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E-Business Solutions: Complete vs Segmented

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E-Business Solutions: Complete vs Segmented

Abstract

The topic of this thesis is "E-Business Solutions: Complete Vs Segmented". This study has analyzed three e-business B2B vendor solutions in order to compare and contrast the similar and differentiating features. Within this study the use of Qualitative, Interpretive and Cross-Sectional methods has been used. Along with these, the use of Document Analysis has been utilized for the extraction of data from the vendor websites. This data is then displayed and analyzed through the use of Cross-Case Comparison tables. The results are comprised through a series of diagrams which illustrate the findings that were established. Some of these diagrams include the Cross Case Vendor Comparison Table and The Complete "End-to-End" Solution diagram. These diagrams along with many other figures and tables demonstrate the primary conclusion that the functionality of the three vendor solutions in question is similar and therefore it is the non-technical features that are differentiating these solutions within the marketplace.

E-BUSINESS SOLUTIONS: COMPLETE VS SEGMENTED

Final Submission

24th October 2005

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Supervisor: Katina Michael

ABSTRACT

The topic of this thesis is "E-Business Solutions: Complete Vs Segmented". This study has analyzed three e-business B2B vendor solutions in order to compare and contrast the similar and differentiating features. Within this study the use of Qualitative, Interpretive and Cross-Sectional methods has been used. Along with these, the use of Document Analysis has been utilized for the extraction of data from the vendor websites. This data is then displayed and analyzed through the use of Cross-Case Comparison tables. The results are comprised through a series of diagrams which illustrate the findings that were established. Some of these diagrams include the Cross Case Vendor Comparison Table and The Complete "End-to-End" Solution diagram. These diagrams along with many other figures and tables demonstrate the primary conclusion that the functionality of the three vendor solutions in question is similar and therefore it is the non-technical features that are differentiating these solutions within the marketplace.

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Firstly I would like to thank Dr Katina Michael for all her time, effort, resources and knowledge that she has offered throughout this year. It was only with her help and guidance that I was able to make this thesis the quality that it is today.

Finally, I would like to thank my family and friends. They have provided me with the guidance and support that I have needed in order to get through this final year of my study. I feel without their support and continuous nurturing I would not be the person I am today which I fell is shown throughout this piece of work.

Thank you.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Conducting business in today's society has changed dramatically from the early 70's, 80's and even the 90's. The corporations of today are moving from the traditional paper-based systems where everything was filed away in hard copy, to more advanced software packages where data can be retrieved and sent from anywhere in the world at the click of a button. The corporations of today are becoming more spread out across different countries and the world which is due to globalization and some corporations are expanding at rapid rates. With this increase in size comes the complex task of organizing and coordinating the business functions wherever they may be anywhere in the world. To overcome these problems/challenges that most large corporations face, many have resorted to the use of the internet in conjunction with enterprise-wide software packages. This thesis will aim to conduct a comparison of some of the leading e-business vendor solutions in regards to enterprise-wide software packages for the purpose of distinguishing their functionality and differentiating features.

These enterprise-wide software packages that are used by corporations lie within the domains of E-Commerce and E-Business. Chaffey (2004, p. 7) describes *Electronic commerce* or e-commerce, to be "simply buying and selling using the Internet" while *E-business* "is seen as a broader definition of e-commerce, which includes not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, and conducting electronic transactions within the organization". (Turban et al, 2004, p. 5) Many corporations are now becoming networked enterprises and are using the web to connect with suppliers, distributors and resellers. (Lawrence, 2002, p. 11) This form of business transactions is a sub-set of e-business and is referred to as *Business-to Business (B2B)* transactions.

This thesis however, also explains the components, known as e-business applications that constitute an e-business solution. In this study *components* refer to the individual packages that help corporations satisfy one of their business requirements. For example, Customer Relationship Management (CRM) is a component as it is an individual package used to manage the customer relations of the company.

The following sections will provide a brief background on the current literature of E-Business, the associated Gap for this research, the aims and objectives, methods that will be used throughout the study followed by some limitations that may be encountered and finally the justification for why this study should be conducted.

1.2 Background

1.2.1 Previous Research

In regards to previous research done on e-business solutions, much of the current literature is on the individual components of e-business solutions. Within this thesis, eight individual components are examined and analyzed. These components include:

1. Enterprise Resource Planning (ERP);
2. Supply Chain Management (SCM);
3. Customer Relationship Management (CRM);
4. Knowledge Management (KM);
5. Enterprise Application Integration (EAI);
6. Business Intelligence (BI);
7. Collaborative Commerce; and
8. Sales Force Automation (SFA).

These individual components have emerged over time from advancements in different technologies. ERP was the first of these components to be formally recognized after the improvements on MRP I (Materials Requirements Processing) and MRP II (Material Resource Planning). *"Enterprise Resource Planning (ERP)* is software providing integrated functions for major business functions such as production, distribution, sales, finance and human resources management "* (Chaffey, 2002, p. 113). ERP provided many functions for corporations, but these were only the basics of what was needed for each function. ERP was then used in conjunction with Supply Chain Management and Customer Relationship Management to look after the suppliers and customers of the corporation in more detail. *Supply Chain Management (SCM)* "is the collaborative use of technology to enhance B2B processes and improve speed, agility, real-time control, and customer satisfaction. It also involves changes in managerial policies, organizational culture, performance metrics, business processes and organizational structure across the supply chain" (Turban et al, 2004, p. 639)

*Customer Relationship Management.(*CRM) "is both a philosophy and an approach to managing the orientation that an organization adapts to its customers and a suite of software-driven tools and techniques, through which an organization can gather, store, analyze and learn from vast amounts of customer data available to it" (McKay, 2004, p. 197). In conducting transactions with the customers and suppliers, corporations contained a lot of data about each customer and/or supplier as well as their own business. The use of Knowledge Management systems provided them with a logical way of storing this data. *Knowledge Management (KM)* is all about capturing, storing, manipulating data and information to enhance a manager's ability to gain insights into and understand patterns, trends and relationships and thus to help current decision-making and control activities while helping to envisage and predict the future (McKay, 2004, p. 222). Corporations started then to apply this newly found knowledge to their products.

Once these previous systems were in place, there was a bit of confusion occurring in the workplace about what systems completed what tasks. To clarify these doubts, the use of Enterprise Application Integration systems was employed. *Enterprise Application Integration (EAI)* "is a business term for the plans, methods and tools aimed at modernizing, consolidating and coordinating the computer applications in an enterprise" (Lawrence, 2002, p. 178) Once the systems were in place and were organized, they could then be utilized to the corporations advantage. The use of *Business Intelligence (BI)* where internal and external data is gathered stored and analyzed to provide accurate information for an organization (McKay, 2004, p. 197) advanced once more the organization and coordination of the business functions.

The preceding components provided the internal corporation with coordination and organization. However, as stated previously the impact of globalization has seen corporations having different divisions of its structure all over the world. To keep in contact with these divisions, partners and suppliers alike, the use of Collaborative Commerce technologies are employed. *Collaborative Commerce* "which is the use of digital technology that enables companies to collaboratively plan, design, develop, manage and research products, services and innovative EC applications" (Turban et al,

2004, p. 242) A more common example of collaborative commerce is the use of Groupware such as Groove Virtual Office to help with the flow of information, even across international borders. The employees of corporations are sometimes spread throughout the world throughout many divisions. Time has seen the employees reaping the benefits of these advancements in technology. This then leads to the final component of *Sales Force Automation (SFA).* SFA is software that automates the tasks performed by sales people in the field, such as data collection and its transmission (Turban et al, 2004, p. 853). SFA is commonly used in everyday life, not only in corporations through examples such as word processors, spreadsheets and faxing (Saviano, 2000, p. 35)

Each of these components has been analyzed by many researchers in single component studies. However, there have been few studies prepared that include more than one component. In a study by Shaw and Chuang (2000, p. 596) they looked at the components of ERP, SCM and e-commerce (EC) in general. The study used existing case studies, interviews and survey data to describe how the e-commerce systems in the areas of the three components were similar and how they were different. Similarly, an article by Thomas Puschman (2001, p. 1) argued that the need to integrate the packaged software components of ERP, SCM, CRM and EC with each other " drives the need for a standardized integration architecture to be able to be more flexibly implemented into new business processes across different organizations and applications". In this article, Puschman also used case studies and interviews as methods of collecting the data required. However, in an article by Lee at al (2003, p. 54) a comparison was conducted on ERP and EAI systems in regards to their benefits and downfalls. In this case, extensive research was conducted into the archival literature of each to find the necessary data for comparison.

These examples show a continuing trend in that more researchers are now looking to analyze more than one component. This is due to the fact that more of these components are being utilized in corporations at the same time.

1.3.2 Literature Gap

As the previous literature has shown, studies that have been conducted, have only included individual components, such as ERP, SCM and KM, while in a few cases such as Shaw (2000), Puschman (2001), Lee (2003) and Summer (2003), two or three components have been looked at together. There has been no known research however that has looked at *all* these components in collaboration together.
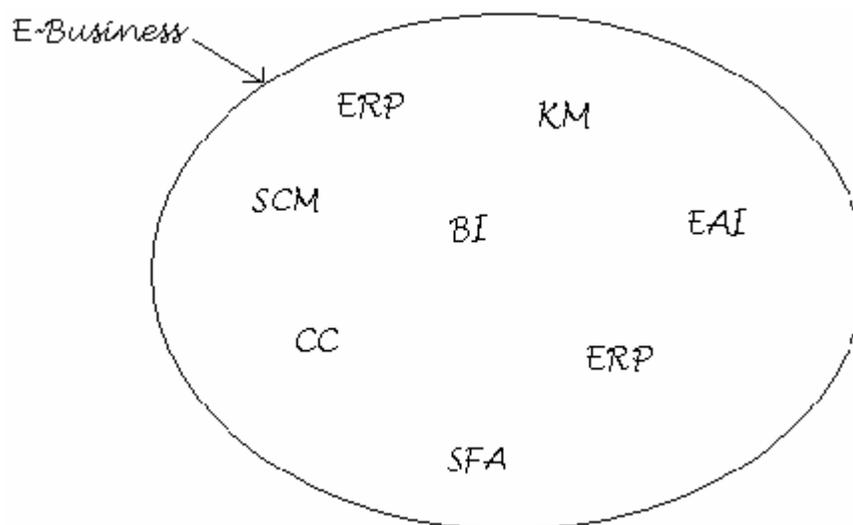
Figure 1.1 Conceptual Framework of the Components of E-Business Solutions

As shown in diagram 1.1, the literature currently available has not been able to define a link between all the components. All of the components are within the boundary of e-business but studies have so far been unable to state how they all inter-relate.

1.3 Aims and Research Objectives

There are four (4) main objectives to this study of E-Business Solutions.

1. To describe the traditional components of an e-business solution for the purpose of distinguishing their individual useful qualities to corporations;

2. To describe the each of the three e-business solutions with a view to identify the distinguishing features including the sub-component functionality;

3. To conduct a cross-comparison of the e-business solutions by comparing and contrasting the distinguishing features acquired in objective 2 for the purpose of identifying one solution from another ;

4. To discover and discuss the different ways in which e-business vendors are using non-technical features to differentiate their solutions from competing solutions in order to identify other aspects of individuality within solutions.

1.4 Research Methods

This thesis adheres to the following strategy.

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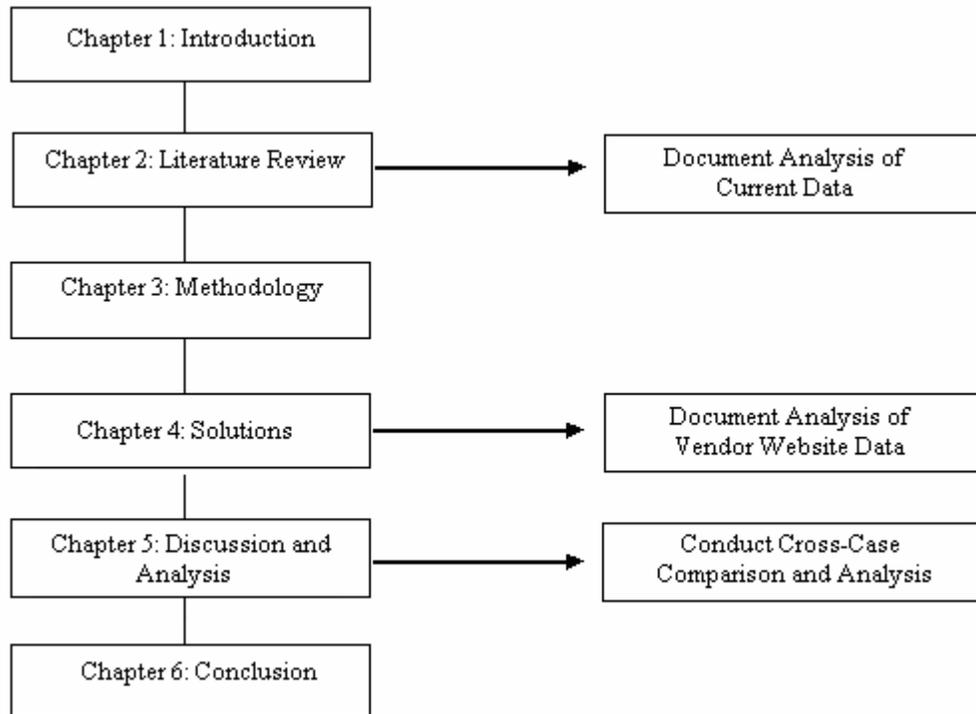
Figure 1.2 Structure of Thesis

1.4.1 Data Collection

In chapter two, the Literature Review, the data collection method of Document Analysis is used. Isabella Thompson (2001, p. 161) explains document analysis "as a systematic procedure for analyzing texts according to defined rules." This method involves an exhaustive search of current literature on the components of the thesis, for example Knowledge Management (KM). In chapter four, a framework for evaluating the e-business solutions is created. This framework is used to evaluate the components and functionality of each solution. This part of the research requires the use of Case Studies.

In order to obtain the necessary data from these case studies the use of document analysis will be once again utilized to analyze the data that is extracted about each solution.

1.4.2 Data Analysis

The data that will be collected using the Document Analysis in chapter 4 will be analyzed in more detail in chapter 5. Within this section a Cross-Case Comparison will be conducted on the three different solutions. The result of this comparison will be displayed through the use of Cross-Tabulation. More detail about these methods is described in chapter 3 Methodology.

1.5 Justification of Research

When corporations invest in technology, many thousand or millions of dollars are spent. This amount of money is not spent everyday and is used to purchase investment type of technologies. It is hoped that these technologies will assist the productivity growth and eventually lead to more profits for the corporation. Therefore they wish to make sure that the product they are receiving provides them with the functionality they require. This study is therefore relevant to pursue, in that by using the framework to analyze some of the complete solutions that are available today, corporations will be able to have a glance at a list of what each solution contains. This is beneficial as they can quickly and easily look at the specifications of what each solutions offers, compare and contrast each, and then confidently choose one that is best suited to their corporation.

1.6 Limitations

There are four (4) main limitations to this study.

1. The study is only limited to three (3) solutions and corporations. Future research could take on many more corporations and solutions for a more accurate view of IT solutions.

2. The products are significant to the IT sector. The products/solutions of different industries such as manufacturing and full virtual organizations would be of interest to analyze and compare with the IT sector.

3. A large amount of data that will be relied on will come from the websites of the corporations. This in turn could end up being a slight bias, but all importance has been allocated to make sure this is not the case.

4. The time limitation inhibits the detail to which the content can be analyzed. If the time frame was extended, to the range of PHD for example, there would be more time available to put more detail into some of the sections, such as the initial descriptions of components and solutions.

1.7 Conclusion

This chapter has provided an overview of what this study will entail. It has provided a brief introduction into the literature which has shown the different components that comprise an e-business solution; the gap in the literature; the research methods of collection and analysis and provided justification for why the research is to be completed. The following chapters will provide more detail on areas such as the literature (chapter two: Literature Review) and the methods that will be used (chapter three: Methodology).

Chapter 2:
Literature Review

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The previous chapter has given a concise introduction detailing with the main issues of this thesis and the path in which it will follow. This chapter will fulfill the first objective of the thesis by providing an exhaustive study of the literature that is available by presenting information on the eight individual components which include:

1. Enterprise Resource Planning (ERP);
2. Supply Chain Management (SCM);
3. Customer Relationship Management (CRM);
4. Knowledge Management (KM);
5. Enterprise Application Integration (EAI);
6. Business Intelligence (BI);
7. Collaborative Commerce; and
8. Sales Force Automation (SFA).

Along with particular studies that incorporate two or more components this chapter will conclude by a further justification of why the gap that is being researched is important and a preview of the next chapter.

2.2 Individual Components

As previously mentioned in section 1.1, *Components*, are known as e-business applications that constitute an e-business solution. However, in this study they are referred to as the individual packages that help corporations satisfy one of their business requirements.
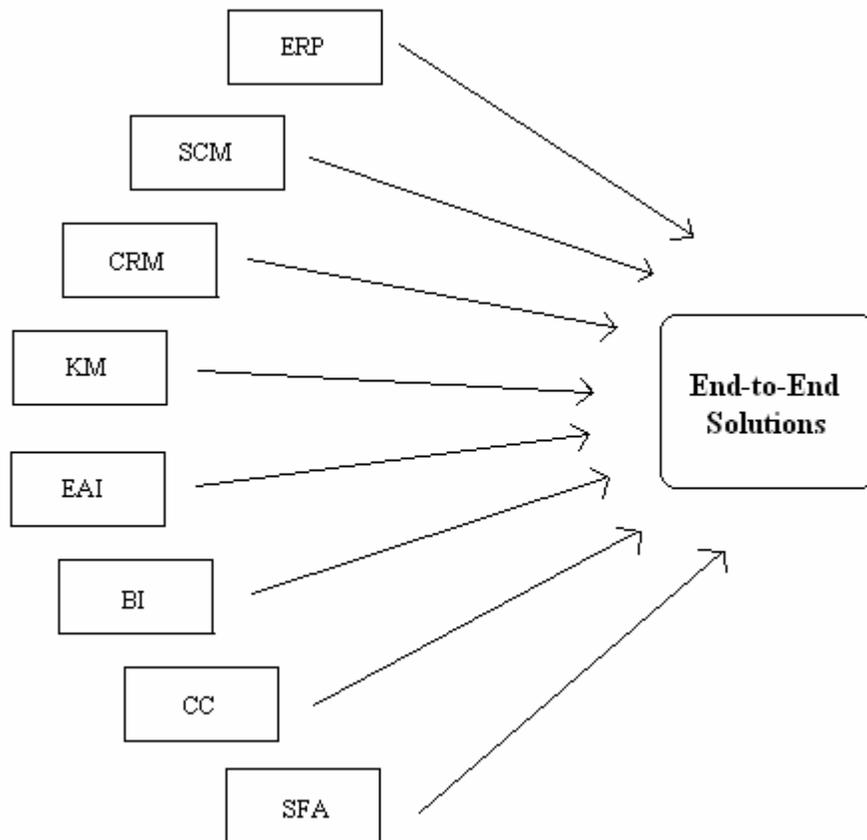
Figure 2.1 End-to-End Solutions Configuration

The above diagram shows each of the eight components join to configure the end-to-end solutions. Each of these will now be analyzed in more detail.

2.2.1 Enterprise Resource Planning

ERP was the first of these components to be recognized. *Enterprise Resource Planning (ERP)* "is software providing integrated functions for major business functions such as production, distribution, sales, finance and human resources management " (Chaffey, 2002, p. 113). ERP has not always been what it is today. In the early 1970's, the first emergence of ERP was known as MRP (Material Requirements Planning) which focused on automating all aspects of production master scheduling. In the 1980's, MRP's functions were expanded to other business functions including order processing, manufacturing and distribution. This was called MRPII. In the early 1990's MRPII was once again expanded to what we know as ERP today, to cover more diverse areas including engineering, finance, human resources and project management (Adam, 2004, p. 2). This process is shown in figure 2.2 below.

Figure 2.2 Evolution of ERP System (Adam, 2004, p.2)

The use of ERP systems in organizations today is becoming more popular. In a survey conducted in 2001, 117 firms in 17 countries were surveyed on their satisfaction of their

ERP system. Of the 117 firms, 34% of the organizations were satisfied, 58% were somewhat satisfied, 7% were somewhat unsatisfied and only 1% were unsatisfied (McNurlin (2001) cited in Summer, 2004, p. 2).

Authors such as Skok and Legge (2001), Baskerville et al (2000) and Holland and Light (2001) have all written articles on different aspects of ERP. Within these articles a variety of methods have been used to gather the relevant data required for the research. All authors of the articles used Interpretive Research which in the article by Skok and Legge (2001) is described as:

> "An attempt to understand phenomenon, by studying it in its natural context from participants' perspectives. No controls, a priori theories or attempts to generalize. Includes case studies and action research from this perspective."

Included in Interpretive Research was the use of Semi-Structured Questionnaires which formed the basis of the Interviews; Case Studies and in the article by Baskerville et al, the use of Cognitive Mapping and Grounded Theory were also used.

As stated previously, each of the articles looked at a different aspect of ERP. Skok and Legge (2001) evaluated the use of ERP systems in organizations. They achieved this be attempting to understand the "…reasons for the apparent lack of success…" by looking at the critical success factors (CSF) and compared them to the nine CSF presented in an article by Bancroft et al (1998). By the use of questionnaires, interviews, and case studies Skok and Legge came to the conclusion that "The research does not support Bancroft's view…" of the nine CSF. Each of the nine CSF that Bancroft had identified were then explained in detail in regards to why they did not match the results of Skok and Legge's research.

The aspect taken by Baskerville et al (2000) included examining the patterns of convergence and divergence when an ERP system was implemented. Through the use of semi-structured interviews and case studies data was gathered. This data was then applied to Cognitive Maps which "…are graphical representations.." of the data. The use of

Grounded Theory methodology which uses the data to "…contribute to a theory" aided in the analysis of the Cognitive Maps. Baskerville et al, came to the conclusion in their article that as a result of ERP implementation the knowledge in the organization was both converging on an organization-wide scope and diverging from an individual perspective. One of the recommendations of the article was that employees in the organization need to diverse in more areas of the organization to help improve organization divergence.

The final article by Holland and Light (2001) examined ERP through the aspect of stage maturity. Within the article they presented a "…maturity model for ERP systems that identifies three stages…". These stages include Stage 1 – managing legacy systems and starting ERP project; Stage 2 – implementation is complete and functionality is being exploited across the organization; and Stage 3 – organizations have normalized the ERP system and are obtaining strategic value from the system. The research was conducted through the use of questionnaires, interviews, telephone conferences and case studies. A total of 80 companies were approached with 24 agreeing to participate. The conclusions that were made showed that "The stages of the ERP maturity model, and the implications analysis highlight the complexity of issues associated with ERP strategies." A recommendation was suggested that managers understand the developing patterns and issues that arise from the implementation of ERP systems and that the Maturity Model was a contribution to their understanding.

All three articles have done constructive research into the area of ERP systems. All authors used similar methods, such as questionnaires, interviews and case studies, to obtain the data they required. From the articles, all the authors present some kind of view on that to best utilize an ERP system the employees (including top management) need a detailed understanding of their company structure for the ERP system to work, be it through the use of models as in Holland and Light (2001), through diversifying work as mentioned in Baskerville et al (2000), or through highlighting the critical success factors as in Skok and Legge (2001).

2.2.2 Supply Chain Management

The suppliers of a corporation are seen as an extremely important part of the business. The use of SCM was then utilized to enhance this relationship. *Supply Chain Management (SCM)* "is the collaborative use of technology to enhance B2B processes and improve speed, agility, real-time control, and customer satisfaction. It also involves changes in managerial policies, organizational culture, performance metrics, business processes and organizational structure across the supply chain" (Turban et al, 2004, p. 639). Within the area of SCM, many important decisions need to be made. Some of the areas include:

- *Production*: What product does the market want?
- *Inventory*: What inventory should be stocked at each stage of SCM?
- *Location*: Where should facilities for production and inventory be located?
- *Transportation*: How should inventory be moved from one supply chain location to another?
- *Information*: How much data should be collected and how much information should be shared?

The sum of all these decisions will define the capabilities and effectiveness of a company's supply chain (Hugos, 2003, p. 3)

In regards to literature that has been written in the area of SCM, there is no shortage. Articles by Roethlein and Ackerson (2004), Folinas et al (2004) and Power et al (2001) present arguments on topics in SCM such as quality communication along a supply chain, case studies and best practices, and critical success factors in SCM.

The article presented by Rothlein and Ackerson (2004) analyzes four entities in a connected supply chain through a case study. The case study focuses on the relationships between the organizations and the specific goals and objectives of each firm. The four entities analyzed in the case study were the Parent Company, Distributor, Manufacturer and Entity (Supplier). The main method of gathering data in this article was through the

use of a series of on-site and telephone interviews. The interviews consisted of open-ended discussions based on a structured set of questions. The findings of this article showed how all of the four entities interacted with each other along a supply chain. Each of the entities has their own quality, manufacturing and corporate goals but none were consistent throughout the supply chain. There were no true partnerships in this chain but some relationships between entities such as the manufacturer and the supplier were extremely strong and were characterized by two-way communication, where in other weaker relationships the communication was mostly one-sided. This research provided the conclusion that the relationships between entities are the dependent variable for the success of the supply chain.

In the article by Folinas et al (2004) the evolution of SCM is shown to have "..shifted from engineering efficient functional processes to the coordination of activities in a supply chain network." through the current advances of information and communication technologies. The paper aimed "..to develop a framework for identifying and analyzing the various types of SCM" over time. There were four types of SCM evolution stated which included: Type 1 – Core logistics activities efficiency; Type 2 – Coordination of internal organizational processes; Type 3 – Inter-enterprise business exchanges; and Type 4 – Establishment of dynamic networks between virtual organizations. Through the use of Case studies being analyzed in the above types, it was concluded that "transforming the system of SCM into a viable e-business strategy and model is critical to future success… and becomes a tremendous catalyst for achieving and maintaining a competitive advantage".

In the final article by Power et al (2001), research was conducted into SCM in order to find out what was the Critical Success Factors (CSF) in agile organizations in managing their supply chain. Within the article Agility was defined as:

> "Agility means using market knowledge and a virtual corporation to exploit
> profitable opportunities in a volatile market place."

The methodology used in the article to obtain the required data was through a survey which was carried out in Australia in 1994. This survey consisted of 962 manufacturing companies. In the results of the survey, 43 variables were identified to be relevant CSF to agility in supply chains. The "more agile" companies were characterized to be more customer-focused and used technology to promote productivity, new product development and customer satisfaction. The "less agile" companies were more internally focused, such as internal operations outcomes, and saw technology as promotion of operational outcomes and not customer satisfaction.

Some of the research that has been conducted on SCM has been mentioned previously. The authors of these articles used similar methodologies in case studies and surveys in order to complete their studies on different areas of SCM. From reading these articles it can be concluded that the evolution of SCM, as stated in Folinas et al (2004), has provided different ways of helping the SCM communications flow in a more productive manner which was then illustrated in Rothlein and Ackerson (2004) through the case study on a supply chain. With the knowledge of the critical success factors in Power et al (2001), the use of SCM in organizations will become more accepted and more productive.

2.2.3 Customer Relationship Management

The suppliers are seen as a major part of a corporations business, but the customers are of equal or more importance. As seen the use of SCM provided a way for interaction between suppliers and the corporation, the use of CRM was then introduced to help the interaction between customers and the corporation. *Customer Relationship Management (*CRM) "is both a philosophy and an approach to managing the orientation that an organization adapts to its customers and a suite of software-driven tools and techniques, through which an organization can gather, store, analyze and learn from vast amounts of customer data available to it" (McKay, 2004, p. 197). CRM was developed around 1997 "as a means of redefining the customer-company relationship through computer based tools" (Bergeron, 2002, p. 2).

One very important distinction that has been made with CRM is that it is not part of the sales process. CRM not only applies to the customers of the organization, but also to the suppliers and business partners. CRM recognizes the role of technology, the importance of self knowledge, the finite nature of customer-organization relationships and the need for consistency in quality of service (Bergeron, 2002, p. 13).

CRM being one of the more common components in today's society has a wide variety of literature written about it. Articles from Xu et al (2002), Crosby (2002) and Corner (2002) all provide insights into the characteristics, advantages, myths and risks of CRM.

In the article presented by Xu et al (2002), the characteristics and advantages of CRM are displayed. The following quote summarizes Xu's idea of CRM in organizations:

> "CRM is a notion regarding how an organization can keep their most
> profitable customers and at the same time reduce costs and increase the value
> of interaction to consequently maximize profits."

The following table displays some of the characteristics of CRM and the impacts they provide to the organization.

Table 2.1 Characteristics of CRM (Xu et al, 2002)

These characteristics in collaboration together provide a sturdy framework of a CRM system. In doing this, many advantages arise for the organization. They can include:

- From a general perspective, improving customer loyalty and internal processes;
- From a marketing perspective, CRM helps to identify potential customer targets for marketing purposes;
- From a sales perspective, CRM improves telesales, field sales and sales management through real time customer information and efficiency is also increased through wireless and internet based orders.
- From a customer support perspective, help can be specific to customer needs, support and service costs are reduced and customer satisfaction is increased.

Xu et al (2002) conclude in this article that the combination of the characteristics and the advantages that come from CRM provide a basis for a well structured and efficient CRM system in any organization.

Even though CRM is a common term and used widely in a variety of organizations, there are however many myths that are about on CRM. In the article by Crosby (2002), six myths are identified and explained why they are not a myth at all.

1. *CRM is about information technology:* The reality is that CRM is a comprehensive business strategy and the use of IT is there to support the progress of the business strategy.

2. *In an age of "1 to 1" marketing, market segmentation is no longer meaningful:* the CRM strategy begins with market segmentation and ends with the individual customer. Therefore market segmentation is still a meaningful part of CRM.

3. *Customer satisfaction, perceived quality, perceived value, and loyalty are interchangeable measures of relationship:* All these measures have their own significant level of relationship so therefore there cannot only be one form of measurement.

4. *CRM and brand strategy have different objectives and can be approached independently:* Both these areas are of equal importance and need to work in collaboration to obtain the best results.

5. *Putting a lot of customer data in the hands of employees will automatically make them good relationship managers:* Employees are easily overwhelmed and maybe mis-lead by the data, and therefore will need support in dealing with customer data properly.

6. *Once the leadership team decides to pursue a customer relationship strategy, the responsibility of the implementation can be delegated to other in the organization:* The success of the strategy is based on the leadership team taking hold of the task and following it through to the end.

In the article Crosby (2002) concluded that it is hoped that in dispersing a few of the myths that organizations will realize the full potential of the CRM approach and utilize it to the organizations advantage.

The final article by Corner (2002) identifies eight variables that present the greatest risk to effective and successful implementation of CRM systems. These eight variables are:

1. The system users;
2. The processes used;
3. Speed of change;
4. Politics and vested interests;
5. The need for mobility;
6. Over-reliance on unproven methodologies;
7. The need for rework; and
8. Inadequate funding.

Corner (2002) presents these variables as a good starting point for implementation risks and if they are kept in mind when implementing a CRM system, the process of implementing will be more efficient and successful.

All the above authors have provided insights into the characteristics, advantages, myths and risks of CRM. From these articles we can see that the opinions of all the authors are different but a main message is that through the use of the knowledge that they have provided in their own article, the effectiveness, ease of implementation or successfulness of the CRM system will be unmistakable.

2.2.4 Knowledge Management

The increased amount of interaction between the suppliers, customers and the corporation generates large quantities of data. Managing this knowledge can sometimes make or break a corporation as there is a potential for extremely vital information to be used to the advantage of corporations. On the other hand, not knowing about this data or not using it sufficiently can lead to problems. The use of KM systems found a way to manage this knowledge and make it useful to the corporation. *Knowledge Management (KM)* "is all about capturing, storing, manipulating data and information to enhance a manager's ability to gain insights into and understand patterns, trends and relationships and thus to help current decision-making and control activities while helping to envisage and predict the future" (McKay, 2004, p. 222). Knowledge creation can be seen as Data being transformed into Information, then that information being transformed into Knowledge. There are two types of knowledge, Tacit and Explicit. A quote by Turpin (cited in Tibben _5, 2004) explains the difference between Tacit and Explicit knowledge.

> "Codified knowledge is characterized by its embodiment in technological artifacts, literature, technological processes and the like. Tacit knowledge on the other hand, is embodied in people and their skills, technical know-how and experience in solving complex problems…"

The conversion of Tacit and Explicit (or codified) knowledge can take on four forms. The following diagram shows these conversions.

Figure 2.3 Nonaka's Four Modes of Knowledge Conversion (Tibben_5, 2005)

Socialisation as shown above is the conversion of Tacit to Tacit knowledge. Common examples of this are conversations with supervisors and work colleagues, learning by copying, "war" stories and gossip. *Internalisation* is where individuals apply explicit knowledge from books, manuals and procedures through a process of experimentation. *Externalisation* is the process by which the skills and experiences of individuals are converted into documents, procedures, rules and theories. *Combination* is the reconfiguring of existing information by adding, sorting and categorizing. Examples of combination include creating spreadsheets, calculating and analysis of data, data warehousing and data mining (Tibben_4, 2004, p. 3).

Knowledge management is not an old technique but is becoming more popular in organizations today. Some of the current literature by Squier (2004) and Hahn (2000) look at the state of KM in organizations and the relationship between type of information and the level of structure it has.

The article by Squier (2004) reports on an investigation that was undertaken of the current state of knowledge management systems in a sample of financial organizations. Electronic questionnaires and face-to-face interviews were used as the methods of collecting the data. The conclusions from this study showed that all companies had a strong awareness of the importance of KM in their organizations and that most of the respondents saw KM as a major strategic imperative that supports their organization in the competitive environment. In most of the cases studied, respondents had implemented one or more KM projects, were in the process of evaluating KM for the organization or were planning a KM project for implementation.

Hahn (2000) took the idea of looking at KM in organizations that one step further. He developed a framework for the important class of knowledge management systems by determining the type of knowledge that was being acquired. The following figure displays the framework.

Figure 2.4 Framework of Knowledge Management Support (Hahn, 2000)

The framework displays that depending on the area of knowledge (artifacts or individual) and the priori structure knowledge management supports can take on different types.

The articles by Squier (2002) and Hahn (2000) provide a snapshot into the literature that is available on KM. These authors used a variety of methods such as questionnaires and meta-analysis in order to collect their data. Their results and conclusions demonstrate that a common topic of research is what type of knowledge management is being used in organizations and the type of knowledge that organizations are collecting and distributing.

2.2.5 Enterprise Application Integration

All the components mentioned previously have each offered different services to the corporation. However, with the large amounts of these individual systems being installed and used, it is sometimes difficult to track what is being used and where. Although it is still adding another system to the pile, the uses of EAI systems have proven to help organize and coordinate the different computer applications running throughout a corporation. *Enterprise Application Integration (EAI)* "is a business term for the plans, methods and tools aimed at modernizing, consolidating and coordinating the computer applications in an enterprise" (Lawrence, 2002, p. 178).

There have been a few articles written on EAI by authors such Themistocleous (2004) and Sharif (2004). The article by Themistocleous (2004) proposes a model for the justification and evaluations of EAI adoptions in organizations. This proposed model is shown below.

Figure 2.5 Proposed Model for EAI Adoption (Themistocleous, 2004)

The methods used in this article consisted of a interpretive, qualitative multiple case study of organizations in regards to looking at how they have adopted EAI within the organization. The results from this study show that EAI is an emerging research area and as a result there remains an absence of theoretical models. The author sought to address the established voids by proposing a novel conceptual novel for the adoption of EAI. The model presents the influential factors that are critical in the adoption of EAI as reported from the organizations in the study. The article presented by Sharif (2004) outlines some of the key challenges within enterprise systems implementation of EAI. Through the use of group studies, brainstorming sessions and the analysis of current literature the conclusions that were presented explained that EAI is a broad concept covering a wide rang of EAI software products, process and methods and therefore the main challenge presented is the task of fully understanding the real components of what EAI entails and suiting them to the organization in question.

EAI is not widely written about and therefore it was difficult to find relevant material on EAI. However, from the articles that have been presented it can be seen that the adoption of EAI within organizations is important and in following the model proposed in the article by Themistocleous (2004) it would lead to a effortless and efficient implementation.

2.2.6 Business Intelligence

Once the EAI systems were implemented and the operation of the corporation was known and understood, the data and knowledge of the business could then be used to its advantage. This was achieved through *Business Intelligence (BI)* where internal and external data is gathered stored and analyzed to provide accurate information for an organization (McKay, 2004, p. 197).

Figure 2.6 Evolution of Business Intelligence (Adapted from Biere, 2003)

The above figure displays the evolution of BI (Biere, 2003, chpt 3). Authors such as Gangadharan (2004) and Hannula (2003) have conducted meta-analysis and case studies to try and add some more literature to the scarce amount that exists. The article by Gangadharan (2004) explains the various stages of development in the life cycle of a BI system. Figure 2.7 shows the process of these stages.

Figure 2.7 Life Cycle of a BI system (Gangadharan, 2004)

From the article Gangadharan (2004) concludes that "BI acts as a source of competitive advantage by turning operational data into a business asset that drives strategic decisions and improves performance for the company and its clients." When implementing a BI system into an organization, following the above mentioned life cycle provides a systematic and efficient way of incorporating BI into the organization.

In the article by Hannula (2003) a case study was conducted on the top 50 Finnish organizations in order to find out what BI represents for each organization. The methods used included telephone surveys and the questionnaires were also used to help the progress of the telephone surveys. The top 50 organizations were categorized into three groups by their industry: 1 – manufacturing, 2 – trade and services and 3 – information and communication technology (ICT). From these surveys, the results saw that 61% of organizations placed business information acquisition and analysis under the heading of BI, Competitive Intelligence or Market Intelligence while 81% of the companies had begun business information acquisition and analysis as they have identified a need for enhanced information to support their planning and decision making. In conclusion, the results of the survey showed that studies like this one will become more common in the future and also shows how the rate of adoption for BI is growing throughout the world.

As stated previously, BI is not a commonly known component but as the articles by Gangadharan (2004) and Hannula (2003) show, the adoption and interest in the use of BI within organizations is growing and most evidently become more popular in the future of e-business.

2.2.7 Collaborative Commerce

With many corporations being spread all over the world, there became a need for quick and reliable means of communication. The use of Collaborative Commerce was seen as a favorable idea. *Collaborative Commerce(CC) "*which is the use of digital technology that enables companies to collaboratively plan, design, develop, manage and research products, services and innovative EC applications" (Turban et al, 2004, p. 242). There are many reasons in which organization decide to collaborate. Globalization being one of the main reasons has seen the organization go from being stable in one location, to having divisions and partners spread halfway across the world. The need to talk and collaborate with other parts and partners of the organization has seen the increase of CC technologies.

There are many different types of technologies that facilitate the collaboration between organizations. Some of these technologies include Groupware, such as Lotus Notes and Groove Virtual Office, video conferencing tools and a major technology of collaboration is the Internet. The use of e-mails and websites allows the transfer of data easily across the world (Tibben_4, 2004, p. 1).

Being a relatively new concept, there is not a lot of literature available on CC. However, a white paper produced by Wipro Technologies (2005) provided a simplistic overview of the main concepts of CC. This paper discusses some of the key business measures of collaborative commerce within organizations. Some of these measures include:

- Revenue;
- Costs;
- Cycle Time (time taken to complete a business process) – has the use of CC improved the time taken to complete a business process;
- Quality (reduction in errors);
- Customer retention; and
- Number of products in the market.

The white paper also discusses how there can be different levels of integration of CC within organizations. The following diagram demonstrates four different levels of integration of CC and at each level, what type of technology is required within the organization to have CC running at this level.

Figure 2.8 Key Technology Investment Priorities at each level of External Integration (Wipro, 2005)

In conclusion the paper described that the use of CC technologies will only get greater as time continues. Most organizations at this time are only at level 1 – minimal integration, but due to the expanding nature of most organizations the integration level will definitely increase over time.

2.2.8 Sales Force Automation

One of the final components to be utilized by corporations these days are the increasing popular technologies of Sales Force Automation. *Sales Force Automation (SFA)* is software that automates the tasks performed by sales people in the field, such as data collection and its transmission (Turban et al, 2004, p. 853).

> "With the rapid increase in computing capability available to companies and individuals, and the equally dramatic decline in the price of computing technology, more and more sales forces are being equipped with tools that are intended to make them more successful." (Khandpur, 1998, p. 3)

The above quote shows how over time the advancements of technology have brought about the change in the way sales staff conduct their tasks. There are a few reasons why the use of automated sales forces is becoming a more popular solution. These reasons include increased sales effectiveness; improved sales efficiency and higher customer satisfaction. From the use of SFA systems, organizations are hoping to be able to utilize the expertise of the staff in order to obtain sales, and therefore not have them caught up with time consuming tasks such as paperwork.

There are many types of tools or applications that are used within an SFA system. They can be categorized into four different categories. They include:

1. Personal Productivity Tools – such as word processors, spreadsheet programs and e-mail.
2. Personal Management Tools – such as calendars, schedules and contact managers.
3. Functional Tools – such as proposal generators, order entry systems and sales analysis programs.
4. Sales Process Tools – such as telebusiness systems and team-selling systems. (Khandpur, 1998, p. 3)

Sales Force Automation is not a commonly seen component, but does have some literature written on it. Engle and Barnes (2000), Pullig et al (2002) and Sohi et al (1997) all present views on SFA in regards to efficiency and effectiveness, productivity and adoption of SFA in organizations.

The article written by Engle and Barnes (2000) poses the question of "Does the use of SFA increase the efficiency and productivity of sales staff?" The set about answering this question by conducting a 42 question survey on 1,641 sales representatives of large pharmaceutical companies in Germany, England and United States. From this survey the results showed that an increase in sales is more likely to come from effective selling techniques than increase sales productivity. The modern technology in SFA allowed the staff more time to prepare for sales and therefore enhanced their "professional image". Engle and Barnes (2000) also posed the question about the implementation of SFA in organizations. The question entailed "..do you implement the technology and run the risk of reducing profitability or do you hold back on investment and run the risk of loosing market share to the companies that have". The solution they proposed for this question based on the research of the article was to implement a simple and flexible system to start with and gradually get more complex as some kind of solution will be expected by the customers.

The article by Pullig et al (2002) poses a different kind of question on SFA. In this article the authors research is intended to identify the specific organizational factors that are likely to lead to the effective implementation of a SFA system and consequently to increase sales force / firm productivity. This article used a mixture of Quantitative and Qualitative methods in order to gather data. The qualitative method included the 23 sales persons from the USA to answer 4 open-ended questions. The qualitative methods saw then the same group of people rank seven different "climate factors" (such as training and rewards) in order of importance. Following this they were then asked to rank another six "shared values" (such as customer orientation and entrepreneurial values) in order in which would lead an organizations commitment to implement a SFA system. From these questions the results (factors) were grouped into three main categories. They included

Implementation Climate, Shared Values and SFA Implementation Effectiveness. Pullig et al (2002) concluded that if the factors addresses in these categories were adopted into the organization the effective implementation of an SFA system would be possible.

In similar context to Pullig et al (2002), the article by Sohi et al (1997) looks at the factors that can influence the adoption and implementation of an SFA system. The main method of data collection in this article was the use of meta-analysis of the literature, which resulted in an exhaustive study of the literature at that time. From this study their main findings were that were four main factors that influenced the adoption and implementation of SFA systems. They included overcoming resistance from non supportive staff, targeting the highly utilized staff in order help make the proposal adopted organization-wide, showing that implementation can lead to reducing non-monetary costs such as time, and making the adoption of the SFA system voluntary to staff members. Sohi et al (1997) suggest that the use of the previously mentioned factors that the adoption and implementation of an SFA system in the organization will me made easier.

The authors previously presented of SFA have similar views. They correspondingly agree to each other and the main theme of the articles is that finding the factors that will help in the adoption, implementation, efficiency and productivity of a SFA system is in the benefit of the organization. The themes of the articles were not the only comparable items in the articles. The authors used similar methods in which to gather their data. Engle and Barnes (2000) and Pullig et al (2002), used surveys as their main source of data. Sohi et al (1997) used meta-analysis as their main source of data, and an assumption can be made that the other authors would have used the same method in order to help support their surveys.

2.3 Articles with Combinations of Components

In the previous chapter in section 1.2.1, a few authors were named in regards to having written articles on more than one of the previously mentioned components. These authors were Shaw and Chang (2000), Puschmann (2001) and Lee et al (2003). Besides the previously mentioned authors, there are a small number of other authors that have also written articles on combination components. These include Igel et al (2003), Huang (2003) and Shoemaker (2001).

The article by Igel et al (2003) looks at the components of KM and ERP. This article has been written in order to investigate how knowledge creates value to corporations through implementing IT solutions such as ERP. The process of this research was a two step process where the first stage was to develop a complete view of ERP management life cycle covering the implementation framework and the second stage was to investigate the practices of managing knowledge through the developed implementation framework completed in stage one. The use of meta-analysis, case studies and interviews provided the necessary methods to acquire the data. The results of the study created a framework that comprised of six stages. These stages included:

1. Planning;
2. Acquiring;
3. Deploying;
4. Operating;
5. Optimizing; and
6. Retiring.

The conclusions of the author present the information that within the planning and acquiring stages of ERP implementation, strategic knowledge was created. Similarly, in the deploying, operating and optimizing stages, operational level knowledge was generated.

Huang (2003) presented a different group of components in his article. The article looked at ERP, SCM and CRM in regards to discussing several perspectives of corporate application integration and points out potential opportunities and challenges inherited in the integration process. In using the meat-analysis method, the author compares and contrasts the integration of the components, ERP, SCM and CRM. From this, the following table of levels of integration and the associated challenges was developed.

Table 2.2 Level of Integration and Challenges (Huang, 2003)

The table shows that for each of the different levels of integration, there are associated challenges or capabilities that occur. In similar context to this the following table demonstrates for each level previously mentioned there are integration strategies that also occur.

Table 2.3 Integration Strategies (Huang, 2003)

From the above tables, the author concluded that for each of the components, the level of integration determines the opportunities, challenges and strategies that can be made possible.

In the final article of combinations of components, Shoemaker (2001) describes a framework for examining the technology available in each of KM, CRM and ERP for enabling market relating capability. From an exhaustive meta-analysis of each of the components, the following conclusions were made: A knowledge management system enables the firm to understand the customers and their preferences in the relationship; The ERP system supports the firm's ability to deliver on its promises while the CRM system orients all the customer touch points to focus on building and maintaining that appropriate relationships with the customer. This article is a real life example of how a company would need the use of all the systems, KM, ERP and CRM in order to be able to satisfy the customer needs and demands.

2.4 Justification of Research

As stated in chapter 1, when corporations invest in technology, many thousands or millions of dollars are spent. Therefore they wish to make sure that the product they are receiving provides them with the functionality they require. From the literature presented above, it can be seen that there is gap, in that not all of the above mentioned components have been combined and studied together in one project. Within this study a framework will be created and will be used to analyze some of the complete solutions that are available today, corporations will be able to have a glance at a list of what each solution contains. This is beneficial as they can quickly and easily look at the specifications of what each solutions offer's, compare and contrast each, and then confidently choose one that is best suited to their corporation.

2.5 Conclusion

This chapter has provided a detailed and critically analyzed description of each of the eight individual components, some studies with more than one component, and a further justification in why the proceedings of this thesis are important. The following chapter will discuss in detail the methodology that will be used to undertake the research required to fulfill the aims and objectives of this thesis.

Chapter 3: Methodology

CHAPTER 3: METHODOLOGY

3.1 Introduction

The preceding chapters have provided detailed information on the fundamental components of e-business solutions. From this, a gap has been identified in that there has been no known account of a study that has been conducted in which all of the eight components have been analyzed. This gap shows the need for research to be completed that conducts a cross-case comparison for evaluating the necessary requirements of e-business solutions. In attempting to address this, the appropriate methodology must be used. This chapter will provide details into the methodology that will be used within the writing of the thesis, and will explain how the data collection and data analysis will be conducted.

3.2 Purpose of the Study

As stated in chapter 1 (section 1.3) the aims of this research are:

1. To describe the traditional components of an e-business solution for the purpose of distinguishing their individual useful qualities to corporations;

2. To describe the each of the three e-business solutions with a view to identify the distinguishing features including the sub-component functionality;

3. To conduct a cross-comparison of the e-business solutions by comparing and contrasting the distinguishing features acquired in objective 2 for the purpose of identifying one solution from another ;

4. To discover and discuss the different ways in which e-business vendors are using non-technical features to differentiate their solutions from competing solutions in order to identify other aspects of individuality within solutions.

These objectives show why this study has been undertaken. In achieving the first objective, the literature review provided in chapter two was created. This chapter provided detailed descriptions of all the components and identified their individual qualities. The review of the literature showed the need for a study that incorporated all the eight components. This thesis will therefore aim to achieve this by completing the remaining objectives

3.3 Approach Taken

In order to satisfy the remaining objectives there are many different ways in which this can be achieved through research methods. This study will encompass the use of Qualitative and Interpretive research techniques along with Cross-Sectional Analysis. *Qualitative Research* "is sometimes referred to as naturalistic design, and is associated with the interpretive or constructive approach or the post-positivist perspective" (Anderson, 2003, p. 33) while *Interpretive Research* "aims to interpret or understand situations or events without producing formal rules or equations" (Hyland_3, 2005, p. 1). *Cross-Sectional Analysis* involves collecting data only once throughout the research process. These processes will be carried out mostly in the formation of chapter 4 in order to generate the required information for the creation of the cross-case comparison which will be demonstrated in chapter 5.

3.4 Unit of Analysis
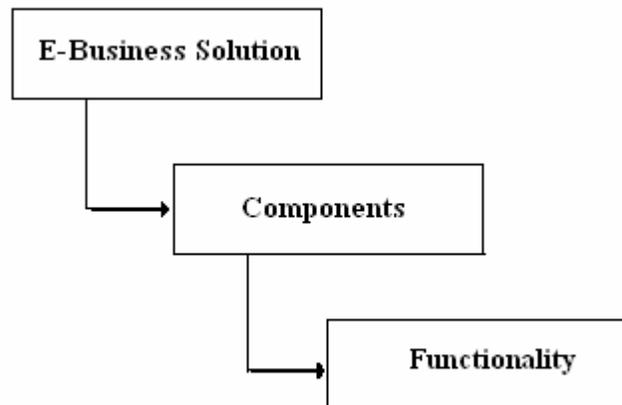
Figure 3.1 Units of Analysis

Unit of Analysis is described as the "level of detail or the specific entities that you are studying" (Hyland_3, 2005, p. 7). As shown in the diagram above the unit of analysis that is being researched in this study has three levels. The first level will look at the e-business solutions as a whole, which is the overall aim of the thesis. The second level will look at the components that constitute an e-business solution which is in relation to the first objective, while the third level will look at the functionality of each of the individual components, which will be a significant part of the second objective, the creation of the cross-case comparison table.

3.5 Case Studies

There is a lot of confusion over the term Case Study as it is a form of research that is used in many disciplines and has different meanings to different people. In this thesis the following definition will be used: "The Case Study strategy seeks to examine a single [or multiple] instance[s] of some broader class of phenomena in order to generate a rich and

complex understanding of it" (Anderson, 2003, p. 21). There are many advantages that come from the use of case studies within research. Some of these advantages include:

- They are often based on qualitative and descriptive data, so they are therefore more likely to focus on rich, detailed, individual analysis;
- Can often highlight new insights and ideas; and
- When used over long periods researchers are enabled to explore variables and relationships (Coombes, 2001, p. 44).

This thesis will use the case study strategy to examine the end-to-end solutions of three different corporate IT corporations.

3.6 Data Collection

As stated previously, the use of case studies will be an important part of this thesis. To assist in the development of the case studies, the use of Document Analysis will be also used in order to examine the information of each of the case studies so as to create a well developed knowledge base.

Document Analysis is defined as "a research technique for the objective, systematic and qualitative description of the manifest content of communication" (Krippendorff, 1980, p. 21) and as "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (Thomas, 2004, p. 218). The content that is being analyzed while using the document analysis method is defined in the purpose of the study (see section 3.2). This shows that in the case of this thesis, the content that will be analyzed will be that of the vendor archival data about the end-to-end solutions. This process will involve examining in detail the pages on the vendor's web sites, to find the relevant data about their solutions. This process make take many weeks as the task of finding the appropriate data is a very time-consuming task, especially if the site in examination is very large in size. A study similar to this was completed by

Summer (2003) in that the main source of data used for analysis was collected from the vendor websites.

3.7 Data Analysis

There are many different ways in which qualitative data can be analyzed. This study will create a cross-case comparison table in order to compare and contrast the e-business solutions. This has been completed in a similar study which was done by Merwe and Bekker (2003). This study is titled "A Framework and Methodology for Evaluating E-commerce Web Sites". Within this article a framework and criteria are developed for the comprehensive comparison of e-commerce web sites. This thesis will aim to do the same, with the difference that the cross-case comparison table will be used to analyze the components and functionality of e-business solutions instead of e-commerce web sites. The following diagram shows the steps that will be taken in order to develop the cross-case comparison table for evaluating the e-business solutions.

Figure 3.2 Development of E-business Cross-Case Table (Adapted from Merwe and Bekker, 2003)

The first step of developing the table involves selecting the appropriate solutions to evaluate. This will involve examining web sites and searching for information on different IT corporations and finding out what solutions they offer to customers. Once the solutions have been chosen, the next step will then go about collecting all the data that

can be found on each solution in order to build the required table. Step three involves the use of the content analysis which was mentioned earlier, to sort through the data collected in step two to identify the important aspects that can be used. These important aspects are then molded into the table which will consist of each component and what each vendor has in regards to that component

Once this data has been collected, there are many ways of representing the findings. The use of graphs, charts, codes and tables all present good options of displaying results. The study by Merwe and Bekker (2003) that was mention previously used tables and pictorial diagrams to illustrate the finding of their article. For the purposes of this thesis the use of Cross-Tabulation tables will be used. Cross-Tabulation is a good way of showing the responses of more than one candidate in one table. The following table is an example of cross-tabulation.

Table 3.1 Example of Cross-Tabulation (Merwe and Bekker, 2003)

From the above diagram it can be seen that for each of the websites in evaluation their corresponding answer to each of the criteria is shown accordingly. In the case of this thesis, the solutions that are being evaluated will replace the websites, while the components of the solutions will replace the criteria. The uses of these cross-tabulation tables are very significant as they show in one diagram the findings of the research (Coombes, 2001, p. 162)

3.8 Conclusion

This chapter has provided the details into the methodology that will be undertaken in order to complete the thesis. This has been accomplished by reiterating the purpose of the study in relation to the aims and objectives and establishing which methods will be used for the collection and analysis of the data. The methods that have been provided within this chapter will help facilitate the research that will continue to progress throughout chapter 4 and 5.

Chapter 4: Solutions

CHAPTER 4: SOLUTIONS

4.1 Introduction

The previous chapter has detailed the research methods that will be used to conduct the investigation. The aim of this chapter is to analyze three major "end-to-end" vendor solutions that are in the market place today. This analysis will be undertaken with the use of Case Studies as stated in section 3.5. The analysis that is presented from these case studies is important as it provides the basis for analysis in subsequent chapters. At the completion of this chapter, the analysis that has been carried out will provided a breakdown of the particulars of each solution's components and their respective sub-component functionality. This will then supply the foundation data for the cross-comparison can be completed in chapter 5.

4.2 Vendor "End-to-End" Solution Case Studies

The vendors whose solutions will be analyzed in each case study include:

- SAP – "My Business Suite"
- Oracle/Peoplesoft – "Enterprise"
- Microsoft – "Navision".

These vendor solutions have been selected to be used in this study, as they are well known corporations in the E-Business industry. Due to their ongoing domination, it can be confidently said that the solutions in question are of quality and value. For example, The OLAP Report (OLAP, 2005) contains statistics that shows that in 2004 the market share these vendors contained were all in the top 10 of On-Line Analytical Processing (OLAP) companies. Microsoft was positioned at number one with the highest percentage of 27.4%, while SAP was ranked 6th with a market share of 6.0% and Oracle/Peoplesoft came in 7th with 3.7%. These percentages have been continually

growing from the last recording of statistics by The OLAP Report in 2000 which reinforces the domination that these vendors have in the industry. These solutions are therefore the best examples to use in demonstrating the structure and components of an e-business solution.

In selecting which solutions would be analyzed, along with the above understanding, the usability of the corporation's website was a determining factor in their selection. Although the IBM Websphere product is well-known it was not a suitable candidate as the website information which would be the primary source of data did not provide the relevant material for this study. Each of the solutions that will be analyzed contained sufficient data on the corporation's website to satisfy the objectives of the research, which was to identify the components and sub-component functionality of each solution. In selecting the individual components for analysis, thought was given to analyze as many different components from each of the solutions as possible. These components will now be analyzed by detailing some of the functionality that they contain. These will be done in the order of SAP – "Business Suite", Oracle/Peoplesoft – "Enterprise" and finally Microsoft – "Navision".

4.3 Case Study 1: SAP – "My Business Suite"

SAP is one of the leading corporations in regards to e-business solutions. The company was founded in 1972 and is a powerful force in many different industries (SAP, 2005e), including automotive, banking, mining and retail. SAP has high standards and quality processes that are used throughout all of the solutions they develop. Examples of how these high standards and quality processes are maintained are shown through the company's three mission statements. These statements include "Designed for YOUR INDUSTRY, Scaled to YOUR BUSINESS and Ready for YOUR FUTURE". SAP (2005a, p. 7) states that each of their "solution[s] are tailored to the specific standards, processes and challenges of [each] industry". This allows SAP to create individual solutions by working directly with each customer's needs and requirements specifically.

As previously stated, these three statements are adapted to all of the SAP range of solutions. This includes the SAP "My Business Suite" which SAP claims "is the world's most comprehensive family of business solutions, enabling adaptive business, complete integration, and easy collaboration over the Internet" (SAP, 2005a, p.1). This solution is an end-to-end package that contains all the necessary modules for a business to coordinate its daily functions. The components that are included in the business suite include: Enterprise Resource Planning (ERP); Customer Relationship Management (CRM); Product Lifecycle Management (PLM); Supplier Relationship Management (SRM); and Supply Chain Management (SCM). The ERP, CRM and PLM components will now be analyzed in detail by using Document Analysis to show their individual functionality.

4.3.1 Enterprise Resource Planning (ERP)

The SAP ERP component provides organizations with the "strategic insight and ability to differentiate, increased productivity, and flexibility they need to succeed." Within the ERP component, SAP has evolved its vision of increasing efficiency within an organization to a next-generation ERP solution by automating end-to-end business processes and extending those processes beyond the enterprise to the entire business ecosystem by incorporating customers, partners, and suppliers (SAP, 2005b, p. 3).

The SAP ERP component is seen as the backbone of the "My Business Suite" package. Due to this, there are a number of benefits it provides to organizations, which make it such a vital part of the suite. These benefits includes: better financial management and corporate governance, which sees the management of accounting functions enhanced with business analytics in order to provide management with deeper visibility of the individual operations of the company. This can in turn help in improving profitability and risk management and advanced extensibility to grow with the businesses needs. This allows each individual solution to be tailored by adding the right mix of components in order to achieve the highest quality of performance (SAP, 2005b, p. 6)

Within this mix of components, there are a number of sub-components that make up the functionality of the ERP system. Diagram 4.1 displays how all these sub-components are used together in order to create the "backbone" that is the SAP ERP system.

Each of the sub-components has specific tasks that are required to make the ERP system run smoothly. As a result of separate sub-components, at any time each or any of these can be updated or modified in order to suit the changing nature of the business.

Figure 4.1 ERP Sub-Component Functionality (SAP, 2005b, p. 8)

This is evidenced by Shiping Liang, Director of Application Division with China Telecom Corporation who states that:

> "mySAP ERP provides us with a single, consolidated, and timely view of our business. This is a major breakthrough for us. With SAP, we can make faster decisions and get a tighter grip on management control."

Additionally, Rohan Muttiah, CIO of John Keells Holdings Ltd believes:

> "The strongest indicator of the success of our ERP project will be the realization of shared services, leading to a measurable competitive advantage. We chose SAP because we knew they could get us there" (SAP, 2005b, p. 7, 11).

The testimonials are examples of how the ERP solution has provided benefits, to companies. The SAP ERP component is the backbone of the Business Suite and is as valuable to a corporation on its own as it is in conjunction with the other components contained within the Business Suite.

4.3.2 Customer Relationship Management (CRM)

Customer Relations are one of the most important aspects of an organization. The organizations of today must be more customer focused in order to respond to the needs of their customers and in turn this leads to growth and increased productivity for the organization. According to SAP, CRM "provides best-of-breed functionality – plus industry-specific features and best practices based on three decades of SAP experience" (SAP, 2005c, p.1).

The SAP CRM component of the business suite aims to make the correspondence between customers and the organization as smooth a transaction as possible. It can achieve this by relying on its unique number of capabilities which include, providing an open, adaptable and user-friendly solution that is easy for staff to use which then improves the ability of staff to interact with the customer at every possible stage. As well as this, the SAP CRM component is able to be integrated with today's mobile devices which include laptops, mobile phones, PDA's and other types of handheld devices. This increases the levels of interaction of the staff member with the customer and improves connectivity overall (SAP, 2005c, p.3).

The SAP CRM has similar functionality to the ERP component in that it can provide a number of benefits alone and within the business suite package. Some of the individual benefits that it can provide a displayed in the Table 4.1.

Table 4.1 CRM Benefits (SAP, 2005c, p. 7)

As this table demonstrates the individual qualities of the CRM component are vital to the overall combination of the business suite. For example the first feature is that it can be fully integrated with the other SAP Business Suite components. The benefits that are derived from this show how overall the this feature is extremely important as it helps the overall solution with faster return on investment and increased efficiency.

As well as providing the previously mentioned benefits, the CRM component provides the support needed for the entire customer life cycle. This includes having the resources required to deal with issues that may arise in any of the following areas, Marketing, Sales, Service, CRM Analytics, Channel Management, Interaction Center, E-Commerce and Field Applications (SAP, 2005c, p. 5). Due to all this functionality and support that the SAP CRM component provides, it is no surprise to see that the SAP CRM component is one of the worlds leading CRM packages for organizations today.

4.3.3 Product Lifecycle Management (PLM)

The concept of Product Lifecycle Management has existed for a significant period of time, but only lately has the concept been incorporated into many corporations' practices. Product Life Cycle Management is the succession of strategies used by management as a product goes through its life cycle (PLM_define, 2005). The concept of PLM is seen as a subset of the SCM and SRM components. In creating the PLM component, SAP generated a definition of PLM:

> "PLM has emerged to describe a business approach for the creation, management and use of product-associated intellectual capital and information. This information is used throughout the product life cycle – from the first idea of a new product, onward through production and sales, all the way to service and support" (SAP, 2005d, p. 19)

In similarity with the SAP ERP component, PLM has many underlying features. These features are detailed in the diagram below.

Figure 4.2 PLM Sub-Component Functionality (SAP, 2005d, p. 27)

This diagram shows that within the PLM component there are six sub-components that make up the functionality of PLM. Each of these sub-components has their own specific tasks which they perform in order to make the PLM component run as smoothly as possible. For example, within the Quality Management sub-component, the

functionality of quality engineering, assurance and control, and improvement are all undertaken to ensure that the quality management of the product using the PLM component is of the highest quality.

With all the sub-components working together as one interconnected unit, there are many benefits that arise from the use of the PLM within corporations. A few of these benefits include: Better business decisions, Better business results, Higher product quality and Higher productivity (SAP, 2005d, pp. 32-33).

These benefits along with many others are what make the SAP PLM component one of the most popular Product Life Cycle Management software packages in the work today. With its many sub-components, the PLM component is able to be integrated with all the other Business Suite modules in order to create a cohesive solution for corporations.

4.4 Case Study 2: Oracle/Peoplesoft – "Enterprise"

Oracle is another one of the leading corporations when it comes to software design and development. Founded in 1977, Oracle today employs over 40,000 employees in many different countries all over the world (OP, 2005a). Over the last 30 years, Oracle have collaborated with and acquired many companies in order to expand and develop its corporation. One of the more well-known acquisitions was in January of 2005 where Oracle acquired Peoplesoft Corporation.

> "Oracle and PeopleSoft bring together the best and brightest talent in the enterprise software industry. We plan to accelerate innovation and offer customers a superior solution at a lower price. The combined companies represent more applications and database customers than any other company in the world" (OP, 2005b).

From this acquisition, many new and improved products and services have been developed. One of these improvements has been the originally Peoplesoft solution of Enterprise. This solution was originally called Enterprise One when fully owned by Peoplesoft. Due to the acquisition by Oracle, Peoplesoft were able to utilize the technology provided by Oracle to improve their Enterprise One set. This solution was then renamed Enterprise.

The Enterprise solution is large in the number of components and sub-components that are included within the solution. The components of the solution are: Campus Solutions; Customer Relationship Management (CRM); Financial Management; Human Capital Management; Service Automation; Supplier Relationship Management (SRM); and Supply Chain Management (SCM). Each of these components contains the sub-components which are the underlying processes of the Enterprise solution. This is similar to the SAP Business Suite solution. A differentiating feature however is the different types of components that are included within each solution. In the SAP solution, the modules of ERP, CRM and PLM were

examined. Within the Enterprise solution, the modules of SRM, SCM and Financial Management will be analyzed.

4.4.1 Supplier Relationship Management (SRM)

Supplier Relationship Management is seen as a part of the Supply Chain Management process and controls the information flows that occur between the suppliers/partners of the corporation (OP, 2005d). Oracle's PeopleSoft Enterprise Supplier Relationship Management (SRM) "is an integrated family of applications that dramatically cuts all supply management costs. It enables organizations to reduce spend on all categories of goods and services, streamline procurement processes, and enforce policy compliance" (OP, 2005c).

Within the SRM component, there are a number of sub-components that are compiled in order to create the SRM functionality. These sub-components include:

- eProcurement;
- eSupplier Connection;
- Procurement Mart;
- Purchasing;
- Services Procurement;
- Spend Mart;
- Strategic Sourcing;
- Supplier Rating System; and
- Supply Chain Warehouse (OP, 2005c)

Many corporations around the world have used the SRM component within their daily functions. Andrew Spidle of Business Systems Sprint has used the component within his IT corporation and states "the allows us to evaluate and target suppliers that have high-volume transactions with Sprint, then negotiate a more-strategic deal to reduce our costs." While Bill Grimes, of Dartmouth- Hitchcock Medical Center states "By using the SRM products from PeopleSoft, we've been able to drive product consolidation and standardization. By using a combination of par carts, favorite lists, and online acquisitioning, we have been able to have more control and lower costs on the items that are being bought by our institution" (OP, 2005e).

As shown by the comments above, the SRM component has provided many benefits for users of the solution. Some of marketed benefits that user can achieve include reducing spending on goods and services; streamlining procurement processes and enforce policy compliance (OP, 2005e).

As seen with the PLM component of the SAP Business Suite, the SRM component was also a seen as a sub-set of the SCM component and only recently has been distinguished on its own. It has always been combined under the banner of SCM and has only lately been seen as a complete component on its own. This is shown by the growing number of SRM components within solutions, the Oracle/Peoplesoft is one example.

4.4.2 Supply Chain Management (SCM)

The SCM component is the parent component of the SRM and PLM components which were discussed earlier. As technology has advanced so have many different types of SCM. The Oracle/Peoplesoft version is just one of these components that has advanced over time.

> "Oracle's PeopleSoft Enterprise Supply Chain Management (SCM) provides a cohesive yet flexible solution for the synchronized supply chain, driving efficiencies in cost savings over your entire supply chain—including your plan-to-produce and order-to-cash business processes" (OP, 2005f).

The SCM component like the SRM component contains many sub-components that create the functionality of the overall component. They include Customer Order Management; Logistics; Manufacturing Solution; Supply Chain Planning and the additional/optional sub-component of Supply Chain Warehouse.

This sub-component is optional in the SCM package. In this case if a user purchases the SCM component without SRM they can add the sub-component in as extra functionality. If the user already has the SRM component there is no need to obtain the additional sub-component as it is already included. This feature shows the way in which the Enterprise components can be used in collaboration in order to create a solutions package that is individual to the user's requirements.

There are three main features and benefits that the SCM component contains. These benefits include extending your supply chain in real time by connecting suppliers and customers with company business processes; providing integrated spend management for all categories of goods and services; delivering embedded analytics to monitor supply chain performance and adjust as conditions and business goals shift (OP, 2005f).

The Oracle/Peoplesoft SCM is only one of the many SCM solutions available in today's society. The different sub-component functionality and the many benefits that are provided by this solution make it a contender in the race for a quality SCM solution.

4.4.3 Financial Management (FM)

Financial Management (FM), or in some cases called Corporate Finance is defined by the online Wikipedia Encyclopedia as:

> "a specific area of finance dealing with the financial decisions corporations make and the tools as well as analyses used to make these decisions. The discipline as a whole may be divided among long-term and short-term decisions and techniques with the primary goal being the enhancing of corporate value by ensuring that return on capital exceeds cost of capital, without taking excessive financial risks" (OP, 2005g).

The Financial Management component provides some tools which can be used in order to maintain the financial management of a corporation. These types of tools were not usually included with complete packages and were needed to be bought separately from a company specializing in financial packages. However, as time as progresses the need for financial tools has become more commonly known as a core part of business procedures. Therefore the need for a financial package in a complete solution was required. The Oracle/Peoplesoft Financial Management component is one of many different FM tool sets available today. The tool set of the Oracle/Peoplesoft component are shown through the sub-components. They include:

- Financial Analytics;
- Financials (which includes, payables and receivables);
- Profitability Management for Financial Services;
- Revenue Management Solution Treasury;

An additional/optional sub-component is also available in this module. This extra sub-component is the Government Portal which would be used if the user of the solution was a government institution.

This FM component has three major advantages: *Total Ownership Experience***:** The solution when purchased is fully owned by the user which includes all the modules spread across the whole corporation; *Best-practice enhancements:* The FM module comes with enhancements such as intelligent self-service, embedded analytics, XBRL and XML capabilities, and instant messaging. *System-based controls for compliance:* Internal controls such as workflow, 3-way matching, and commitment control are all built right into the system (OP, 2005g).

As the growing size of corporation increases the need to organize and coordinate the corporations financials are becoming more apparent than before. The Oracle/Peoplesoft Financial Management component is one of many different packages that are available today in order to manage this daily function of corporate life.

4.5 Case Study 3: Microsoft – "Navision"

Microsoft is one of the most dominant forces with in the IT industry. It is seen as a leader in many different products and solutions in regards to IT. One of these solutions is Navision. The solution "gives the freedom to focus on your business by providing an efficient way to streamline your business and increase productivity. It is designed specifically for medium-sized companies seeking one solution to help increase productivity without disrupting everyday business operations" (MS, 2005a).

As with all the solutions that have been analyzed so far, the Microsoft solution contains components which are the underlying functionality for the solution. Within this solution the sub-components are Analytics, Customization, Distribution, E-Commerce & other Portals, Financial Management, Foundation, HR Management, Manufacturing, Project Management, Sales and Marketing, Service Management and Supply Chain Management. All these components contain individual functionality that helps with the cohesion of all the components working together. In this section the components of E-Commerce and other Portals, HR Management and Analytics will be analyzed.

4.5.1 E-Commerce and other Portals

The E-Commerce and other Portals component is similar to the Collaborative Commerce component that was discussed in the literature review in chapter 2.2.7. This component contains two sub-components: the Commerce Gateway and the Commerce Portal.

The *Commerce Gateway* is seen as a external portal for the business on a more global scale. It allows the corporation to conduct business-to-business (B2B) transactions, allowing electronic exchange of trading documents with other systems (MS, 2005b).

There are three key benefits that the Gateway provides for corporations. These include participate cost-effectively as a supply chain partner; accommodate the changing requirements of any partner quickly and use Microsoft BizTalk Server to orchestrate business processes smoothly, both within and between business organizations.

The Gateway portal provides access to external partners and corporations on a global scale. The *E-Commerce Portal* on the other hand provides internal and external access to vendors and customers on a more limited scale. This portal allows corporations to connect with their customers by allowing them to interact with the corporation's portal via the internet. Partners need's can be reacted to in real-time due to the readiness and availability of the portal to both staff and themselves. The Portal has a few key benefits that it provides improve responsiveness to vendor and customer demands; makes it convenient for supply chain partners to do business and reduces costs by automating commerce transactions (MS, 2005c).

By using the Gateway and Portal, the E-Commerce and other Portals component provides corporations with the most functionality in regards to collaborative commerce.

4.5.2 HR Management

In earlier times most of the HR was completed manually and mostly paper-based. Once again technology has advanced and so have the core procedures of corporations and therefore the tasks of the HR department have been moving to more computerized ways.

Nowadays, the complete solutions cater for the HR department. The HR Management component provided by Navision is an example of one such solution. It provides flexible facilities for organizing and controlling employee records. Built around a central repository of employee information, these facilities add reliable personnel management functionality to Microsoft Navision (MS, 2005d).

This component of the Navision solution controls the personnel of a corporation. In today's society the size of most corporations are large (with over 100 employees) and are continuing to grow as corporations gain profit and market share.

The HR component provides corporations with the tools for managing these large personnel bases they contain in order to see that payment and wellbeing of their staff and partners are taken care of. The benefits that are provided by the HR Management component include maintaining comprehensive employee records; defining corporation's own absence tracking methods; identify absence trends through multidimensional reporting of absence history; gives broad access to basic employee file information while placing tighter security restrictions on confidential data; track equipment issuance and attach comments to records (MS, 2005d).

In using the HR Management component, corporations are able to maintain not only their own staff but their partners and any customers that the corporation may deal with. The tools and programs that are available within the Navision solution are helping staff in managing their personnel, clients and partners alike.

4.5.3 Analytics

This component, Analytics, is similar to the Business Intelligence component discussed earlier in the literature review of chapter 2.2.6. Analytics is defined by the Online Wikipedia Encyclopedia as the most sophisticated analysis of data. It is said to closely resemble statistical analysis and data mining but is mostly based on physics modeling with the use of computers (MS, 2005e).

In today's society the use of Analytics is very important in gaining or maintaining a competitive advantage over your competitors and forwarding the company into the future. The use of knowing the current state of the corporation, its environment and its most rivaled competitors make the Analytics component that much more valuable to a corporation in finding out where they are headed in the future and answering those difficult questions of competitors and consumers.

In order to achieve this advantage and knowledge, this component of Analytics, contains two sub-components: Analytics and Dimensions. The first section of *Analytics* allows a corporation to gather and organize the data that they may contain within their corporation into "business-critical" information that can be used to help make crucial decisions for the entire corporation.

By using the Analytics functionality within the corporation, the company can benefit by gaining insight into the corporation; sharpen their competitive edge with smarter and faster decision making and help each employee drive the success of the corporation (MS, 2005f).

The second sub-component is Dimensions. This sub-component helps in the planning of the corporations present and future. It uses the knowledge known at the present time including the structure and layout of the corporation in order to help predict the future to which the corporation may face.

By using the Dimension sub-component of Analytics, the corporation is able to benefit by:

1. Exploring how the corporation operates on different levels;
2. Allows for growth and change of tools along with the corporation; and
3. Provides a base for important decisions from information that is trusted (MS, 2005g).

An example of the use of the Dimensions side of the Analytics component in practice is displayed by Svend Thomsen, who is the Chief Financial Officer of a corporation called Oticon who states that "The entire dimensions concept is especially useful at our headquarters, giving us the ability to control certain dimensions centrally, while leaving others at the discretion of our local offices" and "Dimensions enable an easy shift to new and unforeseen business models, meaning we can grow in all kinds of new directions." This provides a real life example of how these technological components are working in corporations in today's society (MS, 2005g).

In using these two sub-components in conjunction, Analytics provides a corporation with the tools necessary to make the important decisions and to help in planning the future direction in which the corporation will take.

4.6 Conclusion

This chapter is the result of objective two, stated in chapter 1.3, to describe the each of the three e-business solutions with a view to identify the distinguishing features including the sub-component functionality. It has therefore provided a brief analysis of some of the components of the complete solutions and from this analysis a number of conclusions can be made.

Firstly, in conducting the required document analysis of each solutions components, the quality of the data and information that was extracted from each of the vendor's websites was notably different. The data collected from the SAP and Microsoft websites was of large quantity and of high quality. While the Oracle website contained the required data for the analysis, it was clearly not to the standard of the other two vendors.

Secondly, all of the components (including the ones that were not analyzed) are able to be utilized individually or interconnected together within the end-to-end solutions. This was similar across all solutions, and demonstrates that this concept of separate components and complete packages is very common. In doing this a component can be purchased individually if required or together in a complete solution. In the Oracle/Peoplesoft solution of Enterprise, the option was also given of additional or optional components to solutions. This has also lead to many other solutions becoming "customized" packages as with the SAP Business Suite in that the extra components (including the core components that were mentioned earlier) that comprise the solution are chosen by the customer themselves.

Finally, the sub-component functionality that each component and solution contains are different across the three vendors. Each vendor has their own view to what would best comprise a certain component and this was evident when researching the sub-component functionality of each solution. It was noted that functionality that was included in the Microsoft solution, for example the Foundation and Distribution components, was not necessarily seen as significant in the SAP solution and therefore not included.

In conclusion, the three vendor solutions that have been analyzed all contain many similarities and differences in both website content and actual content of each solution. The up coming chapter will provide a more detailed comparison of the three solutions along with a discussion of other differentiating issues.

Chapter 5: Analysis and Discussion

CHAPTER 5: ANALYSIS AND DISCUSSION

5.1 Introduction

The subsequent chapter has analyzed three e-business vendor "End-to-End" solutions. This analysis described some of the components and sub-component functionality that each solution contained. This chapter will use the information provided in chapter 4 to deepen the analysis of these solutions a step further. At it's completion, this chapter will satisfy objectives three and four, to conduct a cross-comparison of the e-business solutions by comparing and contrasting differentiating features acquired in objective two (chapter 4) for the purpose of identifying one solution from another; and to discover and discuss the different ways in which e-business vendors are using non-technical features to differentiate their solutions from competing solutions in order to identify other aspects of individuality within these solutions.

As stated previously, the method of cross-comparison will be used to compare the three different vendor's solutions. Within this study this method of analysis is extremely important as it provides the information that is required to support the justification of this research. Section 1.5 detailed the justification of this research stating that in comparing each of the vendor's solutions contents, a corporation can quickly and easily look at the specifications, compare and contrast each, and then confidently choose one that is best suited to their requirements. The cross-comparison method is a well suited tool to achieve this. This method will also make known other factors about the three vendor solutions that will help in describing the non-technical features that distinguish these solutions. The cross-comparison of the solutions and a discussion about some of the findings will now be detailed.

5.2 E-Business Vendor Cross-Comparison

The document analysis conducted in chapter 4 on the vendor websites provided a small number of conclusions about the three vendor solutions (see section 4.6). As well as these general conclusions, there were a few specific findings that were established. The foremost finding saw that SAP was the *only* solution to include an ERP component within their "My Business Suite" solution. As described in section 2.2.1, ERP was first developed in the 1970's and has evolved over time. As more individual components such as Customer Relationship Management (see section 2.2.3) and Supply Chain Management (see section 2.2.2) have had the need for more specific technology, the use of the generalized ERP system is becoming less common. It can then be assumed that by not including the ERP component within their solutions, Microsoft and Oracle/Peoplesoft see their "end-to-end" solution as being a large ERP system with each component being a detailed more specific part of the system as a whole.

In analyzing the other components that are contained within each solution another finding was evident, a few of the solutions had some of their components joined together. For example, within the SAP solution, the components of HR, FM and Analytics were all included within the ERP component, where as within the Microsoft solution these specific components are all individual. However, within their solution Microsoft had included the PLM component within their SCM while Oracle was the only vendor to not have joined components. The last significant finding saw that only the Microsoft "Navision" solution contained an E-Commerce and other Portals component. Oracle was seen to have their communications distributed throughout the rest of their components (specific to each component), while SAP did not provide any evidence to suggest any use of e-commerce within the solution at all. Being in a global society today, communications are of high importance within a corporation, between suppliers, customers and partners, so the result of not having a specific component for the communications of the corporation within the SAP and Oracle solutions was most unexpected.

These findings can be summarized into Table 5.1 shown below.

	SAP	Microsoft	Oracle
ERP	✓	✗	✗
CRM	✓	Known as " *Sales and Marketing*"	✓
SCM	✓	✓	✓
SRM	✓	✗	✓
HR	Included within ERP	✓	✓
FM	Included within ERP	✓	✓
Analytics	Included within ERP, CRM and SCM	✓	✗
PLM	✓	Included with SCM	Known as "*Manufacturing*"
E-Commerce & other Portals	✗	✓	Contained within some of the components separately

Table 5.1 Cross-Case Vendor Comparison Table

From this table, one more finding is evident. Within a few of the solutions some of the names of individual components are different. For example, within the Microsoft solution CRM is know as Sales and Marketing, while in the Oracle solution, PLM is known as Manufacturing. This finding demonstrates that each vendor is trying to differentiate themselves from the other vendors by allocating different names to their individual components.

5.3 Vendor Sub-Component Comparison

In examining the solutions on the second level of analysis, Components (see Unit of Analysis section 3.4), table 5.1 indicates that overall all of the three solutions are similar in what components they contain. In this case it would be necessary to take the analysis of these solutions one step further into the sub-component level of functionality, to see whether the findings that were apparent in the component level are the same at the sub-component level. In order to do this, two components will be analyzed at the sub-component level. These components are Supply Chain Management (SCM) and Customer Relationship Management (CRM).

Supply Chain Management as described in section 2.2.2, is an important tool in helping the B2B processes that take place between the corporation, its suppliers and partners. In conducting a comparison of the SCM components of the three solutions table 5.2 can be constructed.

SAP	Microsoft	Oracle
Demand and Supply Planning	Business Notification	Customer Order Management
Service Parts Planning	Distribution	Logistics
Procurement	Manufacturing	Manufacturing Solution
Manufacturing	Manufacturing Foundation	Supply Chain Planning
Warehousing		Supply Chain Warehouse
Order Fulfillment		
Transportation		
Supply Chain Design and Analytics		

Table 5.2 SCM Sub-Component Cross-Comparison

Table 5.2 lists each of the solutions functionality for the component of Supply Chain Management. From this table a few findings are evident. Firstly, the number of sub-components that are within each of the solutions varies. This difference suggests that

each vendor has their own idea to what they feel comprises the ideal SCM solution. However, in seeing these differences, there are common groupings to which the sub-components can be placed into. For example, the sub-components in red display that all solutions have a Manufacturing section to their component, while the sub-components in bright blue indicate there are the use of logistics within each solution. This last similarity (in bright blue) highlights a relationship to the original vendor cross-comparison displayed in table 5.1, where there were components of the same type but of different name, for example, where CRM is called Sales and Marketing and PLM called Manufacturing. In this case, Logistics in Oracle is seen as Distribution in Microsoft, and Transportation in SAP, all resembling the same feature but by different name.

The second component to be analyzed is Customer Relationship Management. This component is also an important tool within the corporation in coordinating the customer relations of the business. A similar table was constructed based on the CRM sub-components of each solution. The results are displayed in table 5.3.

| SAP	Microsoft	Oracle
CRM Analytics	Contact Management	CRM Analytics
Channel Management	Contact Classification	CRM Industry Solutions
E-Commerce	Campaign Management	CRM Operational Dashboards Marketing Solution
E-Mail Response Management	Opportunity Management	Partner Relationship Management Solution
Interactive Center Management	Task Management	Revenue Management Sales Solution
Marketing	Document Management and Interactive Log	Revenue Management Service Solution
Sales	Contact Search	
Service	Email Logging	
	Outlook Exchange	

Table 5.3 CRM Sub-Component Cross-Comparison

This table shows some similarities but mostly differences to that of the SCM table (table 5.2) and the vendor comparison table (table 5.1). The major difference that can be seen is that the sub-components within the CRM solutions can not as easily be placed into groups as the SCM sub-components were. This difference can be noted on the idea that the SCM component is seen as a "standard" part of the organization and therefore there are standard tools that everyone can use to get the results that are needed. As all organizations have suppliers and partners in which contracts are negotiated, therefore not much differentiation is required. Although the CRM component is also a standard part of the organization, the need for organizations to keep customers and obtain new ones, does require a sense of differentiation from their competitors. Therefore, in reviewing table 5.3 once again, the amount of different sub-components within the table demonstrates how each of the three vendors are trying to differentiate themselves from their competition with a component that is vital to an organizations livelihood.

5.4 Complete "End-to-End" Solutions

The subsequent sections have analyzed the three different vendor solutions on the levels of Components and Sub-Component functionality (see Unit of Analysis section 3.4). From this analysis a few conclusions can be made. Firstly, when analyzed at the component level, all three solutions seemed to present similar functionality within their solutions, besides one or two differences, the major being the non-inclusion of an ERP component within Microsoft and Oracle. Secondly, at the sub-component level, different findings were evident. One of these findings showed that within the sub-component functionality, different components were similar in functionality across the solutions while other components were different. This was displayed with the comparison of the SCM and CRM components. The SCM component saw similar features across the three solutions while the CRM component revealed that each solution was different in what functionality was included.

In taking these findings from the component and sub-component levels into consideration, a conclusion can be made: Although there was evidence of a few differences between the solutions at both levels, the majority of functionality of the three solutions can be said to be the same. From this an assumption can be made: When attempting to market these solutions to their respective clients, the vendors market the solutions as whole or "End-to-End" packages. This is displayed below in figure 5.1.
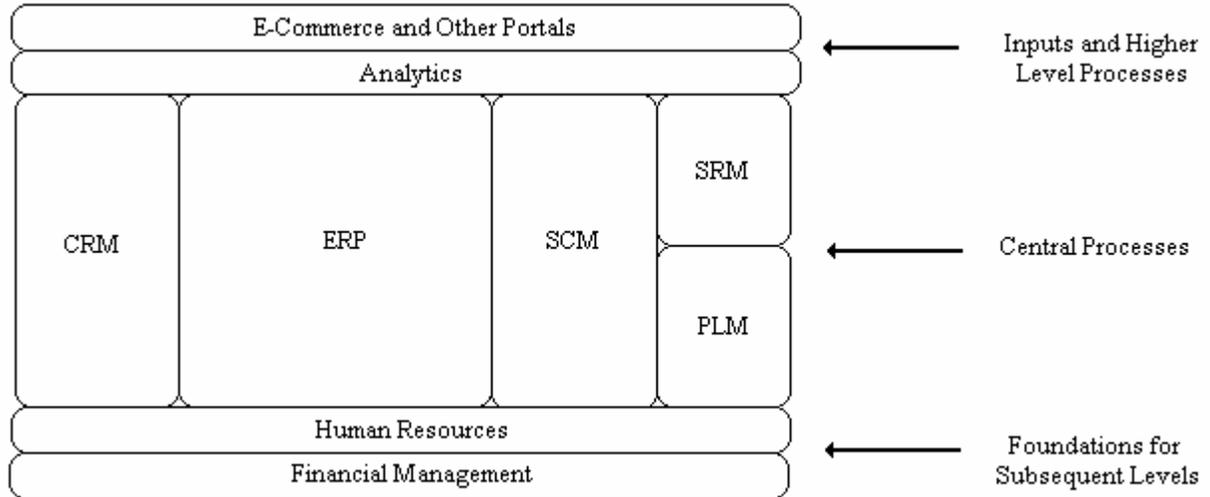
Figure 5.1 The Complete "End-to-End" Vendor Solution

This figure demonstrates the results of the research conducted on the three vendor solutions and displays what is seen to be included within a typical "End-to-End" solution. This figure also demonstrates the different levels of processing that is contained within a solution. The top level of Inputs and Higher Processes sees the e-commerce technology such as the use of the Internet and gathering data from customers be analyzed and transformed into workable information for the corporation through the use of analytics. Once this useful information is gathered it can be passed down into the Central Processes where it maybe used to help identify customer demands (CRM), improve the efficiency of internal processes (ERP) and identify ways to improve the productivity of the corporations products and services to it's customers and suppliers (SCM, SRM, PLM). However, for all these inputs and central processes to be completed efficiently and effectively the wellbeing and organization of staff and finances are a high priority. This sees the use of the HR and Financial Management components as the foundations for the organizations practices.

5.5 Discussion

In examining the different levels of analysis and in concluding that all three solutions are similar in functionality, the question then remains: What features are differentiating these solutions and vendors from one another in the market place? The answer is the Non-Technical Features. These features such as customer support, price, and brand loyalty all can impact heavily on the decision of which solution to choose for the corporation and provide the competitive advantage one vendor may need over another in order to make a sale on their "end-to-end" solution. These features can also be seen as Intangible Resources of each vendor and can be used as part of the Resource Based View of the Firm strategy.

5.5.1 Resource Based View of the Firm

The Resource Based View of the firm is a strategy established on the idea that "…firms can be thought of as bundles of productive resources and that different firms posses different bundles of these resources" (Barney, 2002, p.155). A *Resource* is defined as "…an observable (but not necessarily tangible) asset that can be valued and traded – such as a brand, a software patent, a parcel of land, network infrastructure or close relationship with customers" (Coltman_4, 2005, p. 3).

In this study, it was demonstrated that the use of the technical resources (functionality of solutions, tangible resources) provided no value in differentiating the three vendors and their solutions. It would then seem that in order for these three vendors to differentiate themselves within the marketplace they must use their intangible resources as demonstrated with the Resource Based View of the Firm strategy.

The most common and popular use of an intangible resource is that of Brand Loyalty. As stated by Maloney, brand loyalty "... goes beyond the tangible elements of a product or service" (1999, p. xix) by obtaining the mind and heart of each customer. This then in turn leads to the customer purchasing and re-purchasing products from the same vendor.

Within this study the use of brand loyalty would be seen as a ideal strategy in order to sell the "end-to-end" solutions mainly because if a customer buys one individual solution from a vendor, for example the CRM component, they would be more likely to return and buy another module and therefore keeping with the idea of brand loyalty.

This then leads to another important intangible resource that these vendors can have, the issue of Integration. An article by Baron (1999) demonstrates the impact that the issue of integration can play when choosing software for the corporation. Baron explains that the main reason that a corporation (or customer) will continue to purchase software from the same vendor is to avoid the integration issues that arise with dissimilar components. The article titled 'One Vendor, One Solution' explains how

> "… many businesses are turning to prominent enterprise resource planning software vendors, believing that a single solution from a single vendor may be the best way to coordinate the flow of material among the companies and their suppliers and distributors….
> The reason is simple: Integration."

This article also supports the previously mentioned concept of brand loyalty as by purchasing the complete solution, the corporation (or customer) is staying with the same vendor. This represents the use of brand loyalty on the corporations (or customers) behalf.

Within the article, the findings of this thesis are supported by Baron in that as the title of the article suggests, the market place for complete "End-to-End" solutions will end up being 'One Vendor, One Solution'. In this situation, instead of corporations buying individual components (segmented) they will choose to purchase the complete solution mainly for the reason of ease of integration. Within the article Baron mentions some of the vendor "front-runners" of ERP software today. Included within this list are the vendors used within this study: SAP, Microsoft and Oracle/Peoplesoft. This once again reinforces the domination of these vendors within the industry and establishes once again that they are the best examples to use when conducting this study.

5.5.2 "End to End" Vs Segmented

So far it has been demonstrated that these three main leading vendors of complete "End-to-End" solutions have an established dominance on the market. A question can then be posed: What about the vendors of the individual (segmented) components? It would seem that these vendors of individual components such as CRM and SCM are fighting to compete with these multinational corporations. To make matters worse for these smaller niche vendors, the corporations studied including SAP, Microsoft and Oracle/Peoplesoft also have their hand in the individual component market as well as the complete solutions. Companies such as Seibel, Saleforce.com, IBM and Broadvision specialize in single/individual components. Within their own market of these individual components, these niche vendors have to fight amongst other competitors in order to make sales, but now the playing field has been extended to include the vendors of these complete "End-to-End" solutions.

A question then remains, will these niche vendors be able to survive as the multinational complete solution vendors increase their dominance within the market even more? The future does not look good, and within the market today we are seeing the niche vendors being bought out or merging with the multinationals in order to keep the company alive. An example of this is when Peoplesoft merged with Oracle. Peoplesoft were vendors of mainly individual components, but had one complete suite. However, the company was being outplayed in the marketplace and was loosing sales and market share. In order for Peoplesoft to survive it merged with Oracle. These issues then bring us back to the article by Baron (1999) "One Vendor, One Solution". It would seem that the continued growth of the multinationals, by mergers and/or acquisitions will see the marketplace for B2B solutions become a battlefield for a selected three to four vendors. Who will come out on top remains to be seen.

5.6 Conclusion

This chapter has provided some insight into some of the findings that were found throughout the subsequent chapters. It has satisfied objective three, to conduct a cross-comparison of the e-business solutions by comparing and contrasting differentiating features acquired in objective two (chapter 4) for the purpose of identifying one solution from another. This objective satisfied by concluding that overall the three vendor solutions were similar in technical functionality through the use of the cross-case vendor comparison table 5.1.

This chapter also fulfilled objective four, to discover and discuss the different ways in which e-business vendors are using non-technical features to differentiate their solutions from competing solutions in order to identify other aspects of individuality within these solutions. This objective was achieved by providing insight into how vendors are using the Intangible Resources from the Resource Based View of the Firm strategy in order to try and differentiate themselves from other vendors.

Finally, a look was taken at how the smaller niche vendors are being outplayed and over run by the larger multinational corporations when it comes to B2B solutions. This showed how the niche vendors are having to merge or be acquired to remain within the industry.

Chapter 6: Conclusion

CHAPTER 6: CONCLUSION

1. Introduction

This thesis was written on the topic of "E-Business Solutions: Complete Vs Segmented". The preceding chapters have introduced this topic, provided the necessary background on the literature at current, detailed the methods that were to be used to conduct the study, analyzed in detail the components and sub-components of three vendor solutions and finally provided some in depth analysis and discussion about some of the findings that were evident throughout the study. This final chapter will aim to encapsulate the major findings, conclusions and implications of this research. It will endeavor to provide links to earlier findings, establish some of the limitations that were encountered and finally provide some future recommendations.

2. Principle Conclusions

Throughout the study many findings and conclusions became apparent. The first of these major findings saw the non-inclusion of an ERP component by Microsoft and Oracle. This finding was unexpected and because of this a new perspective was applied to these solutions. This perspective assumed that by not including an ERP component within their solutions, the "Navision" and "Enterprise" solutions were viewed as complete ERP systems. From this it could be thought that each of the individual components that then comprised the Navision and Enterprise solutions were the detailed more specific parts of the total ERP system.

The next major finding and the principle conclusion of this thesis was the discovery that all of the three solutions had similar technical functionality and that their technical capability was not a determining factor in their differentiation. This conclusion was made after the analysis of the cross-case vendor comparison table was constructed and analyzed (See table 5.1). This table provided the necessary data to compare and contrast the three solutions. However, the conclusion stated that the functionality of all three solutions were similar, not identical. This was apparent through the deepened analysis that was

conducted on some of the individual components of the solutions. As it was demonstrated within chapter 5.3, the analysis of the sub-component features in regards to technical functionality provided mixed results. The SCM component was seen to have similar functionality across all three solutions, while the CRM component was different in that all three solutions contain the greater part of different inclusions within their components. From this another assumption was then made. The standard more routine procedures that were apparent with the SCM component did not need to be differentiated as every task was the same for the majority of corporations. However, the CRM component needed to be different as this component demonstrated each vendors view how of they obtain and retain their customers and clients. In reviewing, the differentiation of the CRM component was understandable and expected.

The final major finding that was established saw the non-technical features of each solution becoming the differentiating factor of the three solutions. This finding demonstrated that by using the Intangible Resources from the Resource Based View of the Firm strategy, each vendor could tailor these resources to accommodate their own particular style or method. This then saw that the three different vendors could only be differentiated by their use of their non-technical, intangible resources of brand loyalty and ease of integration for example. This finding showed that by having good brand loyalty with their customers the probability of those customers or clients returning to purchase more goods or services from the vendor were increased. This will help in the sales of the "End-to-End" solutions as customers/clients will take on board both of the intangible resources when choosing a vendor by selecting one that will provide good brand loyalty along with ease of integration of their solutions.

3. Major Implications

In regards to the major implications that can be established from this research they can be classified into the following categories.

Large Multinational Vendors: This category sees the inclusion (but not limited to) the vendors of the case studies within this thesis, SAP, Microsoft and Oracle/Peoplesoft. The results that became apparent during this thesis will affect these corporations in that they can see throughout the marketplace the degree to which the technology differentiates between these corporations is very minimal. This research will hopefully provide them with the inspiration to continue their individual research and development programs in order to one day discover and invent a new innovation that will separate them from the rest of the market. It is hoped that they will also realize that it is not just the technical features that require the most attention. By hopefully placing more attention into their intangible resources they can move to another level in which other corporations may not be able to achieve.

Small to Medium Niche Vendors: This category comprises of the vendors that produce and sell the individual components that were analyzed throughout this study. Examples of these vendors include Seibel, Saleforce.com and Broadvision who are producers of components such as Customer Relationship Management (CRM) software. As explained in chapter 5.5.2, these vendors do now not only have to compete with their own known competitors, they now have the fact of the larger multinational vendors entering their market with the "End-to-End" solutions. It is hoped that the research completed within this thesis will provide them with the inspiration to continue with their individual solutions. They may not be able to compete with the complete solutions, but if they are able to make their individual products superior to what is included within some of the complete solutions they will have a good chance of gaining some market share off these multinational vendors.

Consumers and/or B2B Clients: Within this category are the people who are intended to purchase a solution of some sort for their corporation. This research it is hoped has provided them with the greatest amount of knowledge. The principle conclusion of this research stated that all the technical functionality of the three solutions were similar. In knowing this conclusion, the consumers are in the prime position of choosing which vendor they will select in order to purchase their solution from. As stated, technical functionality will not be an issue, so therefore the consumers' best option would be to scrutinize the intangible resources of each vendor and evaluate which one will provide the best needs for their corporation. In this situation, the vendors will be at the needs of the consumers in order to gain that vital sale of their "End-to-End" solution.

The three previously mentioned categories show the diversity that the findings and conclusions of this research has provided. These categories are not the complete list of the types of people who are affected by this research, but it demonstrates the depth of the IT solutions market within society today.

4. Links to Earlier Findings

As mentioned earlier within the study (section 1.3.2), there was a gap in the knowledge of E-Business solutions that this thesis was aiming to address. This gap stated that in the current literature available today, there was no known study that had been conducted which included all of the eight traditional components of e-business solutions (chapter 2). By completing this thesis, this gap has now been filled. This research has provided a study which has analyzed all eight traditional e-business components and then examined three of the present day leading vendors of e-business solutions to see whether these eight traditional components are still being used today. The analysis that was undertaken provides the following conclusion: Each of the eight traditional components are still being used in today's e-business industry, however they are not the same. An example of this is seen through the component of Customer Relationship Management (CRM). In the past there was fewer numbers of vendors on the market for certain products. The need to target customers and sell the product to them was high, but not to the standard that it is today. In today's society, the use of marketing and advertising to sell a product to a consumer has become a rival business. The importance of the CRM component has increased dramatically and its uses are becoming more diverse and individual as was demonstrated in section 5.3. This research has demonstrated this change in the appearance and functionality of some of the components therefore filling the gap that was apparent within the literature.

5. Limitations

In completing this study there was a number of limitations that were encountered. As stated in section 1.6, the four main limitations of this study are:

1. The study is only limited to three (3) solutions and corporations. Future research could take on many more corporations and solutions for a more accurate view of IT solutions. In addition to this, time only permitted the analysis of two sub-components where the ideal aim would be to analyze all sub-components in regards to functionality.

2. The products are significant to the IT sector. The products/solutions of different industries such as manufacturing and full virtual organizations would be of interest to analyze and compare with the IT sector.

3. A large amount of data that will be relied on will come from the websites of the corporations. This in turn could end up being a slight bias, but all importance has been allocated to make sure this is not the case.

4. The time limitation inhibits the detail to which the content can be analyzed. If the time frame was extended, to the range of PHD for example, there would be more time available to put more detail into some of the sections, such as the initial descriptions of components and solutions.

In addition to these, another limitation that was evident due to the short time frame was the fact that research would have liked to have been conducted on the difference between the functionality of the multinational vendors in comparison to the niche vendors.

6. Recommendations

6.1 Further Research

Within this area of research there are a number of avenues that can be address. The main paths which would like to be addressed concerning this thesis are in conjunction with the previously mentioned limitations. Firstly, the use of more vendors and more solutions would provide a more detailed and accurate description of the e-business marketplace. Secondly, the analysis of more of the sub-components would provide even more depth and accuracy to the degree of differentiation between the vendor solutions.

As this study was conducted within the IT industry, in that the solutions that were analyzed were intended to be used within e-business corporations, future research could investigate the use of IT solutions in other industries such as manufacturing, retail or the health departments.

7. Conclusion

This study has filled the gap in the current literature in regards to e-business solutions. It is hoped that the findings and conclusions that were discovered and presented within this thesis provide corporations within the IT industry with some vital knowledge about the state of their products and competitors and provides the current knowledge base of e-business solutions with some up-to-date, real-life case studies of e-business solutions in practice today.

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