead. The ERP decision is normally a dictate with no employee involvement.

GL "The financial controller in our company had a strong influence on the ERP adoption decision and decided what system to get in. He will also influence the eventual upgrade decision. He sees that, apart from him, there is no one with the experience and knowledge within the business you could work on testing and implementing it. Even with adequate funding an ERP upgrade cannot happen unless he undertakes it. The decision to adopt ERP was taken by me and the choice of ERP was based on my

financial controller's personal experiences. Subordinates had and will have little or no influence in either the decision to adopt or upgrade the ERP system".

Large companies

PD "If a CFO comes from a company where there is ERP, then they will often want to have it again in their new company. They saw what it looked like and this will influence their decision to use it again. Employees at a lower level in the business will not influence the decision to adopt. The company will look at bandwidth within the business and scale back other projects but employees will not influence the decision at all".

DF "Employee input is rare and only happens at the upper levels of the business. There may have been a lot of thought put into the decision but current employee infrastructure does not form part of that thought process. Companies normally do not have a core competence group prior to an ERP implementation. Instead, they rely on consultants".

DR Employee experience is not looked at in detail within the decision making process and is mainly considered afterwards, at the scoping and blueprinting stages, where employees thoughts and ideas are needed.

PT "The director will not have the ultimate decision on the type of ERP solution but on the concept of putting in ERP, he will be a key decision maker. Other employee experience will not form part of this decision but will influence the timing of when the project is undertaken. Companies do not necessarily have to have a team to undertake an ERP implementation. They can get someone to do it. They will need some availability but if employees are not at hand, they will wait until they have the capability".

5.4 Case Analysis

Introduction

The study looks at using cross-case analysis, which Starke (2013) defines as the "systematic investigation of qualitative similarities and differences of values on theoretically relevant variables across several cases" and looks for patterns or differences to establish outcomes (Horn, 2009).

The findings are analysed for the seven cases explored, being subdivided into large and small companies to establish whether a company's size had a bearing on the factors influencing ERP adoption decisions.

The influencing factors are listed in order of most to least important in line with the format of the summary findings.

Small companies

1. **Who in the company chose ERP as a business solution**?

    - The decision to adopt ERP is always made by the company owner.

2. **Why did they choose ERP?**

    - The decision to implement is normally reactive and based on business difficulties needing urgent attention.
    - The company previous systems are normally archaic and based on multiple non-integrated applications which need constant manual intervention. In some cases, these standalone systems are paper based. Consequently, companies are unable to record and analyse financial and logistical data effectively, which may result in delayed strategic decision making and a loss of revenue.

3. **What influenced their choice (in order of importance)?**

a) **ERP costs:** Budget constraints are a major factor in the decision making process and lack of investment budget as a key limiting factor to ERP adoption.

b) **Other influences:** Data analysis on margin and costs are an important influencer of ERP adoption. Immediate cost savings on ERP adoption is a key influencing factor.

c) **Implementation partners:** The ERP implementer competence and capability is often a key influence. Small companies tend to have people with a thorough knowledge of multiple key business processes. Therefore, implementers can be rigorously apprised in terms of how they sell the ERP solution small companies will not adopt unless implementers knowledge is obvious.

d) **Competitive advantage:** This is considered an influence by companies working in markets where profit margins were tight. In such markets, the ability to cut costs and boost revenues based on real time information to aid decision making is seen as important.

e) **Key Stakeholders:** Key stakeholders, apart from owners, are not judged to have a strong influence. Internal company factors rather than external perceptions are seen as being more influential in ERP adoption decisions.

f) **Projected Growth rates:** Growth is not seen as an influencing factor. In the majority of cases involving small companies, reactionary concerns towards stabilising business processes outweigh any concerns in future-proofing IS capacity to grow in line with the company.

g) **Past employee experience:** Employee ERP experience considered as having minimal influence. The lack of suitable personnel within the manufacturing to test the system was mentioned but overall, experience is overlooked as an influencing factor in the adoption decision.

Large companies

1. **Who in the company chose ERP as a business solution?**

   Either the CFO or CEO is the key decision maker for ERP adoption. There is no sole decision maker as multiple sponsoring parties, such as the CEO and CIO are needed for sign off. However, the CEO or CFO normally exerts more influence on the decision than anyone else. Owners and shareholders will be informed but generally do not form part of the decision.

2. **Why did they choose ERP?**

   The decision to implement ERP is normally not taken in isolation and will often be part of an overall corporate strategy such as Shared Services or a rationalisation programme. Corporate compliance such as Sarbanes Oxley or legal banking regulations can also be a prevalent motive. Real-time analysis of data for margin and cost control is also seen as a key reason.

3. **What influenced their choice (in order of importance)?**

a) **Projected Growth rates:** Business growth is seen as the major a key influencing factor. Companies without ERP can be limited in terms of scaling up what goods and services they can offer. Sending a clear message to the market that a company is investing to compete and grow is important to being perceived in a positive light, attracting funding and customer interest.

b) **Key stakeholders:** External influences such as vendor, customers, government and investment companies have a major influence ERP adoption decision. Proactive modernisation of a company's IS system provides assurance to stakeholders that a company is following a progressive business strategy, proactively employing business controls and mitigating against unforeseeable adverse circumstances.

c) **Competitive advantage:** There was a mixed response on whether this was an influencing factor with larger companies. While interviewees looked at this as a key strategic reason to implement ERP, with the

example given being the ability to potentially capitalise on unforeseeable events, it was broadly not identified as a key influence at the pre-implementation stage.

d) **Other influences:** Cost reduction, while being of strategic importance as a consequence of ERP implementation, is not a key influence in the ERP adoption decision. It is normally looked at after a period of time normally needed to stabilise an ERP system post go live.

e) **Implementation partners:** The implementation partner decision is normally based on a thorough tendering process. Bias towards a particular system or partner based on personality or persuasive ability is not seen as a critical influence. Larger companies will decide to implement and then decide on a partner, normally larger implementers who have proven competence and capability. After the partner decision, a company will normally wait to implement in order to secure a particular partner's services. Implementation partners therefore are not a major influence on ERP adoption in terms of whether to implement but to influence when to implement.

f) **Budget constraints:** Implementation costs are not seen as a major influence on ERP adoption. Once the decision to implement is taken, budget considerations may delay the implementation process but will not lead to its cancellation. The future opportunity costs of non-implementation, such as system or regulatory failures associated with the current IS set up, normally outweighs any present ERP cost considerations.

g) **Past employee ERP experience:** The current availability of suitable business personnel to scope and map legacy data is not considered to be a critical influencing factor. Larger companies will normally have adequate provisions to hire qualified staff and consultants when needed.

6. Evaluation and Conclusion

6.1 Introduction

The first section outlines what the author's expectations were prior to undertaking the research. The second section looks at whether all of the research questions have been answered. The third section takes the findings of the research and looks at whether any conclusions can be drawn from them.

6.2 Expected research results

The author has over twenty years working in the area of ERP systems, primarily working with SAP ERP. This career to date has covered a variety of roles, such as core ERP implementations, data migration mapping, post implementation support and ERP training delivery. However, as outlined in the "Limitations and Scope" section of the study, even though the author had not

been privy to the initial ERP decision process, the author did have some preconceptions about what influenced it.

The author has always been interested in what factors influenced a company to decide to spend, in some cases, several hundred million euro on ERP implementations when over 70% of the ERP implementations do not achieve their estimated benefits (Al-Mashari, 2002).

In relation to ERP adoption influences, the author had expected the following to be borne out by the study, prior to undertaking the research:

1. The primary decision makers would be the owner in small companies and CEO or other boardroom representatives in larger companies.
2. Cost saving through system efficiencies leading to redundancies would be a major influence.
3. Cost would be a major constraint in all ERP projects.
4. ERP implementers would have a key influence on companies' decisions through pitches cleverly marketing the virtues of ERP over legacy systems.
5. Future proofing the system requirements of a company would be a key influence.
6. Key stakeholders would not be an important influence compared to others listed.
7. Past employee experience and ability would be looked at as a key influencing factor.

6.3 Were the research objectives met?

The research objective of the study is to assess whether company size affects the importance Irish companies place on factors influencing ERP adoption. The research objective was met through the author's examination case studies in order to establish summary and detailed findings. The author, through analysing these findings, found that although various Irish companies place different levels of importance on influencing factors when deciding to adopt

ERP, company size consistently has a large bearing on how companies order these influencing factors in terms of importance.

6.4 Conclusion

In conclusion, based on the results of the research, the author has found strong evidence that company size does affect how Irish companies assess the importance of factors influencing an ERP adoption decision.

The study found from the research undertaken that all companies look at ERP as an important capital investment and the decision to adopt ERP is not taken lightly. The grounds behind this decision tend to vary based on the size of company making it. In general, small companies see ERP adoption as more of an operational necessity while large companies tend to see it as a strategic tool towards continued growth and stability. Small companies use ERP to react to situations, and are inhibited by costs in using it earlier than they should. Large companies see costs as less of a worry and focus more on its future potential benefits.

The author found the study concurred with many past articles on ERP adoption. For instance, Thong (2001) found that the lack of financial resources, as well as time and knowledge adversely affects IS implementation and growth. Proudlock et al (1999) describes small management related IS decisions as informal, reactive, opportunistic and intuitive with a day-to-day focus.

The author was surprised by some of the findings of the analysis which ran contrary to his expectations. In particular, past employee experience is seen as having a weak influence in both a small and large company's decision to adopt ERP. The author would have considered it far more pragmatic for companies, irrespective of size, to use existing employee experience more than they currently do. It should be noted, that in some cases, employee influence may be impracticable because of overall corporate sensitivities. ERP decisions may require information that only management is privy to. However,

leaving these considerations aside, the author could see companies gaining employee trust, widening the focus of the overall ERP strategy and improving company loyalty by involving employees more in the initial ERP decision making process.

Perhaps the difference in approach to ERP between small and large companies could be summed up by the thoughts of one interviewee, with ERP implementation experience in both small and large companies, when he observed that “most small companies look at ERP a year later than they should have while most large companies look at ERP a year earlier than they could have”.

References

Akkermans, H.A., Bogerd, P., Yücesan, E. & van Wassenhove, L.N. (2003) ‘The impact of ERP on supply chain management: Exploratory findings from a European Delphi study’. *European Journal of Operational Research*, 146 (2): 284-301.

Alavi, M. & Carlson, P. (1992) ‘A review of MIS research and disciplinary development’. *Journal of Management Information Systems*, 8 (4): 45-62.

Al-Mashari, M. (2002) ‘Enterprise resource planning (ERP) systems: a research agenda’. *Industrial Management & Data Systems*, 103 (1): 165-70.

Al-Mashari, M., Al-Mudimigh, A. & Zairi, M. (2003) ‘Enterprise resource planning: a taxonomy of critical factors’. *European Journal of Operational Research*, 146: 352-64.

Ahmad, M.M. & Cuenca, R.P. (2013) ‘Critical success factors for ERP implementation in SMEs’. *Robotics and Computer Integrated Manufacturing*, 29 (3): 104.

Beheshti, M., Blaylock, B., Henderson, D. & Lollar, J. (2014) ‘Selection and critical success factors in successful ERP implementation’. *Competitiveness Review*, 24 (4): 357-375.

Bernard, H.R. (2002) *Research Methods in Anthropology: Qualitative and quantitative methods*. 3rd ed. California: Alta Mira Press.

Black, I. (2006) 'The presentation of interpretivist research'. *Qualitative Market Research: An international Journal*, 9(4): 319-324.

Buonanno, G., Faverio, P., Pigni, F., Ravarini, A., Sciuto, D. & Tagliavini, M. (2005) 'Factors affecting ERP system adoption'. *Journal of Enterprise Information Management, 18(4): 384-426.*

DiCicco-Bloom, B. & Crabtree, B.F. (2006) 'The qualitative research interview'. *Medical education*, 40(4): 314-321.

Doppelhammer, J., Höppler, T., Kemper, A., Kossmann, D. (1997) 'Database Performance in the Real World: TPC-D and SAP R/3'. *Proceedings of the ACM SIGMOD international conference on Management of Data*: 123–134.

Dong, L. (2000) 'A model for enterprise systems implementation: Top management influences on implementation effectiveness'. *Americas Conference on Information Systems*, 13: 1045-1049.

Gobeli, D.H., Koeing, H.F., Mirsha, C.S. (2002) *Strategic Value Creation*. Greenwich CT: McGraw Hill.

Horn, R. (2009) *Researching and writing dissertations: a complete guide for business and management students.*2nd ed. London: Chartered Institute of Personnel and Development.

Hitt, L.M., Wu, D.J. & Zhou, X. (2002) 'Investment in enterprise resource planning: business impact and productivity measures'. *Journal of Management Information Systems*, 19 (1): 71-98.

Holsapple, C.W. & Sena, M.P. (2005) 'ERP plans and decision-support benefits'. *Decision Support Systems*, 38(4): 575-590.

ISME (2015) *SME Facts & FAQ* [Online]: Available from: http://isme.ie/advice/sme-facts-faq [Accessed 30th July 2015].

Jacobs, F. R. & Bendoly, E. (2003) *Enterprise resource planning: Developments and directions for operations management research*. Amsterdam: Elsevier B.V Johansson.

Jacobs, F. & Weston, F.C. (2007) 'Enterprise resource planning (ERP) - A brief history'. *Journal of Operations Management*, 25(2): 357-363.

B. and Sudzina, F. (2008), 'ERP systems and open source: an initial review and some implications for SMEs'. *Journal of Enterprise Information Management*, 21(6): 649-58.

Johansson, B & Sudzina, F. (2008) 'ERP system implementations: Factors influencing selection of a specific approach?'. *Centre for Applied ICT, Copenhagen Business School.*

Kai, A.O. & Per, S. (2007) "ERP for SMEs – is proprietary software an alternative?". *Business Process Management Journal*, 13(3): 379-89.

Laukkanen, S., Sarpola, S. & Hallikainen, P. (2007) 'Enterprise size matters: objectives and constraints of ERP adoption'. *Journal of Enterprise Information Management,* 20(3): 319-334.

Markelevich, A. & Bell, R. (2006) 'RFID: The Changes It Will Bring'. *Strategic Finance Magazine.*

Markus, M., Axline, S., Petrie, D. & Tanis, S.C. (2000) 'Learning from adopters experiences with ERP: problems encountered and success achieved'. *Journal of Information Technology:* 245-265.

Mingers, J. (2003) 'A classification of the philosophical assumptions of management science methods'. *Journal of the Operational Research Society*, 54: 559–570.

Myers, M.D, (2009) *Qualitative Research in Business & Management*. London: SAGE Publications Inc.

Myers, M.D. & Newman, M. (2007) 'The qualitative interview in IS research: Examining the craft'. *Information and Organization*, 17(1): 2-26.

Nazemi, E., Tarokh, M.J. & Djavanshir, G.R. (2012) 'ERP: a literature survey', *The International Journal of Advanced Manufacturing Technology*, 61(9): 999-1018.

Ng, J.K.C., Ip, W.H. & Lee, T.C. (1999) 'A paradigm for ERP and BPR integration'. *International Journal of Production Research*, 37 (9): 2093–2108.

Prahalad C.K & Krishnan M.S (2008) *The New Age of Innovation, Driving Co-Creating Value through Global Networks*. New York: McGraw Hill.

Proudlock, M.J., Phelps, B. & Gamble, P. (1999) 'IT adoption strategies: best practice guidelines for professional SMEs'. *Journal of Small Business and Enterprise Development*, 6 (4): 240-52.

Ragowsky, A. & Gefen, D. (2004) 'A Multi-Level Approach to Measuring the Benefits of an ERP System in Manufacturing Firms'. *Information Systems Management*, 22(1): 18-25.

Ranganathan, C. & Brown, C.V. (2006) 'ERP Investments and the Market Value of Firms: Toward an Understanding of Influential ERP Project Variables', *Information Systems Research,* 17(2):145-161.

Sambamurthy, V., Bharadwaj, A. & Grover, V. (2003), 'Shaping Agility through Digital Options: Reconceptualising the Role of Information Technology in Contemporary Firms'. *MIS Quarterly*, 27(2).

Saunders, M., Thornhill, A. & Lewis, P. (2012) *Research methods for business students*. 6th ed. Harlow: Financial Times Prentice Hall.

Senn, J.A. (1989) 'Debunking the myths of strategic information systems'. *Business*, 39(4): 43.

Shank, J. K., & Govindarajan, V. (1993). *Strategic cost management: The new tool for competitive advantage*. New York: Free Press.

Shiau, W., Hsu, P. & Wang, J. (2009) 'Development of measures to assess the ERP adoption of small and medium enterprises'. *Journal of Enterprise Information Management*, 22, (1/2): 99-118.

Starke, P. 2013, 'Qualitative Methods for the Study of Policy Diffusion: Challenges and Available Solutions'. *Policy Studies Journal*, 41(4): 561-582.

Subba Rao, S. (2000) 'Enterprise resource planning: Business needs and technologies'. *Industrial Management & Data Systems*, 100(2): 81-88.

Sumner, M. (2000) 'Risk factors in enterprise-wide/ERP projects'. *Journal of Information Technology*, 15(4): 317-327.

Taudes, A., Feurstein, M. & Mild, A. (2000) 'Options Analysis of Software Platform Decisions: A Case Study'. *MIS Quarterly*, 24(2): 227-243.

Thong, J.Y.L. (1999) 'An Integrated Model of Information Systems Adoption in Small Businesses'. *Journal of Management Information Systems*, 15(4), 187-214.

Thong, J.Y.L. (2001) 'Resource constraints and information systems implementation in Singaporean small business'. *Omega*, 29(2): 143-56.

Utecht, K.M., Hayes, R.B. & Okonkwo, P.A. (2004) 'Enterprise resource planning and the competitive advantage: The ease of integrating information between corporate headquarters in the United States and factories in Mexico'. *Competitiveness Review*, 14(1/2): 3-17.

van Everdingen, Y., van Hillegersberg, J. & Waarts, E. (2000) 'ERP adoption by European midsize companies'. *Communications of the ACM*, 43(4): 27-31.

Ward, C.J. (2006) 'ERP: integrating and extending the enterprise'. *The Public Manager*, 35(1): 30-33.

Wilson, J. (2012) *Essentials of business research; a guide to doing your research project*. Portland: Ringgold Inc.

Yin, R.K. (1984) *Case Study Research: Design and Methods*. London: Sage Publications.

Yin, R.K. (2008) *Case study research: design and methods.* 4th ed. London: SAGE Publications.

Appendices

Appendix 1

List of Interview questions

1. Who are the main decision makers in ERP adoption?
2. How will they arrive at the point of deciding on ERP?
3. What are the initial pre-adoption expectations of ERP?
4. What influence has the following on the decision to adopt ERP?

    a. Cost constraints?
    b. Competitive advantage?
    c. Implementation partners?
    d. Projected growth rates of the company?
    e. Key stakeholders?
    f. Past employee ERP experience?

g. Other influences (if any)?

Appendix 2

List of interviewees

PD Head of ERP in an Irish Pharma wholesale company with experience of several business implementations from a business and deployment standpoint. Previous experience within the food, banking and drinks sectors.

DF Currently works as a treasury manager with a large Irish food company. Had a key role in their recent ERP implementation. Previous worked with ERP in the finance division of a consulting company. Last implantation was for a well know hotel chain within Ireland as an in-house consultant.

DR Currently works as a senior ERP manager involved in a wide range of international assignments covering business and IT strategies. Over 20 years of IT business experience as a Project manager, service delivery manager and a solution manager.

PT Management partner with KPMG consulting with companies on best fit ERP strategies at pre-implementation stage. Has previous experience in consultancy companies as a systems integration leader, a managing partner and a public service leader.

RV ERP SAGE implementation manager with over 20 years in SAGE ERP implementation experience within SME's in Ireland, specialising in CRM and Manufacturing areas of the ERP.

DD Owner of one of the biggest hospitality consulting companies in Ireland, providing on-site food and beverage stock and personnel solutions, reporting and business development recommendations and ERP solutions for the hospitality industry.

GL Owner of a toy and multimedia SME sized company and business entrepreneur. The company has experienced rapid growth in the domestic and international markets since its creation two years ago.