EVALUATING THE IMPLEMENTATION OF ERP SYSTEM AND ITS IMPACT ON THE BUSINESS PROCESS: A CASE STUDY ON SIBCA ELECTRONICS LLC.

A Management Research Dissertation submitted in partial fulfilment of the requirements of Cardiff Metropolitan University for the degree of Master of Business Administration 2016-17

Submitted by: Sania Harris

16TH May, 2017
Declaration and Statements

DECLARATION

This work is being submitted in partial fulfilment of the requirements for the degree of MBA and has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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Date: 16th May, 2017

STATEMENT 1

This dissertation is the result of my own work and investigations, except where otherwise stated. Where correction services have been used, the extent and nature of the correction is clearly marked in a footnote(s).

Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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STATEMENT 2

I hereby give consent for my dissertation, if accepted, to be available for photocopying and for inter-library loan, for deposit in Cardiff Metropolitan University’s e-Repository, and that the title and summary may be available to outside organizations.

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I acknowledge that the above named student has regularly attended the planned meetings and actively engaged in the dissertation supervision process. They have provided regular timely draft chapters of the dissertation and followed given guidance.

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Abstract

Enterprise Resource Planning (ERP) systems have taken up a strong role in large organizations worldwide to help collect and process data from any location. Its impacts can be seen in Western countries as well as Middle Eastern countries. In the recent years, they have been trying to establish a strong base in the originations in the UAE. As a fairly new system, many organizations are still venturing into the idea of implementation as it is a highly expensive procedure.

Only little research has been done in the field related to ERP systems. This research aims to fill the research gap by studying the ERP system implemented in a company in Abu Dhabi, UAE. It evaluates the implementation procedure undertaken by Sibca Electronics, a construction firm based in Abu Dhabi. Implementation is the most important area when it comes to adopting a new Information System in the organization. If it is not implemented correctly, it can be a failure from the beginning itself. If it follows the recommended implementation procedure, there is high chance of it becoming a success.

This research reviews the existing literature on the subject to learn the major areas of focus from previously done research to summarize key ideas. Form this, a methodology was formed that identified an approach to answering the research questions. The organization that is studied implemented an ERP system in the year 2016. Required data was collected from the employees of the organization through semi structured interviews and questionnaires based on their experience with the system.

This study proposes that organizational fit, employee satisfaction, correct change management, upfront planning, adequate testing, and strong leadership are critical to a successful implementation of an ERP system. These ideas are compared to the actions taken in Sibca Electronics to justify the implementation process undertaken.
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Chapter 1: Introduction

“Evaluating the implementation of ERP system and its impacts on the business process: A case study on Sibca Electronics LLC”

In this chapter, a brief introduction to the context chosen for dissertation will be given. The background to the research, the research questions, aim, and objectives of the project will be discussed. The methodology will be outlined and justification for the research will be discoursed.

1.1 Background

When an organization starts to grow, the intensity of management gets tougher. The organizational data increases day by day making it hard to contain it. In such a situation, it is very helpful to have an online database that will store data and process it faster and better than a group of individuals can. In the gap of such a requirement in early 1960s, due to the joint efforts of J.I. Case and IBM, Enterprise resource Planning (ERP) took form. It is a process by which a company manages and integrates the important parts of its business. It managers areas such as purchasing, planning, marketing, human resource, finance etc. Its aim is to modernize the business process which requires the reengineering of current business processes (Investopedia.com, 2010).

What began as an application software for planning and scheduling materials soon became the most complex and largest enterprise system that provides cost effectiveness, improved operations, business growth, and support for business processes across the enterprise (Chen, Liang and Hsu, 2014). Many organizations have now taken up the use of ERP to manage their procedures, resources, and several other business activities. As it permits different business functions and assists in flawless transactions and productions, it is now considered a vibrant tool for business success.

![Figure 1.1: Evolution of ERP (Jacob, 2014)](image)

As it is growing and becoming more popular, it is an important factor to consider that although they have been considered a great solution in many organizations, there have
been many negative reports on their success too (Shaul and Tauber, 2013). As expressed, 
the ERP system is very complex with applications designed to solve various business issues 
and needs. According to Amoako-Gyampah (2004), ERP systems help different 
organizations reduce costs, share knowledge and data and improve business process by 
taking advantage of advanced technologies to provide necessary solutions.

Al-Turki (2011) in his exploratory study of ERP implementation in Saudi Arabia noted that 
new technology performed differently in differently developed countries. The successful 
effects of it were not the same as that seen in developed countries for which they were 
initially built. ERP solutions are provided to those organizations in the Middle East to help 
them stay competitive in the global market. The acceptance of the new information 
system in developed countries differ when compared to its acceptance in developing 
countries. Lack of strategic planning, inadequate infrastructure and lack of experience 
cause the establishment of these systems to struggle. Despite huge investments in this 
area, ERP systems fail in many organizations. This shows that the benefits of having an 
ERP system partially depends on how it is accepted by the end users; employees. The 
originally expected results are most often not seen after their implementation. This is 
mainly due to the users lack of understanding of what is expected of them (Abuqabah and 
Sanzogni, 2014). Cultural differences were also noted as a factor that determined ERP 
success or failure in an organization. An ERP system used in one region may be successful 
in one region but fail in another. It is also worthy to note that no wide study has been 
conducted on those factors that that influence ERP success in different regions.

1.2 Rationale

Be it big or small, changes are often very unwelcome in most situations. All sorts of 
changes are perceived to have repercussions. Even though this is understood, it is also a 
fact that organizations that do not change according to the demands of time stay stagnant 
and outdated. They do not grow as expected. In fact, they become very vulnerable and 
easily replaced by other organizations that have welcomed change and innovation. 
Kodak, Motorola, and Sony are a few of such organizations that suffered and stunted due 
to lack of innovation in their organization. (Newman and Stephenson, 2010).

The introduction of new technology to replace the existing well used systems in an 
anorganization is a tedious task. An introduction as such is often faced with issues such as 
resistance from the end user in adapting to the new technology, inadequate 
requirements, and lack of support from the management (Salim, Suleiman and Salisu, 
2015). Most employees don’t understand the use of the ERP system or its value to them. 
This is noted as a key issue by Ramdani (2012). The success or failure of ERP can be 
influenced by its end users (Koch, 2011). Despite the literature that is available on ERP 
systems, there is a lack of investigation in the success of ERP system from user’s 
perspectives (Kwak et al., 2012).

In the past researches conducted on the subject of ERP success, the focus has always been 
on developed countries. But many developing countries such as those in the Middle East
have expressed their interest in achieving ERP success in their organizations. This research explores the area of individual level analysis to understand factors that influence ERP users in a company in the Middle East. An understanding of those factors that impact ERP users is central for its success. As most of the research has been done in developed countries, this research is being done in Sibca Electronics, an engineering company in Abu Dhabi, UAE in order to bridge the gap in the ERP research field.

Sibca Electronics LLC is a company that started in 1977. Throughout the years, it has grown to become one of the leading Fire Safety, Security, Building Management and ELV systems solutions provider in the Middle East. More than 600 staff employees from different countries work under this company. They are spread across the branches of Abu Dhabi, Dubai, Al Ain, the Northern Emirates and Bahrain. With a strong reputation over the years, Sibca is now known for their leading technology, customer service and support. The company has partnered with technological leaders such as Tyco, ABB, and Honeywell to deliver some of the most innovative and complicated building system integrations in the UAE and Bahrain (sibca.com. 2015). Currently, they have implemented an Oracle based ERP system that has functions in human resource, finance, sales, and inventory. It was implemented over the period of 6 months during which an outsourced group of implementers were brought in to help in change management. In the current stage, the ERP has been implemented for over a year. It is still being functioned to determine if the company will reap benefits due to it.

1.3 Research aim and objectives

The purpose of this research is to bridge the research gap in ERP implementation in Abu Dhabi by narrowing the scope to an engineering company. This research resolves to critically evaluate the effectiveness of ERP in a medium sized organization. The success or failure of the ERP established in the organization will be identified and the factors behind it acknowledged.

The idea behind this is to understand if the organization has benefited from establishing such an expensive software. If so, the outcomes will be analyzed and the employee satisfaction taken into account to understand the success or failure of ERP system in an organization.

The following is the aim of this research:

“To evaluate the process of implementation of ERP system in Sibca Electronics.”

The following are the objectives this research will try to meet;
1. To assess the satisfaction level of employees with the ERP system in the chosen organization.
2. To evaluate the benefits (or lack of) of the implemented ERP system.
3. To evaluate if the process of implementation followed by Sibca will lead to its success.

1.4 Relevance and significance

ERP system implementation has brought about many success stories. However, it is estimated that there is up to 70% failure in establishing ERP systems (Iskanius, 2010). At such an alarming rate, it is clear that establishing an ERP system successfully is a complex and time-consuming task. In many researches, it can be clearly seen that many organizations that have adopted ERP systems have not gone forth to extend or fully utilize their system to cultivate success (Chao Peng and Baptista Nunes, 2009; Zhu et al., 2010). It was identified that employees as the end users play a vital role in the success of any organization. It is therefore important to identify those factors that have a large impact on users in the ERP environment and understand them clearly.

With reference to the above, the results obtained from this study could be helpful for the chosen organization to understand the factors that influence the ERP end users. By understanding the significance of end users in ERP success, this research can help place emphasis on those leading issues that are faced by end users at the time of ERP implementation (Hsu, Lai and Weng, 2008).

1.5 Summary

This chapter gave an introduction to the research by explaining the important aspects of the research. The evolution of the ERP system that is used now was discussed. This will help form the base of the research as the next chapters would go into depth of its uses, critical success factors, failure factors, benefits, and so on. The company introduced here will be the one on which the case study will be conducted. Chapter 2; Literature review will go into more details by referring and reviewing the literature related to it. It will then proceed with Chapter 3; methodology where the chosen methodology for the research study will be reviewed. This will then be followed by Chapter 4; findings and discussions where the quantitative and qualitative data collected will be explained in detail. The final chapter, Chapter 5 will be on the results achieved with the research study. It will conclude the research and answer all the questions that are raised throughout the research. It will justify the research question and the objectives set. The following chapter, Chapter 2, on literature review will act as a secondary data on which the research study will be compared with.
Chapter 2: Literature Review

2.1 Overview

This section will provide an overview of Enterprise resource Planning systems, the process of their implementation, and their impacts to the organization. It will also provide an overview of those literature on ERP systems, their process and evaluation. The main aim in this chapter is to discuss and review the literature related to ERP implementation and their effects in the Middle East.

2.2 ERP History and benefits

The currently known ERP systems have developed out of 2 systems that had emerged in the 1960s known as Materials Requirement Planning and Manufacturing Resource Planning (Kalakota and Robinson, 2001). Both of these systems were used to control inventory, manage production, evaluate production environment and make adjustments based on different conditions. The development of these systems and their coordination and integration techniques and tools made the development of ERP systems possible (Bedworth and Bailey, 1987). It began to be developed by companies like Oracle, SAP and such others. ERP can be defined as a program that has the ability to provide solutions to multiple corporate functions such as finance, human resources, manufacturing, sales management of materials etc. all in one unified database (Davenport, 2000).

Figure 2.1: Benefits of ERP (VanPutte, 2015)

The benefits of the ERP, as per Zeng, Lu and Skibniewski, (2012) can be classified into the following dimensions:

- **Operational benefits**: Cost, performance, quality and cycle time can all be benefitted through ERP. The interaction between different business functions and information can be improved (Alsalem, 2008). The quality of information increases and the time taken to complete tasks are reduced by a large extent (Payne, 2002).
- **Intangible benefits**: Johansson (2012) identified intangible benefits due to ERP implementation such as increased flexibility, better customer satisfaction,
improved resource utility, and improvement in accuracy and better decision making ability.

- **Managerial benefits**: Planning and decision making of managers can be improved by ERP systems.
- **Strategic benefits**: Businesses can grow and have innovations with the help of ERP.
- **IT infrastructure benefits**: If any changes are to occur in the current scenario or in the future, the ERP system can provide flexibility to balance them.
- **Organizational benefits**: ERP system can effectively bring a common vision and idea to empower the employees.

Despite these benefits states above, many researches have concluded that many organizations have been unable to make use of the ERP systems successfully (Chao Peng and Baptista Nunes, 2009).

**2.3 ERP System evaluation**

In a strictly theoretical viewpoint, a firm may enjoy new opportunities and positive changes in the business strategy due to the implementation of ERP systems. But it has to be noted that even though an ERP system is implemented, it needs to make adjustments, integrate its flow of information, and reconfigure itself and the business process on a continual basis because the market is constantly changing and technology is developing (Teece et al., 1997).

In order to have a successful ERP implementation, there should be a transition from an inflexible, production oriented organization to a knowledge based and lean business (Law and Ngai, 2007). Business processes should provide training programs and incorporate corresponding operating procedures and other information technologies during the transformation of business in order to support the new organizational structure being built. Aptly implementing the ERP system would result in improving the firm’s performance by restructuring the business process and expanding the information accessibility (Chung et al., 2007; Wier et al., 2007).

There have been limited studies conducted in this field with most of them focusing on single cases where ERP was implemented in those organizations. Moreover, the rest of the studies were based on one or two successfully implementations only which did not lead to concrete evidence as to what leads to a successful ERP implementation.

**2.4 Critical Success Factors**

In a research by Motwani et al. (2002) on a case study of two companies where one had a successful implementation while the other had an unsuccessful implementation of ERP system, it was concluded that ERP can be successful only in an environment that is cautious, evolutionary, careful about change management and works on network relationships and changes in culture. It could be troublesome if the top management does not use or
understand proper change management techniques (Motwani et al., 2002). Ashja et al. (2013) also identified those same factors as vital to success.

According to Mabert, Soni and Venkataramanan (2003), there are some focus points to be noted for a successful implementation or ERP. The companies under their case study stressed that planning upfront is key. This gives a better understanding of the costs and time involved. In regards to modifications to the ERP source code, it will be mandatory but it has to be kept at minimum else the complexity would increase. Olhager and Selldin (2003) also agrees with these focus points as they found high success rates of ERP implementation in Swedish companies. Al Al-Mashari (2003) on the other hand specifies that leadership and commitment is the biggest pre-requisite as that was most noted in those companies which successfully employed the ERP system. In a case study done on Rolls-Royce by Yusuf et al. (2004), they noted a few reasons why the implementation of a complex ERP system was successful in an organization of such great size. The Rolls-Royce management worked on training their senior management who controlled the overall direction the company took. They also developed better relationships with their employees which lead them to strive for a common goal. They gave simulation exercises that helped understand the system before it was established. Transactional training was offered and communication channels were made better (Yusuf, Gunasekaran and Abthorpe, 2004). Somers and Nelson (2004) conducted studies on 86 organizations to understand those success factors. There are many successful cases of ERP installation in USA. Their experience should be understood by those developing countries in their pursuit of the same (Ngai, Law and Wat, 2008).

2.4.1 Factors to be an organizational fit

Marius and Ashok (1996) also hypothesized that the implemented ERP should be fit to the user organization for it to work smoothly. It cannot be common for all types of organizations. ERP researchers Gattiker and Goodhue (2000) suggests that dependence of sub-units among themselves allow a better fit of ERP with global operation needs while differentiation among them gives rise to a poor fit of ERP with local operation needs. Misfit of ERP branches out of specific organization requirements that don’t match with the capabilities of the ERP (Soh et al., 2000). The interests and requirements of the organization and the ERP vendor should not conflict (Swan et al., 1999). The concept of organizational fit is therefore considered vital to the success of ERP systems in a diverse environment (Hong and Kim, 2002). All these critical success factors were discussed in Rockhart’s (1979) influential work where he states that these factors are those conditions that have to be met with without fail. Lee and Kim (2016) did a latest examination in this field to understand the effects of the organization of ERP success. Different sectors were observed to comprehend the impact. The Aluminum Company (ALCOA) is an example of a company that successfully implemented ERP system in their organization in 2001. They have successfully implemented modules including financial management, business process management and human resource management. Their branches in different parts of the world have also implemented ERP according to their diverse culture and organizational requirement (Modernenterprisemanagement.blogspot.ae, 2011).
2.4.2 Expectations of a successful ERP

There have been no proper basis formed for the sure success or failure of ERP system. To have an understanding of the outcome, we can adopt the identification method of Kamhawi (2007) where he uses three approaches to outcome; focus on the project to check if ERP project is done under set time and cost (Hong and Kim, 2002), focus on its impact on the organization such as improvements in quality, time and cost (Umble and Umble, 2002), and focus on user satisfaction (Wu and Wang, 2007). At the time of ERP implementation, there are some expectations on the results that could be achieved. It would help in adding new systems (Kripaa, 2013) and improve reporting methods between departments (Al Salem, 2015). The data quality is expected to be improved and the cost of operations eliminated or reduced significantly (Ragan et al., 2011). If implemented correctly, it is anticipated to improve the customer relationship management. It would also improve data access across the organization and improve the supply chain management. It is expected to reduce the complications that is generally faced (Kripaa, 2013). These effects are measured by comparing the revenue and cost budgets of two or more years (Lech, 2013).

2.5 ERP System implementation failure factors

Even though ERP system is quite popular around the world, the failure of its implementation still remains very high (Chen et al., 2009). According to reports, the failure rate is as high as 80% (Calogero, 2000). Another survey reveals that 70% of implemented ERP systems do not deliver the anticipated results (Wang et al., 2007). Some surveys claim that failure of ERP systems cannot be foreseen and their success can never be guaranteed even in the best situations (Liao et al., 2007). Some well-known companies like FoxMeyer, Hershey, and Nike etc. all have reports of failed ERP systems. ERP failures could even lead to bankruptcy or interruption of core operations (Khaparde, 2012).

An easier method to assess ERP systems implementation is by going through the literature on IS (Information System) success and failure. Though outdated works of literature, it is still relevant to how a system is installed in an organization. A 1987 publication of Lyttinen and Hirschheim provides a general literature on the failure of IS. And specific literature on their failure in developing countries can be found in a 1996 work by Beeharry and Schneider. They are very helpful in building knowledge and determining the reasons for failure of ERP systems. However, they have been criticized as to not take into account the different scenarios under which the systems are implemented (Montealegre, 1999). The central idea to most of these literature is the idea of ‘fit’. That is, the ERP system fails mainly due to its degree of mismatch with the organization (Hawari and Heeks, 2010). In a work by Leavitt (1965), he focuses on understanding the fit between the IS and the people using it, the structure it is based on and the process it undergoes. Another work focuses on the fit between the assumptions and expectations of the stakeholders (Orlikowski and Gash, 1994). The main focus that is important to this research is on the fit between the IS and the organizational setting into which the system is introduced (Pliskin, 1993). It can be conceded into five dimensions where
this fit or misfit may occur; user competency, organizational culture, structure, politics and other contextual factors. While the ideas may be transcribed in the setting up of ERP system, it may mismatch in the reality of the organization where it is implemented (Akrich, 1992).

The available literature on failure of ERP systems in the developing countries simple explain failure in terms on lack of sufficient skills, lack of technology, lack of money, resistance from users, and other cultural issues (Dezdar and Ainin, 2011; Bitsini, 2015; Dantes and Hasibuan, 2010). On a better focus of the issue at hand, the main reason of failure of ERP in a developing country is the mismatch between the ERP system and the Client culture (Hong and Kim, 2002). Heeks (2002) divided the outcome of ERP systems into three. The first one is ‘total failure’ where the implemented system is immediately abandoned or never implemented. The second one is ‘partial failure’ where major goals are unattained or where there are many undesirable outcomes. The final outcome is ‘success’ where major goals are attained and insignificant undesirable outcomes are experienced (Anikin, 2013). Based on the theory by Heeks (2002), Gargeya and Brady (2005) classified ERP failure into two levels: complete failure and partial failure. Partial failure is achieved where the organizations has increased implementation costs more than estimated and the determined goals are not achieved (Kumar et al., 2003).

2.6 ERP implementation in the Middle East

ERP is relatively new to SMEs in construction industries in the UAE. The industry used to be less focused on growth in technology as information was easily manageable. As the companies have grown bigger and wider across the emirates, many companies have now incorporated ERP systems in their companies. The companies in this sector is only in the beginning stages of learning. As it is a large scale implementation, the failure rates are relatively high. This can easily be scaled back to errors during implementation (Ang, Sum and Chung, 1995).

Some key methods have to be followed to ensure ERP is implemented properly (Somers and Nelson, 2004). Most of the literature focuses on training end users and increasing their knowledge in the ERP applications (Nelson and Cheney, 1987). Lack of training is responsible for most of the ERP issues and their failure (Brenner, 2000). Use expectations should be held at a reasonable limit as oversold ERP systems may fail to meet their expectations. This would affect their positive contributions to the organization (Ginzberg, 1981). Successful implementations of ERP systems are the result of minimal customizations as they increase cost and time and decreases their benefits if not done correctly (Hamraz et al., 2013).

Sun et al. (2015) discusses different stages of ERP implementation. The first stage of implementation is to ensure that the organization is prepared and prepped to accept such a critical software. The management and resources should be evaluated and assigned (Ahmadi et al., 2015). The second stage is ERP selection. The company evaluates different ERP packages and partners. The best fit to the organizational need is selected for implementation (Haddara, 2014). The third stage is the main stage where ERP implementation takes place. The business process is redesigned and the software is tweaked to meet desired
requirements. System configuration, testing and installation are conducted (Boltena and Gomez, 2012). The fourth stage is the final preparation stage where the ERP is ready for a live-run. Stress tests and disaster recovery tests are performed in this stage (Talmi and Barnacle, 2016). The final stage is one in which the system is given a live-run to collect customer feedback. Performance is measured and output is noted in this stage to understand the possible benefits of the system (Maheshwari et al., 2010).

The major reason for developing countries in the Middle East to adopt ERP systems is to be in par with the economic expansion happening worldwide. Secondly, it is to compete with those Western corporations who put up great pressure and fiercer competitions for those in developing countries. Inadequacy of Information Technology, lack of experience, government policies, etc. seriously affect the implementation of ERP in these countries (Huang and Palvia, 2001).

In a review of 22 ERP projects that were implemented in the United Arab Emirates (UAE) till 2004, three main training approaches were identified to ensure a smooth implementation. These were organizations in the Oil and Gas field which was major in the UAE, and some Utility and Manufacturing industries. They have used either the traditional HRD approach, the ERP methodology prescribed approach or an integrated ERP end-user characterization based competency building approach (Mouakket, 2012). Some of the companies in UAE that have established ERP systems are Hidayath Group of companies, MITTICO, and JRD International (Datadubai.com, 2014).

A work by O’Connor and Dodd (2000) focuses on the construction industry and the delivery of ERP system in that field specifically. They concluded through a survey that there were diverse functional, technical and usability issues that were prominent in the ERP systems examined. The designers of these systems have to take into consideration the work process of engineering and construction industry and the complexity of it for the broad product acceptance (Wen-sheng and Zhi-chao, 2013). Another related study based on the same industry focused on those companies where ERP systems were in place. Many barriers were found at the stage of their implementation in these firms such as financial capital, and human and technical resources (Ehie and Madsen, 2005).

An investigation was undertaken by Newman and Zhao (2008) on the development of ERP systems and their effective implementation for material management in the construction industry. This study focused on benefits achieved through ERP such as reduction in manpower to perform tasks and avoiding redundant entry of data thus effectively reducing the procurement cycle. Shi and Halpin (2003) found that internet based ERP system has the potential to achieve construction enterprise-wide business automation. They tried implementing a Construction Enterprise Resources Planning (CERP) that is specific for construction companies. But it was unrealistic for a company that desired a quick and successful implementation. Mature ERP systems are best for most companies as they require technical support for long (Yang, Wu and Tsai, 2007).
ERP implementation in the construction industry based on a case study is sparsely researched. A case study based on three Dutch based construction firms establishes that ERP system is the right step for those businesses changing their business strategy and expanding into other market segments (Voordijk et al., 2003).

2.7 Case study description

The company studied in this research is Sibca Electronics LLC. It is a construction company in Abu Dhabi, UAE that was established in the 1970s. It now has a staff count of about 700. In the UAE construction industry, this company was ranked among the top 20 engineering and construction firms as per their annual revenue (Dubai Travel Guide, 2016). The type of projects undertaken by this company in the recent years include housing, infrastructure, hi-tech building and mass transit project (Protenders.com, 2016).

This company had previously run on a home grown ERP system that catered to the immediate needs of the employees. It facilitated independent management of activities internally as well as externally to a limit. Despite being outdated, it achieved the purpose of collecting data and sharing information among the stakeholders. It met the basic construction requirements of the organization and its management. Due to the demand and requirement of a more accurate information for the higher management and their clients, the company decided to evaluate whether there was an actual need for implementation of ERP system to enhance their IT capability.

Before the implementation of a new ERP system, the company developed an implementation plan that was divided into 3 phases. It included self-evaluation to understand the feasibility of implementation, evaluation of the new ERP system software, and finally the ERP contract negotiation. They formed a task force to deal with the activities related to ERP implementation that carried out a self-evaluation to determine if this system was required in the organization. After evaluation, a contract was given to an ERP implementation company who then formed a team and implemented the ERP system in the company.

2.8 Summary

The literature reviewed above explains the critical success factors that can assure the success of an ERP system. It mentions the history of the ERP system and its slow but steady influence on organizations everywhere. It reviews the benefits that can be achieved by implementing it in an organization. It also wholly evaluates the ERP system and its defining factors. It gives a detailed review of those factors that can lead to the failure of the system if it is not implemented in the right way. It also reviews ERP systems implementation in the Middle East and discusses the case study that has been chosen. This data that has been collected will be stored as secondary data that will further be used in Chapter 4 which discusses the findings of the research. This data will be used to compare with the data collected from the selected sample size. The next chapter, Chapter 3: Methodology, will go into detail on how the sample size is selected. It will also describe the methods and techniques followed to collect the required data.
Chapter 3: Research Methodology

3.1 Introduction

“Methodology of a research is the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice of methods to the desired outcomes” (Crotty, 1998). This chapter focuses on outlining the research methods used and justifies their use. The selection of research methodology is very important as the aims and objectives mentioned in the first chapter of this research is supported by this. This chapter then goes into further details about the adopted methods and how they were used to collect data.

3.2 Research philosophy

According to Baroudi and Orlikowski (1989), there are three underlying epistemologies on which the IS philosophical foundations rely on. They are, positivist, interpretative, and critical traditions.

**Positivism**: They are premised on the existence if relationships within phenomena which are typically investigated using structured instrumentation (Bani Hani, 2013). It is a scientific approach that employs a “social science theoretical lens” (Zhang and Creswell, 2013). It is founded on the idea that credible data can only be based on that phenomena that can be observed. This is the dominant epistemology in the field of IS research (Baroudi and Orlikowski, 1989).

**Interpretivism**: This philosophy is used during interviews. This is employed when research is conducted on human beings rather than objects. This is based on the idea that people create ideas and associate meanings as they interact with the environment surrounding them. (Baroudi and Orlikowski, 1989).

**Critical Studies**: This study pretends to critique the current situation by looking at the structural contradictions that are found in social systems.

This research comes under the Orlikowski’s philosophy of positivism as it emphasizes on testing relationships between data using quantifiable variables collected from a sample of a population.

3.3 Research purpose

The purpose of an academic study can be divided into three types; namely exploratory, explanatory, or descriptive (Lucas, 2006).

- **Exploratory studies** are useful if the academic study demands understanding of problems or scenarios (Saunders, 2000). It is described as a method of investigating and finding out what is happening, asking questions, seeking new ideas and assessing the whole situation in a new light (Robson, 2009).
• **Descriptive studies** are suitable for portraying events, situations, and processes. It is also used where the problems at hand have a clear structure but the research intention is not to find the connection between causes and symptoms.

• **Explanatory studies** are appropriate where a relationship between variable have to be established.

The purpose of this research leans towards exploratory as I wish to evaluate the ERP system implemented in comparison to the critical success factors in order to understand the success or failure of ERP system in the selected case study. It would also be partly descriptive in nature for it to give a clear picture of the phenomena on which data is collected prior to collection of data and the research purpose. It also partially falls under explanatory as it sometimes examines situations and problems to explain the relationships between different variables.

### 3.4 Research approach

A qualitative research heavily relies on the detailed and systematic description of events taking place and people involved. They are best effective in small scale studies such as the undertaken one due to its capability to understand situations or problems at a different light (Travers, 2006). With regards to that, the best mode of approach for this study is qualitative approach. The main aim of this study is to understand the effects of the ERP system that was implemented and compare them with the theory of successful implementations. As I do not wish to make generalizations, using this technique to hold a small scale study, I can investigate the variables included in depth. This would help provide a better understanding of my research area.

At the same time, a quantitative research approach would also benefit the research study as it would give a numerical weight to the values. This would help weigh the answers at the end to determine the answers for the questions and help achieve the research aim.

### 3.5 Research strategy

Case study is defined by Robson and Dunk (1999) as the “development of detailed, intensive knowledge about a single ‘case’, or a small number of related ‘cases’”. This strategy, according to Morris and Wood (1991), will be interesting to those that would like to gain a better understanding of the research context and the process being enacted. Case studies contribute to producing unique information in relation to generalized data generation. It takes into consideration the individual, social, organizational and, political occurrences and allows the researcher to retain the meaningful characteristics of real life events like an organization’s life cycles and managerial processes. This research approach also has the ability to generate answers to questions such as ‘what’, ‘how’, and ‘why’ (Robson and Dunk, 1999). It also helps explore existing theory and situations. If the case study is simple and well-constructed, it could even challenge existing theories and provide a scope for new hypothesis. The case study can either be a single case study like the one in this research or a multiple case study. This case study investigates only one entity. It
has the potential of investigating either an industry, a company or even a district. But only a multiple case study can help research two or more entities and compare the results, thus increasing the validity of the research.

This study is conducted on the pursuit of finding information to questions such as ‘how’, ‘what’ and ‘why’ in relation to a single company. I want to collect data and analyze them in order to compare them with existing theories and find differences if any between my case study and the effect found in the literature.

Figure 3.1: Research strategy

3.6 Data collection and analysis

According to Wang (2015), the best source for case study is through interviews. Both telephonic and personal interviews can be used as strong techniques. This technique helps gather valid information that can be relied upon and are applicable to the research questions and objectives (Saunders, 2000). Structured interviews are those that use sets of questions that are predetermined, and standardized or identical.

In semi structured interviews, there will be a list of questions based on a particular theme to be covered. They may vary from one interview to another. Some questions may be omitted in some interviews according to their context and level of experience or knowledge available. The order in which the questions are asked are also shuffled according to the conversation flow. Some interviews require additional questions to go into depth of the research. The data is generally collected by means of note taking or tape recording.
For this research, due to the requirement of understanding the ‘what’ and ‘how’ questions, I have chosen to conduct semi-structured interviews. I have formed a framework for the discussion. There are a set of certain questions that should be answered to obtain relevant data. Furthermore, the interview will be open ended in such a way that it is flexible, informal, and has room for additional information that may come up. The data is collected by means of note taking.

The other method I chose for primary data collection is questionnaire that will be emailed to the participants. Unlike the interview, it is a predetermined set of questions that do not differ person to person. It is a combination of closed questions and statements that can be cumulated to form the quantitative analysis. The participants will be able to mark their answers on the basis of yes/no, agree/disagree for direct questions and ranking by Semantic or Likert scale for statements. This forms the positivistic deductive approach of the research.

The combination of semi-structured interview with questionnaire will bring forth a well-rounded study with both quantitative data analysis as well as qualitative data analysis.

Secondary data has already been collected from various available sources such as reference books, journals, newspaper articles, internet etc. and discussed in Chapter 2: Literature Review. This data will be used to structure the findings in Chapter 4.

3.7 Sampling strategy

Sampling techniques are used to reduce the amount of data that has to be collected by considering only that data from a group rather than from all the possible cases (Saunders, 2000). Purposive sampling, also known as judgmental sampling is a non-probability sampling method where the researcher selects those cases that seem to be suitable for the research questions.

I have chosen this sampling method to be used in this research as it works best in case studies where the population is less and the researcher wants only those that are particularly informative. The people selected in the sample are those that have completed one year or more in the company selected for the case study. This is based on the reasoning that it takes at least 6 months to understand and be used to an Information System.

In order to generate sufficient data and a sample that can representation the data, all the employees with over 1 year experience will be considered for the questionnaire survey. With the case study in mind, the population would come up to 300 people. Out of the group, I will randomly select 30 people for the questionnaire. I will mail the questionnaire to 35 people with the expectation that not everyone would respond. The first 30 I receive on time will be selected as data.
For the requirement of interviews, a sample size of 8 employees would be selected from every main department in Sibca Electronics with the same eligibility requirements. My rationale for this selection is that by doing so, I can understand the common themes and patterns. These 8 people will be asked about their interest to participate and will be allowed the chance to set the time and location for the interview. The data collected will help me to further build the aim and objectives of the survey and interviews.

3.8 Pilot and limitations

Once the questionnaire was set, it was given to 2 employees of the chosen organization who were not eligible for participating in the research. They completed the survey in less than 15 minutes and submitted the full response. They provided their opinion about the questionnaire in order to make it better. They suggested a few change of words in a few questions to make the questionnaire more professional. They found it easy and not time consuming. They agreed it would collect the required response for the research study.

The interview questions that were set was piloted with a friend of the researcher who works in the same organization but is not eligible for the interview. The interview took up to 30 minutes as each question went into detail. The pilot interviewee provided valuable opinions to make the interview more comfortable such as use of better words and prevention of emotional questions.

A few limitations were faced at the time of data collection. Firstly, there isn’t enough resources to interview a preferable number of people. Due to this limitation, the research has reduced it to a sample size of 8 people. It is still unsure if they will all be present for the interview within the time frame available. The second limitation is therefore the time limit available. Due to the short period in which the research has to be completed, the collection of data had to be reduced with respect to the time required to sort and analyze it. Another limitation faced for interviews was the availability of significant financial data. It was either too sensitive or not available to be used for this research.

3.9 Reliability and validity

Considering the validity and reliability of data collected will help reduce the risk of collecting incorrect data for the research questions (Aven and Heide, 2009).

3.9.1 Validity

Validity is the level of fitness of data collected after observation and the basis on which it has been made. It is concerned with ensuring that the results achieved are as they appear to be (Saunders, 2000). There are three validity tests that can be used according to Yin (2003).

- Construct Validity
- Internal Validity
- External Validity
According to Yin (2003), Construct validity test has to be performed to ensure the data collected in this research is valid. It used three tactics: use of multiple sources of evidence, establishment of chain of evidence, review of draft case by key informants (Yin, 2003). In this research, I have relied on interviews I have personally conducted and internal documents as sources of evidence. These documents are not used in the analysis and are only used as complimentary sources of information. I have established a chain of evidence by making reference to all the sources from which the evidence has been collected. The interviews were conducted in Malayalam and then translated to English. This would increase the risk of error during interpretation. But the interviewees would have misunderstood my questions if it were in any other language and would have found it hard to communicate freely. Their answers were written down and rechecked to ensure there were no errors in the data. The questionnaires only have answers to be ticked and therefore the ability of data being invalid is minute.

3.9.2 Reliability
Reliability tests are done to ensure that if this research were to be repeated by someone else, the results achieved would be the same. However, it has to be ensured that the researcher does the exact same research with the same methods of investigation rather than a similar case study. The ultimate goal is to minimize errors and biases that may occur during the research (Yin, 2003).

One factor that affects reliability is the lack of knowledge of the respondent. If they are tired or stressed, they might give a negative impact on the reliability of the study. To avoid this, I have selected the best respondents with the best knowledge of the issue at hand for the interview. They are well experienced in the case at hand and can give a knowledgeable response. Also, the time for interview was scheduled by the respondent to ensure that they are free and not stressed at the time. During the interview, I received the impression that none of them were stressed and all were very relaxed. For those that took part in the questionnaire, the data collected from them were of little weight. They are all employees of the company with exposure to the same ERP system. Therefore, their information can also be relied upon.

3.9.3 Ethical considerations
The organization in the case study has been informed and updated on a regular basis about the proceeds of the research. The individuals participating in the interviews and questionnaires are doing so voluntarily. All the participants were sent a letter and a participant information sheet (attached in Appendix) explaining the research, its nature and purpose and the extent of their involvement in it. Their right to withdraw from cooperation were also informed. All participants have given their consent in the form of a consent form following the university ethical protocol. The participants were assured that their contributions would be
confidential and presented anonymously. Cardiff Metropolitan University Ethics Committee approved this study granting the approval number 2016D0476.

3.10 Summary

This chapter makes reference to the literature reviewed in chapter 2, assesses the methodological considerations and also identifies the reasons for choosing the positivism philosophical approach. This chapter also discusses the research strategy planned and the appropriate research methods selected. The ethical considerations are discussed according to the proposed research question. The methodology therefore shapes the research study leading to the next chapter, namely, findings and conclusions.
Chapter 4: Findings and discussions

4.1 Introduction

This chapter presents the findings that have been derived from the research that has been conducted as explained in the methodology chapter. The data discovered with relation to the research objectives has been presented as data findings. The qualitative data derived from the semi structured interviews held contribute to the construction of thoughts as to why the findings are as they are. This chapter is structured to present data findings related to ERP implementation, its failure or success in the case study, the benefits of implementation, and its effect on employees and business work flow.

As the chosen method for research is case study, this research has focused only on Sibca Electronics LLC to participate in this research. After the ethics confirmation, the following is the breakdown of people that were surveyed and interviewed.

4.2 Quantitative data analysis

Quantitative data analysis is a systematic approach where data is collected and is then transformed into numeric data as per the requirements. It helps describe an event by answering questions such as ‘what’ and ‘how many’. It measures or counts attributes. Such an analysis is concerned with finding evidence that either supports or contradicts an idea that has been made.

In this research, quantitate data analysis is very important as it allows for a better accuracy of results.

As research in the field of ERP implementation is quite less, data analysis as such allows for a broader study easily, involved a greater number of respondents and reduces the generalization of results. This research involves few variable but many respondents to ensure the results are valid and reliable. Another great benefit of using quantitative analysis is that it can be used for further studies easily as it follows a standard mean. It makes it easier to summarize a large group of data and enhance comparisons across categories and over time.

On the other hand, there are a few disadvantages of using this form of data analysis. The results are generally very limited in such a way that it does not provide detailed analysis of why it happened or how. It does not bring to light the human perception in it. It may not reflect how people really feel about something. In many cases, it is just the closest match. Keeping these points in mind, I have used the quantitative data analysis technique to analyze the data I have collected through the method of survey through questionnaires.

4.2.1 Questionnaire design

Questionnaires are a form of written interview that can be carried out by mail, telephone or face to face. It is comparatively a cheaper way to obtain large amounts of data quickly
and efficiently. The researcher does not have to be present at the time of data collection which makes it time productive. The problem often seen is that the respondents may lie in the questionnaire to look good. To avoid that, the questionnaire used in this research requests the respondents to be anonymous.

The questionnaire prepared for this research contains a total of 20 questions. Out of which, 10 questions were given distinctive points according to their relevance. These 10 questions were then weighed and totaled to understand the average at which the response regarding ERP implementation is at. This will be detailed in section 4.2.6. The questionnaire includes 4 focus points that are important to this research. The first 3 questions are general. They collect information about the respondent by ensuring their anonymity. The next two questions focus on the topic ‘change’ and its relevance in the organization. It discusses about the training received prior to implementation of ERP and employee resistance to change. The next set of questions focus on the restructure of business processes. It discusses the effects the new ERP system has had on their work flow and completion of projects. It also talks about its influence on the working culture in the organization post implementation. The majority of the questions focus on the assumed benefits for the organization due to implementation. It ventures into cost reduction, increase in productivity, and reduction in time taken etc. as they are the generally discussed benefits of implementing a new ERP system. The final set of questions focus on the issues faced by the employees due to the implementation of ERP.

The questionnaires were sent through mail to 30 random employees in Sibca Electronics (Abu Dhabi branch) after ensuring that they had completed 1 full year working with the ERP system implemented in Sibca electronics. They marked the questionnaire and sent it back through scan. It took just a week to complete collection of data through this technique. The results of the survey will be discussed in the coming sections. The questionnaire can be found in Appendix B.

4.2.2 Key point 1: Change in organization
As per the literature reviewed, the importance of training and development in workplace is very high. It is particularly important when a new software is being implemented in the organization. It improves employee performance in the particular field by enhancing their knowledge in the subject. It addresses weakness and ultimately increases employee satisfaction. It is highly required in a situation where change is implemented. In this case, the employees are faced with a change in their normal working routine. This change has to be dealt with care as the employees may easily resist. In such a scenario, the employees have responded the following way when asked about their attitude to change and their satisfaction level with the training received.

In Figure 4.1, it can be noted that 81% of the employees have a positive attitude for change. They do not see change as a threat and therefore do not resist it in the workplace. In such a workplace, change can be easily brought without disrupting the work flow.

Figure 4.2 brings to light that sufficient training was given to the employees of Sibca prior to the implementation of ERP system. 40% of the employees were satisfied with the training while another 40% were neutral in the subject. This means that training was well provided in the area but not as effective as it should have been. It did not give enough encouragement to the employees or enhance their knowledge in the system.

From the above figures, it can be understood that the new ERP system was established in a change friendly environment where the employees were not agitated with the introduction of a new system. Sufficient training was also given to the employees on how the system has to be used. These two points pave way to a successful implementation of ERP system.

4.2.3 Key point 2: Restructure of business process
The economy in UAE underwent chaos in 2015 when the oil prices started to fall. At the wake of such an unstable economy, SMEs such as Sibca felt the effects like reduction in projects, less demand and a stagnant flow of activities. In such cases, businesses may try to restructure their operations and improve their efficiency to ensure the company does not fall. Restructuring of business processes in Sibca electronics took place by alteration of duties within the organization and introduction of a new ERP system to improve their performances. As per the literature reviewed, employees perform better when they are well informed about the restructure and the reasons behind it. The questionnaire asked the employees about the changes in their working environment and restructuring of business processes.

Figure 4.3 shows that 87% of the employees are aware of the restructure in their business process. This leaves a very small group of people that were unaware of it. This is a good sign as awareness of change can help employees adjust to it. At the same time, the majority of people have also agreed that they did not face any job insecurity due to the implementation. This means that the management has considered user satisfaction to a level. Many also agree that with the new ERP, the management has shown more involvement in the work flow. They keep track on the work being done as the ERP allows management through issuing reports. Even though the management is keeping an eye on the change, the respondents collectively agree that there is no leadership with enough ERP knowledge to guide them in the process. This is one of the biggest factors determining the ERP success or failure. Only very few people know how to use the ERP effectively. Most of the others seem to struggle without guidance.
Figure 4.4 shows that half the employees are not happy about the changes in their responsibility. The limitations of a questionnaire is evident here as we do not know why the same people that are generally positive about change is now unhappy about it.

4.2.4 Key point 3: Benefits of ERP

There are various benefits of implementing an ERP system in an organization. It is these benefits that attract companies to implement them in their organizations. These benefits include having a central database, reduction of duplicate data, ease of use, security etc. It also comes with drawbacks such as high cost incurred, long time consumed, and customization. The questionnaire included some questions regarding the benefits that should have been noticed by now in Sibca Electronics. It also asks about the drawbacks that has been seen.

According figure 4.5, the participants were asked about the ease of using the new ERP system, the apparent reduction in cost to the company, and the increase in overall productivity. Most of the participants felt the system was easy to use and understand. Only few people found it hard to catch up with. At the same time, majority of the participants did not believe the ERP helped reduce costs to the company. A majority of the participants believes there was not much increase in productivity within the company with the implementation of ERP. But a fair amount of people did agree that changes have been noted. Figure 4.6 shows that 80% of the people find the work load to have increased after ERP implementation. But most of them are able to handle it due
to the participative environment prevalent in the work place. The working culture in Sibca is therefore very accommodative and helpful for employees to adapt to changes. The work load is supposed to have reduced with the implementation of ERP as it removes the need for manual duplication of data and other data manipulation techniques. At the same time, when asked about the information sharing in the organization after implementation, 97% of the employees agreed that there has been a tremendous improvement in information sharing within the organization after the implementation of ERP.

4.2.5 Key point 4: Issues faced

The main issue faced when the idea of a new ERP is introduced in the organization is in selecting the right software for the organization. As the company has selected Oracle based ERP system, this research proceeds with the assumption that the organization has selected the best available ERP software to implement. The next issue often faced is if the implemented ERP caters to the technical needs of the organization. The ERP may not have easy solutions for customized requirements. The data quality is another issue which occurs when the old data that has been stored and sued for years is transferred to the ERP. Therefore, replacing a legacy system is one of the biggest challenges faced by organizations. Another issue often faced is the shift in mindset of employees. This is where resistance comes in. But in section 4.2.2, we have already discussed the issue of resistance of employees.

Figure 4.7 shows that a little more than half the participants feel the ERP does not cater to the technical needs of the organization. They find the solutions provided by ERP not satisfying the customized requirements of the company. At the same time, 43% of the surveyed people find it satisfactory. When asked about the quality of old data transferred, a big majority of 87% find it poorly done. This means the data that was transferred were with error which in turn affects the results achieved. In the question asking about the common issues faced, most of them responded to lack of know-how. This brings to picture the vastness of the system implemented and the potential being unexploited by the employees.

4.2.6 Table showing questionnaire response

<table>
<thead>
<tr>
<th>Quality of data transferred</th>
<th>Catering of ERP to technical needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good, 4</td>
<td>Satisfactory, 13</td>
</tr>
<tr>
<td>Bad, 26</td>
<td>Not satisfactory, 17</td>
</tr>
</tbody>
</table>

Figure 4.7: General issues faced
The overall satisfaction of the employees seem to be in good morale according to the survey. It can be understood better by awarding marks to each question in the survey. The following table will show the distribution of marks according to their questions.

<table>
<thead>
<tr>
<th>Questions ↓ / Weight →</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude to change</td>
<td>6</td>
<td>14</td>
<td>12</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Satisfaction with training</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Awareness of business process restructure</td>
<td>4</td>
<td>26</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job insecurity</td>
<td>5</td>
<td>25</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in responsibility</td>
<td>15</td>
<td>11</td>
<td>4</td>
<td>24.5</td>
<td></td>
</tr>
<tr>
<td>Increase in Productivity</td>
<td>18</td>
<td>12</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction in cost</td>
<td>22</td>
<td>8</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easy to use</td>
<td>10</td>
<td>20</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work load distribution</td>
<td>2</td>
<td>4</td>
<td>14</td>
<td>10</td>
<td>46</td>
</tr>
<tr>
<td>Information sharing</td>
<td>4</td>
<td>19</td>
<td>7</td>
<td>46.5</td>
<td></td>
</tr>
<tr>
<td>Catering of ERP to technical needs</td>
<td>17</td>
<td>13</td>
<td>43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of data transferred</td>
<td>26</td>
<td>4</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>12</td>
<td>16</td>
<td>2</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Track by management on activities</td>
<td>6</td>
<td>24</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of leadership to guide the change</td>
<td>27</td>
<td>3</td>
<td>33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.1: Questionnaire division of marks

The lowest total score that could be achieved is 390. The highest total score that could be achieved is 900. The mean of both the scores is 645. According to the division of weights, if the total score of the questionnaire is less than 645, it would mean that the implementation of ERP system is a failure. If the total score is above 645, it would give an idea that the implementation of ERP system is a success. After calculating the marks of the survey, the result achieved is 646. As the result is greater than the mean, numerically, the questionnaire concludes that the implementation of ERP in Sibca Electronics is a success.

4.3 Qualitative data analysis

Qualitative data analysis is the analysis of data that answers the questions ‘why’. It is achieved by giving greater attention to details. It is based on an interpretative philosophy. The data for this analysis is gathered in many ways such as interviews, focus groups, observation, discussions etc. This is a popular form of analysis as it delves further than numerical evidences go. It focuses on events, behavior, descriptions and comments. It helps develop theories and can find patterns between different data.

The advantage of qualitative data analysis is that it avoids pre-judgements. If it is used along with quantitative data analysis, it can give reasons as to why answers were such. It provides depth to the research as it understands individual experience. The disadvantage of it is that generally, only a small group of people are studied as it is more time consuming and sometimes even expensive to do so. As each individual has a unique outlook, it is harder to generalize the findings. It also affects the ability to make comparisons.

This research has selected interviews as the best method of collecting qualitative data.

4.3.1 Semi-structured interview design

Out of the 30 people that took part in the questionnaire, 8 of them were invited from different departments for the purpose of interviews. Out of that, 6 agreed for interview but only 4 could make time to participate within the limited time provided. The interview was held for 15 minutes each. The interview was divided into five sections with each addressing a key point. The first set of questions focused on general information regarding the employee and his/her relationship with the ERP implemented. The second set focused on assessing the organizational fit of the ERP system which is the most important deciding factor. The third set focuses on the important of training and the last two sets focus on the issues faced and output received. A copy of the interview questions can be found in the Appendix C.
4.3.2 Key points from interviews

i. First interview

The first person interviewed is a team leader with 6 years of work experience in Sibca Electronics. He is an MBA holder with sufficient knowledge in change management. As an old employee of Sibca electronics, he has used the older homegrown version of ERP system that was used for the past 4 years in the company. He is therefore quite knowledgeable in the area of ERP management. The biggest challenge faced by him during the implementation was getting his team to not resist it. The commissioning engineers in his team were not cooperating with the new ERP system and were not accepting its terms easily. As a team leader, he had to put extra effort in training them to use the system even though basic training was provided earlier. This brings to the point that the ERP system was not established in a well manner. The training provided for the employees were not up to the standard as it bored the employees easily. Training was provided before the ERP system was given to the employees to use which made training just an oral class with no hands-on practice. If the employees were given a temporary ERP system to use while the training ensued, it would have created a great change in how it was accepted. This respondent considers the ERP system fit for the organizational needs up to an extent as it caters to the immediate requirements of the organization. The implementation of ERP system has left the interviewee stressed out with unfinished work as the time taken to complete each task is high. But, at the same time, he is not unhappy with the output received from the ERP. He has completed projects successfully albeit not being any better than before. The time taken to complete projects through the system is a big longer but it is not affecting the projects considerably. There are no particular benefits from the system according to the interviewee.

i. Second interview

The second interview was held with a Project Manager with over 10 years of working experience in the field and 2 years in Sibca. He has prior experience with managing change in his previous organization. He is fairly new to the ERP experience as he has only been using it for the past one year. As he was unsure of what to face at the time of implementation, his biggest challenge was the lack of technical know-how. The training provided to him at the time of implementation was very poor for two reasons. The first being that it was oral with no hands on practice and the second being he could not spare enough time to attend the long training sessions. The management had not given him enough room to manage his work and training together. As he is unsatisfied with the ERP, he believes he is biased and considers the ERP is not fit for the organization. It does not cater to the requirements of the organization. In turn, the organization tries to change business process to cater to the needs of the ERP. He had to undergo stressful days as he could not complete his projects through the ERP in the given time. It
lowered his morale and prevented him from doing his best for the organization. According to him, the benefits of the ERP system is only the collection of data in one place which in turn helps in easy retrieval of data from any place. He does not believe it has benefitted him or the organization in any other way.

ii. Third interview

The third interview was held with the Director of one of the departments in the organization. He has 14 years of work experience with a major part of it spent as a leader which involves dealing with change. He has prior experience in using the homegrown ERP system used in Sibca before. He was well informed in the planning stage of ERP implementation. The challenges faced by him at the time of ERP implementation was minimal. But throughout its use, he found it very time consuming as it required his final approval for all actions undertaken by his subordinates. This came in between his important work schedule. At the same time, this also kept him informed of all activities of his subordinates. It raised his responsibility but also benefitted him in such a way that he was aware of all the things that happened in his team. As far as he is concerned, the ERP was established well as it provided sufficient training to his subordinates and he was available to guide them when required. He underwent less stress during the establishment phase as he did not have much to do with the ERP. His work was not affected by it majorly. The projects under his attention were all completed as usual with no particular delay. It has to be noted that the ERP did not benefit in having the projects completed any faster than before. The main benefit according to him is the possibility to overlook at all the work being done by his subordinates. All individual work was recorded in the ERP which enabled him to manage his team better. His subordinates seemed to work efficiently as they were aware of their work being monitored.

iii. Fourth interview

The final interview was held with a commissioning engineer with 2 years’ work experience. He is new to the ERP system and does not have prior experience with managing change. The biggest challenge he faced was the lack of technical know-how. The training that was given to him did not register with him as it was oral and uninteresting. As he was not provided a system at the time of training, he still requires help in using the system. He specified that he is not eligible to assess the ERP system established but feels that it was not established well as many of his colleagues also found it very hard to operate. He does not get enough support from his leaders either as they are not well versed with the system either. Over all, he avoid the use of ERP as much as he can due to these many reasons. He is not involved in full project completions as he does only a part of it. Therefore, he does not know if the new ERP has helped in quicker project completion. As far as
he is concerned, there have been very minimal benefits due to the ERP system. It has just made work harder and longer for him.

4.3.3 Cumulative interview response

The following is the cumulated response of interviewees based on the key points of the interview.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Key points</th>
<th>Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Challenges faced</td>
<td>i. Employee resistance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Lack of technical know-how</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii. Time consuming</td>
</tr>
<tr>
<td>2.</td>
<td>Organizational fit</td>
<td>i. Caters to needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Caters to only particular needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii. Organization caters to ERP needs</td>
</tr>
<tr>
<td>3.</td>
<td>Training</td>
<td>i. Insufficient training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Oral and uninteresting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii. No hands on training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iv. Very basic</td>
</tr>
<tr>
<td>4.</td>
<td>Issues faced</td>
<td>i. Time consuming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Delay in project completion</td>
</tr>
<tr>
<td>5.</td>
<td>Benefits achieved</td>
<td>i. No particular benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Collection of data in one place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii. Ease of management</td>
</tr>
</tbody>
</table>

*Table 4.2: Cumulative interview response*

4.4 Summary

The quantitative and qualitative analysis done through collection of questionnaire and interview respectively have been analyzed in this chapter and their results found. The quantitative analysis has helped put a figure to the state of ERP implementation in Sibca Electronics. It has found that according to the people surveyed, neither is the ERP system is particularly well established nor poorly implemented. While the questionnaire gave a basic understanding of the situation, the interviews helped go in depth and analyze the state prevalent in the organization. It brought reason and emotions to the research. The interviews helped explain most of the reasons behind the response received in the questionnaire. The interlinking of the questionnaire and interview is therefore beneficial to this research. The key themes that were found in both the questionnaire and the interview are as follows:

i. The challenges faced by the employees
ii. Method of training
iii. Benefits achieved or lack of them
By the results achieved in these key areas, we can come to a conclusion whether the ERP system implemented in Sibca Electronics is a successful implementation or not. This will be discussed and presented in the next chapter.
Chapter 5: Conclusion and recommendations

5.7. Introduction

This chapter will discuss the findings collected in chapter 4. It will compare and contrast with the literature reviewed in chapter 2 about the ERP system benefits, challenges and implementation. This chapter will come to conclusions in terms of the research aim and the research objectives that were set in chapter 1. It will also act as a conclusion for the whole research. The limitation of the study and the opportunities for further research in the subject will also be outlined.

5.8. Critical Evaluation of Adopted Methodology

The methodology based on the research philosophy of positivism that this study adopted has proven its effectiveness in identifying the key themes related to ERP implementation and its impacts on the business process in Sibca Electronics. It has helped identify the extent in which the ERP system has been effective in the chosen organization and the role of change management in it. The research hoped to access more data related to the projects undertaken by Sibca Electronics before the implementation of ERP system. But this information was unavailable either because it was not recorded properly or because the data was too sensitive to be shared.

The qualitative data analysis is the method of data collection that was very helpful for this research. Even though the data could not be presented in a graph, it gave the most important data to understand the research objectives. The interviewees have an opportunity to express more and give their opinions on each question. Due to it, the research as able to reason out each issues and benefits faced by the organization. This was the quality that was missing from quantitative data analysis. While the data collected could provide a collective response of the participants, it was not very helpful for the research as it did not give a proper insight into the issues faced.

5.9. Conclusions about the Research Objectives

This research study examined the ERP system implemented in Sibca Electronics and evaluated its impact on the employees and the business process as whole. It assessed the general benefits of ERP system and the benefits achieved by Sibca Electronics. It judged the importance of training and development for employees at the time of implementing a new change. It focused on the issues faced by the employees which adversely affected the organizations ultimate goals of implementing a successful ERP system. It analyzed data collected through questionnaires and interviews to determine if the implementation of ERP system was done in an acceptable and successful manner. Conclusions and findings regarding the research study will be discussed against each objective set.

5.9.1. Objective 1
To assess the satisfaction level of employees with the ERP system in the chosen organization.

According to the quantitative analysis, 81% of the employees agreed that they were rather positive with change in their workplace. This means that they are not against changes that may disrupt their comfortable work flow. Through qualitative data analysis, it was understood that the employees were comfortable with change as long as it was implemented properly. The change that was brought in the workplace of Sibca Electronics was the introduction of a new ERP system. This change was well accepted by the employees. It was understood during the interviews that the upper level employees did not resist it. They accepted it as a beneficial change as they saw the benefits it could bring. But it also has to be noted that some junior level employees resisted against this change as they did not see the use of disrupting their work flow for a system that did not show any benefits for them.

In such a scenario, when the ERP system was introduced, there was not enough training provided that was beneficial to all the employees equally. For most of them, as the training was given orally with the trainees having no access to the system, it was hard to follow and take note of. This resulted in the training efforts being wasted. The few employees that did benefit from the training were upper management who had access to the ERP and had only minimal roles to play in it.

With reference to the secondary data, an employee is generally satisfied with the implemented ERP system when their specific needs and goals are radically customized. The ERP in the case study has failed to do so. But it has provided a centralized project management ability and inventory tracking ability. Such benefits have satisfied the employees to an extent.

In conclusion, the employees are not generally satisfied with the ERP system. But it has to be noted that through continuous use and changes being made to it, the level of satisfaction is slowly but surely increasing. It can thus be assumed that the employees will be satisfied with the ERP system gradually as it continues to incorporate their needs.

5.9.2. Objective 2

To evaluate the benefits (or lack of) of the implemented ERP system.

The establishment of an ERP system is generally with the hope of benefits such as integrated business processes, central database, ease of use, ease of management, lower cost, improved efficiency, improved customer satisfaction, improved data accessibility etc. These benefits were compared with those achieved in Sibca Electronics.
**Increase in Productivity**: It was noted from the quantitative analysis that there was very less increase in productivity. Most of the employees had very little knowledge on how to use the system. Due to this, their work flow did not get better. Instead, due to the time taken for each task, the productivity as a whole came down.

**Reduction in cost**: The implementation of ERP system was very expensive to the organization. When comparing the time taken and the money spent on it, the cost to the company was very high. But after a year of implementation, the costs to maintain it has come down considerably. But there has been no considerable reduction of cost in comparison to the projects and their processes.

**Easy to use**: Most of the employees agree that the ERP system is easy to use as it was basic in design and did not complicate most of the tasks. Even though time was taken to understand the methods of use, it was fairly easy to figure out.

**Information sharing**: As the most important benefit of ERP, this factor was achieved in the company. Data could be easily shared between departments easily without duplicating it or bringing unintentional errors in between. Even though this was true, due to the poor quality of data that was transferred from the legacy system, it gave way to errors while decoding messages.

**Time saving**: As the employees were not given clarity on their work in relation to the ERP, they could not save any time that they would have generally. Instead, the ERP system became a time consuming factor where each task took time to be completed. This effected the work flow and eventually the project completion.

According to the above, the only benefit that can be clearly seen is the ease in using the system, and ease in information sharing. In conclusion, the major benefits that are important to the success of the ERP system have not come into effect yet. This can be considered as a major drawback of the system as without these benefits, the implementation of such a huge system becomes impractical.

5.9.3. **Objective 3**

To evaluate if the process of implementation followed by Sibca will lead to its success.

With reference to the literature reviewed, there is a set process that has to be followed at the time of implementing change in an organization. The following are the stages and their comparison to the implementation process undertaken in the chosen company:
Planning: According to the interviews, it was understood that Sibca has undergone a good stage of planning where they discussed, formed a group and planned what their requirements were from the ERP system.

Design: The ERP design was undertaken by a team that did not refer to the employees who were working at a lower level but had a great stake in the system use. Due to this reason, many important requirements of the ERP were not fulfilled.

Development: This is the stage where the system is prepared to go live by completing necessary activities such as customizations and importing data. The ERP system in Sibca was not successfully customized. It did not seem to cater to the needs of the employees. Instead, the employees were catering to the requirements of the ERP system. With regards to importing data, the legacy system was erroneously transferred to the new system which resulted in generating wrong data.

Testing and deployment: By the end of the testing phase, the users will be partially comfortable in doing their work in the new system. In the case of Sibca, the system was not put out for testing till it went live. Due to this, the employees did not know how to use the system when it was given to them to work in. It was deployed quickly and the employees weren’t given enough training to use it.

Support: Over time, the work done in ERP increases and the requirements increase too. Adjustments and changes have to be made accordingly. The ERP support system in Sibca is very supporting as they try to incorporate the requirements of the employees. The employees do not have any grievances about the support that they receive from them.

In conclusion, the ERP system chosen for the organization is not fit for the organization. It does not cater to the needs of the employees according to the demands of their work. It was poorly implemented in the organization with the implementation team not focusing on satisfying the users of the system. Even though it was planned well, it was not executed as expected. Correct implementation is the biggest factor that contributes to the success of the system. In this case, it can be inferred that the process of implementation followed by Sibca will not lead to its success.

5.10. Conclusion about the Research Aim

“To evaluate the process of implementation of ERP system in Sibca Electronics.”

This research project focused on the process undertaken by Sibca Electronics in their pursuit of implementing a new ERP system in the organization. By comparing the critical
success factors found in the literature reviewed and the analysis of data collected from the organization, it has achieved the aim of evaluating the implementation process of ERP system.

This research concludes that the ERP system implementation process in Sibca electronics was only average. The possibility of it leading to a successful ERP system with benefits is very low. All the stages in the implementation was done with average efforts. No proper care was taken to ensure several factors such as organizational fit, effective training, user satisfaction, correct change management techniques, etc. Due to this the employees are left unsatisfied and with no proper understanding of how to use the system. The qualitative research gave a strong insight into this area. The employees had heightened emotions and opinions about the system that they did not have a choice about. With poor training and a vague understanding of the whole system, they could not give their all to the work they did. This would eventually effect the output of the organization as a whole. Numerically, the quantitative analysis showed that the ERP system is an almost success. But it was proved wrong by the qualitative data analysis.

5.11. Limitations

After the completion of the research study, it has been acknowledged that a notable limitation is the size of sample used to proceed with the study. Due to the restrictions faced on time and resources, the number of employees in Sibca Electronics that could be interviewed for the collection of qualitative data was very limited. An increase in the sample size would have enhanced the quality of the research and increased the validity of the results achieved. Another limitation that strongly affected the study is the limited access to quantitative data. Due to security and sensitivity concerns, many important data that was available for the researcher could not be used in the research. This affected the ability to analyze the financial data and forecast the benefits that could have been achieved.

5.12. Opportunities for further research

As expressed earlier, the research done in the field of ERP system is very minimal. The research done on ERP in the Middle East is even lesser. Therefore, it would be very beneficial to conduct further research in the subject using a larger sample size. Further research could include the comparison of ERP systems established in different companies in the Middle East. The critical success factors for ERP systems in Middle Eastern companies have the possibility of being different. This area could be ventured upon. Also, the financial benefits to these companies could also be ventured into if possible. These would make way to strong academic researches.
References


Appendix A

PARTICIPANT INFORMATION SHEET

To evaluate how effective implementation of ERP systems lead to successful delivery of construction projects: A case study on Sibca Electronics LLC

Cardiff Metropolitan University Protocol Number: N/A

Project summary

The purpose of this research project is to critically evaluate the implementation of ERP system in Sibca Electronics. Your participation will enable the collection of data which will form part of a study being undertaken at Cardiff Metropolitan University.

Why have you been asked to participate?

You have been asked to participate because you fit the profile of the population being studied; that is you are over the age of 18 and have over 1 year of experience in using the ERP system established in Sibca Electronics.

Your participation is entirely voluntary and you may withdraw at any time.

Project risks

The research involves the completion of a questionnaire and participation in a private interview (for some). The output will be recorded for later analysis. No sensitive data will be collected. Only basic questions that do not delve into personal relationships with the company will be asked. We do not think that there are any significant risks associated with this study. However, if you do feel that any of the questions are inappropriate then you can stop at any time. Furthermore, you can change your mind and withdraw from the study at any time – we will completely respect your decision.

How we protect your privacy

All the information you provide will be held in confidence. We have taken careful steps to make sure that you cannot be directly identified from the information given by you. Your personal details (e.g. signature on the consent form) will be kept in a secure location by the research team. When we have finished the study and analysed all the information, the documentation used to gather the raw data will be destroyed except your signed consent form which will be held securely for 10 years. The recordings of the focus groups/ interview will also be held in a secure and confidential environment during the study and destroyed after 10 years.

YOU WILL BE OFFERED A COPY OF THIS INFORMATION SHEET TO KEEP

If you require any further information about this project then please contact:

Sania Harris, Cardiff Metropolitan University

Cardiff Metropolitan University email: st20114327@outlook.cardiffmet.ac.uk
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number:

Participant name or Study ID Number:

Title of Project: To evaluate how effective implementation of ERP systems lead to successful delivery of construction projects: A case study on Sibca Electronics LLC

Name of Researcher: Sania Harris

_________________________________________________

Participant to complete this section: Please initial each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [ ]

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. [ ]

3. I agree to take part in the above study. [ ]

4. I agree to the interview / focus group / consultation being recorded [ ]

   Yes  No

5. I agree to the use of anonymised quotes in publications [ ] [ ]

6. I would like my organisations’ name to be anonymised in all publications [ ] [ ]
Signature of Participant

Date

Name of person taking consent

Date

Signature of person taking consent
Appendix B

QUESTIONNAIRE

To evaluate how effective implementation of ERP systems lead to successful delivery of construction projects: A case study on Sibca Electronics LLC.

Dear participant, this is a questionnaire designed to evaluate how effective implementation of ERP systems lead to successful delivery of construction projects. The purpose of this survey is to study the results of this questionnaire and draw conclusions for my MBA research project, effects of ERP implementation, with the study being based on Sibca Electronics. Your valuable responses to this questionnaire will enable me to successfully complete my study. Please complete each question by either putting your answer in the space provided or circling the appropriate response. At the end of the questionnaire you will be asked to submit your responses. Submission will be taken as voluntary informed consent. All your responses are confidential and will only be used for the purposes of this research. Thank you in advance for taking the time to complete this survey.

Thanking you

Sania Harris

Cardiff School of Management
Cardiff Metropolitan University
Llandaff Campus, Western Avenue,
Cardiff, CF5 2YB
st20114327@outlook.cardiffmet.ac.uk
1) What is your employment position?
   □ Project Leader    □ Financial Support    □ Sales Engineer    □ Other

2) Gender:
   □ Female    □ Male

3) Age:
   □ Less than 30 years    □ 30 up to 40 years    □ 40 up to 50 years    □ 50 up to 60 years

4) What is your general attitude to having change in the organisation?
   □ Very negative    □ Rather negative    □ Neither positive nor negative
   □ Rather positive    □ Very positive

5) Are you satisfied with the training that was given during implementation of ERP system?
   □ Very satisfied    □ Satisfied    □ Neutral    □ Not satisfied

6) Do you think due to implementation of ERP your Business Process has restructured?
   □ Yes    □ No

7) Is there any form of job insecurity after the implementation of ERP?
   □ Yes    □ No

8) Have your responsibilities changed after the implementation of ERP?
   □ Yes, in a bad way    □ Yes, in a good way    □ No

9) What do you think about the work load in the organization after implementation of ERP?
   □ Work Load is very much and task are not finished on appropriate time
   □ Work Load is very much but due to participative environment employees are able to complete their task
   □ Work Load is evenly distributed and employees are able to complete their task on time
   □ Work Load is less as compared to before the ERP implementation

10) Do you think that ERP implementation has helped increase productivity?
    □ Yes    □ No

11) Do you think that ERP implementation has helped in cost reduction?
    □ Yes    □ No

12) Is the new ERP system easy to use?
    □ Yes    □ No

13) Does the management keep track on the activities in the organization due to ERP implementation?
    □ Yes    □ No

14) Is there a good leadership that guides you in adapting to the new system?
    □ Yes    □ No
15) Are you satisfied with information sharing within the organization due to ERP Solution Implemented in the organization?
   □ To a great extent  □ To some extent  □ To very little extent  □ Not at all

16) What issue do you often face while using ERP?
   □ Slow loading of pages  □ Long path to access required file  □ Lack of know-how
   □ No issues

17) Does the ERP cater to your technical needs in the organisation?
   □ Yes  □ No

18) Is the quality of old data transferred to the new system satisfactory?
   □ Yes  □ No

19) Rate your satisfaction with the new ERP in the organization.
   □ Highly Satisfactory  □ Satisfactory  □ Average  □ Dissatisfactory

20) Provide your views on the topic, if any.

Thank you for participating in the survey
### SEMI STRUCTURED INTERVIEWS

<table>
<thead>
<tr>
<th>Order of semi structured Interview</th>
<th>Discussed</th>
</tr>
</thead>
</table>
| 1) Ask respondent approval to use recording systems  
  Ask respondent to sign and acknowledge consent form |           |
| 2) Ask Background questions  
  Confirm information about; |           |
|   • respondents position |           |
|   • years working for the organization |           |
|   • Level of study |           |
| 3) Discuss about Experience in using ERP system |           |
|   • How many years have you been using any form of ERP system? |           |
|   • Is there a specific type of ERP system that you’ve liked very much? |           |
|   • In your opinion what is the biggest challenge faced when implementing a new ERP system? |           |
|   • Is experience in using ERP systems required to have a successful implementation of it in an organization? |           |
| 4) Discuss about implementation of ERP in the organisation |           |
|   • Do you think the current ERP was established in a well manner? |           |
|   • Which area of ERP do you consider to be more challenging? How did you overcome this? Experience? |           |
|   • Were you informed of the implementation beforehand? If yes, how long before? |           |
|   • What form of introduction were you given to the new ERP? |           |
|   • Was the ERP fit for the organisation? |           |
| 5) Discuss the importance of training at the time of ERP implementation. |           |
|   • Do you consider training an important element whilst successfully establishing an ERP system in an organisation? |           |
|   • Did you receive any training at the time of implementing the ERP system? |           |
- What do you think is essential when establishing a new ERP system?
- Who do you turn to when you need help with the ERP system?

6) **Discuss the issues faced while using the ERP system?**
- What issues do you face when you use the ERP system?
- What is the main difference that you have noticed between the old ERP and the new ERP?
- What would you recommend for a better use of the ERP system?
- Describe the stress faced due to the implementation of ERP. Do you feel restricted or calm?

7) **Discuss the output received after ERP implementation.**
- Have you had any successful project completion through this ERP? Describe the hurdles faced in between.
- Describe the benefits reaped due to the implementation of the new ERP during project completion.
- What is the average time taken to complete a project usually? Has it changed due to the new ERP implementation?
- What are the significant changes that can be noted due to the new ERP system?

**Ethics Committee Approval Number:** 2016D0476

**Word count:** 13,895
n.b. excludes tables, appendices, reference list