



THE ROLE OF BUSINESS INFORMATICS IN BUSINESS TRANSFORMATION:

A CASE OF A COMPANY IN CAPE TOWN

by

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ABSTRACT

The objective of the thesis is to determine the role Business Informatics plays in transforming an organisation using a selected organisation in Cape Town as a case study. Business informatics is an emerging discipline that combines various aspects of business management, information technology and informatics. Informatics is broadly defined as the science of processing information; thus, increasingly, it involves processing and analysing information digitally with the aid of computers. Therefore the aim of the research was to understand what components of business informatics are being leveraged to transform businesses, and the challenges thereof.

This was done using a social theory – duality of technology from Orlikowski adapted from Giddens' Structuration Theory (ST) as a theoretical framework, particularly, the dimensions of duality of structure. The theory was used as a lens to understand and interpret this social phenomenon - the role business informatics can play in business transformation. It is argued that business informatics concepts are able to assist in business transformation through effective use of information systems and business management concepts. In that regard, ERP system in a Cloud platform was recommended to illustrate these concepts. The concepts helped to device guidelines for determining the challenges of a business to use informatics to transform and become sustainable and competitive. Therefore, the research explained and recommended why business entities have begun to move from an application-based enterprise resource planning (ERP) system to cloud computing-based ERP (cloud-ERP) system.

The study used the interpretive approach where qualitative philosophy was applied together with the underpinning theory and literature reviewed to design a semi-structured interview schedule as a data collection instrument. It was a case study of an Organisation where the units of analysis were the IT, Finance, HR and Sales and Marketing departments and object of analysis was 50 employees. The output is a general framework to guide businesses as to how to apply the concepts of business informatics to achieve improved business transformation.

Key Words: Structuration theory, Informatics, Business, Transformation, Resource Planning, Enterprise

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GLOSSARY

Terms/Acronyms/Abbreviations	Definition/Explanation
AST	Adaptive Structuration Theory
BI	Business Informatics
BP	Business Process
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning System
ETIP	Enactment of Technology in Practice
ETL	Extract, Load And Transform
IDE	Integrated Development Environment
IS	Information System
IT	Information Technology
ST	Structuration Theory

CHAPTER 1 : INTRODUCTION

1.1 INTRODUCTION

This chapter provides a lens through which the whole thesis can be viewed. The chapter gives a brief background to the research, and the problem that was investigated, that led to conducting this research. In addition to the aforementioned elements, it also presents a brief overview of the research design and methodology, along with all the underlying ethical considerations that were followed throughout this research.

On the 25 March 2014 there was an 'Oracle open day' in the Cape Town International Convention Centre (CTICC), where Oracle representatives demonstrated why it was necessary to move to the cloud based ERP technology instead of maintaining an application-based enterprise resource planning system (ERP). At the same time, one speaker mentioned that businesses should not be conducted like in the past, but should rather adapt to current technological trends.

This research agrees with the Oracle presenter in that running a company in today's business environment cannot be conducted as in the past. Along with the enterprise need for adaptability in a contemporary environment is the business need to expand and survive (Chou and Zolkiewski, 2010; Mayson, 2011; McKinsey, 2012; Winnard et al., 2014; Accenture, 2014; Vohra, 2015).

These needs led to new ways of doing business made available through new technology such as cloud computing or social media, whose costs are more predictable and benefits can be recouped faster (McKinsey, 2012; Durkin et al., 2013; Kouatli, 2014; Ratten, 2014; Accenture, 2014; Gangwar et al., 2015; McCann & Barlow, 2015; Doherty et al., 2015). The benefits associated with these new ways of doing business are numerous; they include the reduction of costs while improving efficiency and effectiveness, customer satisfaction, a bigger market share and a competitive advantage (McKinsey, 2012; Durkin et al., 2013; Ratten, 2014; Accenture, 2014; Gangwar et al., 2015; Doherty et al., 2015; McCann & Barlow, 2015).

Also, these new trends in the concepts of business informatics will provide operational knowledge and analytical expertise, and will assist top management to formulate a good strategy for the company (McKinsey, 2012; Durkin et al., 2013; Accenture, 2014; McCarthy et al., 2014; Doherty et al., 2015; McCann & Barlow, 2015). This operational knowledge and analytical expertise will come from the data emanating from various technological platforms, which is why businesses are data-driven (McKinsey, 2012; Vuori, 2012; Accenture, 2014; Gangwar et al., 2015; McCann & Barlow, 2015). Data-driven insight and forward-looking

guidance can pinpoint areas of concern, and potential areas of investment or even growth. These areas of concern will thus be able to guide the business during the transformation by identifying opportunities of investment and growth.

This can be accomplished through leveraging the latest technologies and hence streamline the legacy systems to identify opportunities based on facts rather than opinion, and also to detect bottlenecks (McKinsey, 2012; Vuori, 2012; Durkin et al., 2013; Accenture, 2014; Doherty et al., 2015). These new technologies will allow the automation of routine transactions whenever possible, which will enable the business to focus on value-added activities that can differentiate and drive the business forward (McKinsey, 2012; Kouatli, 2014; Accenture, 2014; McCarthy et al., 2014; Gangwar et al., 2015; Doherty et al., 2015).

As established above, these trends in the concepts of business informatics (BI) can assist in transforming a business. But these trends in the concepts of BI are not its only components that can assist with the transformation of a business. In fact, BI can be subdivided into components such as Information Technology (IT)/ Information System (IS), computer science, and business (strategic) management (Chauchat et al., 2011; Henderik, 2013). All these components come together to constitute a solution-oriented approach for any business that wants to enhance and transform its business activities (Krstev et al., 2011; Korczak & Miecz, 2013).

1.2 Overview of the Case

Company X conducts its activities in the messaging business in which it has been involved since the early 2000s and it has been on the rise gradually ever since. The company has now turned out to be an international pioneer in business-to-consumer messaging, supplying some of South Africa's top banks, insurance companies and retailers. This remarkable evolution, however, did not occur without challenges of its own. This is due to the large amount of data transacting across departments.

The business is facing an issue with the amount of data the company has been generating and accruing, and which has grown immensely. Also, management of this increasing data has not been tackled in a scalable and effective manner. The loads of competition is continuously increasing, with business practices and regulations continually inducing businesses to re-assess, update, renovate or streamline business processes; change or transformation have thus come to be indispensable.

There is a growing necessity to consolidate the data into one centralised database. A database is consequently necessary where Company X employees would be capable of retrieving current information about sales, finance and any other relevant department.

1.3 RATIONALE

In his book “The Origin of Species the anthropologist,” Darwin (1859; cited in Megginson, 1963) said:

“It is not the strongest or the brightest that will survive, but the ones that are most adaptive to changes.”

One might be tempted to apply this quote only to anthropological studies; however, it can also be extended to business transformation. To maintain leadership in any industry, achieve competitive advantage, and manage economic volatility, a business needs to reinvent, or go through a business transformation (Horton, 2011).

Lee et al. (2008) define business transformation as key management initiatives that align procedures, people, and technology with its goals and visions. Rouse (2005) concurs with Lee et al. (2008) by stating that a change in management strategy or business transformation is driven by value deficiencies, such as:

- Unexpected downside losses of value, e.g., declining enterprise revenues and profits;
- Unexpected failures to meet projected or promised upside gains of value, e.g. failures to achieve anticipated enterprise growth;
- Achieving new levels of value such as exploitation of market and technological opportunities, which is at the crux of this research.

It is from the exploitation of technological opportunities and value deficiencies that the need for business informatics, which is the focus of this research, emerges. Business informatics is considered as a solution-oriented approach to problem solving (Krstev et al., 2011; Korczak & Miecz, 2013). Business informatics is an interdisciplinary concept that strives to solve problems or deficiencies by applying new technologies.

Figure 1.1 below shows the concept of business informatics, which Chauchat et al. (2011) state as:

- **Informatics:** informatics refers to the science of processing information through the aid of computers. This refers to transforming the data into relevant information (Oestreich, 2011). Information in the current business environment has significant value and is of great importance, to the point that accessing the right information at the right time can lead to successful business undertaking (Chauchat et al., 2011).
- **Information technology:** IT refers to the setup, configuration and maintenance of computer systems. This aspect of business informatics assists in applying new technologies and strategies for problem solving (Chauchat et al., 2011; Henderik, 2013).
- **Business management:** this aspect deals with the leadership and strategic thinking needed to stir the business in the right direction Chauchat et al. 2011; Korczak & Miecz, 2013).

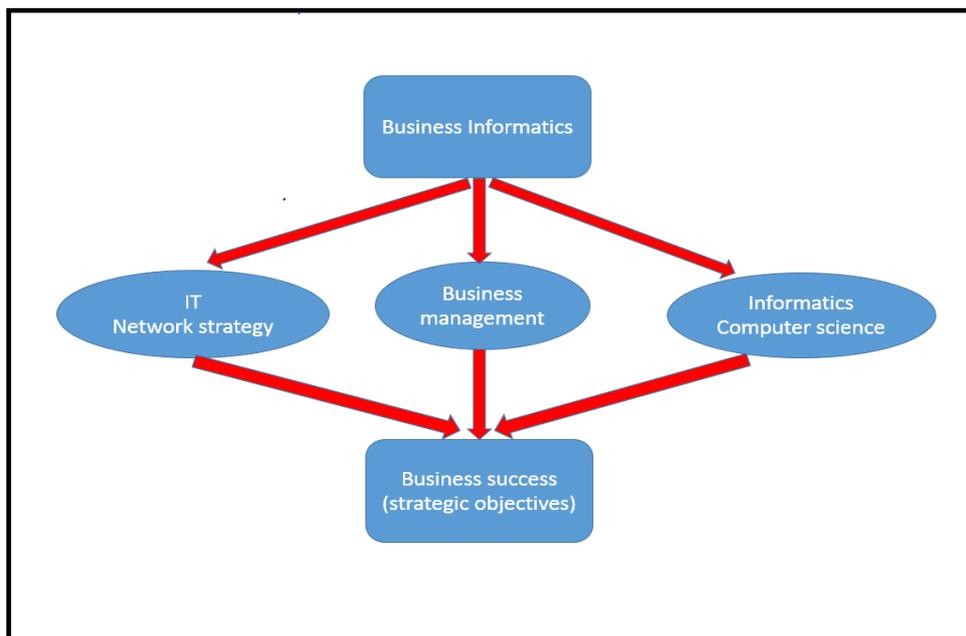


Figure 1.1 Business informatics concepts (Source: Chauchat et al., 2011, adapted)

The perception stemming from the above Figure 1.1 is that business informatics encompasses several areas or bubbles of knowledge that can be used as the foundation for formulating business strategy to transform any business (Krstev et al., 2011; Korczak & Miecz, 2013), concomitantly ensuring that it adapts to the requirements of the modern business environment.

As mentioned above, business informatics includes business management or strategy. Strategy will drive the business into processes which are turned into application that are subsequently deployed. In fact, an ERP system for example follows the same procedure. Indeed, an effective ERP system should encompass and support several aspects of the strategy of the organisation. This will ensure that the ERP does not function as a stand-alone within the enterprise. The system is built on processes that arise, and are defined from strategy. These processes emanating from the strategy delineates the business into services (Doherty et al., 2015). Again, as strategy is a *sine qua non* condition underlying an ERP system, necessities of any aspect (or services) of the system will be determined from that strategy. This entails that, if an aspect or service of the system is not needed on a strategic level, it will easily be removed and vice versa.

This research considers therefore that Enterprise Resource Planning (ERP) systems are core to the concepts of business informatics and could be the foundation for business transformation. The research defined how business informatics related systems such as the ERP systems used by Company X will lead to the transformation of a business. Figure 1.1 illustrates the business informatics concepts where ERP could be considered the business strategy and the ERP System as the business application with embedded processes and services.

However, several areas of potential deficiencies (that link up with the strategic position of the business, and observed in company X) whereby business informatics concepts can assist in business transformation are highlighted as below:

- **Competition:** in certain industries, competition can be so tough that a business might not be able to survive if it does not find a way to differentiate its product.
- **Innovation:** the business can be affected by new technological trends if it does not engage in business transformation, innovation, and the incorporation of these technologies in its operations.
- **Efficient and effectiveness:** the business might need to reinvent itself to deal with the challenges it might be facing. Business informatics will thus provide a solution that will assist in enhancing the current business activities.
- **Profitability:** once the survival side is under control, there comes the issue of profitability in which the firm needs to focus on increasing its profit margin.

- **Customer loyalty:** within a competitive environment, businesses are faced with many issues to retain customers. Improving customer service through services transformation can assist in retaining them
- **Expansion:** eventually, after dealing with main start-up issues, a business needs to look into expanding from a small entity into a major entity.

Furthermore, businesses provide services or products which are in turn delivered to customers. Several deficiencies can be pointed out in an organisation that is leveraging a form of ERP system. Several deficiencies can be noted as spotted with Company X, these includes:

- **At the level at which input are entered in the ERP system;**
- **The way inputs are entered and processed in the ERP system:** organisations might sometimes process their input in an outdated fashion that can lead to a loss of time and increased production costs;
- **At the delivery level of the ERP system:** customer (including employees) satisfaction is also attained through proper relationship management and the effective delivery of products or reports.

From all the potential deficiencies mentioned above, a business transformation can occur to lead the business to the heights of increasingly more efficiency and effectiveness. Indeed, this can be done by either altering the ways business and processes are run to fundamentally new ways, or by proposing new products or services, how they will be supported and delivered, and how the entity will be organised to deal with these new products (Rouse, 2005).

Business informatics concepts, such as the application of cloud computing and social media, can assist in dealing with the aforementioned matters by addressing and significantly improving operations. Business informatics concepts can be used to assist the business to transform, enabling it to either sustain itself or expand (Saini et al., 2011).

Furthermore, these relatively new ways of doing business have been made available through new technology, which can help the business to cut down on costs, increase efficiency and effectiveness, as well as customer satisfaction, leading to a bigger market share and competitive advantage. For instance, entities are starting to move from an application-based

Enterprise Resource Planning (ERP) system to Cloud-ERP (Saini et al., 2011; Fauscette, 2013; Rabay et al., 2013).

According to Twum-Darko and Sibanyoni (2014), companies are able to reduce the cost by reducing the maintenance and support cost of owning infrastructures by leveraging cloud computing. Moreover, a cloud-based ERP can also assist in becoming more agile, flexible, efficient and effective (Saini et al., 2011; Fauscette, 2013; Rabay et al., 2013). This is possible because the cloud-based systems will run directly through the Internet, hence forgoing all the excessive hardware (Saini et al., 2011). And as the cloud directly fits in with any infrastructure, it will easily plug in and integrate with the existing platform. This is an important aspect, as it can assist entities such as Company X to integrate their systems, hence solving their data-inconsistency problem.

Additionally, as the onus on running the system is on the cloud service provider, this limits the need for in-house support (Rabay et al., 2013). Hence, by using cloud computing, the business will be able to reduce the cost of production which will/can be redistributed to customers in the form of lower cost, thus increasing the chance of competitive advantage and customers' retention (Saini et al., 2011; Fauscette, 2013; Rabay et al., 2013).

Finally, through social media (and customer-relationship management), businesses can get closer to their customers to learn their preferences, and even discover new ideas for products to be manufactured. By doing so, they will then be able to increase their customer loyalty.

In conclusion on this section, several factors affect the business's survival and growth within its environment. To remain sound economically, retain market share and even increase it, the business might need to transform the organisation. This transformation can be assisted by business informatics such as cloud computing and integrating social media within the ERP system.

1.4 PROBLEM STATEMENT

Suboptimal use of technology has resulted in business transformation challenges in many organisations. In fact, Moreno (2014), Wayde (2015), Accenture (2016), McKinsey (2016) are of the opinion that technology is constantly evolving and that failing to transform via using and adapting to technological trends lead to inadequacy in meeting customers' needs. The problem is that Company X has multiple sources of revenue entered across several systems, and the duplication of data entries is causing errors in the reporting of official revenue numbers. There are several systems with different repositories, but no central repository

available from which accurate data can be accessed and used for reporting, business analytics or forecasting. In this regard, Company X cannot achieve greater and long-term business sustainability as it is unable to transform its business by leveraging and adapting to new trends presented by the concepts of business informatics (Stratton 2011; McKinsey, 2011; Reinertsen, 2012; Accenture, 2012; Ernst & Young, 2014; Deloitte, 2014).

The above mentioned problem had come about due to the advent of improved information technology strategies. These improvements such as cloud computing and social media which have flooded the business environment had tremendously influenced business informatics concepts and their application in the business environment (Morgan & Page, 2008; Teece, 2010; Oestreich, 2011; Deloitte, 2014). However, Company X is transforming without considerable attention to these new trends and the impact of technology on employees and stakeholders (Narain, 2011; Rotibi et al., 2012, Accenture, 2012, Rotibi et al., 2012).

Company X was at risk for failing to adapt to recent trends and impact of technology on its business (Teece, 2010 and Accenture, 2012). Actually it is facing the risk of losing some market share, customers, revenue or their competitive edge (Morrisson 2009; KPMG, 2011; Rotibi et al., 2012; Ernst & Young; 2014 Deloitte, 2014). Inconsistent data between the various data sources is causing inaccurate reporting and time wastage, with constant reconciliation of data being done between staff members almost daily. It was therefore necessary to do this research to understand and address the business transformation requirements that Company X could leverage on business informatics concepts to address them. Addressing these requirements would assist them in remaining competitive, ensuring customer satisfaction, and increasing their revenues by utilizing the trade-offs from low costs of production and operations (KPMG, 2011; Stratton, 2011; McKinsey, 2011).

1.4.1 Research Objectives and Sub-Objectives

Given the problem statement, the main objective of this research was *to determine the factors of business informatics that will drive business transformation.*

To assist with the aforementioned research objective, the following three research sub-objectives were identified:

- To determine the need to conduct business transformation in organisations;
- To determine the role business informatics concepts plays in the transformation of business organisation;
- To determine the challenges business faces while performing the business transformation.

1.4.2 Research Question, Sub-Questions

Given the above objectives which have been derived from the problem statement, it was agreeable that the main research question should be: *How can business informatics concepts help a business organisation in the process of business transformation?*

To answer the above research question, the following three research sub-questions were identified and were answered in this research:

- Why conduct business transformation in an organisation?
- Why are business informatics concepts relevant in helping business transformation?
- What are the challenges when conducting business transformation?

1.5 RESEARCH DESIGN

This research used the structuration theory as a lens to understand and interpret the role of business informatics in business transformation. The structuration theory as a social theory of human ontology by Giddens (Jones & Karsten, 2003) is centred on the basic tenets of agency and structures (Giddens, 1984). Agents are affected by structures, which in turn are affected by agents during interaction. Aspects of the problem at hand were embodied as aspects of the theory (i.e. agent and structure) so that the theory can be used as a lens to understand the problem. The theory was used to determine the epistemological direction of the research.

As such, the research study used the interpretive paradigm and a mixed approach (with a predominance of qualitative approach) where semi-structured interviews were used to collect data from each unit of analysis representing a specific department of the organisation. This research applied a case-study research strategy, which according to Yin (1992) can assist in investigation of business transformation using business informatics concepts. The case study is made with several unit of analysis which are the source of information (Yin, 1994), in this case, the various departments of the participating business organisation.

For this research study, data was collected from respondents through means of a semi-structured interview based on the research sub-questions compiled on the basis of the conceptual framework derived from the theory. The use of Semi-structured interviews in this study is supported by Leedy and Ormrod (2010) who emphasise its need in the study when the research phenomena cannot be described or explained through general observation alone.

The semi-structured interview instrument that was used was piloted first by one member of the general public, and consists mostly of questions which take the form of five-point Likert scale questions. The layout of the questions was such that respondents were able to indicate their perceptions depending on statement(s) by choosing among the following options: 'strongly disagree', 'disagree', 'neither agree nor disagree', 'agree' and 'strongly agree'. The participants were also allowed to make further comments on why they felt like towards the particular question. These answers were then substantiated with the results of observation and extensive document review.

Non-probability sampling was used to select respondents, specifically purposive sampling – the reason was to obtain rich data on a particular delineated area of focus. Moreover, only responses from the selected company were regarded as valid. In addition, interviews were conducted on a selected company from which the data gathered was analysed through means of interpretative methods.

1.6 DELINEATION OF RESEARCH

The case study is based on Company X. Company X is a telecom company which has offices in South Africa, Nigeria and the United states. The company provides services to customers in over 220 countries. The complexity of business that Company X is involved in requires it to constantly evolve to keep up with market changes, which makes it a great opportunity for this research. The units of observation are the Finance department, IT department, HR department, and Sales & Marketing department.

1.7 CONCEPTUAL FRAMEWORK

Given the discussion already presented, Figure 1.2 below shows the initial underlying conceptual framework derived from the theory and how the problem is conceptualized. It shows how a business is affected by new IT trends that lead to a business need to transform. The transformation will thus have to be included in the strategy of the organisation and reflected in the business processes design. Furthermore, the research makes use of Orlikowski (2000) duality of technology adapted from the dimensions of structure of structuration theory as a lens to understand and interpret how business transformation can be enacted through concepts of business informatics. Figure 1.3 shows the conceptual framework embodied as a concept of transformation-in-practice and explained in more detail in Chapter 2.

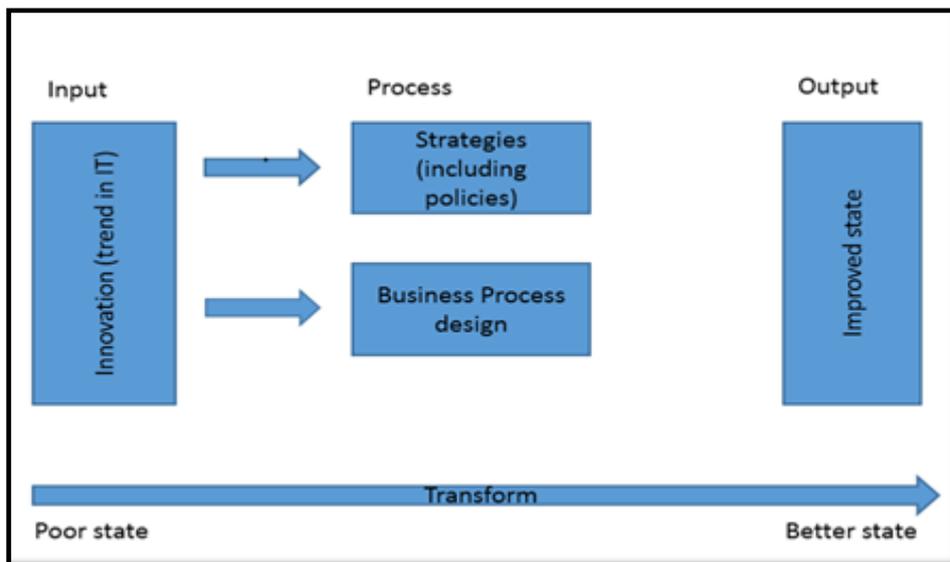


Figure 1.2: Initial Conceptual Framework

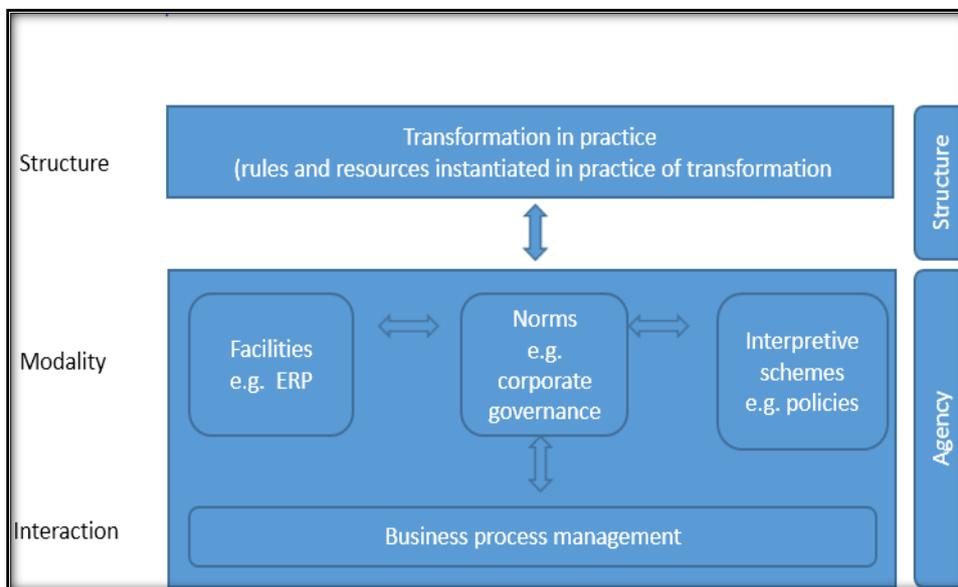


Figure 1.3: Enactment of Transformation-in-practice (Adapted from Orlikowski, 2000)

1.8 CONTRIBUTION OF THE RESEARCH

The contribution of this research is a proposed general framework that defines the extent to which business organisations can make use of business informatics concepts to achieve effective business transformation. It is also acknowledged that the underlying perception of businesses failing to achieve their business transformation objectives is due to limited application of the concepts of business informatics very much influenced by continuous improvement to technology and business practices. Ensuing from the framework is a recommendation to guide businesses to adopt, enhance and improve their competencies in line with technological developments.

1.9 ETHICAL CONSIDERATION

All respondents to this research were informed in advance on the purpose of the research before agreeing to participate in the research. The research also considered a voluntary participation through which respondents were allowed to 'voluntarily' opt to participate in the study and withdraw from it if they no longer wished to do so. Respondents were assured that responses given as part of this research would be treated with confidentiality, and if they wished to remain anonymous it would be reported as such. Impact on participants on how the data was analysed and reported was taken into account. Respondents were assured that the research would not harm them or the company in any way. If it happened to be so, the reasons would have been fully disclosed, thus allowing them to make an informed decision.

1.10 RESEARCH STRUCTURE

The structure of this research is built around six chapters inclusive of this introductory chapter. A brief overview of these chapters is as follows:

Chapter 1: the introductory chapter discusses the background of the research problem, followed by the statement of that problem, and the research questions and objectives, with a brief overview of the research design.

Chapter 2: discusses the theoretical perspectives, as in structuration theory, and how they were used to assist with this research. The basic tenets of the structuration theory were explained and then applied to the problem at hand. The chapter also discusses the conceptual framework that will be used to understand and interpret the problem at hand.

Chapter 3: is the supporting literature on the concepts that support or will assist the understanding of "*the role of business informatics in business transformation*". Chapter 3 provides literature on business transformation and important aspects of business informatics of concern to this research that can assist or influence a business transformation.

Chapter 4: discusses the research approach for this research. The design and methodology were expressed along with all the philosophical assumptions and their implications. The chapter discusses the research design that was chosen, including a determination of the case study.

Chapter 5: discusses the analysis and interpretation of the fieldwork conducted. The results of the interviews are first analysed, and then interpreted through the use of interpretative methods. In particular, structuration theory was used as a lens to conduct this interpretation, and a general framework was enacted.

Chapter 6: discusses the conclusions and recommendations of the research. The chapter first discussed how the research solved the problem through the different questions asked, and by enunciating the contributions of the research. Then it provided recommendation and future researches.

1.11 SUMMARY

This chapter introduced the area of study denoted as “*the role of business informatics in business transformation*”. The questions asked here are pertaining to the aspects of business informatics that can or are being leveraged, in the process of business transformation, and the potential challenges. The chapter sets up the scene to discuss business transformation to ensure continuity and success. The role of business informatics is considered in the enactment of transformation. That role will be understood and interpreted through the lens of structuration theory.

The next chapter deals with all the theoretical perspectives that will assist in interpreting the problem narrated in this chapter.

Chapter 2 : THEORETICAL FRAMEWORK

2.1 INTRODUCTION

Given the nature of the research problem and the envisaged output to derive a general framework to apply concepts of business informatics in business transformation, the subject matter was a social construct which was studied by using socio-technical approaches found in the duality of structure of structuration theory (ST). ST is a social theory which was first developed and applied by Anthony Giddens (Rose & Scheepers, 2001).

The authors further expressed a view that ST encompasses the structuralist tradition and hermeneutic (phenomenological tradition) strands of thought. The structuralist tradition places an emphasis on structure (constraint), while the hermeneutics tradition stresses human agency as the major focus (Rose & Scheepers, 2001). The theory scrutinizes the hermeneutics along with societal conduct through intertwining structure and agents. Agent and structure are then both analysed without giving predominance to either as they affect each other (Rose & Scheepers, 2001; Gehman, 2008).

2.2 BACKGROUND

The structuration theory (ST) is a social theory, amongst many others, which is abstract and aims to deal with the ontology of human society, as in social life and actions (Jones & Karsten, 2003; Broger, 2011). Giddens (1984) started his work on social theories because of a cessation in the orthodox consensus. Social theory had to be renewed or reconstructed. At that time most writers chose to focus their work on functional and practical issues. Giddens, on the other hand, devoted a great part of his work to the renewal of social theories from scratch (Broger, 2011).

However, it was never Giddens's intention to replace the old consensus; instead he was driven by two reasons. The first was the fact that the ontological issues of social theories had been under theorised. This was due to the fact that attention from ontological issues had shifted to epistemological issues since there were many arguments over the fact that the social theory could be used for empirical investigation (Giddens, 1984; Jones & Karsten, 2003; Broger, 2011).

Also Giddens disagreed with the deterministic views that the human agents are restricted by their social structure, and the volunteerism view which claimed that human agents were not constrained by their social structure (Giddens, 1984; Rose, 1998; Rose & Scheepers, 2001; Rose & Hackney, 2003; Poole & McPhee, 2005; Smith & Madon, 2007; Parker, 2010; Lamsal, 2012). By rejecting both these views, he came to establish the concepts of social

transformation and reproduction (explained later in this chapter). From these concepts he established the concept of dualism such as agency vs structure, micro vs macro (Rose, 1998; Rose & Scheepers, 2001; Rose & Hackney, 2003; Poole & McPhee, 2005; Smith & Madon, 2007; Parker, 2010; Broger, 2011; Lamsal, 2012).

The underlying assumptions of Giddens's structuration theory are from Marx's phrase that men can make history independently of their own choice (Giddens, 1984; Broger, 2011). For that reason he embarked on defining a theoretical framework that will define the role of the actor, and how that actor creates the social system which in turn also influences him (Giddens, 1984; Broger, 2011). That theoretical framework will be used in this research as the lens to determine the role of business informatics in business transformation.

2.2.1 Why Structuration Theory

The structuration theory, when initially introduced by Giddens, was initially meant to define the ontology of human action (Jones & Karsten, 2003; Broger, 2011). However, it has now been re-adapted by many scholars and organisations in social and administrative sciences, such as information technology (including information systems), strategic management, entrepreneurship, accounting, communication, and organisational discourse (Broger 2011; Heracleous, 2013). The theory has been re-adapted for several reasons. It can assist in reconciling numerous theoretical perspectives because of its integrative capabilities (Broger, 2011). Also, it can be valuable in deepening knowledge on the social phenomena being investigated as it can assist with empirical work (Heracleous, 2013).

2.2.2 Empirical Employment of Structuration Theory

The structuration theory can contribute in the solving of many substantive issues as it provides guidance for empirical work. Indeed, through framing the research and assisting in the analysis and interpretation of results, the structuration theory is very beneficial to research (Pozzebon, 2004; Jones & Karsten, 2008). Actually, Giddens declared that ST finds its worth when it adds to resolving empirical research-related issues (Giddens, 1984; Heracleous, 2013).

The structuration theory would thus be critical in assisting with the methodological challenges. In fact, Giddens claims that he does *"not try to wield a methodological scalpel"*. Rather, he thinks structuration can be used in conjunction with other research methods. He is of the opinion that the theoretical accounts should be used as a 'sensitizing device' that will offer new insights, approach data in new ways, and provide a scope for viewing the inherent methodological challenges (Giddens, 1984: 326; Jones & Karsten, 2008; Heracleous, 2013).

With respect to information systems (IS) research, the structuration theory assists with the analysis of data structuration and transformation of business using business informatics. Indeed, the concept of structure in the structuration theory offers an epistemological ground for these inherent analyses and they should be based upon routinized practices of social interactions through the understanding of human-human and human-computer interactions, and how their interactions are related to social situations (Ma, 2010).

2.2.3 The Organisational Level

The structuration theory was used as a lens to understand the ongoing, challenging and

“Homogeneous mix of the patterns of organisational interaction as they shape and reshape identity, values and capability” (Yates, 1997).

ST is the underlying theory responsible for most of the work on organisational analyses in the past 20 years (Albano et al., 2010). Also, it can provide a theoretical framework that assists in the analysis of the firm at a *micro-business* level. That same framework, analytical in nature, offers the possibility of incorporating several institutional structures, such as executive management, in the decision-making process and the use of business-informatics fundamental concepts such as IT, business management, and business Informatics, without forgetting the relevant actors such as the employees (Yates, 1997; Albano et al., 2010).

Furthermore, the structuration theory can be extended to the behaviour of people within their institutions, and how these institutions are created. That is why it can be used to consider the organisation perspective internally, as well as in the broader social context. This is possible through the understanding of the interaction between behaviours in practice, the values placed into actions, and discursive accounts. Hence, the organisation is perceived as successions of interlinking

“cogs, in motion and in tension, always structured but always changing, reproducing values in action, but mediating and re-authoring those patterns of practice” (Yates, 1997; Barratt-Pugh, 2007; and Toland & Yoong, 2010).

Also, the reductionists express the view that an information technology drives the development of its social structures. The structuration theory aims to reconcile this technological determinism with the social construction of technology. This is done through recognising that technology influences social structures while being influenced by them at the same time (Yates, 1997; Toland & Yoong, 2010).

Before enacting the theory for this specific research, perhaps an explanation of the conceptual relations that Giddens (1984) establishes needs to be given in the following section.

2.3 AGENT AND STRUCTURE

Structure and agent are represented as mutually dependent; agent continuously creates, recreates and develops the social structure which affects them both (Rose & Scheepers, 2001). Structure in this research is the corporate strategy that will serve as a guide to the agent or user in the practice of transformation within the organisation. The basic tenets of structuration with regard to this research are explained below.

2.3.1 Agency

Human agency denotes a “*capacity to make a difference*” which can further be defined as a transformative capacity (Giddens, 1984:14, Jones & Karsten, 2008). Giddens states that human agents often maintain some transformational capacity, although small. This transformational aspect of the agent is of concern to this research, as agents or employees are at the core of the transformation of the business. An agent or employee will be relying on structural concepts, such as corporate strategy, to conduct the transformational process. The transformation process itself is well explained in the section of transformation in practice further down in this chapter. Also, agency is closely associated with power, and ‘powerlessness’, which would then represent the inability to make a difference; power is thus one of the characteristics of the agent.

Power entails making use of resources.

“Resources (focused by signification and legitimation), are structured properties of social systems, drawn on and reproduced by knowledgeable agents in the course of interaction” (Giddens, 1984:15).

With regard to this research, agents will make use of the resources available to them within the organisation to conduct transformation or business-related activities. The use of these resources will be based on the meaning they instil in them. Also, through these resources, legitimation will be enacted to derive acceptable conduct. However, it is important to note that power itself does not constitute a resource. Rather, it is reflected through the signification and legitimation of the resources. In actual fact, the company will use an ERP system, a resource, to enact power on the employees. The system will force the employees to follow certain processes and regulations.

The recursion of actions

In defining the agent it is necessary to note the recursion of actions. Like some self-reproducing matters, social behaviours or activities are recursive as agents do not forge them. Rather, it is continually recreated by the actors who express themselves as actors. Also, in and through their activities the actors reproduce the circumstances that make these activities possible (Giddens, 1984:2; Fuchs 2003; Ma, 2010; Broger 2011). Basically, once agents have been affected by structure they continuously create and recreate these structures. So in this research, corporate strategy (structure) will be used to define the necessary guideline for behaviour, including transformation in an organisation. Once this corporate strategy affects the employees, they will continuously create and recreate the concept of transformation in practice mentioned in the strategy (explained below).

Saying that human activities are recursive entails that they are routinized. This routinized conduct thus forms a great part of actors' day-to-day social activities (Giddens, 1984:3; Fuchs, 2003; Broger, 2011; Broger 2011; Lamsal, 2012). As defined by Giddens, ontological security thus provides the routinized aspect of life, which provides a way to go on with life (Giddens, 1984; Fuchs, 2003; Broger, 2011). Once actors are affected by the structure, the process of creation and recreation of the structure becomes routinized. In an organisation, agents will draw on the corporate strategy to derive behaviour and conduct; this process will be continuously created and recreated until it becomes routinized.

2.3.2 Structure

Structure is a French word defined by Giddens as a “*set of rules and resources*” repetitively involved in social production. Resources can be authoritative and are related to the transformative capacity to produce directions to people or actors, and allocative resources, which represent a transformative capacity from which derives

“control of material products or aspects of the natural world”
(Giddens, 1984).

Rules, on the other hand, can be guidelines of social conduct which are practices sanctioned during social practices. Rules can also be seen as formulated rules, or

“codified interpretations of rules rather than rules as such”
(Giddens, 1984:17-23).

Giddens asserts that structure exists

“only as memory traces and is instantiated in action”.

In fact, it is bound by time and space.

According to Giddens (1984:25) structure does not exist physically, but is rather instantiated in action. Structure is instantiated in action as a set of rules and resources. These sets of rules and resources will be drawn from the production and reproduction of social conduct, hence a set of transformation relations (Fuchs, 2003; Ma, 2010). The section below explains rules and resources in more details.

a) *Rules*

Giddens (1984:21) defines rules as a set of procedures or techniques used
“in the production and reproduction of social practices”.

These rules are responsible for regulating the behaviour of the human agents (employees), as well as making these behaviours compatible with those of others and/or the organisation. Giddens (1984: 18) furthers this view by stating that social interaction is attained through a methodological procedure that stems from these rules of conduct. Hence, deriving his conduct from socially and mutually accepted practices or rules of conduct, the competent actor is said to be a *“methodological specialist”*.

An important aspect of rules is their transformational capabilities linked with the constitution of meaning and the possibility of sanctioning misconducts (Giddens, 1984:20). Stemming from this, rules can thus be said to be enabling and constraining at the same time. Giddens goes on defining the nature of rules as weakly vs strongly sanctioned, intensive vs shallow, informal vs formalized, and tacit vs discursive. With regard to this research, rules were considered embedded in the corporate governance and policies and procedures. Corporate governance will be responsible for driving organisational behaviour, while policies and procedures were used to constitute meaning within the organisation (these concepts are explained below in the last section of this chapter).

b) *Resources*

According to Giddens (1984:18), rules cannot be set aside from resources which are modalities (explained later in this chapter) drawn by actors in the enactment of their conducts. Two types of resources can be highlighted. Allocative resources are characterised by their inherent transformative ability to *sanction*

“power over objects, goods or material phenomena”.

Authoritative resources are defined by their

“transformative ability to generate commands over persons or actors” (Giddens, 1984:33).

In the case of Company X, one example of resources that is used is an ERP system. The system was implemented to allow the company to enact power over the employees, as it

enforces processes, hence guiding behaviours. Through the interconnection of rules and resources, agents can come to construct control strategies such as the

“ways to change or reproduce the existing system of domination and advance their own strategic autonomy” (Broger, 2011).

Indeed, with regards to this research, this entails that transformation can be conducted through the interaction of corporate governance, policies and procedures and the ERP system which are the embodiment or rules and resources in this research. Furthermore, the relative ‘fixity’ of rule-resource sets

“makes it possible for discernibly similar social practices to exist across varying spans of time and space and which lend social systems their ‘systemic’ form” (Giddens, 1984: 17; Broger, 2011).

2.3.3 Duality of Structure

The traditionalist dualistic view defines the social system as being created by either structure or an agent. The structuration theory addresses this by defining a social system resulting from both structure and agency, and not either of them. This means that structure will affect an agent which in turn affects structure (Jones & Karsten, 2008). In this research, corporate strategy will affect employees and other stakeholders by guiding their activities; employees will continuously draw on it to create and recreate organisational conducts.

However, in their routinized interaction with structure (corporate strategy), they will come to apply their transformational capabilities, hence affecting, changing and transforming it in the long run. The dimensions of the duality of structure include legitimation, domination and signification. Signification is associated with the procedures that produce meaning through the use of the interpretive scheme. Legitimation refers to the norms and resources that also determine domination (Giddens, 1984).

a) Dimensions of the social system

The components of the dimension of structures can be characterised as doing, knowing and ordering (Barratt-Pugh 2007). More specifically, Giddens identifies three dimensions of structure: domination, legitimation and signification. These dimensions can be associated with corresponding dimensions of agency, described as power, sanction, and communication. These dimensions of structure and agency interact through the modalities of interpretive schemes, facilities and norms, as shown in Figure 2.1 (Jones & Karsten, 2003; Lamsal, 2012). These concepts are applied within this research in the section of transformation in practice. In fact, as the actor will not enact the structure in vacuum, namely corporate strategy, it will be conducted through the modalities. Following are brief

explanations of the concepts duality of technology before they are applied in the last section of this chapter.

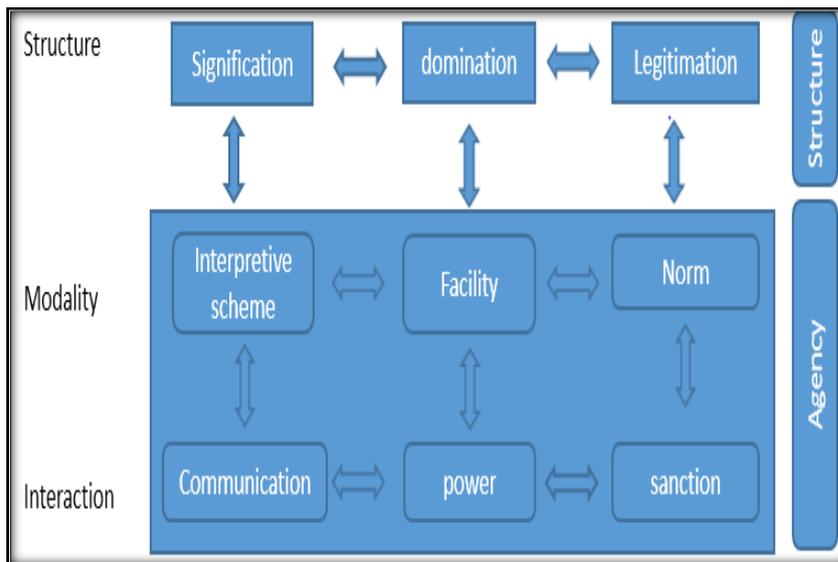


Figure 2.1: Dimensions of the duality of structure (Source: Giddens, 1984)

b) Signification and Communication

Structure of signification produces meaning through semantic codes, interpretive schemes and discursive practices which enable communication. Giddens (1984) furthers this view by stating that the agent is able to handle and understand structure through interpretive schemes (Lamsal, 2012). Interpretive schemes are used by agents and drawn from the rules and codes to construct meaning and make sense of interaction. Shared meaning is a vital characteristic of the creation and recreation of the societal conduct, which is conversely moulded through these very interactions (Barratt-Pugh, 2007).

c) Domination and Power

Giddens establishes that forces of domination and compliance find their being in the delicate rapport of power. Giddens is of the opinion that domination relies on the deployment of the resources

“allocative resources and authoritative resources”

(Giddens, 1984:258; Fuchs, 2003). Thus, agents make use of these resources to enact control and power over people and objects. For example, resources can enable authority as illustrated in the hierarchical relationship between a boss and his employee (Lamsal, 2012).

Giddens’s objective was the cognition of the balance of power represented in the interaction between structure and agents. Power is equally conferred to

“the institution or individual, but structures of control have transformative capacity over organisational actors through the consistent allocation of resources” (Barratt-Pugh, 2007).

Resources, which are assigned by actors, define ground for individual power. However, when these resources are legitimized, it leads to structures of domination (Pinsonneault & Pozzebon 2001).

d) Legitimation and Sanction

About legitimation and sanctions, agents derive from rules and norms, legitimation of practices through dissimilar contexts to conduct social practice. Structure can be expressed in the form of rights and obligations. Practices, drawn from rules, facilitate the proper enactment through sanctions and incentives (Barratt-Pugh, 2007). Through the appropriation of standards, values and societal norms, legitimation yields a moral order. Actors divulge whether consciously, subconsciously or unconsciously, denotations of their behaviour which are referred to by Giddens as sanctions in their interaction (Lamsal, 2012).

e) Modalities

In Giddens dimensions of structure, the modalities

“are accessed by human actors to recursively link structures and human action and are both a production of systems and a reproduction of relatively similar social practices across time and space” (Barratt-Pugh, 2007).

Modalities are the locus of interaction or the bridge between the enactment of meaning in social agents and

“structural features of social systems”

in the enactment of social performance (Jones & Karsten, 2003; Barratt-Pugh, 2007). However, not only do modalities enable the recursion of social practices, but they also enable delicate alterations and distinctions of those practices also modifying structures in the process of reproduction (Barratt-Pugh, 2007). Giddens (1984) defines the modalities as interpretive schemes, facilities and norms.

1) Interpretative Schemes

While interacting with other agents, actors derive meaning from norms, resources and interpretative schemes. Indeed, interpretative schemes can be expressed as vehicles included within actors' stock of knowledge for the communication of meaning (Pinsonneault & Pozzebon, 2001; Broger, 2011). In terms of organisational practices, interpretive schemes permit the access of the structure of the enterprise to create continuing, transformative structural patterns. The latter also facilitate the practices in an ongoing cyclical patterns within an organisation. That cyclical process, according to Giddens (1984), includes three interconnected constituent systems that repeatedly try to institute meaning, govern relations, and outline behavioural patterns (Barratt-Pugh 2007).

2) Facilities

Facilities are used

“to allocate resources, and is enacted in the wielding of power, and produce and reproduce social structures of domination” (Rose & Hackney, 2003; Poole & McPhee, 2005).

Facilities are the means to achieve intended and desired outcomes, and to exert power (Veenstra et al., 2014). Power is intrinsically linked to the role of agency to

“intervene in the world to ‘act otherwise’ and ‘make a difference’” (Giddens, 1984: 14; Broger, 2011).

3) Norms

Norms refer to rules and agreements drawn from the recursive interaction between actors, further grounded on personal knowledge and awareness of what can be sanctioned, and which constrain behaviour within conventional boundaries (Pinsonneault & Pozzebon, 2001).

The constituents of norms of the social system that enable sanctions of conduct are

“contingent claims which have to be sustained and ‘made to count’ through the effective mobilization of sanctions in the context of actual encounters” (Giddens, 1984: 30; Broger, 2011).

The joint and recursive interaction of these three modalities within the enactment of human conduct, or organisational practices, constitutes the process of structuration (Pinsonneault & Pozzebon, 2001). However, production of meaning, control and regulation are continuously interacting. For instance, the deployment of resources in a social system can be normative and based upon a pre-existing code of meaning (Barratt-Pugh, 2007). Also, not only do rules sanction conduct but they can also be responsible for producing meaning as the interpretative schemes do. Structures are maintained by the recursive interaction of rules and resources through these modalities. Without this ongoing interaction, they will disintegrate and cease to exist (Barratt-Pugh, 2007).

2.4 STRUCTURATION THEORY AND BUSINESS TRANSFORMATION

With regard to the structuration theory and transformation, Giddens mentions that the agent retains some transformative capacity. This relates to power as a characteristic of the agent, as:

“the loss of capacity to make a difference is associated with powerlessness” (Giddens, 1984).

Orlikowski (1992:411) takes this concept further by specifying that technology transforms the structural properties of an organisation.

In that order, many IS researches have been conducted on the effect of technology in the work environment using the structuration theory. The researchers demonstrated how technology can transform an organisation (Davies & Mitchell, 1994; Orlikowski, 1996; Barrett & Walsham, 2001; Rose, 2002). However, despite the large amount of writing on the effect of technology on the organisation, the literature on the effect technology (or in this context business informatics) on business transformation using the structuration theory is almost non-existent. This research study will aimed to tap into that area of deficiency. This was done through readapting Orlikowski's (2000) duality of technology in technology in practice.

2.5 STRUCTURATION THEORY AND IS RESEARCH

The theory has been extensively utilised in IS research to determine the interaction of information systems with people, the organisation and in a personal context (Rose & Scheepers, 2001). However, when speaking about the structuration theory perhaps it is necessary to refer to the fact that when ST was created, the author made no mention of the information system (Jones & Karsten, 2008). That is why it was later re-adapted by information system researchers. Indeed, the structuration theory was later adapted as the duality of technology by Orlikowski and the adaptive structuration theory (Poole & De Sanctis, 1994; Jones & Karsten, 2008). Also, Twum-Darko (2011) built on the work of Orlikowski (2000) to pursue the work on structuration theory. This section will give a brief overview of the different adaptations of ST in IS before focusing on the concept of technology which is re-adapted in this research as transformation in practice.

2.5.1 Adaptive Structuration Theory (AST)

When enacting AST, Poole & De Sanctis (1994:125) aimed to deal with Giddens's ST initially not making any mention of technology and social processes. As mentioned above, Giddens did not intend his theory to be used for technology; rather it was re-adapted to the field. Poole & De Sanctis (1994:125) explained the need for the re-adaptation by stating that

“social structures serve as templates for planning and accomplishing tasks”,

and further argued, along with appropriation, that:

“designers incorporate some of these structures into the technology [with the result that structures may be reproduced or modified], thus creating new structures within the technology.”
AST proposes that “social structures delivered by IT can be defined as structural features of the technology and the spirit of this feature set.”

Structural features of the technology refer to meaning along with control in relation to group interaction. This aspect of AST links up to signification and domination in the dimensions of

the duality of structure (Poole & De Sanctis, 1994). The authors established the spirit of the feature as a

“general intent with regard to values and goals”,

and it links up with legitimation in the dimensions of the duality of structure. The spirit of the feature set can be further acknowledged from (a) the design metaphor underlying the system; (b) the features it incorporates and how they are named and presented; (c) the nature of the user interface; (d) training materials and on-line guidance materials; and (e) other training or help provided in or by the system (DeSanctis & Poole, 1994:126, Jones & Karsten, 2008). Appropriation refers to the

“immediate visible actions that evidence deeper structuration processes” (De Sanctis & Poole, 1994:128)

and it corresponds to the modalities of structure established by Giddens (Poole & De Sanctis, 1990).

2.5.2 Duality of Technology

The concept of duality of technology defines IT as the social construct of an individual's doings in relation to particular structural and cultural settings. Furthermore, IT can be seen as a set of rules and resources implicated in enabling conduct, which leads to the production and reproduction along with the transformation of those settings (Rose & Scheepers, 2001).

The notion of duality of technology is deeply investigated by Orlikowski (1992) who expressed the view of technology not to be solely perceived as a physical object, even though she does define it as a material artefact. She further explains material artefacts as:

“the outcome of coordinated human action and hence inherently social.”

Orlikowski (1992) and Jones & Karsten (2008) further argued that material artefacts are:

“created and changed by human action, but also used by humans to accomplish some actions.”

This is thus labelled as the duality of technology. Orlikowski (1992:411) asserts that technology can strengthen or change the established structure of organisations. Thus, reinforcement happens when users follow the technology's rules and resources. This was further articulated by Twum-Darko (2011:63, 2013, and 2014), Twum-Darko and Sibanyoni (2014) and Twum-Darko and Iyamu (2015).

2.5.3 Enactment of Technology-in-Practice

The concept of Enactment of technology-in-Practice (ETiP) is re-adapted within this research as transformation in practice. This section gives an overview of ETiP and how it has been re-adapted in the next section. Furthermore, because Giddens' work was not initially intended to be applied in technology, however, technology could benefit from its structural perception and conceptualization (Orlikowski, 2000).

Given the above argument, it has to be stated that social constructivist approach to structural technology did not come without problems of its own. In fact, stating that technology could be embodied in the structure raised the issues that technology would have had to be 'stabilized' after the development. Also, defining technology as a structure would imply that technology would have to represent a set of social rules, resources and political interest as per the structure definition (Orlikowski, 2000).

Given the assumption that technology is to be stabilized contradicts the fact that people, users, can alter the properties, meaning and applications of technology while interacting with it. Therefore, going with that assumption is challenging because it portrays technology as a

“static and settled artefacts with built-in arrays of fixed and determinate structures that are (always and readily) available to users” (Orlikowski, 2000).

Drawing from the above suggestion that technology embodies social structure actually positions structures within technological artefacts. In other words, viewing technology as embodying social structures means that structure is embodied in artefacts as technology is. This is in contrast with Giddens (1984) intended definition of structure, which states that structure does not exist and can be understood as rules and resources instantiated in recursive human actor or agent's conduct.

Furthermore, should you take, for example, certain constituents of technology such as data and graphical interfaces once they have been built into the technological application, they become external to human action; this means that the technological elements will not constitute sets of rules and resources, and cannot be seen as structure. However, when the elements of technology are routinely and recursively mobilised *“in practice”*, they can be said to be *“structuring”* human actions and practices. In other words, when repetitively used in practice, technological properties come to be instituted by users as rules and resources that drive their social practice. In that way it forms what Orlikowski (2000) calls the technology in practice as structure.

Human actors interact with some or all the components and properties and some of a technology when they engage with it continuously. Through that ongoing, routinized interaction, a number of properties of the technology become involved in a continuous structuration pattern. This will result in recurrent social practices that will produce and reproduce specific structures of technology in practice. Hence, rules and resources that shape interaction are formed as structures of technology in practice and are produced recursively by agents who routinely interact with certain properties of the system (Orlikowski, 2000).

For example, in most companies employees receive personal computers with pre-set and installed technological software. Even though this software exist and are installed, the employees can decide not to use them. In that case, the software or technology will not participate in recurrent social practices; thus no rules and resources will be enacted. However, once these technological artefacts are used continuously or routinely they can constitute rules and resources in the enactment of working activities. This case illustrates the concept of technology in practice.

Technologies in practice are enacted through interpretive schemes, facilities, and norms. Agents in their social interaction do not produce structure in a vacuum; rather, they resort to tacit and explicit knowledge of their preceding activities, the facilities and resources on hand, and the norms to guide their practices (Figure 2.2). Through that process, actors recursively produce and reproduce rules and resources in the instantiation of their social action. As technology in practice is assimilated into structure, so the same establishment is valid in Figure 2.3.

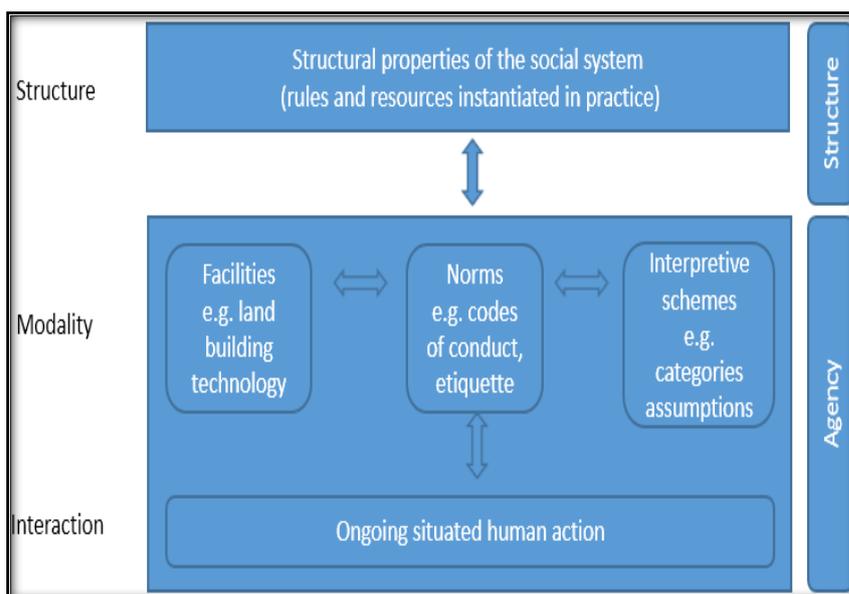


Figure 2.2: Enactment of structures in practice (Source: Orlikowski, 2000)

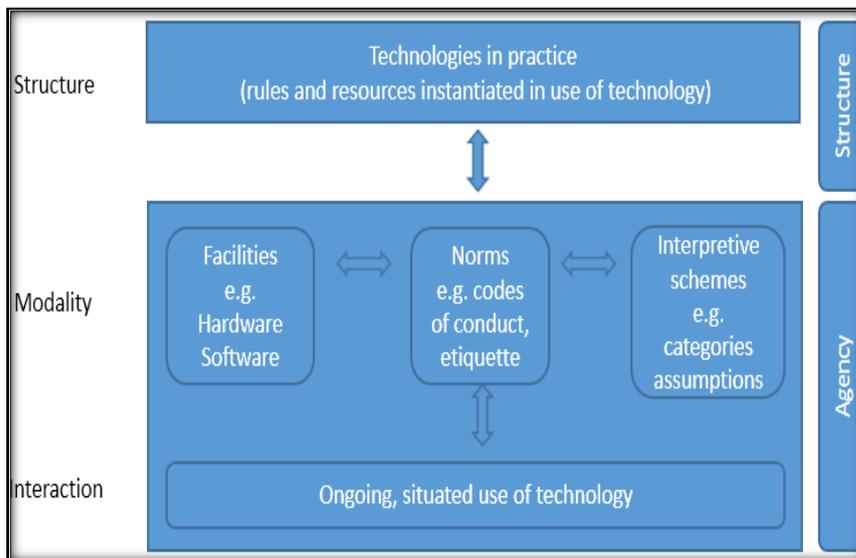


Figure 2.3: Enactment of technologies in Practice (Source: Orlikowski, 2000)

2.6 TRANSFORMATION-IN-PRACTICE

It has to be noted, that the research is primarily concerned with the ‘transformation’ of the business properties such as its application of the concepts of business informatics. Given the previous section, it was argued that technology by itself cannot embody structure because it is *physically* embodied in artefacts, unlike structure which exists only when instantiated in action. Also, the elements and properties of technologies, when they are built, are external to human actions, and they cannot constitute a set of rules and resources in the enactment of social action. Finally, technology could not be embodied in structure as it is stabilized.

The same case can be made for transformation. Transformation cannot be stabilized in artefacts as its properties are continuously being altered in practice. That is the essence of transformation. Besides, transformation is a physical concept, meaning that the stages of transformation can be embodied in physical activities, which would mean that transformation cannot represent structure. However, it can be argued that transformation is not a physical concept but rather a virtual one that results in physical outcomes. Even if that is the case, transformation properties cannot constitute a set of rules and resources that actors can draw upon unless they are actually instantiated in use.

So transformation cannot embody structure because it constitutes rules and resources only when instantiated in practice. This is where the concept of transformation in practice (illustrated in Figure 2.4) comes from. That is why in this research, structure, as defined by Giddens, refers to the corporate strategy. The duality of structure implies that structure facilitates conduct (which is recursively organised by it) and that structure does not exist apart from human action

“but only in human memory traces and social practices”.

From these two aspects, structures are in charge of the production and reproductions of social systems (Giddens, 1984; Jones and Karsten, 2003; Ma, 2010).

In the context of an organisation, this implies that work activities are not only the mere results of special skills or the simple achievement of tasks, but also the production and reproduction of structure. These work activities would then both be influenced and influence the professional standards, practices and policies (Ma, 2010). In this research, structure refers to corporate strategy which underpins the formulation of policies and procedures, corporate governance and even the specifications of an Information System such as an ERP system. All these documents stemming from the corporate strategy will thus influence working activities that are continuously produced and reproduced.

Furthermore, these ‘routinized’ working activities continuously produce and reproduce the *“Authority, legitimacy and acceptability of certain professional practices, standards and policies”*

The enactment of the duality of structure enables a more profound cognition of the rules and practices that are in effect. Similarly, it makes possible critical and reflective thinking about the eventuality of:

“Intended and unintended consequences of the act of following these rules and practices, and as such, their ethical, cultural, and social implications” (Ma, 2010).

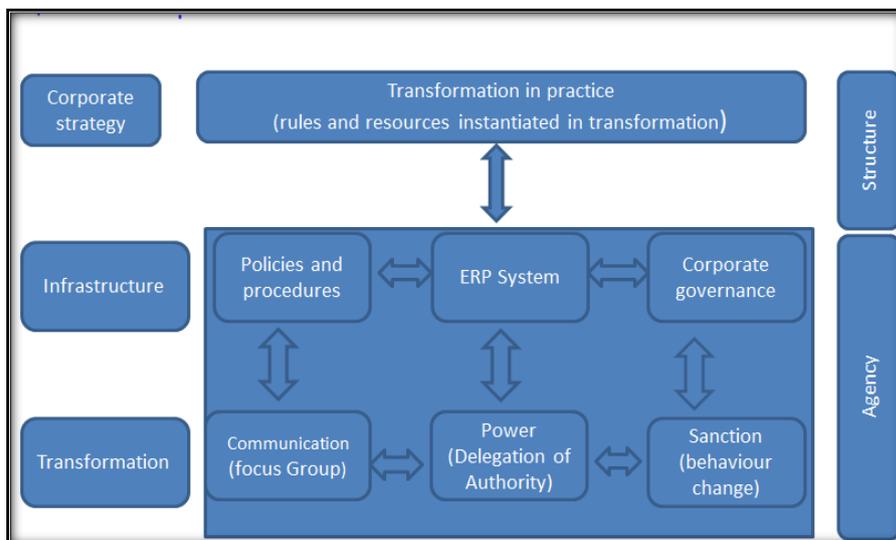


Figure 2.4: Conceptual Framework (Source: Orlikowski, 2000)

Structuration can be used to understand the concepts of business informatics to determine the appropriate technology to drive business transformation. Indeed, as defined in Figure 2.4 above, structure, namely corporate strategy will be used to affect the agent or the user, who will also end up affecting the structure in return, in their interaction with the structure. In other words, employees will have to refer to the strategy if they want to transform any institutional properties of the enterprise. So, the concept of transformation-in-practice can be referred to as provisions of strategy instantiated in transformation or strategic objectives instantiated in transformation

Hence, corporate strategy will be encoded in the business management documents representing the structure on which the agent can draw in the process of conducting work activities, including any transformation that will need to be conducted within an organisation. The organisation will have focus groups with the aim to discuss the strategic decisions of the company. The focus group will be responsible for the communication aspect of the company in the process of deriving meanings or signification on the decisions taken by the organisation. This will include any need to transform the business, as this need arises from a strategic perspective.

Like technology in practice, transformation in practice is enacted through the modalities. The modalities are reflected in the infrastructure of the organisation. Actors will use facilities, represented by the ERP to exercise power through enforcing employees to follow business processes, as ERPs are built on the basis of the business processes. Policies and procedures in an organisation determine why practices are conducted and how they should be conducted; this is why policies and procedures are used as interpretive schemes to constitute meaning and knowledge of practices within the organisation.

Finally, corporate governance is meant to discipline the behaviour of the organisation. It contains rules the organisation must comply with. Corporate governance will thus be used to legitimate the working practices.

The structuration theory was used in this Chapter as a lens to determine the role of business informatics in transformation. Figure 2.4 although initially used as the basis for transformation in practice is now used as the conceptual framework in this research. The conceptual framework will be reviewed and presented in Chapter 5 as a general framework. Along with the structuration theory, it will be used in Chapter 5 to interpret the data.

2.6.1 The Transformation Process

Actors conduct transformation by relying on the properties or concepts of transformation, those offered by its fundamental materiality, those established by best practices in any transformational projects, and those developed by actors through previous transformation projects. This is due to the fact that agents continuously create and recreate these actions. Although agents mobilise their assumptions, skills, knowledge, and power; expectations about the transformation from prior interactions, the primary source, should be the corporate strategy, which will be communicated in focus groups. In fact, transformation-in-practice can be defined as provisions of strategy instantiated in transformation or strategic objectives instantiated in transformation.

Transformation in practice entails the establishment of signification, emotional and intellectual connexion with transformation and its enactment, stemmed from prior involvements in several transformations projects. Workers make use of knowledge and prior interaction within the settings in which they live and work.

In this manner, people's usage of transformation becomes structured by prior interactions, knowledge, signification, behaviours, control relations, rules, and the transformational objects available to them. Such structuring sanctions a particular set of rules and resources in practice that then serves to structure forthcoming transformational use as actors carry on with the transformation in their ongoing practices. Hence, over time, they produce and reproduce structure of transformation in practice.

Human interaction with transformations is basically repeated so that, even as users produce transformation-in-practice through their current use of a transformation, they are also influenced by prior transformation practices previously enacted. Ongoing performing of a transformation-in-practice emphasises it, so that it becomes normalised and repetitive, a practical and customary reaction to recurring use of a transformation within the necessities of the institutional contexts. Indeed, a transformation-in-practice typically helps as a basis of habitual, interpretative means while performing the transformation. Recurrent practices of transformation can replicate the same transformation-in-practice, hence emphasising it over time so that it turns into common practices.

2.7 SUMMARY

In light of all the above, the chapter introduced ST as a lens to determine the role business informatics can play in business transformation. It is assumed that ST will address the fact that the development of business informatics concepts as drivers for business transformation. This is because businesses' need to transform also affects the evolution of informatics. Also business informatics concepts will be a social product in a specific context, a set of rules and resources that continuously creates and recreates to transform those contexts. Finally, the chapter presented the conceptual framework including the theories that will be used to interpret the problem expressed in Chapter 1.

The next chapter will provide an analysis and review of relevant literature identified through the eyes of the theory and the conceptual framework to tease out the phenomenon "*the role of business informatics in business transformation*".

Chapter 3 : LITERATURE REVIEW

3.1 INTRODUCTION

The previous chapter discussed the underpinning theory of this research. The theoretical framework developed on the basis of the structuration theory was discussed. This chapter therefore reviews current work relevant to business informatics and how it supports business transformation. Hence, the chapter begins by introducing the concept of business transformation which then leads to the understanding of business informatics and the role it can play in business transformation.

3.2 BUSINESS TRANSFORMATION

3.2.1 Introduction

The market and business environment in the public and private sectors are evolving constantly and at a fast pace (Morgan & Page, 2008; Ernst & Young, 2014; Deloitte, 2014). Due to this perpetual evolution, businesses have to adapt and alter their responsiveness to change. Morrisson (2009) and Stratton (2011) outline business transformation as:

“A change in management strategy with the sole purpose to align people, processes and technology initiatives of a company more closely with its business strategy and vision. In turn, this helps to support and create new business strategies”.

By transforming, the business will be able to compete with existing businesses (surviving) and even expand their share of the market (Reinertsen, 2012; Rotibi et al., 2012).

3.2.2 Factors Prompting Business Transformation

A business organisation is a system made of various components servicing the processing of materials from input into output. These components (as mentioned in Figure 3.1) can at any time prompt the business to transform.

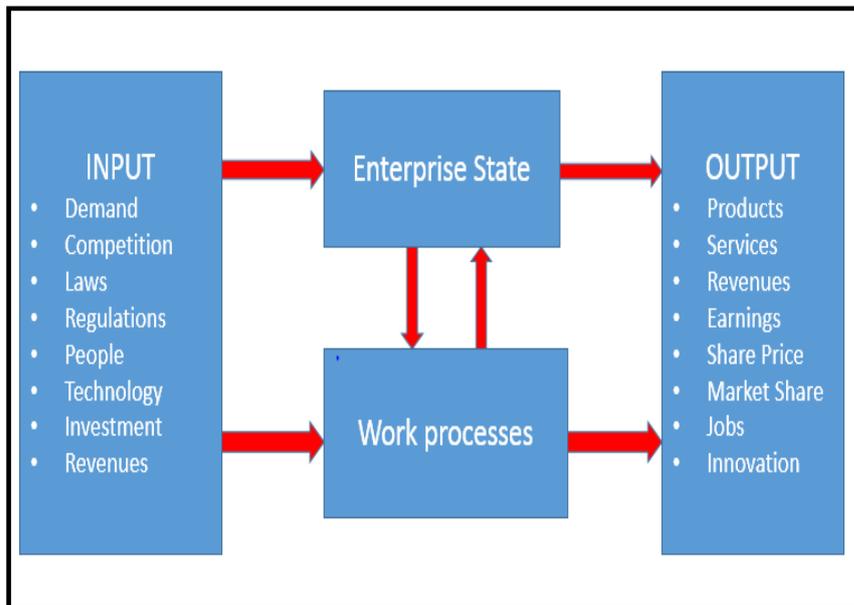


Figure 3.1: Elements of an enterprise system (Source: Rouse, 2005)

The following are explanations of some of the factors mentioned in Figure 3.1.

- **Competition:** competition can affect businesses as new entrants can introduce some innovative form of products or services, leading to current businesses also trying to innovate or reinvent themselves (Rouse, 2005; Oz & Jones, 2008). It is also important to note that innovation or transformation is not stirred only by new entrants in the industry, but also by firms that are trying to survive in the long run coupled with those that are aiming for expansion and a bigger market share.
- **Stakeholder expectation:** the various constituents that have an interest in the business can exert direct pressure on a business leading them to renovate and transform. The constituencies can be customers increasing their demand of the product, or even new laws and regulations that can lead to restructuring (Morgan & Page, 2008; Oz & Jones, 2008).
- **Restructuring:** restructuring in this research study refers to the shift within management team power; a change in senior management (often happening to deal away with performance decline) can often be seen as change of strategy which might end up changing the whole organisation (Morgan & Page, 2008; Perumal & Pandey, 2008).
- **Performance decline:** when faced with performance decline, organisations often choose to rejuvenate the way their business is conducted (Morgan & Page, 2008).

- **Technology:** technology is also at the forefront of business transformation triggering through constant evolution and a fast adoption rate (Rouse, 2005; Morgan & Page, 2008; Perumal & Pandey, 2008).

Figure 3.1 illustrates that factors such as competition, demand, investment technology and revenues can affect businesses and initiate business transformation. In addition, some of those factors can be derived from the framework of Porter's five forces, drawn by Michael Porter, Harvard professor (refer to Figure 3.2 below) who stated that a business is affected by supplier bargaining power, competitive rivalry, buyer power, threats and substitutes and new entrants (Oz & Jones, 2008:50).

The model implies that businesses are under the constant threat of new market entrants taking over some of the market share. Also, from this model it can be gleaned that business faces the threat of consumers gaining too much power, and through/even substituting to other better/cheaper products. Finally, industries are built with inherent rivalry between businesses that drive these businesses to constantly reinvent themselves (Oz & Jones, 2008:50).

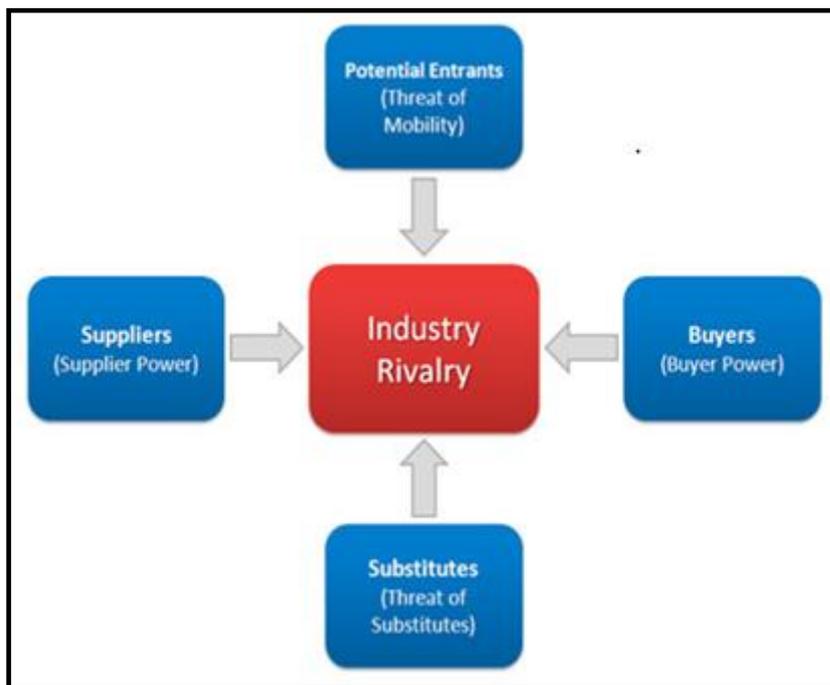


Figure 3.2: Porter's five forces (Source: Oz & Jones, 2008:50)

In this contemporary business setting, companies are moving towards technological environments. This means that they are more business-processes oriented (Perumal & Pandey, 2008). In that regard, the next section explains business transformation with regard to business processes.

3.3 BUSINESS PROCESSES AND TRANSFORMATION

Business transformation signifies some 'revamp' or make-over brought into business processes (Perumal & Pandey, 2008). The authors further define business transformation as a drastic change in the way of running a business that extends to processes, people, technology, policies, vision, or any other business component, with the intent of achieving previously set business objectives. Drawing from that definition it can be deduced that business transformation affects business processes.

Murzek et al. (2002) assert that business transformation through business process (BP) modelling moved from a luxury for entities to being vital. Perumal and Pandey (2008) concur with the latter by stating that business transformation now implicates strategic thinkers, with an aim to attain substantial business process improvements, leading to performance improvement, financial benefits, sustainability and market leadership.

All these results can be achieved through the renewal and revitalization of any such business processes. Top management will thus develop a strategy involving re-engineering, restructuring, or reinventing business processes and structures for performance improvement and then drive organisational change to align with the new business model.

Sparx Systems (2004) define business process as:

“A collection of activities designed to produce a specific output for a particular customer or market. It implies a strong emphasis on how the work is done within and organisation, in contrast to a product's focus on what, a process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly defined inputs and outputs: a structure for action”.

Business process as a collection of activities defining how the work is conducted within an organisation can be incorporated through a system which will contain all the values and controls of the organisation. The system that can achieve this result can be defined through business informatics deemed a solution-oriented approach to problem solving (Krstev et al., 2011; Korczak & Owoc, 2013) and it is discussed later in this chapter as an ERP or enterprise-resource planning. The next section will discuss business informatics and highlights the concepts that are relevant in business transformation.

3.4 OVERVIEW OF BUSINESS INFORMATICS

Helfert and Duncan (2007) define business informatics as a methodological approach that integrates computer science technology and software engineering principles with business administration and management principles. It can be further explained as follows:

- **Computing and computer science:** it is usually referred to informatics; this part of business informatics relates to the technical and theoretical base of information (Helfert, 2007).
- **Business management and administration:** this refers to the function of the management of operations and decision making (Helfert, 2007).
- **Information system:** the combination of both aspects mentioned above, including social and technical constituents, establishes an information system as defined by Helfert (2007).
- **Methodological approach:** management-orientated systems are deemed as lacking the methodology that links up the theoretical orientation of computer sciences with a practical system design and application. This aspect of business informatics complements the traditional area of information system that deals with defining the social world (Helfert & Duncan, 2007).

In the light of all the definitions presented above, business informatics is used to implement solutions tailored to a business problem. It assists in aligning the corporate goals and strategy with the business processes and information technology (Helfert & Duncan, 2007). Duncan and Helfert (2005) are of the opinion that business informatics can be further explained as information-system architecture because of its strong mathematical, structural science and logical base.

This means that business informatics can be seen as an engineering and analysis of business systems. The aspect that will be supporting the rest of the research study in terms of business informatics will be that of information-system architecture design or re-engineering which plays an important part in a business transformation.

Furthermore, when dealing with business informatics, one must keep in mind that several types of informatics exist. For instance, bio informatics refers to the storage, analysis and interpretation of biological information, while the same can be said of legal informatics, which applies to legal information (Luscombe et al., 2001; Ittig et al., 2008). In that order, business

informatics would then refer to the science of analysing and interpreting business information.

This research thus uses business informatics to analyse and interpret business-related information through technology. Throughout the years, technology has been investigated that could drive business transformation.

Also business informatics was defined above as being made according to business management principles. With regard to this research, these business management principles were defined as strategic management, corporate governance, and policies and procedures. The policies and procedures represent the interpretive schemes as per the structuration theory, while corporate governance will link up to the norms in the structuration theory discussed in Chapter 2.

3.5 BUSINESS TRANSFORMATION AND BUSINESS INFORMATICS

The business aptitude to transform itself has been deemed an imperative requirement to both attain and maintain competitive advantage, as achieving competitive advantage is not sufficient if an organisation does not manage to stay ahead of its competitors. When business margins and prices are under pressure, or even to increase the profit margins, a company must be able to rethink its business strategy to enable itself to transform and adapt to the current market (SAP AG, 2014).

Business transformation can be achieved through using business informatics concepts such as the information system as explained above (Oz & Jones, 2008: 52). They further assert that through automating several areas of the business, the organisation can come to lower its costs. By doing so, it will be able to redistribute the cost savings to customers through lower prices. Low cost is one of the six generic value propositions (presented in Figure 3.3) that can also drive business transformation.

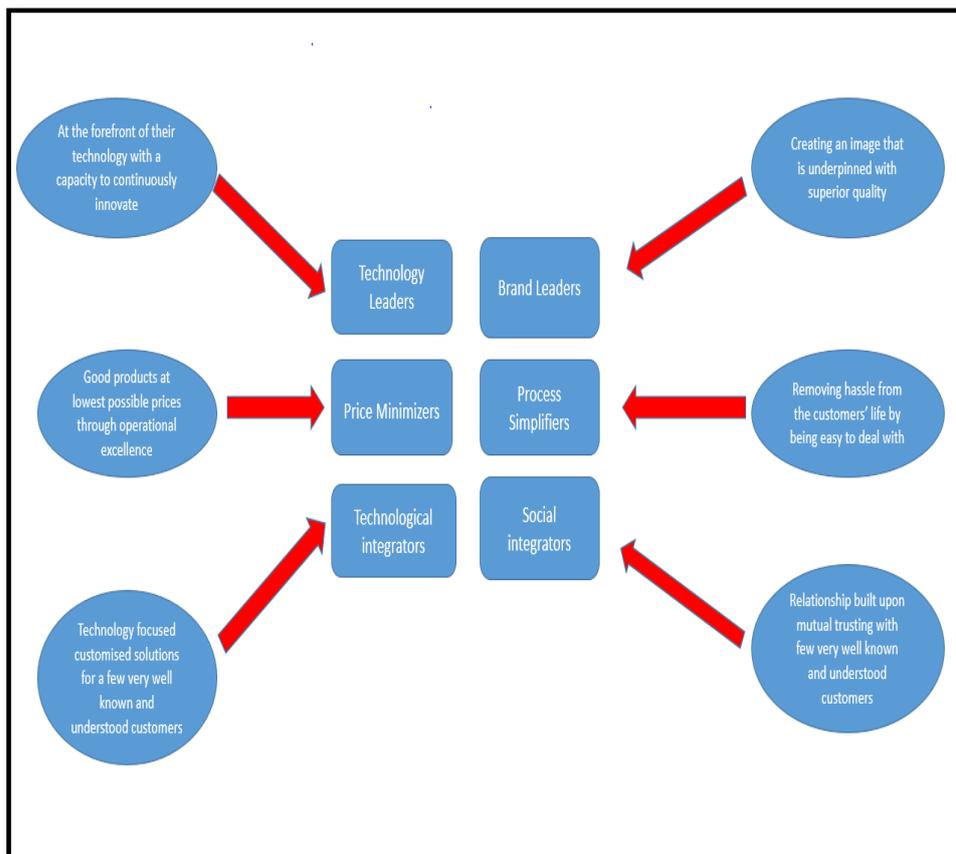


Figure 3.3: The six generic value propositions (Source: Martinez & Bitici, 2001)

Figure 3.3 shows six types of values propositions that can be added through business transformation by the use of business informatics. The first one is price minimizers, where good products are offered at the lowest prices because the organisation has managed to cut down on the cost of production. This can be achieved by using cloud computing, as it will contribute to lowering costs, as explained below.

Technology leaders and integrators refer to the new trends to retain customers and increase market share. Brand leaders, process simplifiers and social integrators are all customer-facing value propositions. In fact brand leaders refers to developing an image that will be associated with superior brand quality, while process simplifiers will make customers' life easier by removing 'hassles'; finally, social integrators constitute a formation of relationships with few and well-trusted customers. Together, these values can be addressed through an effective customer-relationship management or even informed relationships with customers through social media. Another way through which business informatics (technology) can assist the transformation of a business is through cloud computing.

Business management principles, as mentioned above, are also a concept of business informatics that can aid with business transformation. With regard to this research, and in relation with the conceptual framework discussed in Chapter 2, business management in this research will be represented by aspects such as policies, procedures, and corporate governance.

The next section will discuss the ERP concepts of business informatics; then it will discuss the business management aspect of business informatics (policies and procedures and corporate governance) and how they can help businesses in the transformation.

3.6 IS: A TRANSFORMATIONAL BUSINESS INFORMATICS CONCEPT

3.6.1 Information System and ERP System

As explained above, business informatics within this research study includes concepts such as business management, methodology or even information systems or enterprise resource planning (ERP) system. The previous section briefly explained how business informatics can affect transformation through technology such as an ERP System. This section will provide additional explanation on the aspects of ERP system that can help with business transformation such as social media and cloud computing.

Because of the fast pace and growing competitive environment, it had become necessary to replace the traditional systems with an enterprise resource planning (ERP) system (Willis & Willis-Brown, 2002). From its history, ERP emerged from Material Requirement Planning (MRP) to cater for an organisation's practical needs (Yu, 2005). An ERP system includes software with various capabilities that leads the business to transform and meet its strategic objectives, including improved business forecasting, streamlined processes, and fostered achievement of financial targets (Ajit et al., 2014; Leger et al., 2014; Parthasarathy & Daneva, 2014).

An ERP can allow business transformation by allowing data and activities to be shared via an enterprise-wide system (Beheshti et al., 2014; Elkhani et al., 2014). ERP can also integrate and automate company-wide processes and functions (Elkhani et al., 2014). This transformation will thus enable organisations to have access to reliable, real-time information, which is necessary for effective decision making (Beheshti et al., 2014). This is possible because redundancies, and inconsistencies of data created by traditional systems functioning in silo, can be addressed through a single repository (Ajit et al., 2014; Leger et al., 2014; Parthasarathy & Daneva, 2014).

The ERP was initially built as applications, which are stand-alone software that can be purchased from vendors (such as SAP and Oracle) and can be installed within a business technological stack (Yu, 2005). However, with the advent of Internet-based technology, ERPs are moving from being application-based to being based in the cloud (Leger et al., 2014). Many organisations are making the switch to a cloud-based ERP as this option offers many capabilities, including lower prices and scalability (Leger et al., 2014). The next section will discuss an ERP integrated with Internet-based technologies such as social media and cloud computing as new trends of business informatics.

3.6.2 Social Media Integrated With ERP

This research deals with new trends of business informatics that can assist in the transformation of the business. Among a few, social media and cloud computing were chosen. However, with regard to Company X's needs, cloud computing (discussed in the next section) is the advised solution to cater to their issues. This section will however introduce social media as a trend of business informatics through an integration with ERP.

Wicks (2012) expresses the view that all businesses should have an online presence such as a social media platform. These numerous social trends in business informatics can assist businesses in their transformation through the integration with an ERP system with consumer-based technologies such as Facebook and Twitter. Following are explanations of how businesses can gain from the integration of an ERP with social media. In fact, social media can foster business transformation through developing into a low cost social customer relationship system that will improve relationships with customers (Gröne et al., 2011; Malthouse et al., 2013).

3.6.2.1 SOCIAL CRM

Social media can assist business transformation through emerging as a low-cost and efficient system to manage relationships with customers. This is possible because social media can develop into a platform that can foster product innovation i.e. through crowd-sourcing (Malthouse et al., 2013). The next sections will define several ways through which social media can assist business transformation by evolving into a social CRM.

1) Product Innovation

As explained in the section of business transformation, innovation and businesses reinventing themselves is a requirement for businesses to sustain themselves and expand (Reinertsen, 2012; Rotibi et al., 2012). Social media can assist with the transformation through advancing the product innovation process. It can be achieved through gaining insight

from social media, product design collaboration and crowdsourcing research and development to market and increase the rate of adoption of the product (Gröne et al., 2011; Malthouse et al., 2013).

a) New Customer Insights on Products

Consumers' insight can be generated by observing conversations and getting consumers' feedback from social media at a lower cost, yet faster than traditional methods (Cvijikj et al., 2011; Baird & Parasnis, 2011; European Commission, 2013). On the social media platforms, not only can the company engage with the consumers directly, but also they will be able to monitor conversations between consumers (Malthouse et al., 2013; European Commission 2013). Through engaging and monitoring conversations with and between consumers, behavioural data (whether structured or unstructured data) can be obtained and analysed, and that process will assist the company with the following activities:

- Innovation or product improvement: the data obtained can help the company to discover customers' needs, thus generating new ideas for new products or be a guide to product improvement (Isaca, 2010; Gröne et al., 2011; Cvijikj et al., 2011; Baird & Parasnis, 2011; European Commission, 2013).
- Control the market perception: with the advent of social media and mobile technology, communication can go viral very fast and negative messages can spread quickly, hence damaging the company's image. By leveraging the social media platform, the company will be able to control its image, and act on any issue raised by a customer, even converting consumer critics into active defenders of the brand (Isaca, 2010; Gröne et al., 2011; Cvijikj et al., 2011; Harvard Business Review, 2012; Malthouse et al., 2013).

b) Product Design Collaboration Platforms

Social media can assist companies' transformation through assisting in designing products via market intelligence gathered from customers' feedback. Social media platforms offer the potential for advertising by facilitating viral marketing, product development through the gathered marketing intelligence and by involving consumers in the design process (Isaca, 2010; Gröne et al., 2011; Cvijikj et al., 2011). European Commission (2013) supplements the latter argument by adding that the design process can be facilitated by improving collaboration between the employees, or the research and design engineers in charge of that process (whether they are in the same place or dispersed).

c) Crowd Sourcing for Product Innovation

Crowd-sourcing is an aspect of social media that can assist social media in fulfilling the social CRM role. Crowd-sourcing consists of leveraging the social technologies platform to generate ideas for new products, or co-create some aspect of the product. This entails that social technologies users will be enlisted in an attempt to get them to generate some ideas, which will in turn be evaluated either by the users themselves (by commenting on the ideas, making suggestions) or the initiator of the process (Gröne et al., 2011; European Commission, 2013).

2) Social Marketing & Public Relations

Social marketing and public relations management is another aspect which affects the transformation of a business. It was established above that companies are customer centric. So effective relationship management through marketing can address many issues. In fact, customer perception on social media can be gathered by means of contact initiated through chatter and other available communication means on social networks to monitor market sentiment of the product (Gröne et al., 2011).

a) Customer Sentiment Analysis

Wicks (2012) expresses the view that unlike traditional marketing tools, social media communication is neither formal nor exclusive or one-sided. This is the main reason why engaging customers on social media is effective as the consumers can be sincere (Wicks, 2012). From those sincere conversations data can be obtained, and there is a possibility to determine an accurate perception of the product or brand, even competitors. Finally, this data can be used as input for product requirement for the design process, and for marketing activities such as advertising, packaging and even pricing (Andersson, 2011; Cvijikj et al., 2011; Harvard business review, 2012; Kurbel, 2013; European Commission, 2013; Sap AG, 2013).

Andersson (2011) and Cvijikj et al. (2011) express the view that an ERP should incorporate both aspects of synchronous and asynchronous communication tools. Basically, the difference between the two is based on the fact that a synchronous communication is a sort of immediate communication tool (such as instant messaging, chats), while asynchronous communication can allow time lagging (such as a blog or a wiki). These two types of tools when leveraged can then facilitate market sentiment monitoring (Andersson, 2011; Cvijikj et al., 2011; Sap AG, 2013) and make it possible for business transformation.

b) Influencing Consumer Spending Decisions

Harvard Business Review (2012) conducted a study on the implementation of social media strategy which resulted in discovering that people roam through social media platforms to do research, to seek information on the product or brand. Thus, many leaders have decided to use that information to influence consumers' buying behaviour. This would occasion the market rate of product adoption to be dramatically enhanced (Isaca, 2010; Gröne et al., 2011; Harvard Business Review, 2012; European Commission, 2013).

c) Demand Forecasting

With the prominence of Internet-based technologies such as social media, the traditional ways of managing a business have been challenged, as the new platforms provide the means and opportunities to understand and connect with a customer instantly and at a granular level. As an illustration, from the social media platforms, an organisation can improve efficiency and effectiveness for distribution as they can infer the demand for their products on these platforms (Isaca, 2010; Harvard Business Review, 2012; European Commission, 2013).

3) Social Sales

Social sales will allow a business to provide social customers with access to product information through leads and sales opportunities from social media. That process will enable peer-to-peer led generation through social recommendation, referrals and customer testimonials (Gröne et al., 2011).

a) Online Conversion

Customers can now be closely approached through more personal communication, leading to a quick extension of the customers' database, as the approach is more effective and less intrusive. Unlike the traditional marketing channels, the customer role has now changed from a passive to an active role, as he or she is now participating in sharing information, experiences and opinions with peers or organisations on social networks (Gröne et al., 2011; Malthouse et al., 2013).

From social media analytics, insight can be gained of what potential market should be targeted, and an assessment can be conducted on the attractiveness of these prospects. Thus, conversion rates and purchases can be boosted by leveraging online research, referrals and testimonials emanating from these social platforms (Cvijikj et al., 2011; Malthouse et al., 2013; European Commission, 2013; Sap AG, 2013).

b) Sales Lead Generation

Paul Gillin, cited in Harvard business review (2012), is of the opinion that a dissatisfied customer in the past could only tell ten people, while in this new era he can tell ten million. From this it can be safe to assume that consumers can share their opinions and thoughts to large audiences (Malthouse et al., 2013). Social media, which is part of business informatics, is playing an important role in the business community, and fully leveraging these platforms can enhance the productivity of the sales agents, even leading to reducing cost for call centres, as some of the work conducted in call centres can be reproduced on social media. Also, sales leads can be produced and nurtured through social media (Malthouse et al., 2013; European Commission, 2013).

c) Sales Lead Intelligence

Since the customer's role has now changed, and mostly everything revolves around him, companies draw out policies through which sales agents can establish social contacts with consumers (Sap AG, 2013). They will even be able to convert these contacts into leads by making tailored offers or by cross-selling to specific customers, hence creating some type of 'social capital' on social media platforms (Cvijikj et al., 2011; Baird & Parasnis, 2011; European Commission, 2013).

4) Social Service

It is a necessity to create an effective social-response system to issues raised on social media through pro-active monitoring and social support structures built in-house (Gröne et al., 2011; Sap AG, 2013). The usual one-to-many communication has now evolved into a one-to-one customer approach, which is why companies have compiled a structured system to initiate contacts and provide assistance (Cvijikj et al., 2011; European Commission, 2013). Finally, through the social-media response system analytics, by monitoring, engaging and managing, an organisation can gather insight that can be given back to consumers in the form of personalised responses (Bali & Okeleke, 2014).

a) Customer Care and after Sales Service

Social media technologies can help improve customer service as it can conduct some of the work generally achieved by the call centres. Through social media, sales agents can support their products by answering questions or technical enquiries from customers, even informing them on new aspects of the products (European Commission 2013; Bali & Okeleke, 2014).

b) Social Recruitment Hiring of Talent & Best Staff

Social media can also be leveraged to gain access to talents, as it can be a tool to find out what skills are on the market, hence determining the competencies of the potential candidates. Many companies are now linking their systems to social media platforms such as LinkedIn or even Facebook. These channels are very efficient alternatives even though they are less costly, as the technological infrastructures required are minimal (Gröne et al., 2011; European Commission, 2013).

c) Knowledge and Interaction Productivity

Social media tools can also be used to manage collaboration between employees within the organisation if it is made part of the culture (explained below). Also, social media can be used to capture tacit knowledge by transforming as a sort of knowledge-management system, such as a wiki or even a blog (Gröne et al., 2011, Pwc Health Research Institute, 2012).

Kimberling (2014) enumerates a few considerations to any such integration. He is also of the opinion that integrating social media with ERPs will give employees a more structured approach to interact with customers through capturing tacit information. This undocumented information can be used to stir the transformation of the business.

5) Organisational Structures

For social media to be an effective driver of change it has to become an important aspect of the company. This is achievable through incorporating social media in the organisational structure via clear defining in the strategy of the company (Gröne et al., 2011; Bali & Okeleke, 2014).

a) People and Skills

There is a growing need to allocate a team that will be specialised in coordinating, publishing and monitoring the social media (Gröne et al., 2011). This will work out if there is a team that is specialised to establish and maintain contact with consumers, and through that contact they will be able to make personalised offers or even do some cross-selling (Gröne et al., 2011; European Commission, 2013). Cvijikj et al. (2011) emphasize the view that these new marketing techniques should not be seen as an abandonment of current marketing techniques; rather these should be perceived as an addition to the marketing mix.

b) Culture

For social media to make an impact it has to be made an important aspect of the culture of the organisation, if possible by including it as part of the strategy of the company, with clear objectives and ways to measure it with measurement items such as return in investment (ROI), or key performance indicators (KPIs) (Gröne et al., 2011).

A strategy on social media must be defined as there are many aspects to consider, such as which platforms to use amongst the numerous available platforms, or how to use those platforms and what conduct to maintain. Once it has been established as part of the strategy, it is a necessity to communicate to employees, who must be rallied to the cause. As a strategy on social media is communicated to employees, care must be taken that they make the right use of the platforms (Baird & Parasnis, 2011; Andersson, 2011; Wicks, 2012; European Commission, 2013; Bali & Okeleke, 2014).

c) Social ERP and Management

As aforementioned, social media can be used within the organisation as well by mirroring some ERP functionalities to cater for a simplified communication and collaboration amongst employees and partners, whether in the same location or dispersed in remote geographical areas or networks. By doing this they will be able to work together in elucidating business problems. The collaboration can be facilitated as they can track how a project is evolving; they can share files, learning materials or even information and ideas. This can be transformed in a knowledge-management system that will encompass the tacit knowledge in people's heads along with best practices (Pwc Health Research Institute, 2012; European Commission, 2013; Kurbel, 2013; Bali & Okeleke, 2014).

6) Technology Platforms

It was previously defined how social media can assist in the transformation of the business through integration with an ERP system. This section, however, deals with how these social media can practically be integrated with the ERP system.

a) Social Media Tools

Most companies are now leveraging the free social media platforms already available with minimal or no investment in hardware and software (Gröne et al., 2011). Here the social media refer to:

“a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content (UGC)”
(Kaplan & Haenlein, 2010; Cvijikj et al., 2011).

The Web 2.0 referring to Internet-based applications which forms the underlying technological platforms and the UGC can be defined as the ways people make use of the social media platforms (Cvijikj et al., 2011; Kaplan & Haenlein, 2010). Social media tools can be easily accessed such as social plugins or even built into the system such as mashups (explained later) (Cvijikj et al., 2011; Andersson 2011; Kurbel, 2013).

However, Isaca (2010), Gröne et al. (2011), Andersson (2011), Cvijikj et al. (2011) and Kurbel (2013) argue that even though social media tools do not require new or specific technological infrastructure, they have to be included in the strategy and have to be part of the organisation's IT infrastructure, as explained in the next section, through an integration.

b) Integration

As previously established, to fully exploit the social media platform to initiate and maintain contacts and collaboration with customers, employees and partners, the social media strategy must not be run in silo or as an isolated project, but rather it has to be integrated with the ERP, the organisation core application (Isaca, 2010; Gröne et al., 2011; Baird & Parasnis, 2011; Andersson, 2011; Andersson, 2011; European Commission, 2013; Kurbel, 2013). Andersson (2011) mentions that business will benefit from an ERP system that mimics the functionality of the social media tools as a great deal of the company business is already conducted on these platforms but are not recorded.

As mentioned above, for social media functionalities that are isolated, and not integrated with the core application, the ERP in this case will not fully achieve the desired objectives and intended benefits. As an illustration, Figure 3.4 shows a discussion about customer orders that is linked with the relevant functionality in the application. When a question needs to be asked, it can directly be asked to the customer himself or herself. Also, this system permits collaboration between employees, employees and customers, and employees and suppliers, without having to leave the source data as an employee can raise any issue directly from the screen on which he is working (Andersson, 2011). To be specific, the following figure (Figure 3.4) shows how social media can be integrated into ERP platforms to interact with customers.



Figure 3.4: Example of integrated social media and ERP (Source: Andersson, 2011)

Furthermore, a mashup, a tool combined with the screen and which facilitates communication with an external web service, can be used as an integration tool (Kurbel, 2013). Through some adaptive tools a mashup can be developed that will allow integration with the ERP system. The mashup illustrated in Figure 3.5 shows how collaboration can be achieved between employees through twitter mashups combined within the ERP system. Through this twitter mashup, when employees log in they can see what their fellow colleagues have posted and can even keep track of what it is going on within the company.

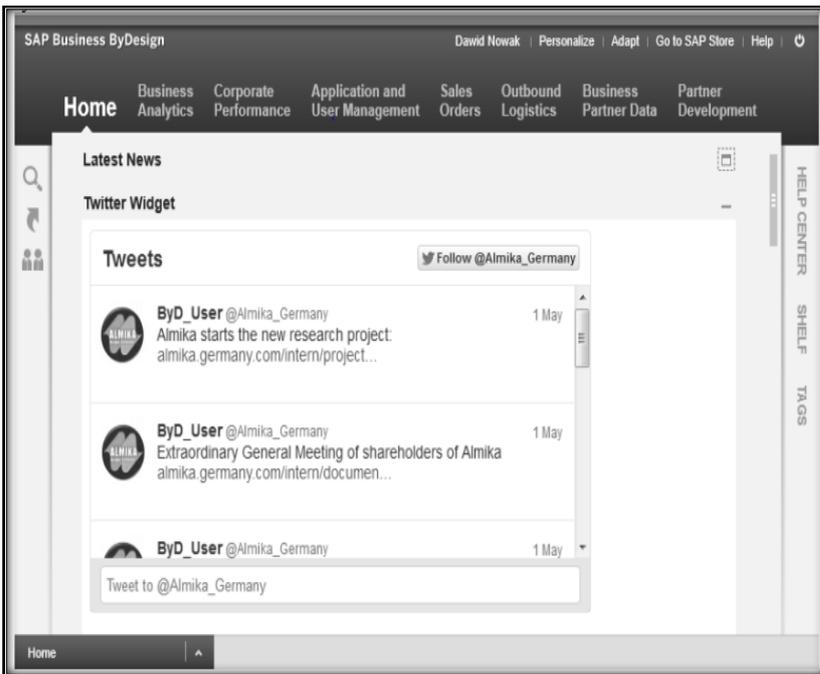


Figure 3.5: Mashup integrated in an interface (Source: Kurbel, 2013)

A Facebook mashup can also be used for the purpose of being the link between Facebook and the organisation enterprise resource planning system, as shown in Figure 3.6 (Kurbel 2013). From this screen, while the employees is busy with compiling the customer purchase order, he can directly communicate with the customer and ask him or her any particular question he might have, or inform the customer on an issue.



Figure 3.6: Facebook integrated with a business process (Source: Kurbel, 2013)

3.6.3 Cloud computing as a Business Informatics concept

The previous chapters established cloud computing and social media as new trends of business informatics that can be used to drive a business transformation. The preceding section dealt with social media as a solution for business transformation in general. However, this section will define and explain cloud computing as a solution for Company X in addressing the multiples of issues they are faced with system-wise.

3.6.3.1 Cloud Computing

Carroll et al. (2011) describe cloud computing in the following way:

“Cloud computing provides a shared pool of configurable IT resources (e.g. processing, network, software, information and storage) on demand, as a scalable and elastic service, through a networked infrastructure, on a measured (pay-per-use or subscription) basis, which needs minimal management effort, based on service level agreements between the service provider and consumers, and often utilises virtualization resources”.

Virtualisation, as mentioned above, refers to the creation of a ‘virtual’ version of the resources or applications. Virtualisation will assist in balancing the workload and increase scalability by migrating, duplicating storing, and instantiating the virtual version of computing resources (Wolf & Halter, 2005; Marinos & Briscoe, 2009).

The cloud has more advantages and is easy to implement with any business logics. Thus, through using cloud computing the organisation, such as Company X, becomes flexible, elastic, increases the robustness of their activities, and increases revenues through the reduction of production costs. In this way, cloud computing assists Company X to focus on its core activities as it requires little management effort to handle the systems (Arockiam et al., 2011). Figure 3.7 shows an illustration of a basic cloud computing model as per the definition.

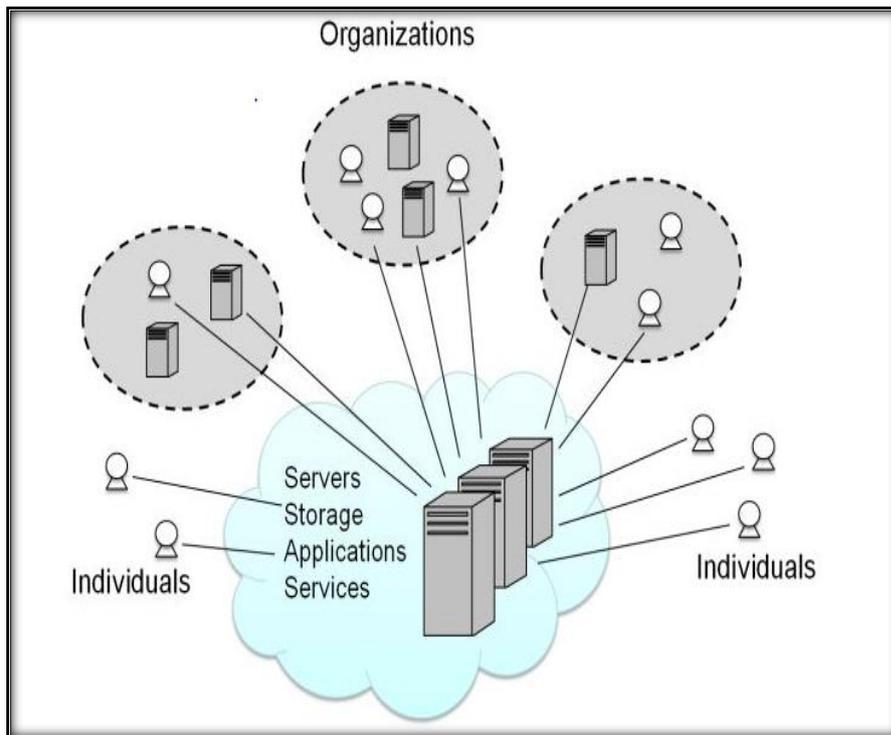


Figure 3.7: Cloud computing basic model (Source: Opengroup, 2014)

The fast adoption of the prominent data centres, which are growing exponentially, is an indicator of the increasing adoption rate of the cloud (Marinos & Briscoe, 2009). Data centres can be defined as facilities that have enough security devices and environmental systems, such as air conditioning and fire suppression. These facilities can host a collection of computer servers that can achieve the server needs well above the capacity of one machine (Arregoces & Portolani, 2003; Marino's & Briscoe 2009).

The easiest solutions for Company X data inconsistencies, duplication, and the lack of a single repository, will thus reside in moving all their data into the cloud. However, most enterprises would be reluctant to move their data into the cloud while totally discarding the existing environment. This is due to several reasons such as the cost of scrapping the existing system, and the disinclination to fix what is not broken (Yegulap, 2012). The section on data integration explains how a company can integrate its current business solutions with the cloud.

All these characteristics of the cloud are necessary for Company X's effective transformation, as they will fundamentally change and improve business activities. To understand how cloud computing can assist in the transformation of an organisation it is necessary to look at its properties, characteristics, deployment models and services. This will foster the understanding of how the cloud can fit in any technological infrastructure and transform it.

3.6.3.2 Properties of the Cloud

Cloud computing can grant organisations access to shared applications and resources within a network environment. That access can be arranged without apprehensions about who will own, manage and maintain the resources, applications and services within the network (Abedi et al., 2011). As presented below, cloud computing has numerous attributes which are briefly discussed below according to the perspectives presented by Arockiam et al. (2011) and Abedi et al. (2011):

- **User-centric:** upon connection to the cloud, the data stored in the cloud belongs to the specific user that is connected to it. In the case of Company X, for example, once they switch to the cloud they will be able to store their data. Furthermore, Company X is facing issues with its multiple databases that are causing several issues. By moving to the cloud they will be able to solve that issue by having a single repository.
- **Task-centric:** the users place their attention on how tasks are achieved rather than what the system can do. The cloud itself will become less important than the task it is supposed to achieve.
- **Powerful:** the cloud can be reliable and scalable because of the numerous computational resources added together. This will be of particular help for a company the size of Company X. They will be able to benefit from the power and scalability of the cloud at a low cost.
- **Accessible:** the cloud instant access and response provided through different repositories. The ease of accessibility will be of use to any organisation that is going through a transformation, as it will facilitate easy retrieval of information in real time. Through the ease of accessibility of the cloud, Company X will be able to have a single repository from which they will retrieve information in real time.
- **Intelligent:** data mining techniques are used to find information from vast volumes of data. Data mining and analysis techniques inherent in the cloud will provide assistance in the retrieval of information, hence supporting the decision-making process. Company X will be able to utilise that aspect of the cloud to analyse information in different facets.
- **Programmable:** data is replicated on the cloud so that, if a computer crashes, it can be reproduced on another computer. That safety rule is a necessity to ensure business continuity in case an unplanned and unwelcome event might occur. As

illustrated later in Chapter 5, Company X was faced with a DDOS attack. This characteristic of the cloud could have assisting in regaining data afterwards.

3.6.3.3 Characteristics of the Cloud Computing

Cloud computing can assist businesses in reducing costs and fully leveraging 'state of the art' technologies through consolidating and outsourcing IT infrastructures through a platform of virtualized technologies (Keung & Kwok, 2012). This is possible due to the characteristics of the cloud that can be spread into essential characteristics and key characteristics.

a) Essential Characteristics

Cloud computing has various characteristics that define its services and help in maintaining the services offered and support in business transformation. The essential characteristics are enumerated and are briefly explained. The characteristics include on-demand self-service, measured service, broad network access, rapid elasticity and resource pooling.

The characteristics enumerated below are essential in effective business transformation.

- **On-demand self-service:** provision given to customers on computer capabilities (such as server time or network storage) (Arockiam et al., 2011; Doherty, 2012; Opengroup, 2014). Customers can access according to their needs and focus on business-related activities. Company X would be able to access the cloud according to their needs. And when/if more capabilities become necessary, they will be able to upgrade.
- **Broad network access:** cloud accessible through PCs, laptops or mobile devices because of capabilities available on network (Arockiam et al., 2011; Doherty, 2012; Opengroup, 2014). This will allow employees to easily retrieve information regardless of the location and device. This will be of interest to a company such as Company X which has several offices in different locations of the world. Their employees will be able to easily access information.
- **Resource pooling:** by using a multi-tenant model, where physical and virtual resources are assigned and reassigned to customers (without them realising the background operations) (Arockiam et al., 2011; Doherty, 2012; Opengroup, 2014).

- **Rapid elasticity:** capabilities can be quickly increased, as cloud provides easy provisioning to users (Arockiam et al., 2011; Doherty, 2012; Opengroup, 2014). This is an interesting and important point, as the transformation of a business such as Company X should lead to future growth. This growth can easily be accommodated in the cloud due to the rapid elasticity.
- **Measured service:** cloud can control and optimise resources. The latter can be achieved by monitoring resources, and matching their use to the required level of services (Arockiam et al., 2011; Doherty, 2012; Opengroup, 2014). This characteristic of the cloud will assist businesses (Company X) in reducing costs as they will only be paying on a pay-per-use basis. This will produce some savings which can be reinvested somewhere else.

b) Key Characteristics

Apart from the characteristics presented above, there are also key characteristics that define cloud computing which are presented. These key characteristics are made up of agility, cost, reliability, sustainability, maintenance, metering, device and location independence (Arockiam et al., 2011) and are briefly discussed as:

- **Agility:** technological infrastructure can be easily acquired and for a reduced cost. For an entity such as Company X, which is subjected to constant changes, this aspect of the cloud will enable them to easily adapt to changes in their environment. Changes and transformation can be swiftly conducted and at a low cost.
- **Cost:** cost can be reduced for Company X as no hardware will be purchased. It will be billed on a pay-per-usage basis, and the savings reinvesting in other operational cost. Cloud cost can be instrumental for transformation as one of the aspects the organisation looks at in addition to scalability and power. The cloud will enable organisations to get some savings that could be reinvested or transferred to customers in the form of lower prices.
- **Device and location independence:** users can access their services through a web browser regardless of their devices. Again, this will benefit the company, as their sales agents are continuously on the go and service clients worldwide.

- **Reliability:** business continuity and disaster recovery can be possible as the cloud will store data on multiple servers. This is a necessity for the security of an organisation: to have some sort of business continuity in the case of unsolicited events come to pass.
- **Sustainability:** can be possible as computer systems are more efficient and carbon neutral.
- **Maintenance:** not required as no application will need to be physically installed on the clients' computers. If there are any updates in the application, such as patches, these will be automatically provided on the system. The fact that the onus on maintenance falls on the cloud provider will free up the organisations. Organisations like Company X will thus be able to reinvest the time in business value-added activities.
- **Metering:** cloud resources can be monitored and measured on a per client basis and on a weekly, monthly and yearly basis. Metering will enable the effective monitoring of cost. Organisations will be able to plan better for future consumption.

3.6.3.4 Deployment Models

There are several deployment models for the cloud as displayed in Figure 3.8. The models include private cloud, public cloud, and hybrid and community cloud: (All, 2013).

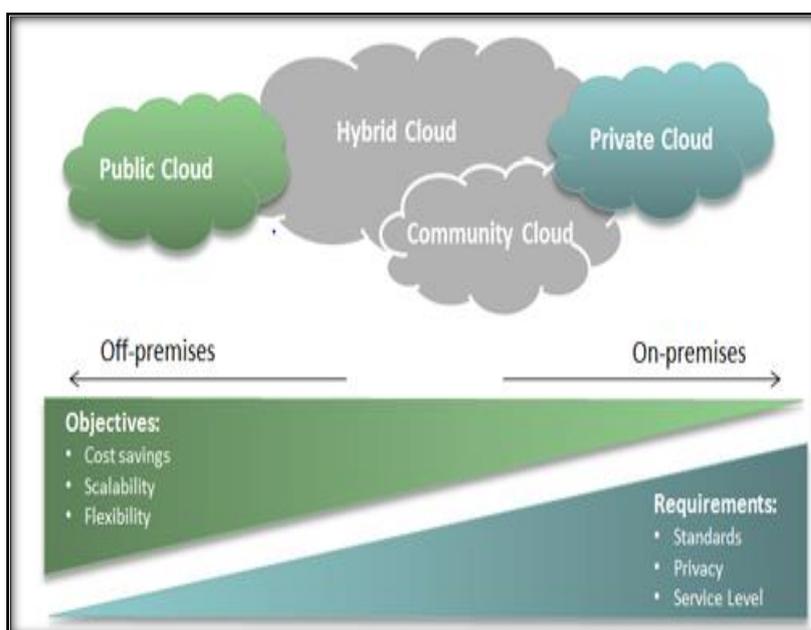


Figure 3.8: Cloud computing deployment model (Source: All, 2013)

The deployment models available for the cloud are as follows:

- **Private Cloud:** is owned and used by a single user or cloud service provider. Private and public clouds make use of the same technology as they aim to take full advantage of computing resources and increase responsiveness to company requirements (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; All, 2013).
- **Public Cloud:** they are owned and run by a third party, usually not situated in the user location. Several companies partake in these resources, with each user assigned their own virtual computing resources. This is built on 'pay as you go' style for the public (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; All, 2013).
- **Hybrid Cloud:** as the name implies, public clouds make use of both public and private clouds in an attempt to meet specific needs. For instance, a company might use a hybrid cloud to integrate aspects of an ERP that are on a private cloud to their own ERP that will be on a private cloud (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; All, 2013).
- **Community Cloud:** community clouds are pooled by several organisations and render services to a specific community that might have the same issues or agenda. It can exist on and off the premises, and can be managed by either a third party or the organisations themselves (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; All, 2013).

3.6.3.5 Cloud Services

The cloud has an architecture that allows it to be offered as several types of services, including infrastructure as a service, software as a service, and a platform as service (Ubiry, 2014). The services are illustrated in Figure 3.9 along with an explanation of the different cloud services.

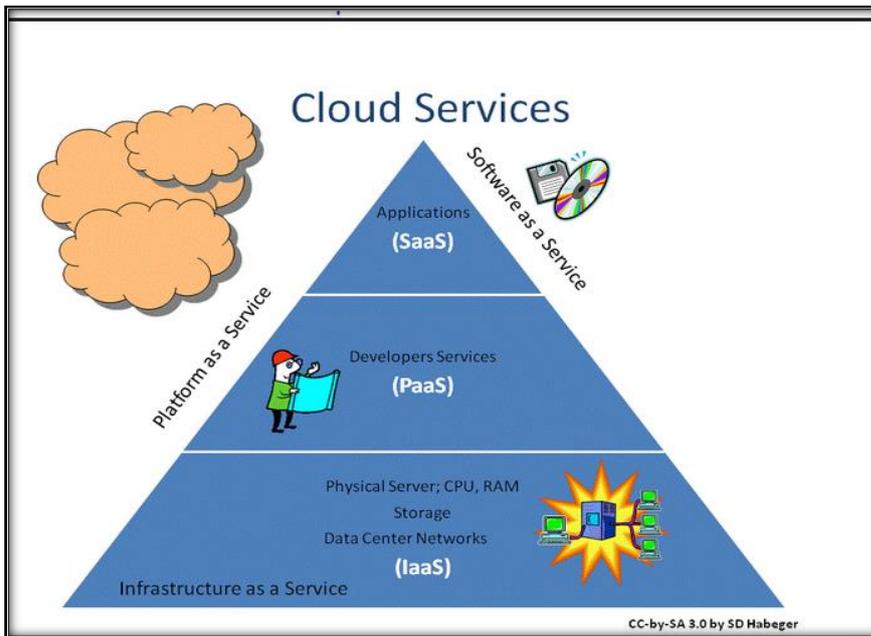


Figure 3.9: Cloud services (Source: Ubiry, 2014)

The cloud services are necessary for companies trying to conduct transformation. The companies will adequately define what their needs are, and through the cloud they will be offered a platform that can fit with their required and optimal level of technological infrastructure. The services offered include:

- **Infrastructure as a Service (IaaS):** this allows users to have access to computing resources such as storage that is billed on a pay-per-usage basis. The user will retain control of the storage and operating systems' deployed applications with limited or no control over the networking components (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; Ubiry, 2014).
- **Software as a Service (SaaS):** the cloud will assist users by giving them access to software. Such software will not need to be installed on the client's side, but will be accessed through the Internet with any computing devices. The users will be able to use the software but will not have any control of the software itself, as control is retained by the cloud computing service provider (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; Ubiry, 2014).
- **Platform as a Service (PaaS):** software and applications that are deployed can also be provided through a cloud computing platform. Users can retain control over their deployed application and hosting environment configurations, but will have to acquire confirmation from the cloud provider on whether their application will be supported by the cloud (Abedi et al., 2011; Arockiam et al., 2011; Mohlameane & Ruxwana, 2013; Ubiry, 2014).

3.6.3.6 Provisioning Service

Cloud computing can for many organisations be a new way to make businesses lower their cost (Gentzoglanis, 2011). This section shows different ways of providing services through which organisations can have their requests answered. These different provisioning services are necessary in the sense that they can enable companies to build the best solution to drive change in their organisations (Gentzoglanis, 2011). The services are cited below and defined as:

- **User interface (portal or desktop):** through this the user can be allowed to interact with the cloud interface to request some services (Arockiam et al., 2011; Gentzoglanis, 2011).
- **Services catalogue:** this service contains the list of available services from which the user can choose (Arockiam et al., 2011; Gentzoglanis, 2011). Users can choose readily defined services if they do not have a need to customise.
- **System management:** this service permits the management of the resources that are on the cloud (Arockiam et al., 2011; Gentzoglanis, 2011). Companies will still be able to manage their resources in case they are concerned with privacy, which is one of the issues of concern in the cloud.
- **Provisioning tool:** this service provides a service to the user by allocating the system from the grid, and can also assist in deploying the software (Arockiam et al., 2011; Gentzoglanis, 2011).
- **Monitoring and metering:** this service allows for the tracking of the usage, so that the users can be charged per their use (Arockiam et al., 2011; Gentzoglanis, 2011). It cannot be stressed enough how this aspect of the system will assist with monitoring the cost of being in the cloud. The organisations will be able to monitor costs and plan for future consumption through this provisioning service.
- **Servers:** this service can either be real or virtual, and can be managed through system management (Arockiam et al., 2011; Gentzoglanis, 2011).

3.6.3.7 Issues and Challenges

There are several issues involved with the cloud that affect service delivery; they stem from privacy accountability, connectivity and reliability and are briefly discussed below:

- **Privacy:** several users will confide their data onto the cloud; this might raise the issues of privacy along with security and legal issues. While the legal issues will stem from concerns as to who owns and accesses the information (Arockiam et al., 2011; Doherty, 2012), some security issues can involve the undermentioned items, as mentioned in Doherty (2012):
 - **Physical and personnel security:** access to the machine, application and customers might not be properly controlled.
 - **Applications security:** the applications and services offered through the cloud may not be properly secured.
 - **Data confidentiality:** as the cloud makes use of the multi-tenant model, there might be issues over data leakage.
- **How users' information may be used:** cloud computing retains unlimited memory capabilities; it can thus contain a huge amount of customer data. There is a concern on how the cloud services providers might use this data, as they might decide to sell them to third parties depending on the agreement (Arockiam et al., 2011; Doherty, 2012).
- **Accountability:** this challenge arises from concerns that if the cloud was to fail, will the user still be able to recover and access their data from somewhere else? Who will be responsible for the recovery of the lost information and, subsequently, who will bear the cost of recovery? (Arockiam et al., 2011).
- **Connectivity:** as cloud services rely on the Internet, if there is minimal or no access to the Internet, it might prove to be an issue (Arockiam et al., 2011; Doherty, 2012).
- **Reliability:** performance issues regarding the services and or applications offered by the cloud service provider can affect the user (Orrgren & Ghazawneh 2012).

African countries are investigating new ways to adapt to the deployment of fixed infrastructure and high speed networking such as the cloud (Sanou, 2012). South Africa is deemed slower than other African countries like Nigeria in adopting the cloud (Roontga, 2014). This is actually a surprising fact as South Africa is supposed to be the technology leader in the region.

Roontga (2014) further argues that the reason behind this slow adoption is the misconception on cloud computing. People are still wary of the risks associated with the cloud such as data security administration and control, network security, logical access, and physical security. Although this might have held true in the past, these issues have been addressed recently, making it safer for organisations to adopt the cloud. These issues can be easily addressed these days through service level agreements (SLAs) (Carroll et al., 2011). Finally, according to Roontga (2014), other issues are now affecting the decision on making cloud adoption, hence ranking the security issue in a much better position.

3.6.3.8 Data Integration

The previous section presented some characteristics, architecture and potential limitations in moving to the cloud along with ways through which they can be elucidated. However, once the decision has been made to move to the cloud, other issues arise. The ones of concern can be illustrated in the case of Company X. Company X has several entry systems that are not integrated. They have an Oracle Ebusiness Suite, an Admin Pages website, and a Salesforce subscription, each with their individual databases. If the company was to move to the cloud, they will still be confronted with some issues. As such, in chapter 6, the research makes the recommendation to Company X to move from their Oracle application-based ERP to an Oracle cloud-based ERP.

This recommendation to move toward an Oracle-based ERP will be most effective if the new system encompasses all the tasks of all the previous systems altogether (Oracle Ebusiness application, Admin Pages, and Salesforce). In the case where the company chooses to move only the Ebusiness solution to the cloud, they will still be faced with three systems functioning in silos. An integration of the systems would thus become indispensable. The next sections will discuss several ways that can be used to integrate data in the cloud, with on-premises data. However, it is important to note that these solutions can also be leveraged by Company X regardless of the fact that they do not choose to move to the cloud. In short, they can be used with any system available now.

a) *The Data Warehouse Approach*

The underlying intent in using a single repository is vested in getting the data emanating from different systems (such as Company X) and merge them through a sole repository (Yegulalp, 2012). For example, Oracle offers a data-service integrator that is readily available for these sorts of transaction. The tool makes use of an ETL (extract, load and transform) script of the next generation (Oracle, 2015).

Furthermore, the tools that can assist in the unification of data originating from disparate sources basically generate some sort of meta-warehouse into which data extracted from the incongruent sources will be deposited and updated in real time, through ETL scripts for instance (Neal, 2011; Yegulalp, 2012; Oracle, 2015). This offers organisations the opportunity to produce enterprise-wide dashboards that can be compiled from several dissimilar sources and analysed in multiple facets.

A data warehouse represents the locus where data is stored and which technological infrastructure allows the consolidation of data originating from different sources, and to perform several analyses and queries (Neal, 2011). Figure 3.10 shows how data is extracted from dissimilar sources through ETL scripts and deposited into a data warehouse. The data can thus be analysed subsequently through OLAP analysis and data mining usually for reporting purpose.

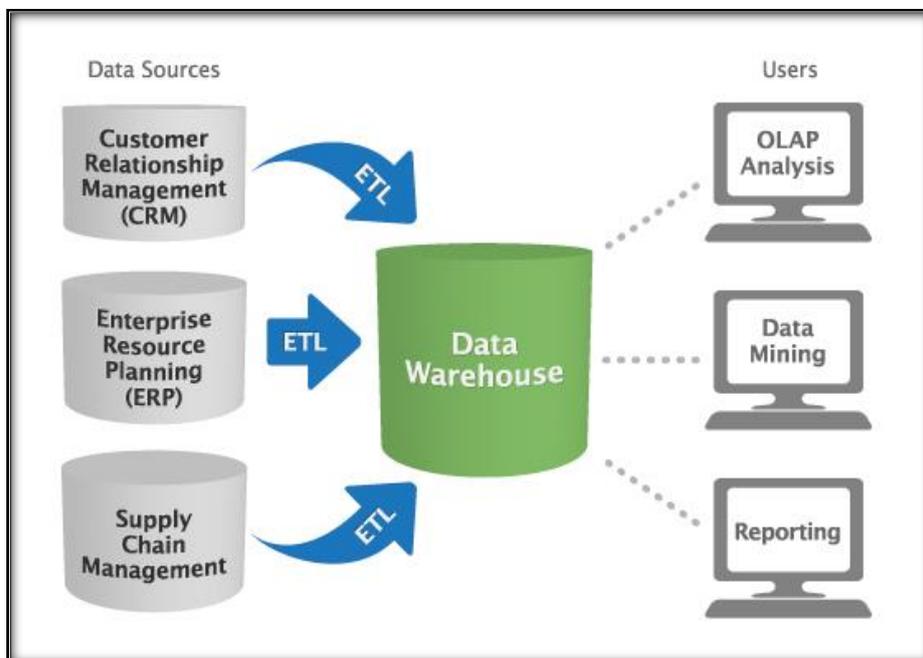


Figure 3.10: Example of a data warehouse (Source: Neil, 2011)

As shown in the picture above (Figure 3.10), this type of technological infrastructure is associated with the OLAP cube which is the underlying technology behind several business intelligence software (Neil, 2011; OLAP, 2015). OLAP is an acronym for online analytical processing which deals with a multi-dimensional array of data. Basically, the cube will assist the multi-dimensional analysis of data stored in a warehouse. The cube offers access to unlimited report viewing and an inherently built complex calculation system and 'what if' scenario analyses, data modelling and trend analysis (Neil, 2011; OLAP, 2015). Figure 3.11 below shows how the cube can interpret in multiple dimensions. In this case, the cube interprets the data in three dimensions, namely the stores, the period and the products.

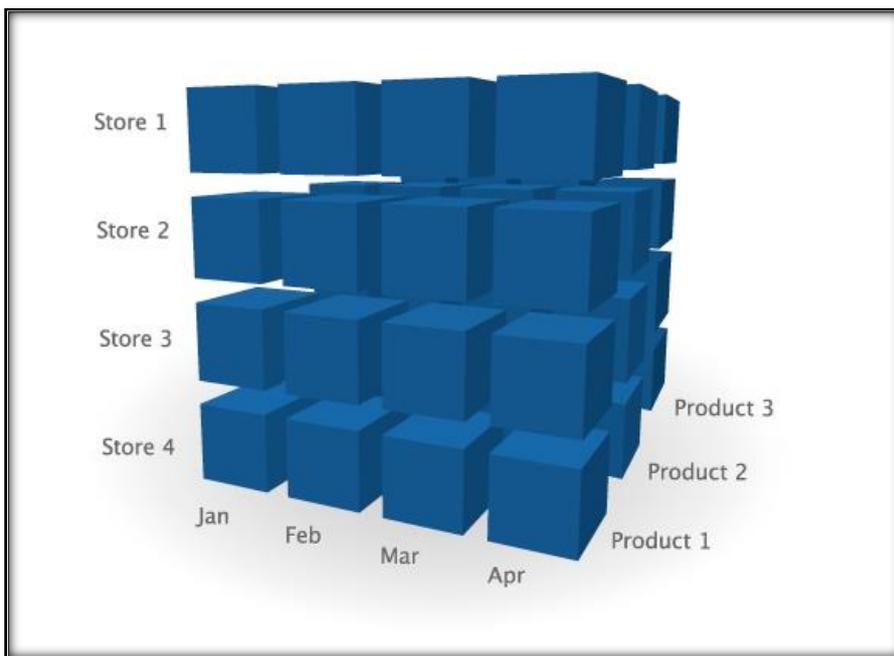


Figure 3.11: Example of an OLAP cube (Source: Neil, 2011)

It has been argued that moving everything into a single repository will not always resolve the matter of integration of the disparate sources of information. This stems from the management problem that arises from the federation of cloud and local data (Yegulalp, 2012). Thus, this application can only be effective if the single repository and dashboards are utilized company-wide while limiting the interaction with the old legacy systems.

b) The Toolkit Approach

The next approach consists of making available to the business a set of tools that can be used to unify data instead of at a single repository. This implies that a toolkit will be used that will create custom connections which will feed information between databases (Yegulalp, 2012). For instance, employees working on the Oracle Ebusiness suite will continue interacting with the software while receiving a feed from other systems such as Admin Pages or Salesforce (in the case of Company X).

The issue with the toolkit is the fact that the onus of the data integration falls on the company. Indeed, while dealing with the toolkit the company must make use of the IDE (integrated development environment) to couple the different types of data sources available to them. This can be technically challenging (Yegulalp, 2012).

c) Data Virtualization

Data virtualization is a tool that is utilized for data integration. This tool functions by giving the user the impression that the data being used is coming from one single repository, while in fact it is coming from several repositories (Ferguson, 2014). The system offers the opportunities to create virtual views of data extracted from disparate sources, whether internal or external.

The software will thus present the data as integrated through these virtual views. Similar to the OLAP cube, the data will be analysed through a dashboard, a business intelligence (BI) tool. When the BI tool, dashboard, or application queries the data, the tool will integrate the data 'on-the-fly'. Figure 3.12 shows an example of this infrastructure (Chandramouly et al., 2013; Van der Lans, 2013; Ferguson, 2014). The picture shows how several databases are presented by the system as a single logical repository that feeds the organisation's applications.

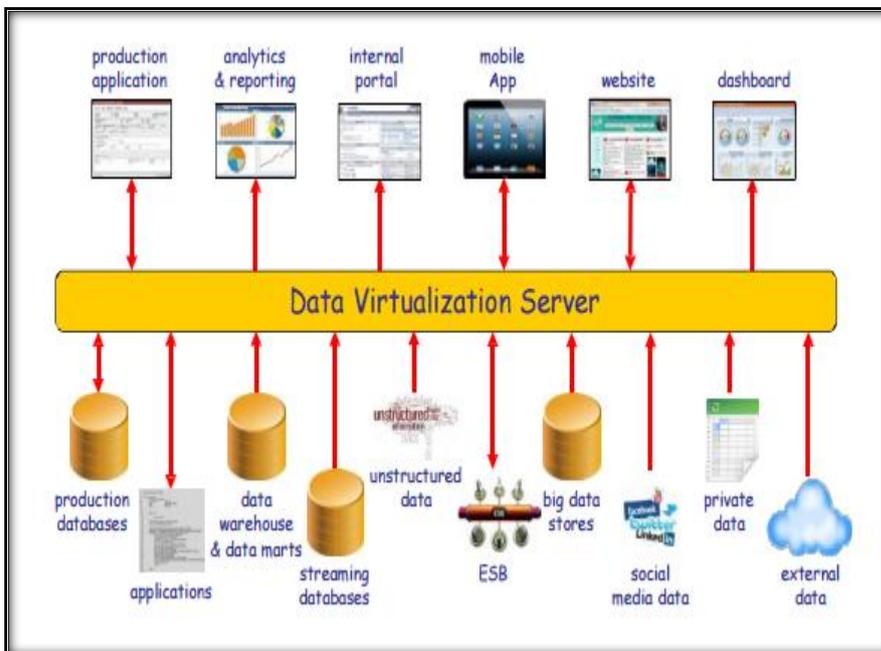


Figure 3.12: Data Virtualization example (Source: Van der Lans, 2013)

Figure 3.13 below shows how data virtualization works. It first starts by establishing a connection and virtualizing data from the disparate sources into an abstracted format (Chandramouly et al., 2013). Then it merges and federates these data sources in data access layers or views. These views are then used to feed and service the application and web-based tools (Chandramouly et al., 2013).

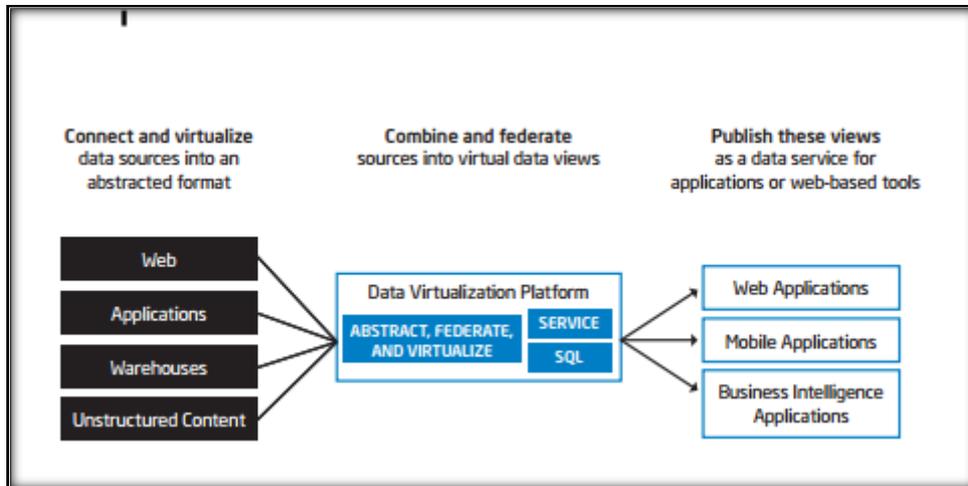


Figure 3.13: Data virtualization process (Source: Chandramouly et al., 2013)

3.6.3.9 Conclusion on Cloud Computing

Suboptimal use of technology has led businesses like Company X to be confronted with several data entries points leading to data inconsistencies, duplication, and a lack of a single repository. As such, appropriate use of technology such as migrating to the cloud will be the ideal option. However, migrating to the cloud, although ideal, is usually considered an onerous option as several considerations must be made. Most companies would make sure that the cost of moving to the cloud does not outweigh the benefit of doing so. This is due to several reasons such as the cost of scrapping the existing system, and the disinclination to fix what is not broken (Yegulap, 2012). Also, consideration must be made that data can be safely moved to the cloud concomitantly with business operations. Finally, the cloud should be adopted only once the proper considerations have been made.

3.7 ROLE OF BUSINESS MANAGEMENT

The definition of business informatics presented in section 3.4 BUSINESS INFORMATICS was threefold. One fold of the definition included business informatics being linked to business management and administration principles. The business management and administration principles within this research will refer to corporate strategic management, corporate governance and policies, and procedures which are used to guide the business operations and shape its operations. This section will aim to discuss these concepts and how they can affect or prompt a transformation within an organisation.

3.7.1 Strategic Management

Mutual (2010) indicates that the strategy refers to the plans of top management to develop and maintain a competitive advantage, whereby successful business strategies cannot be easily replicated by its competitors, thus enabling the mission of the organisation to be accomplished. Saylor (2012) concurs with this view of strategy by declaring that that strategy can be perceived as a ploy to outperform its competitors through creativity to boost success.

Additionally Gregory et al. (2005) support the view that strategic management entails analysing, making decisions and implementing them to create and uphold competitive advantage. More explicitly, strategic management examines how senior management resolutions and the organisation in its environment impact business success or failure (Saylor, 2012). In addition, strategic management can be defined as a facilitator of the accomplishment of the entity objectives or mission through the formulation, implementation and evaluation of cross-functional decisions (David & Carolina, 2011).

Henry (2008) argues that in the absence of a well-defined strategic direction, an organisation is exposed to crafting decisions based solely on day-to-day activities or any other prevailing conditions. This puts the company at the risk of failure because of a lack of clear direction. Hence, the main objective of strategic management is to provide a framework that guides all your business activities in the medium and longer term (Henry, 2008).

Strategic management focuses on the integration of concepts such as management, marketing, finance and accounting, production or operations, research and development, and information systems to drive success within the organisational (David & Carolina, 2011). Perhaps it is important to note that the aspect of strategic management this research wants to highlight is the integration of information systems with the strategic management principles.

Moreover, David and Carolina (2011) point out that the goal of strategic management is to exploit and create new and different prospects for the future. This is possible because strategic management is an approach based on management systems to identify and make the necessary changes and measure the performance of the organisation as it aims to attain the business's vision and mission (Wells, 2000). The author continues his argument by stating that the strategic management system planning and decision making with the daily activities of operational management are intertwined.

3.7.1.1 Strategic Plan

A move towards an organisational culture that easily adapts to changing strategic management needs as a first step a strategic plan for the organisation (Wells, 2000). A strategic plan is a carefully designed set of steps that a company intends to follow to be successful. Every organisation must compile a strategic management plan to guide its future operations (Saylor, 2012). Strategic planning centres on a process that requires senior leaders of an organisation to define its strategic direction (Wells 2000).

David and Carolina (2011) express the view that a strategic plan should be likened to a game plan. The plan will assist the company to assess many good prospects and focus on the project that will go in the same direction as the strategy. As part of this research, the strategic plan will include management decisions to effectively make use of the information system.

3.7.1.2 Strategic Management Implementation

A holistic understanding of the company is needed before drafting a strategic management plan, as the whole industry and its strategic challenges need to be taken into consideration. Also, a continuous assessment needs to be performed on internal and external factors to assist in putting in the strategy into place and monitoring the effect on the organisations (Mutual, 2010). Therefore executives must become strategists and leaders of the organisation and its culture, and replace it if necessary (Wells, 2000).

3.7.1.3 Environmental Analysis

It is essential to conduct a thorough environment analysis such as the SWOT analysis that assists in determining the strengths, weaknesses, opportunities and threats to your business (Henry, 2008). Gregory et al. (2005) defend the view that strategic management is concerned with the analysis of the strategic goals (vision, mission) and the analysis of the

internal and external environment of the organisation. Mutual (2010) are consistent with the latter and define the external and internal analysis as:

External Analysis:

“It is an analysis of the opportunities and threats, or constraints that exist in the organisation's external environment, including industry and the forces of the external environment”.

Internal Analysis:

“An analysis of the strengths and weaknesses of the organisation of its internal environment. Examine the context of ethical management and social responsibility”.

After the completion of the initial analysis stage, as in the analysis of the company in its environment, three other stages constitute the strategic management process: strategy formulation, strategy implementation and strategy evaluation (David & Carolina, 2011).

3.7.1.4 Strategy Formulation:

The results gathered in the initial stage of the research will assist this section with the crafting of the strategy that will enable the company to achieve competitive advantage and to sustain it over the long term (Mutual, 2010; David & Carolina, 2011). Formulating the strategy will include activities such as determining which projects or prospects to invest in, deciding on diversification and expansion inter alia. Also, as in most organisations, resources are restricted; the strategy formulation will decide whether to allocate resources to make the most efficient use of these resources (David & Carolina, 2011).

With regard to this research, as we focus on the integration of strategic management with information system, the top management will make use of the information system to deploy their human resources. Resources will be allocated to different projects despite location and time constraint issues, as explained hereafter.

3.7.1.5 Implementation of Strategies:

Activities in this section will put into action the strategic management plan that has been developed in the initial stage, as well as resourcing the plan (Wells, 2000; Mutual, 2010). Here, the strategic plan, policies, objectives and goals that have been conceived in the formulation section must be communicated to employees who must be rallied to the cause, motivated and allocated to the projects (Wells, 2000). For the strategy to succeed, it has to be incorporated as some sort of culture within the organisation, and which structures will be

diverted into rethinking the organisation processes through an effective use of information systems (David & Carolina, 2011).

3.7.1.6 Strategy Evaluation

All strategies are subjected to the risk of amendments as there are major influences from the internal and external environment. That is why it is necessary to conduct an evaluation to monitor the progress of the aspects of the strategies that were implemented, i.e. through key performance indicators. Where strategy has been deemed to fail, it would be necessary to reconvene and come up with new directives. The strategic implementation must always be an ongoing process (Mutual 2010; Wells 2000; David & Carolina, 2011).

Michael Porter, as cited in Gregory et al. (2005) expresses the view that competitive advantage can be attained by being more operationally efficient than the other suppliers. This is only possible through a diversification, or rather a differentiation of the activities or the services offered. In this particular case, business will have to be conducted in a different but more efficient manner. With regard to this research, Bring Your Own Device, telecommuting and a work-life balance model can be integrated in the strategy to aid the company into differentiating the way it conducts its business activities. By doing so it will also allow a business transformation. In the case of Company X, competitive advantage can be mainly achieved through improving operations by leveraging cloud computing, as explained in the previous sections.

3.7.1.7 Strategic Management Models

As defined in the section of business informatics, strategy is an essential component within the organisation. This means that successfully managing employees and resources will assist in the transformation of the business as resources will be allocated and deployed in an efficient and effective manner. This section introduces some management concepts that can assist in the transformation made available through business informatics (technology).

(a) Telecommuting

Working at home is now possible because of the advent of technology. Figure 3.14 shows how telecommuting, as an example, can advance digital telecommunication technologies for fundamentally transforming work. Telecommuting includes working at home, at neighbourhood work centres or satellite centres (Nilles, 1994; Olson, 1982; Kurland et al., 2002; Biz, 2014; Berkeley, 2014). Employees will then communicate with the office via telecommunications or computer-based technology.

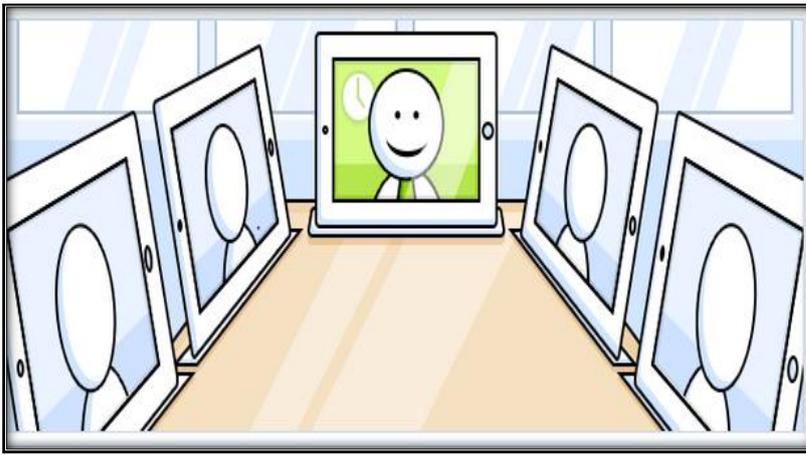


Figure 3.14: Telecommuting (Source: Biz, 2014)

The satellite work centre excludes both working from home and from the conventional workplace. It differs from the neighbourhood centre by the fact that satellite work centres only cater for one employee, while the neighbourhood can accommodate more than one. Various types of technologies can be used, starting from a simple phone line to a network of computers, virtual private networks, faxes and the like (Kurland et al., 2002; Biz, 2014).

There are several advantages for employees to telecommute. Indeed, employees can decide to do so with the aim to lower or reduce work-related stress, mostly, and stress created by being in the office. Also, by telecommuting the users can get to reduce lengthy travelling hours to the office should they not stay close to the workplace. Finally, telecommuting can help resolve clashes between work and family duties; 'work longer hours', but in an interrupted and more comfortable environment (Mokhtarian & Salomon, 1997, Hartman et al, 1992; Hill et al., 1996; Venkatesh & Vitalari, 1992; Becker, 1986; Kurland et al, 2002; Biz, 2014; Berkeley, 2014).

The main benefits for telecommuting are an improvement to employee morale, which in turn leads to increased productivity. Telecommuting can also reduce real estate costs since less space will be required to accommodate all the employees and can accord with legislation involving disabilities acts in certain countries such as America (Khan et al., 1997; Egan, 1997; Ramsey, 1997; Korzeniowski, 1997; Tomaskovic-Devey & Risman, 1993; Kurland et al, 2002; Berkeley, 2014).

(b) *Bring Your Own Device (BYOD)*

This research aims to establish how to transform a business by making use of the most recent technologies. Mobile technologies have been deemed to be a good alternative to drive business transformation (Maan, 2012; SAP AG, 2014). That is why it has been judged necessary for an ERP system to encompass some reliable mobile access (Maan, 2012; Kurbel, 2013; SAP AG, 2013).

As employees are working away from the office environment, the need for mobile access is made greater. However, as there is a proliferation of mobile devices, it is safe to say that they play a major influence on the way people live, work and collaborate, as these devices allow for better interactions, real-time insights, and immediate access to data (SAP AG, 2012; Maan, 2012; Kurbel, 2013; and SAP AG, 2013).

Although Waldeck (2012) and SAP AG (2012) raise the security concern of organisational data, mobile applications have been thriving as they are revolutionising and transforming the way business is conducted, and contributing to an enhancement of productivity of employees that are working remotely (Maan, 2012; Waldeck, 2012; Kurbel, 2013). Several companies are already leveraging mobile technologies, but the impact of any such technology is at a fast pace. This is why it is necessary to include it as part of the strategic plan needed to drive the transformation of the business (Kurbel, 2013; SAP AG, 2014). Mobile technologies such as BYOD have been discovered to achieve great business benefits (SAP AG, 2013).

In this fast-growing technological era, organisations have noticed that employees tend to want to use their own personal devices for both work and leisure. Most companies must have come to realize that it might be difficult to dissociate the two, so instead of stopping the use of personal devices, a program can be created that will help leverage the mobile device in a most efficient manner (Waldeck, 2012; Symantec, 2012; Ernst & Young, 2014). This program is called Bring Your Own Device (BYOD).

Although BYOD is an interesting prospect, it does not, however, come without risks and challenges of its own. Indeed, there is a security risk associated with employees using work-related information on their personal devices, and the challenge for organisations for having to fix a widespread range of issues on a portfolio of devices that they do not own or control (Ernst & Young, 2014). Nevertheless, combining BYOD with mobile device management (MDM) and mobile application management can reduce the security risks (Ernst & Young, 2014). Table 3.1 below shows several issues affecting BYOD and how they are sorted.

Issues	Solutions
Support through device agnosticism	This system will allow any device to be connected with any system. Agnostic devices will assist employees that are working remotely, managing and controlling their devices.
Simplified device commissioning	Device commissioning can aid employees through remote provisioning to facilitate the configuration of personal devices to be utilised in the office.
To sever the business use from personal use	Data partitioning can be used to define the segregation of personal and business uses on the mobile devices
Automatic alerts and controls	Exceptional charges and real-time cost management can be avoided through automatic alerts and control
User configuration	This configuration will allow users to manage their personal working environment.
Single console device tracking	This will assist with the devices (regardless of the devices types) tracking and monitoring.

Table 3.1: Issues with BYOD and their solutions (Source: SAP AG, 2013)

Bring Your Own Device will result in an increase in productivity as employees will use their own devices which they already know how to use and, most of all, enjoy using. Allowing employees to use their devices can reduce capital expenditure as employees can leverage devices that they have already paid for. Last but not least, employees always are weary of mistreating devices that they have bought for themselves; this can result in better care of the devices and the information they will contain (Ernst & Young, 2014; Symantec, 2012). Figure 3.15 below is an illustration of how mobile technology can be used and integrated with an ERP system. The ERP system and Internet-based technology are synched, allowing mobile technology to receive a feed from the ERP system.

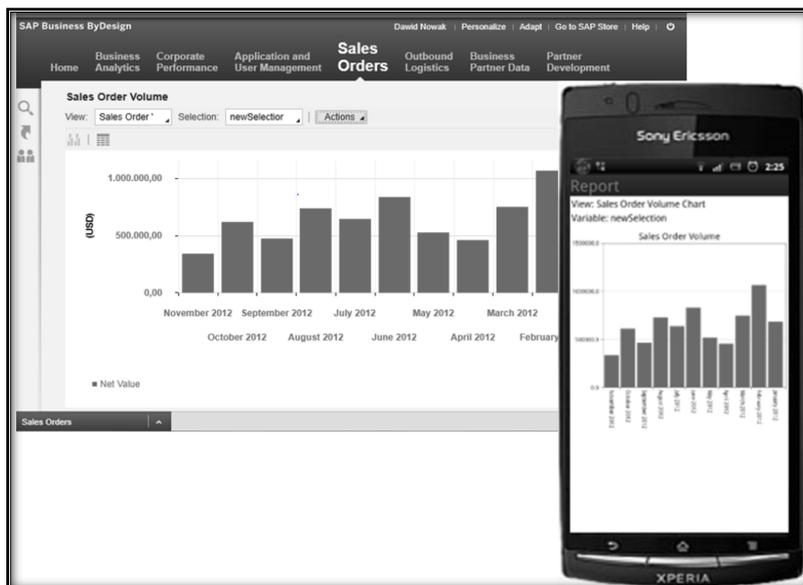


Figure 3.15: Mobile application linked with an ERP (Source: Kurbel, 2013)

(c) *Work-Life Balance (Flexi-Working Hours)*

A research was conducted on 13 000 UK students; the participants were to define the work-life balance and the results are displayed in Figure 3.16. As can be seen from that figure, 27% defined a work-life balance as a positive work atmosphere, 26% as financial stability, 24% as job security and 22% as flexible hours (Employeebrandingtoday, 2011).

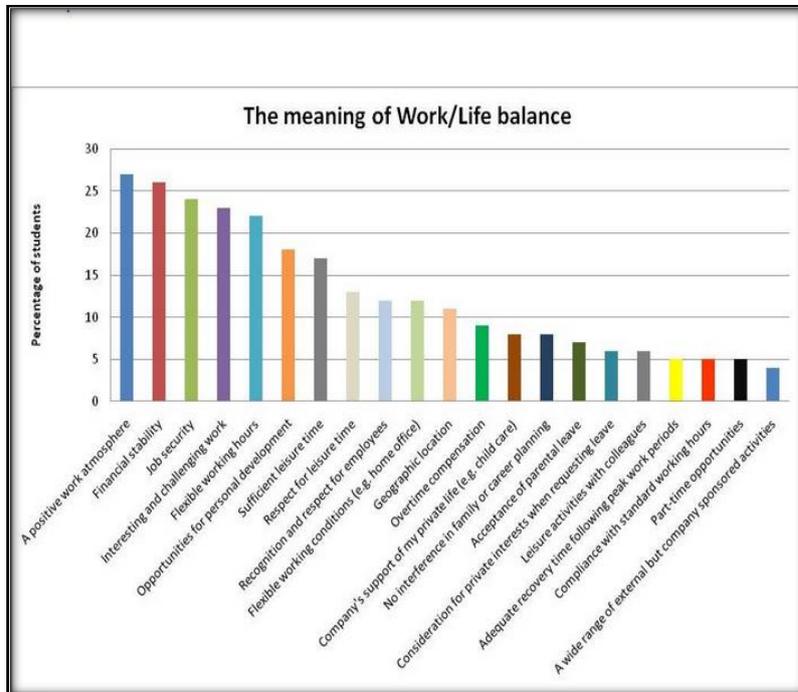


Figure 3.16: The meaning of work-life balance (Source: Employeebrandingtoday, 2011)

Work-life balance is a concept that is based on the proper delineation of priorities between work and life (family life mostly). Through that concept, the employees can easily balance their family and work, leading to increased productivity in the workplace and happier family life. Indeed, many workers face some clash between their life and their career; these issues can have indirect costs on both the workplace and family (Yasbek, 2004). The workplace can be impacted by these clashes as it will result in lower productivity and there can be some kind of discord within the family.

Work-life balance can have a great effect on productivity for the following reasons:

- Enhance recruitment and retention rates, with associated cost savings; offering work-life balance in a highly competitive market along with complete package can increase the likelihood of attracting best recruits, but can also help reducing costs as workers would be retained (Yasbek, 2004).

- Reduced absenteeism and sick leave usage; work-life can be an effective way to combat fatigue in the workplace; will result in healthier workplace, thus limiting the amount of sick leave or reasons to be away from the office. This is possible because a work-life balance offers great flexibility for hours (Yasbek, 2004).
- Improved loyalty: because work-life balance comes with many advantages and benefits to the employee, it can be an extra motivation for any such employee to produce more effort to repay the company's 'thoughtfulness'. Finally, through work-life balance the amount of negative 'spill over' from the employees personal life can be reduced (Yasbek, 2004).

In the light of all the above, it can be established that a work-life balance can be quite technologically challenging. It will then have to make use of the two aforementioned strategic management issues, namely, bring your own device and telecommuting.

3.7.2 Corporate Governance

Business informatics was defined in a previous section as being linked to business management and administration principles. The business management and administration principles within this research refer to corporate strategic management, corporate governance and policies and procedures which are used to guide the business operations and shape its operations. This section will aim to discuss corporate governance while the next will discuss policies and procedures.

Corporate governance can be defined as a

“set of relationships between a company's management, its board, shareholders and other stakeholders”

vis-à-vis of social norm that enacts sanctions and the enforcement of appropriate behaviour (Guo et al., 2013; Galander et al., 2015). Furthermore, corporate governance can be defined as the way to control and direct organisations (Baydoun et al., 2012; Muneeza & Hassan, 2014). Corporate governance is also necessary for an organisation to transform and meet its strategic objectives through improved performances; any organisation will require a sound environment to attain any such objective (Muneeza & Hassan, 2014; Galander et al., 2015).

Koerniadi et al. (2014) support this view by stating that in the absence of corporate governance, management can choose to conduct their business in a way that can hurt the organisation. Corporate governance was in fact created after the various corporate scandals that took place a few years ago (Nerantzidis & Filos, 2014; L'Huillier, 2014). Hence, corporate governance stems from a need to separate ownership and control but mainly to

protect every stakeholder. Stakeholders represent a group or individuals directly or indirectly impacted by the achievement of organisational objectives (Spitzeck, 2009).

Finally, good corporate governance needs to include transparency disclosure, accountability ethics and risk management. When one of these constituents fails to be achieved, failure for the rest will follow as well. Poor corporate governance will lead to poor performance, thus impeding the organisational transformation (Jones & Thompson, 2012; Muneeza & Hassan, 2014).

3.7.3 Policies and Procedures

Every business has an objective to be achieved for conducting its activities in an effective and efficient manner. To achieve this objective, organisations have to follow well-established best practices, methods and techniques (Moule & Giavara, 1995; Wolosz, 2007). Organisations have to convey these methods, best practices and techniques in an effective manner. Hence, policies and procedures can assist a business to transform by providing:

- **Employees with consistent processes**, which will make the deliverables stemming from these processes consistent as well (Moule & Giavara, 1995; Wolosz, 2007; Fitsimmons, 2011).
- **An effective performance measurement basis**, as it would be easier to compare employees' practices with the required practices set in policies and procedures (Moule & Giavara, 1995; Wolosz, 2007; Fitsimmons, 2011).
- **A solution for recurrent problems**; policies will guide how to behave each time a problem occurs (Moule & Giavara, 1995; Fitsimmons, 2011).
- A way to save time by avoiding employees having to reinvent the wheel each time they conduct a process (Moule & Giavara, 1995).

Therefore policies and procedures can assist the business in transformation with the aforementioned objectives. However, policies and procedures need to be distinguished as they are not the same (Fitsimmons, 2011). Policies can be formerly defined as statements nurturing consistent board and senior management objectives (Lane, 2011; Fitsimmons, 2011). Policies will thus be generated on the basis of best industry practices, regulations and laws (Lane, 2011).

Policies have to do with 'why' activities have to be carried, so they establish meaning for processes and activities within an organisation (Wolosz, 2007; Fitsimmons, 2011). Procedures on the other hand have to do with a delineation of how policies are to be carried out (Fitsimmons, 2011). Procedures are instructions that map the policies. Policies can be further explained as a formulation of the values of a business, while procedures will be their application (Fitsimmons, 2011). Finally, together, policies and procedures, and corporate governance, influenced by the corporate strategy, will thus constitute a sound environment that will assist in an effective transformation. This is made possible as these documents will provide the meaning and guidelines to conduct the transformation.

3.8 SUMMARY

Transformation is an important concept for organisations as they hope to sustain in this rapidly growing technologically driven business environment. Achieving this sustainability within their relevant industries entails that these entities would need to adapt and apply the appropriate technologies that can help reduce operating costs, hence attaining the competitive advantage. The chapter largely discussed concepts such as cloud computing and social media as illustrations of these new technologies. However, a sound working environment was also deemed necessary for transformation to be effective.

The next chapter introduces all the research approach underlying this research together with the description of the fieldwork.

Chapter 4 : RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The aim of this chapter is to discuss the research design and methodology that was used to address the main research question, which is to discover: *How can business informatics concepts help the selected business organisation in the process of transformation?*

This chapter discusses the research methods that were used; it also defines the scope of the design and highlights its potential limitations. The research approach, methodology and design chosen for this research were chosen amongst existing research traditions. In addition, the philosophical assumptions underlying this research were explained along with their implications on the finding of the solution to business transformation using business informatics. Finally, the discussion is focused on Company X, a case study research strategy with its four units of observation adopted for this research. The sources of information stemming from these units were also discussed.

4.2. RESEARCH METHODOLOGY AND METHOD

4.2.1 Type of Research

There are four forms of research: exploratory research, descriptive research, analytical research and predictive research (Collis & Hussey, 2009:5-6). They further define these purposes of research as follows:

- The exploratory research: is the type of research conducted when only little or no knowledge exists about the topic. In core, it is carried to generate new knowledge about the topic.
- The descriptive research: merely describes the phenomena by finding information and characteristics on the phenomena.
- Analytical research: this type of research goes beyond the descriptive research form by not simply describing the aspect, but by analysing and explaining why the issues of investigation are actually happening. This type of research answers the questions What? Who? Why? and How?
- Predictive research: uses the result of analytical research to enhance the research outcome by using the results of the analyses to predict certain occurrences of the phenomena as the basis of a hypothesized relationship.

Stemming from all the above, the purpose of this research was deemed analytical, as it explained why business transformation occurs and how business informatics can affect the transformation.

4.2.2 Research Methods

The research process defines the problem that will be studied and the method through which it will be done. Macdonald and Headlam (2009) ascertain the existence of qualitative and quantitative research as types of research methods. These abovementioned methods are defined below:

- Quantitative research: as the name implies, quantitative research aims to quantify or measure an amount. The quantitative research method asks questions such as 'how long', 'how many', and the 'degree to which' (Macdonald & Headlam, 2009). This type of research method addresses the research question and design through the collection of quantitative data which will be further analysed by means of statistics and interpreted in terms of numbers and formulas (Collis & Hussey, 2009:7).
- Qualitative research: Macdonald and Headlam (2009) express the view that qualitative research is concerned with the quality of information. They emphasize that qualitative research seeks to establish the underlying reasons for action and define people's interpretation and experience of the surrounding environment. In addition, Collis and Hussey, (2009:7) state that this method addresses the research questions and research design by means of collecting qualitative data such as perception and analysing it by means of interpretative methods. The data collected and analysed will possibly be inferred in terms of words and diagrams.

Table 4.1 goes further by establishing the differences between qualitative and quantitative research. The difference in purpose is established between qualitative and quantitative research. In quantitative research the purpose will be to generalise and predict, while qualitative will rather contextualise, interpret and understand perspectives. In qualitative research, the researcher is responsible of gathering data as opposed to tools (survey) used in quantitative research. Other differences can be seen by referring to the table below.

	Quantitative	Qualitative
Aim	The aim is to count things in an attempt to explain what is observed.	The aim is a complete detailed description of what is observed.
Purpose	Generalizability, prediction, casual explanations.	Contextualisation, interpretation, understanding perspectives.
Tools	Researcher uses tools, such as surveys, to collect numerical data.	Researcher is the data gathering instrument.
Data Collection	Structured	Unstructured
Output	Data is the form of numbers and statistics.	Data is in the form of words, pictures or objects.
Sample	Usually a large number of cases representing the population of interest. Randomly selected respondents.	Usually a small number of non-representative cases. Respondents selected on their experience.
Objective/subjective	Objective-seeks precise measurement & analysis.	Subjective-individuals' interpretation of events is important.
Researcher role	Researcher tends to remain objectively separated from the subject matter.	Researcher tends to become subjectively immersed in the subject matter.
Analysis	Statistical	Interpretive

Table 4.1: Qualitative vs Quantitative study (Source: Macdonald & Headlam, (2009)

This research applied a mixed research method and gathered data through semi-structured interviews. This research is mixed, mainly qualitative but with a flexibility towards quantitative research to enrich the qualitative aspect. Semi-structured interview allowed the flexibility to navigate from a questionnaire to comment that respondent wanted to make as a way to explain their perception on the matter questioned. The reasons driving this choice were that the interpretation was subjective and pertaining to the selected case study (Company X) experience. The research will thus establish the underlying reasons for action and define people's interpretation and experience in the environment of Company. The role of business informatics in business transformation was contextualised to the Cape Metropole and further

to the selected company. The data, which was gleaned, fell within the interpretive research paradigm explained in the section 4.3 - philosophical approach to the research.

4.2.3 Logic

This research study was inductive in nature, as a theory is developed from observation in order to shift the focus from a specific understanding of the phenomena to a general understanding. Also, inductive reasoning can result in a conclusion that is deemed false while the grounding on which it is based is true (Collis & Hussey, 2009:8). In fact, the data gathered for this research stems from a *single* company. The apparent limitation in the amount of companies analysed might lead to a conclusion that holds true for Company X, but might not however hold true for another company. The inductive reasoning is opposed to the deductive reasoning for which the initial perception of the authors is derived from consulting existing literature which, in turn, will be tested through means of empirical observations. The focus is then shifted from a general understanding to a specific understanding of the phenomena (Collis & Hussey, 2009:8).

4.2.4 Outcome:

According to Rajasekar and Chinnathambi (2006), there are two types of research: basic research and applied research.

- The basic research is used when the author wants to investigate the problem at hand, and establish the causal relationship for the occurrence of a phenomenon. The basic research is deemed 'basic' as it is not always applicable; it does not solve a problem, but rather it increases the knowledge and awareness of the phenomenon (Rajasekar & Chinnathambi, 2006).
- The applied research, on the other hand, mitigates or solves an existing research problem at hand. As this research is deemed applied, a solution will be provided in the form of a recommendation in Chapter 6. The result of this research model has a direct applicability in the context within which the problem is being investigated.

The following table shows the differences between basic and applied research:

Basic research	Applied research
Seeks generalization	Studies individual or specific cases without the objective to generalize
Aims at basic processes	Aims at any variable which makes the desired difference
Attempts to explain why things happen	Tries to say how things can be changed
Tries to get all the facts	Tries to correct the facts which are problematic
Reports in technical language of the topic	Reports in common language

Table 4.2: Difference between basic and applied research (Source: Rajasekar & Chinnathambi, 2006)

From the table above, many aspects differentiate the two types of research. The research outcome is applied research. The reasons why applied research was used are explained below:

This research was done on individual case (specifically one selected company in Cape Town). Findings were not generalised from a sample to a population as in basic research; rather, a theory of the importance of business informatics in business transformation was contextualised. This means that the outcome of this research might hold true for Company X but not necessarily for another company due to the limitations in the data, as the research focuses only on one case study.

This research determined how things can be changed, by recommending the current trends in the concepts of Business Informatics and how they can be used to improve Business Transformation.

4.3 PHYLOSOPHICAL APPROACH TO RESEARCH

Guba (1994) states that philosophical approaches stem from a need to answer questions based on ontology, epistemology and methodology.

- **Ontology:** deals with the form and nature of reality and how it can be understood (Guba, 1994). Ontology can be divided into materialism ontology and idealism ontology (Björn & Carsten, 2006). Ontological materialism refers to the belief that material artefacts are deemed more 'real' in relation to a human mind for instance. This belief alludes to the fact that there is a single reality. On the other hand, ontological idealism refers to the belief that the human mind is considered more 'real' than material artefacts. In that case, reality is constructed (constructivism) in the mind of the observer. This alludes to the fact there exists several realities as opposed to a unique reality. The ontology of this research is constructivist, as there are several realities and perceptions of the role of business informatics on business transformation that are constructed in the mind of the observer.
- **Epistemology:** deals with the validity of knowledge and the 'knowhow' on how to access this valid knowledge (Guba, 1994; Krauss, 2005). Epistemology can be subdivided into empiricism and rationalism (Virtanen, 2014). Empiricism refers to the belief that knowledge is obtained through our senses rather than logic (experiences and observations (Virtanen, 2014). Rationalism refers to the belief that knowledge is obtained through reason as opposed to experiences and observations (Virtanen, 2014). The ontology section deemed this research as a social construct. For this reason, on an epistemological level, the researcher is deemed empiricist and will try to obtain perceptions, observations and experiences to justify these realities.
- **Methodology:** refers to how the data can be obtained in relation to the research philosophical assumptions (Guba, 1994). This part is discussed in the sections above.

Stemming from questions regarding these three concepts (epistemology, ontology and methodology), several schools of thought on research paradigms were conceived in the domain of information-system research literature (Orlikowski & Baroudi 1991; Myers, 1997; Jones, 2004). The main research paradigms in information system research are positivist, interpretive and critical, all in reference to the underlying philosophical assumptions. (Orlikowski & Baroudi, 1991; Jones, 2004; Weber, 2004).

4.3.1 The Critical School Of Thought

The critical paradigm takes the ontological stance that social realities are based on various injustices and unfairness (McGrath, 2005). It defines social realities as instituted historically, and that these realities integrate several social, political, ethnical and cultural supremacy views (Walsham, 2005; Björn & Carsten, 2006). On the epistemological level, the researcher and the matter under study are deemed interdependent, and knowledge or truth is believed not value-free and ought to be uttered (Guba, 1994; Ngwenyama & Lee, 1997).

Stemming from the several injustices in social realities, this social theory aims to enact 'change' in society. This change is conducted through emancipation, whose aim is

"to free alienated human subjects from oppressive regimes within societies and within the institutions that constitute them" (McGrath, 2005: 88).

However, it can be argued that the pure critical research paradigm does not exist, but rather it contributes to the positivist and interpretivist and forms the critical-positivist or critical-interpretivist respectively (Björn & Carsten, 2006).

4.3.2 The Positivist School of Thought

The positivism research paradigm is based on the fact that reality is seen as objective in relation to the social world (Collis & Hussey, 2009). The researchers have no effect of the reality at all. The positivist ontological stance is based on the belief that reality is objective, recognizable and reproducible by others (Jones, 2004; Weber, 2004). This alludes to the assumption that there is a single reality that others can discover (Myers, 1997).

On the other hand, the positivist epistemological position entails impartiality and objectivity in the process of conducting a research study to maintain unbiasedness (Orlikowski & Baroudi, 1991; Myers, 1997). In fact, natural science models (constituted of formal propositions and hypothesis testing) in association with statistical inferences and deductive reasoning (logic) test theories and derive conclusions in an objective manner (Lee, 1991; Orlikowski & Baroudi, 1991; Myers, 1997; Krauss, 2005). In that case, IS research can be deemed positivist when formal propositions are made; hypotheses are tested through quantifiable measures of variables and inferences are drawn from sample to populations (Orlikowski & Baroudi, 1991).

4.3.3 The Interpretive School Of Thought

The interpretive paradigm presumes that reality is affected by human perceptions, hence it is subjective (Collis and Hussey, 2009). This research makes use of subjectivity and contextualisation to derive deeper knowledge on the matter being investigated. Pertaining to this research study, the interpretive paradigm is chosen as through involvement of the researcher an understanding of the research matter can be formulated. Indeed, the ontological perspective reality, such as the role of business informatics on business transformation, is a social construct by human agents (Björn & Carsten, 2006). Actors will thus enact meaning to the matter at hand and exhibit conduct that will be analysed, hence constituting an important aspect of the research study (Lee, 1991; Walsham, 1995).

On the epistemological standpoint, the retrieval of socially constructed reality can be undertaken via social constructions or discourse such as language, perception and shared or collective meanings (Myers, 1997). Thus, social phenomena such as the role of business informatics in business transformation cannot be 'probed' objectively because the researcher interacts with human actors during the investigation (Myers, 1997). These interactions instigate a change of perceptions on both parties in the process. This research thus used an interpretive case study. The next section defines a case study and attempts to highlight its relevancy in this research.

4.4 CASE STUDY AND THE CASE

4.4.1 The Case

Chapter 1 introduced the fact that Company X conducts its activities in the messaging business in which it has been involved since the early 2000s. The company has now turned out to be an international pioneer in business-to-consumer messaging, supplying some of South Africa's top banks, insurance companies and retailers. However, this significant evolution occurred with several challenges. This is due to the large amount of data transacting across departments.

Figure 4.1 below shows the structure of the company. To understand the complexity of the technological architecture of the Company X it is important to look at the numerous departments comprising the business as shown in the below Figure 4.1. This research however, only examines four departments; the research will be mainly investigated the shared services departments (IT department, Finance department, HR department) and marketing and sales which have a strong interaction.

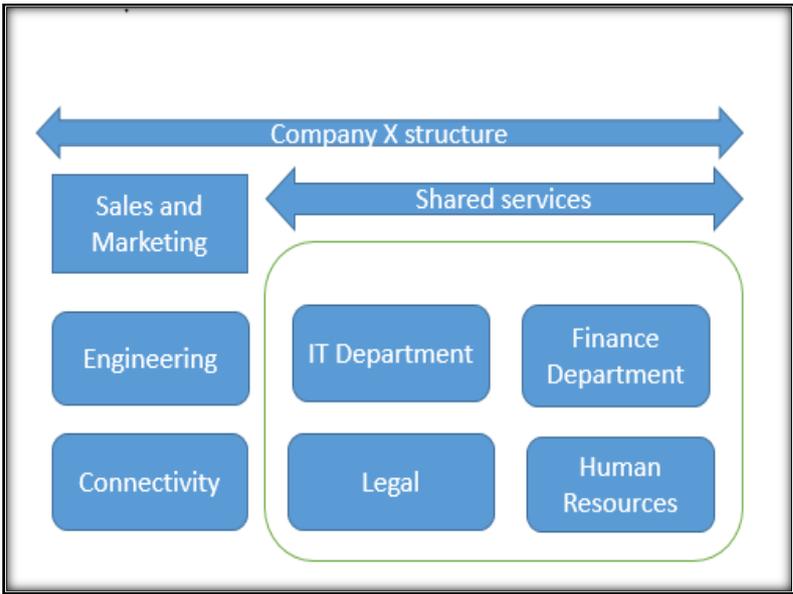


Figure 4.1: Structure of Company X

Company X has multiple sources of revenue and duplication of data at the entry points which are triggering inaccuracies in the presentation of statements and the reporting of official revenue numbers. There is no central repository accessible from which correct data can be retrieved and used for reporting, business analytics or forecasting. Inconsistent data amongst the numerous data sources is instigating inaccurate and untimely reporting, with endless reconciliation of data required from different departments and stakeholders on a daily basis.

The Figure 4.2 below shows the complexities of the current technological infrastructure. Company X leverages an Admin Page, Sales force, Oracle EBusiness Suite and a Pastel Payroll system (not shown in the picture). Because of all these numerous data entries points, several manual reconciliation must be performed.

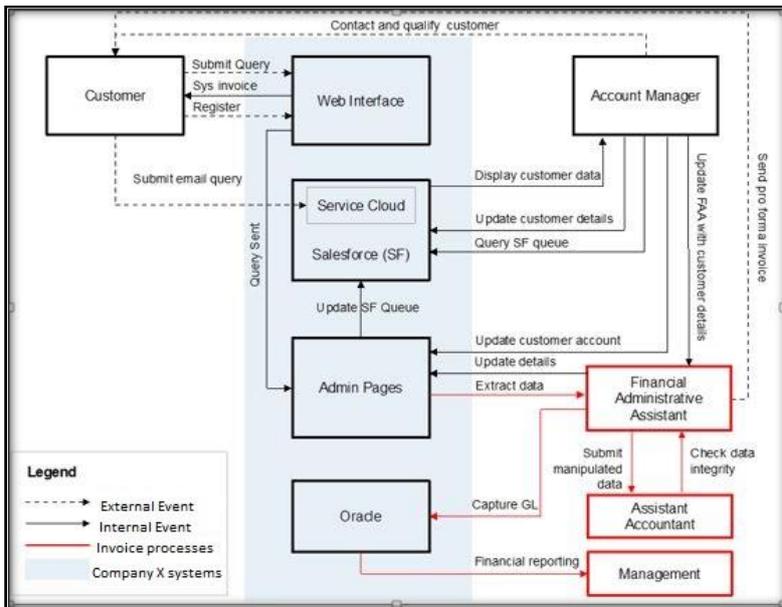


Figure 4.2: Company X' systems

At this time data capture and invoicing are being manually processed, which leads to accruing errors along the way. These errors are manually reviewed and adjusted in a monotonous way to put an end to the inherent glitches. Company X strives to better this process by concentrating on streamlining business processes, compliance to financial reporting targets and regulations to attain accurate reporting in the impending future. Furthermore, these transformations are envisioned to profit the company by offering a day-to-day sales reporting channel for business and financial analytics on a comprehensive level. This transformation will similarly ensure that all products and services are invoiced and accounted for through the correct revenue and VAT rules.

Chapter 3 argued the need for a centralised data warehouse that will have the ability, as a prerequisite, to enable the relevant staff to input data with no trouble from existing applications, update information, demand a diversity of reports and access the comprehensive data as needed across all the available platforms.

The chapter also discussed the opportunities fashioned by improving communication and information sharing capabilities (i.e. through social media) will be needed to warrant more efficient and effective platforms, and to increasing productivity and enhanced client relationships through improved, current and comprehensive reporting. The system will correspondingly be critical to reducing loss of profit through incorrect billing and VAT charges, and will help in simplifying the operational activities of staff and generating a productive environment by reducing routine tasks.

4.4.2 Case Study

In terms of the research methodology, this study will be using a single case research strategy. The case study research strategy is defined by Shell (1992) and Yin (1984) as an empirical investigation in which the contemporary phenomena is researched within its context, using different sources of evidence, and when the frontiers between the phenomenon and context are not clearly evident. Zainal (2007) furthers this definition by stating that a case study research methodology gives a detailed and holistic investigation of the phenomenon, and that data can be gleaned over time and relative to the context (in relation to a particular industry, for instance).

In addition, Yin (1994) states that a case study should be used when the researcher has little or no effect on the phenomena being investigated. He defines the case-study approach in the following categories: focus, procedural characteristics, type of case studies, design and methods. The focus of the case study is on the phenomena and its context. In this study, the focus will be on business informatics and transformation taken in the context of Company X. The procedural characteristics (conceptual framework) guide the collection and analysis of data. For this study the source of evidence was the interview, and was accompanied with theoretical propositions.

The type of case studies: case studies can be descriptive, exploratory or explanatory (Yin, 1984). This research study was explanatory as it went hand in hand with the analytical purpose of the research mentioned above. Indeed, this research study not only defined business informatics and transformation, but it also attempted to explain why the two variables must be linked together.

The design of the case study: a case study can either be a single or a multiple case study. A case represents the topic of interest to be studied empirically (Yin, 1994). A single case will then be a focus on a specific event, such an organisation that went through business transformation. Baxter and Jack (2008) assert that multiple case studies are composed of more than a case study. This research used a single case-study approach as it investigated one company. However, it is important to note that single case studies are usually considered detrimental in research.

Nevertheless, these shortcomings are only based on a statistical level rather than methodologically. This can be further explained by the fact several cases are advisable to draw objective inferences (Yin, 1994).

Furthermore, Yin (1994) and William and Trochim (2006) emphasize the importance of determining the unit of analysis. They define the unit of analysis as the actual source of information representing the matter under study. For this research the unit of analyses were business informatics and business transformation in Company X. Finally, Yin (1994) and Fisher (2007) define the units of observation of the entity that reflect the data that were analysed (in this case, in Chapter 5). The case was subdivided into four units of observation, including the finance

department, the IT department, the HR department and the sales & marketing department. Fifteen employees were interviewed from the IT, finance and sales departments. However, only five employees were interviewed in the HR department.

4.5 SOURCE OF INFORMATION

4.5.1 Semi-Structured Interviews

Information was obtained through primary and secondary data. The primary source of information for this research was semi-structured interviews. Semi-structured interviews are a way to solicit information from a person through asking questions during a conversation (Longhurst, 2003:104; Galletta, 2012; Teijlingen, 2014). It is achieved through setting predetermined questions. These questions can be adjusted during the verbal exchange on the basis of the participant's perceptions of what seems important (Longhurst, 2003:104; Galletta, 2012; Teijlingen, 2014). Certain questions can even be omitted, while extra explanation can be given to participants while conducting the interviews. Also, some questions can be willingly removed from the interview if they are not of concern to some participants (Longhurst, 2003:104; Galletta, 2012; Teijlingen, 2014).

For this research, semi-structured interviews were based on the questions attached as Appendix A. It is important to note that this type of interview was necessary because, as it was conducted on several departments, there was a need to amend the questions according to the department being interviewed. For the section on policies and procedures in Appendix A, some questions were only specific to some departments. This was due to the fact that employees would only be asked questions on policies and procedures relating to their departments, as they were not aware of policies and procedures pertaining to other departments. Also, during the interview, employees could give extra information that was not directly related to the question, but necessary for a holistic understanding of the research problem and the definition of a possible solution.

Non-probability sampling was used to select respondents, specifically purposive sampling – the reason was to obtain rich data on a particular delineated area of focus. Purposive sampling counts on the researcher's judgement to determine the units (case, people, and organisation) that will be investigated (Palys, 2008; Black, 2010; Saunders et al., 2012). That is why it is sometimes called judgmental or subjective sampling. Its objective is to create a sample from units not randomly selected from a population to allow for generalisations. The population will not be represented by the sample determined. Rather, particular characteristics of the population of interest can receive to receive a focus that will lead to answering asked by the research study (Palys, 2008; Black, 2010; Saunders et al., 2012). In This research 50 employees were purposely selected in relation to their direct involvement with the systems investigated.

The secondary sources of information included observation and documents to which the researcher was allowed access, but not to reveal important information that could affect the competitiveness of the organisation, and to comply with ethical requirements. Amongst the documents included code of ethics and employee handbooks which helped the researcher to glean data for purposes of interpretation; they served as official sources to confirm data obtained from interviews. The observation took place during the period of September 2014 to May 2015. During that period the researcher was a finance system analyst at Company X. All these sources were subjective sources; that is why an attempt was made to corroborate the answers through several sources of data.

4.5.2 Observations

Observation is necessary in reconciling what people say with their comportment (Mack et al., 2005). Indeed, there is often an incongruence between what people say and how they express these sayings into actions. Also, as mentioned above, this research was deemed mainly qualitative; this implies that the research is driven on the underlying assumptions that there are several perceptions or realities, and that these realities are subjective (Mack et al., 2005; Guest et al., 2014). Hence, observation will be useful in this type of research as it will assist the researcher in learning and determining the perspectives held by the all the participants, as the researcher will be able to confirm these perspectives by assessing the participants in their natural environment.

Furthermore, observation can serve as a basis to reconcile participants' subjective beliefs and their manifestations. Observation will further increase knowledge on the context (cultural, social, and political) in which the study participant interacts (Mack et al., 2005). The interplay amid ideas and context norms can be made clearly evident. Familiarity in the milieu will be developed, hence demonstrating significance in the research for several reasons, including:

- The researcher's propensity to gain invaluable and deeper knowledge that can only be retrieved through personal experience. Undeniably, observing and participating are crucial in conjecturing the extent and densities of the human experience (Mack et al., 2005). As the researcher worked at Company X, he was able to gather extra information that would not otherwise have been available if not the case. An illustration of that can be made in the fact that employees were open to answering questions as they had prior relationships with the researcher.
- The discerning of factors that were unknown in the design of the research. In fact, observation supported the researcher in compiling better data collection tools as he was better suited to determine which questions were appropriate to be asked in that environment (Mack et al., 2005). Questionnaires can sometimes lead to truthful answers, which are not relevant unless they are answering the right questions. The observation can

also corroborate and help with the understanding of results inferred from other data sources such as interviews and questionnaires (Mack et al., 2005; Guest et al., 2014).

Moreover, the researcher is able to conduct observation by solely observing or by partaking to some degrees in the activities undertaken by the group or community setting under study (Mack et al., 2005). This is of importance to this research because the participant was employed as a finance system analyst at Company X during the period of September 2014 to May 2015. Therefore, during that interval, the researcher was not just observing but participating as well.

Usually, the observations are conducted in the community settings believed to hold relevance to the research question. This will commonly be happening in the participants' surroundings, in which the researcher will approach the participant in their own environment instead of having the participants go to the researcher (in a controlled research environment, for instance) (Mack et al., 2005). This research was conducted on the premises of Company X so as to understand the matter at hand (the role of business informatics in business transformation in its context).

Despite the several pros given above, observation is also subject to shortcomings. In fact, observations can be extraneous as they are deemed lengthy. They typically take longer period to be conducted, while academic research generally does not offer up such long periods (Mack et al., 2005; Guest et al., 2014). However, with this research, this issue will not hold true as the researcher had been employed for over two years in Company X, and was thus able to make observations for an appropriate timeframe (Mack et al., 2005).

There is also a difficulty in documenting data as it is difficult to write everything observed while in the act of participating. In that case, the researcher will have to rely solely on his memory. Finally, observation can be considered 'subjective' as a researcher will have to transcribe what he sees into his writing. This might not always be a true reflection of the reality, or it can be a different reality altogether. In that case it is necessary to filter personal biases when possible (Mack et al., 2005).

4.5.3 Fieldwork

The fieldwork took place during the period of September 2014 to May 2015. During that time the researcher was employed at Company X and was able to make observations during staff meetings or group meetings. The researcher was allowed access to the code of ethics, contracts of employment, employee handbooks and project documentation. However, Company X was reluctant for the researcher to disclose any of the contents except for the request for a proposal that was made on behalf of the company by the researcher, and attached as Appendix B.

Despite the content of these documents not being available for disclosure in this research, access to the documents was enough to confirm the results that of semi-structured interview. For example, in the semi-structured interview it was established that there is a code of ethics available to employees, and the researcher was able to have access to it and confirm that the

code exists in an attempt to corroborate the results of the interviews (as the interviews are subjective sources of information).

With regard to the semi-structured interviews, all the participants were asked questions on the basis of the questionnaire attached as Appendix A. Participants chose to remain anonymous and only agreed to be identified by their job titles. The interviews were conducted in a conference room in which willing participants came one at a time. For those unwilling, interviews took place during lunch, or at their desk in their relevant offices (This held true specifically for senior management). During the interviews, participants answered questions relevant to them and their departments; extra explanations and clarifications could be given when necessary. When explanations and clarifications were given, the words were transcribed to Microsoft Word. Table 4.1 below gives the summary of the data collection tools and participants involved in this research.

Location of the study	In Cape Town at Company X office
Period of the study	September 2014 to May 2015
Data source	Primary sources
	Semi-structured interviews
	Observations
	Secondary sources
	Oracle request for proposal
	Project documentations
	Employee handbook
	Code of ethics
	Employment contract
Participants	15 Finance department employees
	15 IT department employees
	15 Marketing and sales department employees
	5 HR department employees

Table 4.3: Summary of data collection tools

4.6 INITIAL FRAMEWORK OF ANALYSIS

In chapter 3, the reasons behind business transformations were enumerated. Also, the chapter showed the different aspects of business informatics and how they can assist in the transformation. Structuration theory was used in chapter 2 as lens to determine the role of business informatics in transformation. In fact, Chapter 2 referred to the detailed analysis of the concept of transformation (business) in practice.

In that chapter it was established that corporate strategy as a structure initiates business transformation (i.e., Transformation-in-Practice) that creates actions and interactions of ongoing situated use of rules and resources. These interactions are done through focus groups (communication), exertion of power (delegated authority) and driving behaviour change (Sanction) to effect business transformation. Figure 4.3 was introduced as the conceptual framework for analysis and will be reviewed and presented in chapter 5 as a general framework. Also, structuration theory will be used in that chapter 5 to interpret the data.

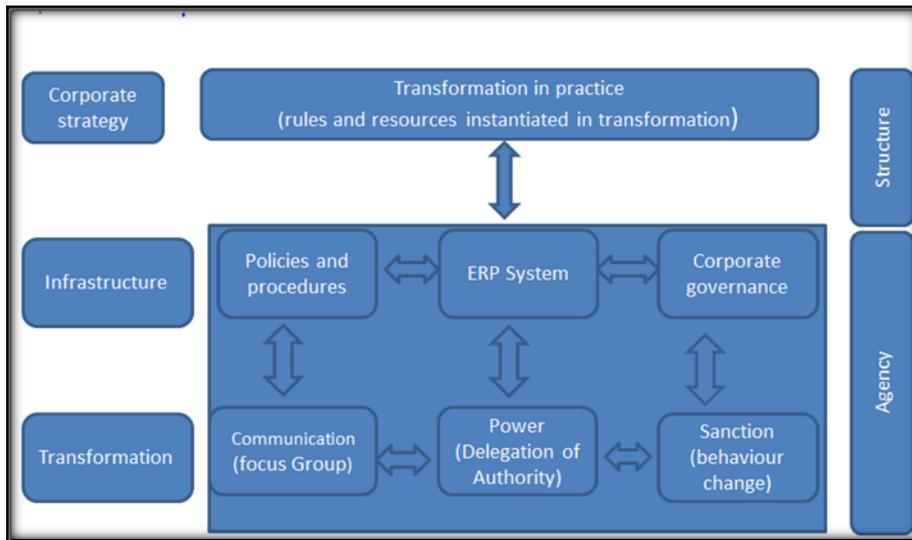


Figure 4.3: Conceptual Framework

The analysis of data will be conducted in chapter 5 through using structuration theory and the conceptual framework that was derived from it as a lens to sensitise the data. Hence, the conceptual framework set the scene of how the data was analysed. The transformation was defined as being enacted by referring to the Corporate Strategy to effect Domination on the Agent through guiding and enforcing the adherence to the Transformation. In Giddens' (1984) concept of the Duality of Structure, facilities (Resources) are used to effect Domination. However, the enactment of these Resources (facilities) are used in conjunction with the application of Rules (Norms) that will result in legitimized practices, and sanctions when breached. Therefore, norms are also required in the practice of transformation to legitimize the practice of transformation and result in sanctions when proper practices are not followed.

Data was analysed in attempt to find out if resources were used to enact Domination (control and power) over people and objects. Thus, the data was analysed to determine if the existing ERP system exerts power and control through access control, authorisation, coercion, self-interest. The data was also analyzed to find out if corporate governance does legitimate the working practices, and if these working practices are enforced. The data was also analyzed

to find out if the interpretive schemes permitted the access of the structure of the enterprise to create continuing, and transformative structural patterns by generating meaning.

4.7 SUMMARY

This chapter reviewed the underlying philosophical assumptions, the research methodology and the design for this study. The research paradigm on which this research is based is the interpretive approach, while the research strategy will be based on a single case study.

The data collection techniques applied for this research was semi-structured interviews, documentations and observations. Company X was selected as a case study, and the units of observation were defined as the finance, HR, IT and HR departments. The semi-structured interviews were conducted with 50 employees within these units of observation, while observations were made during the period September 2014 to May 2015. The research will use (as per Chapter 5) the structuration theory to analyse and interpret the collected data.

The next chapter will give the results of the fieldwork, and these results will be analysed and interpreted through the lens of the structuration theory.

Chapter 5 : ANALYSIS AND INTERPRETATION

5.1. INTRODUCTION

This chapter presents the results of the fieldwork conducted. It first presents how the research was conducted, then reports on the findings from the field research with the interpretation of the results.

5.2. LEVEL OF INFLUENCE

The aim was to determine the role (impact) of business informatics on business transformation. This role or impact of business informatics on business transformation is analysed in this research through the lens of the structuration theory (ST). As explained in Chapter 1, business informatics includes information technology, computer science and business management principles. With regard to this research, the computer science and IT aspect of business informatics are represented as the Enterprise Resource Planning system, and the business management principles are represented as corporate governance, policies and procedures.

Corporate governance, policies and procedures, and the enterprise resource planning system also relate to the modalities of structure (ST) which underpins this research study. As stated in Chapter 2, the modalities include facilities, norms and interpretive schemes. In this research facilities were defined as the ERP system, norms as corporate governance, while policies and procedures represented interpretive schemes. Table 5.1 below was used during the data collection to determine the impact or role of business informatics on the business transformation.

The transformation was defined as being enacted by referring to the Corporate Strategy to effect Domination on the Agent through guiding and enforcing the adherence to the Transformation. In Giddens' (1984) concept of the Duality of Structure, facilities (Resources) are used to effect Domination. However, the enactment of these Resources (facilities) are used in conjunction with the application of Rules (Norms) that will result in legitimized practices, and sanctions when breached. Therefore, norms are also required in the practice of transformation to legitimize the practice of transformation and result in sanctions when proper practices are not followed.

Components of duality of structure	Application	Impact				
		5	4	3	2	1
Facilities	Enterprise resource planning system	Very high influence	High influence	Near influence	Low influence	No influence
Norms	Corporate Governance					
Interpretive schemes	Policies and procedures					

Table 5.1: Level of business informatics influence

5.3. DATA COLLECTED

The findings are made of data collected during the fieldwork. For data collection, semi-structured interviews were conducted on 50 employees from four departments. The employees were asked to answer a questionnaire (attached as Appendix A) that was built on the premises of the conceptual framework and the theoretical perspective (structuration theory) which was used as a lens to determine the role of business informatics on business transformation. The hierarchical composition of these employees is illustrated in Table 5.2 below.

Description	Finance department	IT department	Sales & marketing department	HR department	Total
Senior management	1	1	1	1	4
Medium management	3	4	3	1	11
Low-level management	11	10	11	3	35
Total	15	15	15	5	50

Table 5.2: Hierarchical composition of employees

Table 5.3 below shows the actual findings of the research. This table gives the impact of business informatics represented in the ERP system, corporate governance and policies and procedures. The table shows the overall impact or influence at the departmental level and company level. To understand the table below (Table 5.3), the level of impact defined in Table 5.1 is used. Hence, the numbers 1 to 5 used in Table 5.3 to evaluate perceptions are defined in Table 1.

Following the conceptual framework, Data was categorized in three major areas: Facilities: ERP system, Norms: Corporate governance and interpretive schemes. These broad area were subdivided into smaller sub sections in which perception were captured and substantiated with observation and document analysis for interpretation. The results of the sub sections were thus combined to arrive at the overall perceptions on the broad area. The numbers showed in this table reflect the questions asked per the questionnaire attached as appendix A. The results of these questions were combined to reflect the results of the subsections, which were in turn combined and averaged to produce the results of the main section.

Description	Finance department	IT department	Sales & marketing department	HR department	Overall influence on company
Facilities: ERP system					
Average on the section	2	3	3	2	3
Access control	3	2	2	2	2
Level of authorisation	2	4	4	2	3
Coercion	2	4	3	2	3
Self-interest	2	4	2	2	2
Norms: corporate governance					
Average of the section	3	3	3	3	3
Ethical behaviour	4	4	4	4	4
Standard and policies	4	4	4	4	4
Control environment and processes	3	3	3	3	3
Transparency and disclosure	3	3	3	3	3
Interpretive schemes: Policies and procedures					
Average of the section	4	3	3	4	3
Finance function	4				4
IT function		3			3
Network function		3			3
Marketing and sales function			3		3
HR function	4	4	4	4	4
Overall influence on departments	3	3	3	3	3

Table 5.3: Findings

5.4. ANALYSIS AND INTERPRETATION

5.4.1 Introduction

This research uses ST to determine the role of business informatics on business transformation. In fact, Chapter 2 referred to the detailed analysis of the concept of

transformation (business) in practice. In that chapter it was established that corporate strategy as a structure initiates business transformation (i.e., Transformation-in-Practice) that creates actions and interactions of ongoing situated use of rules and resources. These interactions are done through focus groups (communication), exertion of power (delegated authority) and driving behaviour change (Sanction) to effect business transformation. Figure 5.1 was introduced as the conceptual framework for analysis.

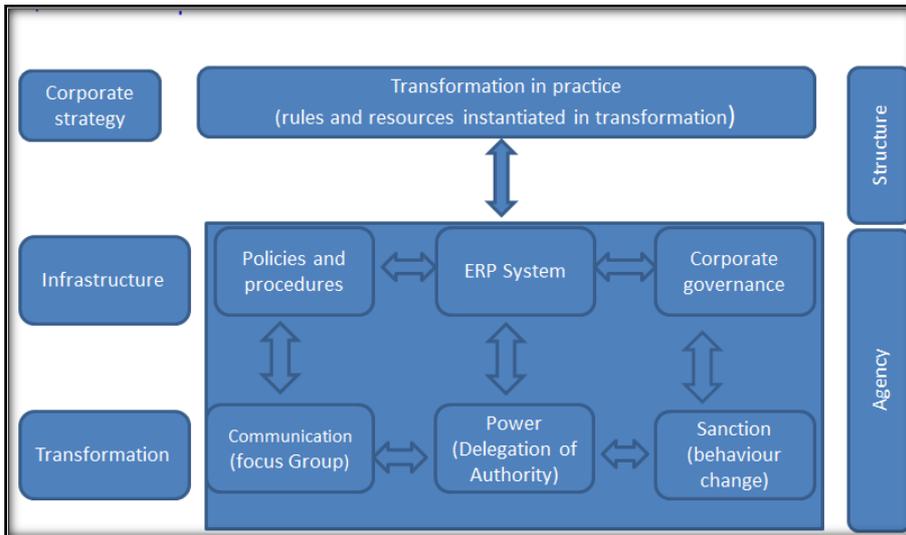


Figure 5.1: Conceptual Framework

Also, actors do not conduct the transformation in a vacuum but rather through the modalities of structure. Thus the data will be interpreted by using structuration theory to determine if the transformation is enacted through the modalities. These modalities are reflected in the infrastructure of the organisation. The modalities include facilities, norms and interpretive schemes. In this research facilities were defined as the ERP system, norms as corporate governance while policies and procedures represented interpretive schemes.

5.4.2 Facilities and Power as ERP System

5.4.2.1 Background

Giddens (1984) establishes that forces of domination and compliance find their being in the delicate rapport of power. Giddens (1984) continues his argument by stating that the deployment of resources as a mean to enact domination (Giddens, 1984:258; Fuchs, 2003). Thus, these resources can be used to enact control and power over people and objects. For example, in this research resources such as ERP System can enable authority by enforcing processes that employees will have to follow (Lamsal, 2012).

Giddens's aimed to define the balance of power vested in the interplay between structure and agents. Power is equally conferred to

“the institution or individual, but structures of control have transformative capacity over organisational actors through the consistent allocation of resources” (Barratt-Pugh, 2007).

From the above it can be established that Structure represented as Corporate Strategy in this research, can effect power over employees/actors through the allocation of resources such as the ERP system. Resources, which are assigned by actors, define ground for individual power. However, when these resources are legitimized, it leads to structures of domination (Pinsonneault & Pozzebon 2001). Finally, these legitimized resources leading to domination were defined as facilities by Giddens (1984)

The concept of transformation in practice shown in Figure 5.1 (which also represents the conceptual framework) above was adapted from Orlikowski (2000) concept of Technology-in-Practice which was originally Adapted from Giddens' work. Drawing from that, transformation within an organisation will have to be drawn from Structure, the Corporate Strategy, to enact dominion over employees. This means that the Strategy will enforce the adhesion to any transformation that will be conducted in the organisation. As explained in the previous paragraph, Domination and Power are effected through the allocation of Resources represented in Facilities.

Facilities are used

“to allocate resources enacted in the wielding of power, and produces and reproduces social structures of domination” (Rose & Hackney, 2003; Poole & McPhee, 2005).

Facilities are the means to achieve intended or desired outcomes and to exert power (Veenstra et al., 2014). Actors will use facilities, represented by the ERP to exercise power through enforcing employees to follow business processes, as ERPs are built on the basis of the business processes.

The necessity for an ERP system has been nurtured in today's rapid growing technological environment, and the need to overcome traditional limitations of legacy systems (Spathis & Constantinides, 2003; Elkhani et al., 2014). Limitations of the traditional systems are numerous, but include data redundancy, inconsistencies and a lack of integrity. Just as in the case of Company X, having multiple systems leads to the aforesaid limitations (Haug et al., 2009; Ajit et al., 2014). An ERP system (business informatics) with its transformative capabilities can address these limitations (Saleh et al., 2012; Ram et al., 2013; Ajit et al., 2014). This is possible through the 'complete and full' integration and automation of the core

processes and function of an organisation such as finance or human resources (Kakouris et al., 2005; Maditinos et al., 2011; Saleh et al., 2012; Ekman et al., 2014 Al-Jabri, 2015).

As explained above, the structuration theory uses facilities to exert power and control over actors, or in this case over employees. The critical aspects of an existing ERP system through which power and control can be exerted involve security (access control and authorisation), ensuring that the ERP enforces business processes (coercion as per this research) and optimisation of information flow within the departments (self-interest as per this research) (Spathis & Constantinides, 2003; She & Thuraisingham, 2007; Ram et al., 2013; Ajit et al., 2014; Xie et al., 2014; Al-Jabri, 2015). That is why for this research, to determine the level of influence of the ERP on the organisation, the participants were interviewed on access control, level of authorisation, coercion and self-interest.

50 respondents were approached on the section of ERP as facilities and power across the selected departments as per Table 5.2. The results of the interviews showed that an ERP system has a near influence (3) on the organisation. This was determined by combining and averaging results from sections on access control, level of authorisation, coercion and self-interest. These results are explained below.

5.4.2.2 Access Control

She & Thuraisingham (2007) express the view that access control is a critical factor within an organisation. The authors insist that access must be monitored and reviewed to ensure that qualified personnel have access to the system, in an aim to maintain data integrity. This involves routinely monitoring for access rights and enforcing password security. For Company X, access control has a low influence on the organisation, as it was rated at 2; this is defined as low influence in Table 5.1. This was determined by asking questions on access control, access to sensitive data, departing employees' access termination, and password security and averaging the results of each question.

a) Password Security

Through the researcher observations it was noted that the system enforces a strong password security through the characters required while composing them. However, these passwords are not changed on a regular basis, as the ERP system is a stand-alone software within the organisation. For security reasons, the company is reluctant to integrate it within their active directory or single sign-on program which is fairly monitored as explained by the Finance Manager. That is why, except for the finance department, every other department rated the access control at 2. The rest of the departments are unhappy at having to use a different password to log on software such as Oracle. They would like to log on once in the

network, and access all the software available within the company, and it is possible through the active directory or single sign-on.

The finance department, however, scored a bit higher (3) represented as near influence. The fact that the system is not integrated directly benefits them as they feel their system is more secure that way. The financial system manager explained and illustrated the situation through the following example; if a finance employee for any reason forgoes the password that allows him/her to access the company networks, he/she might put the organisation at risk (finance employees deal with financially sensitive data) as somebody can use this password to access the networks. However, if the passwords used to access the network and the one used to access the ERP system are not the same, it might not have a big influence on the ERP system; the financial data will thus remain protected.

b) Periodical review of access rights

Authorisation is required in general to access sensitive data. Nonetheless, there are currently no policies to review access rights on a periodic manner. The issue with this as explained by the finance system manager is that some employees could have been granted access to sensitive data temporarily. However, because there are no existing policies to review these access rights, they end up holding on to the access longer than intended. Not only are these policies for access rights non-existent, none of the departing employees are terminated on a timeous manner, which exposes the company to great security threats. This can be explained by the fact that these departing employees can still log onto the system and cause damage.

5.4.2.3 Level of authorisation

a) Introduction

She and Thuraisingham (2007) also discuss the need of authorisation within an organisation. Authorisation must be granted by the proper authority to the intended users to ensure information security as well as data integrity. In the case of Company X, the level of authorisation was determined by asking questions on the ERP system link with the hierarchy of the company, authorisation to conduct specific transactions and the ability of the system to cater for the need of the organisation.

The level of authorisation has a near influence on the organisation as they scored an overall 3. This is mainly due to the fact that the modules of the ERP system that are used enterprise-wide are set up according to the hierarchy of the company. The finance system manager gave an overview of the ERP system to help picture the situation better explained below. Nevertheless, it is important to note that an ERP software can be 'assembled' by purchasing

an entire solution from a single supplier or by using pieces of software from a vendor or several vendors (Kakouris et al., 2005).

Company X's attempted to build their ERP System by focusing on the latter category. As explained by the finance manager, the technological stack is made of an Admin Pages website, a Pastel Payroll system that the HR department uses for payroll and software such as the Salesforce system used by the marketing and sales departments. Also, there is an Oracle financial solution that mainly assists the finance department with all their relevant tasks with modules such as payables, receivables fixed assets, and general ledger.

However, this Oracle financial system also includes an Internet expense module (iexpense), for employees' expenses made on behalf of the company, and a purchasing module (iprocurement) for relevant company-related purchases. Both these modules are used enterprise-wide and are built on the basis of a cost centre and hierarchy of the company. Thus, only the transactions performed on the iexpense and purchasing modules have emphasis on the approval level and hierarchy. The rest of the modules do not include such a hierarchal system although offered by the systems.

b) The case of ERP system in an organisation

The systems do cater to the needs of the company to a certain extent but not fully. The financial system manager explained that the HR department seems to be the least impacted by the ERP system, as their Pastel Payroll system is becoming obsolete. That is why they have the lowest ratings for this section (it is rated at 2). Also, the ERP system does not fully cater for the needs of the company taken in its entirety, as the three software packages mentioned above are not fully integrated, with no single repository, hence they function in silos. These different technological stacks largely affect the finance employees (because of manual entries and multiple reconciliations) in their month-end processing, hence the 2 they scored.

5.4.2.4 Coercion

Coercion in this research refers to the ability of the system to ensure that the system enforces employees to follow business processes, ensure the quality of the data entered into the system, and that transactions are approved by relevant management. It is done like that because, for ERP to be influential and use its transformative capacities, it has to embody these characteristics (Madininos et al., 2011; Ajit et al., 2014; Ekman et al., 2014; Al-Jabri, 2015). Hence, the level of influence for coercion was determined by inquiring about the system's capabilities to force employees to follow approved processes, to ensure data validation, and to ensure also that transactions are approved by the relevant management.

a) ERP System and business process enforcement

The organisation scored an overall 3 on coercion, which is near influence. It is important to note the highest rate was given by the IT department. This is stemming from the fact that the only aspects of the ERP system they do interact with are the expense and procurement modules. The employees in the IT department are content with what the system can do for them as it allows them to conduct their financially related tasks effectively and in safe environment.

Nevertheless, while looking at each of the software packages comprising the ERP system, each department feels that their software could be somewhat effective within their original and pre-intended department, with the exception of the HR system that is believed to be obsolete. This means that taken individually, each system offers possibilities to employees to conduct their work. However, because these systems work in silos, with no single repository, they do not fully cater for the needs of employees or, simply put, they do not make life and work easier for employees. Employees have to conduct extra manual tasks.

Actually, the financial system manager emphasised the lack of flow of information between the systems. This means that information has to be output from one system in the form of reports to be manually input into another. This process does not come without risks of its own, as it allows for error and duplication of data.

Finance employees that are in charge of capturing and making payments have to make use of output from other systems such as the Salesforce, Admin Pages, and Pastel Payroll to capture invoices and make payments. With the volume of transactions and the pressure they are submitted to, this usually leads to multiple errors and data duplication.

The HR department scored very low on coercion. The HR manager explained the low scoring by stating that they have an HR module on the Oracle application that is not in any way linked with their payroll system. So they have to capture employees' information twice, which is such a difficult process and time-consuming. In addition to that, their Pastel Payroll system is becoming obsolete, and they continuously have to perform extra manual work. They feel the Pastel system does not cater for their needs anymore. They are investigating new solutions, but the issue is that they need to find a cheap alternative.

b) ERP System and Data Validation

Likewise, the system attempts to make sure of the data validation i.e. input mask, or predefined items are available within some input box from which employees can choose.

However, the system is still not fully automated as yet, leaving some transactions including calculations to be conducted manually. Hence, this makes the system error prone. The financial system manager also mentioned that they are looking for new solutions to improve the level of automation and integration of the systems. However, like the HR system, the company is not willing to pay for an expensive solution; the finance system manager mentioned that *“it has to make financial sense above everything else”*.

c) *ERP System and delegated authority*

Lastly, the Oracle system does enforce hierarchical access to the Internet expense and purchasing module, as aforementioned. This enforcement is an automated process that is built into the system. However, for the rest of the Oracle modules, and systems (Salesforce, Admin Pages, Pastel Payroll), there is no such automation-enforcing approval of transactions depending of their level and the amount of money. This process would be conducted manually and depend on the employees' discretion, which adds to the risk of errors as well, and to transactions that will be conducted by unauthorised employees.

5.4.2.5 Self-interest: Collaboration and the System

Self-interest in this research refers to the elevation of the employees' interests through the system. As Elkhani et al. (2014) have mentioned, it is the aptitude of the system to make employees aware of and accept the mission and purpose (Strategy) of the organisation first. This will thus get them to transcend beyond their own self-interest for the profit of the organisation. In other words, the ERP system is supposed to enhance the collaboration within the department through the optimisation of information and resource sharing. (Spathis & Constantinides, 2003; Ajit et al., 2014; Ekman et al., 2014; Xie et al., 2014). The level of influence for self-interest was determined by asking about the system's ability to allow for collaboration and data sharing between employees.

The organisation scored an overall of 2 on self-interest. As the system functions in silos, it does not permit easy data sharing with employees across departments. Reports have to be drawn from one system to another, rendering working activities and collaboration among employees from different department very difficult. This explains the low rating assigned by the finance, marketing and sales, and HR departments. Employees in these departments would prefer information flowing from one system to another. The HR team insists that their software does not allow any sharing or collaboration. However, the IT department rated highest again at 4, because they have minimal interaction with the system. As mentioned above, they are content with the way the system is set up.

5.4.2.6 Summary: Facilities and Power as ERP System

As explained above, facilities are used

“to allocate resources enacted in the wielding of power, and produces and reproduces social structures of domination” (Rose & Hackney, 2003; Poole & McPhee, 2005).

Facilities are the means to achieve intended or desired outcomes and to exert power (Veenstra et al., 2014). Actors are to use facilities, represented by the ERP to exercise power through enforcing employees to follow business processes, as ERPs are built on the basis of the business processes.

In the case of Company X, the systems used by the company were good enough taken individually. This means that these systems enforced employees to follow business processes, to a certain extent, within the department in which they are intended for use. However, employees do not conduct their activities on a departmental level only, but also have to conduct enterprise-wide transactions as part of shared services. The issues stem from enterprise transactions, as the systems are not integrated and function in silos. This means that there is no information flow between the systems; this leads to data inconsistencies and a lack of integrity. This section dealt with facilities as ERP; the next section will deal with another component of the structuration theory, namely norms (embedded in corporate governance).

5.4.3. Norms and Sanctions as Corporate Governance

5.4.3.1 Background

As aforementioned, this research uses ST to determine the role of Business Informatics in business transformation. The transformation was defined as being enacted by referring to the Corporate Strategy to effect Domination on the Agent through guiding and enforcing the adherence to the Transformation. In Giddens' (1984) concept of the Duality of Structure, facilities (Resources) are used to effect Domination. However, the enactment of these Resources (facilities) are used in conjunction with the application of Rules (Norms) that will result in legitimized practices, and sanctions when breached. Therefore, norms are also required in the practice of transformation to legitimize the practice of transformation and result in sanctions when proper practices are not followed.

About legitimation and sanctions, agents derive from rules and norms, legitimation of practices through dissimilar contexts to conduct social practice. Structure can be expressed in the form of rights and obligations. Practices, drawn from rules, facilitate the proper enactment through sanctions and incentives (Barratt-Pugh, 2007). Through the appropriation of standards, values and societal norms, legitimation yields a moral order. Actors divulge

whether consciously, subconsciously or unconsciously, denotations of their behaviour which are referred to by Giddens as sanctions in their interaction (Lamsal, 2012).

It was established that actors do not conduct the transformation in vacuum, but through the modalities of structure. The modalities are reflected in the infrastructure of the organisation. The modalities include facilities, norms and interpretive schemes. In this research facilities were defined as the ERP system, norms as corporate governance, while policies and procedures represented interpretive schemes as displayed in Figure 5.1 above. The previous section discussed facilities as the ERP system; this section will discuss corporate governance as norms on the basis of Table 5.3.

Norms refer to rules and agreements drawn from the recursive interaction between actors, further grounded on personal knowledge and awareness of what can be sanctioned; and this constrains behaviour within conventional boundaries (Pinsonneault & Pozzebon, 2001). Likewise, corporate governance is meant to discipline the behaviour of the organisation. It contains rules the organisation must comply with. Corporate governance will thus be used to legitimate the working practices, this is illustrated in the Conceptual Framework presented in Figure 2.4 above.

Corporate governance is a business management principle (Boucher, 2005) which refers to legal and organisational structures aiming to minimize the divergence between social and private returns on activities within an organisation and to look after its integrity (Ararat et al., 2003; Alam et al., 2006). Separation of control and ownership are the reasons that drive the enactment of corporate governance. In the absence of clear directions and effective sanctions from owners, management can pursue their own goals, not necessarily in the best interests of the business (Ararat et al., 2003). To ensure that these issues do not happen, effective corporate governance can be enacted to discipline the behaviour of every stakeholder (Ararat et al., 2003; Adegbite, 2012).

Effective corporate governance will be achieved by adhering to and complying with a business code of ethics and standards. Furthermore, an organisation will also need to be transparent (through disclosure) and monitor compliance with these measures (Ararat et al., 2003; Thomsen, 2004; Adegbite, 2012).

In this research, the level of influence of corporate governance was derived by interviewing all the units of analysis on the aforementioned measures. 50 respondents were approached on this section across the selected departments as per Table 5.2. Empirical findings reveal that the level of influence of corporate governance on Company X was 3, a near influence.

This was obtained by combining and averaging results from sections on ethical behaviour, standards and policies, control environment and processes, and transparency and disclosure. The results of these sections and their explanations are discussed in the following section.

5.4.3.2 Ethical Behaviour

Company X relies on strong corporate values based on the high ethical standards of managers of employees (Thomsen, 2004). Organisations such as Company X believe that to remain profitable they need a strong ethic in the workplace (Ararat & Ugur, 2003). This work ethic will thus be built to comply with rules and regulations whether internal or external, to protect all parties affected by the decision of the organisation (Bhasa, 2004; Adegbite, 2012). The ethical behaviour will also need to include their corporate responsibility, drawing the line between ownership and the rest of the organisation (Alam et al., 2006; Spitzbeck, 2009). Finally, strong ethical behaviour will require transparency and disclosure amongst all the parties involved (Ararat & Ugur, 2003; Guo et al., 2013).

With regard to Company X, ethical behaviour has a high influence as it was rated at 4. The questions that led to determining this score were based on the four groups discussed below which they all scored 4 regardless of the department. Questions were asked on compliance to local legislation, protection and equitable treatment of stakeholders' rights, Board of Directors and the executives and information disclosure and transparency and the results of these questions were averaged.

a) Compliance to local legislation

Integrity of a business is strongly reliant on corporate governance, which deals with legal and organisational structures of a company (Alam et al., 2006; Adegbite, 2012). This corporate governance is however affected by the environment within which business is conducted. In fact, corporate governance must include sets of rules that must be legitimated by local legislation and protected by the legal tenet of the local government (Alam et al., 2006; Adegbite, 2012). In other words, organisations will have to adhere to local legislation, including their social responsibility as well (Thomsen, 2004; Alam et al., 2006; Adegbite, 2012).

With regard to Company X, the HR manager briefly explained that the business does have a charter that ensures that the company complies with local legislation. The local legislation they have to comply with includes mainly the Black Empowerment Economic system (BEE). For that reason, it makes sure it employs enough employees and executives from previously disadvantaged races. Also they engage in social outings in which they give back to the

community, to the poor; and they conduct business with businesses that raise their points on the BEE certificate.

b) Protection and equitable treatment of stakeholders' rights

People who are affected by the decisions of the organisation have an influence on the achievement of organisational goals (Spitzeck, 2009). The stakeholders' importance derives from that. In fact, a stakeholder can be defined as individuals or a group directly or indirectly impacted by the accomplishment of organisational objectives (Spitzeck, 2009).

Stakeholders are instrumental in corporate success; hence, there is a necessity of welfare maximisation by the organisation (Bhasa 2004; Reddy, 2009). It is for this reason that stakeholders' entitlement of moral and legal rights and interests is enacted (Bhasa 2004; Chahine & Safieddine 2008). This is achieved through the crafting of a plurality of values with the intent to advocate the protection of stakeholders (Spitzeck, 2009). This protection is usually achieved through contractual obligations (Reddy, 2009).

Concerning Company X, the HR manager explained that the firm also has a duty towards its stakeholders. They have documents in which they specify their relationship with each stakeholder. This is done to provide adequate, equitable treatment to all of them, hence ensuring that every party is accountable for their duties and tasks. For every customer there are policies on how to purchase items the company sells. However, returning customers have contracts in which they stipulate the role of every party, including any possible termination reasons.

For suppliers, the company obtains contracts as well to ensure accountability to each other. As for the employees, the enterprise, in addition to a code of ethics mentioned below, has contracts compiled for each and every one of them. Those contracts stipulate the duties of each employee, their corporate responsibilities, and the rules and regulations they must comply with. The contracts include also any potential right and reward that the employees can obtain.

c) Board of directors and the executives

Corporate governance is needed to establish the difference between ownership and the rest of the management (Ararat & Ugur, 2003). This difference is usually made evident through external and sometimes independent control mechanisms such as outside directors or a board (Alam et al., 2006; Chahine & Safieddine 2008). In this case, the corporate governance will have to define and attain the role of every member and a framework to coordinate the relationship between the board and the rest of the company (Alam et al.,

2006; Guo et al., 2013). This framework will have to include an ownership and a board structure, which will be intended to discipline the behaviour of corporate governance actors (Guo et al., 2013).

In the case of Company X, the HR manager clarified that the enterprise does not issue any shares to the public as of now, so it does not have any shareholders. However, they do have proper documentation in which they stipulate the role and duties of every board member and executive to ensure adequate interactions with the rest of the stakeholders. The documents also mentioned that the board members must remain independent of employees so that they can conduct their assessment of the employees' day-to-day activities on an independent but mostly objective manner.

d) Information disclosure and transparency

Through corporate governance, the organisation is supposed to ensure the welfare maximisation of all the stakeholders (Guo et al., 2013). Corporate governance will discipline the behaviour of the insiders of the business vis-à-vis other stakeholders (Ararat & Ugur, 2003). One solution with respect to this discipline is the transparency and disclosure requirements. Organisations will be required to be transparent and to disclose information to relevant stakeholders, and comply with any disclosure thereof (Ararat, & Ugur, 2003; Alam et al., 2006; Adegbite, 2012).

Pertaining to Company X, the business has the duty of transparency toward all their stakeholders, as explained by the HR manager. They produce financial statements for reporting both in the USA and in South Africa, for entities to which they have a duty to do so. Regarding the employees, they conduct staff meetings every Friday morning in which every activity undertaken in each department is disclosed to ensure transparency between the departments and employees, and to develop an open corporate culture. These meetings are mandatory for every employee, unless with dispensation from the manager. However, certain decisions are taken on a management level that employees feel they have not known in time, but only when the decision is about to be implemented. Because of that, employees feel a sense of distrust toward the management team.

5.4.3.3 Standards and Policies

To reduce the divergence between social and private returns in an organisation, corporate governance standards can be enacted to drive the behaviour of corporate actors (Ararat & Ugur, 2003; Thomsen, 2004; Alam et al., 2006). The standards will serve as regulations to discipline behaviour (Guo et al., 2013). In fact, these standards will condone good behaviour, and become the basis from which to punish corporate offenders. As mentioned in Adegbite (2012), the standards must be carefully monitored by law to ensure effectiveness of

governance principles. Furthermore, he states that only statutory and a regulatory framework will be effective in disciplining behaviour. Standards must be enacted and complied with; compliance with them must be monitored to ensure their effectiveness (Adegbite, 2012; Guo et al., 2013).

With regard to Company X, standards have a high influence as it was rated at an overall score of 4. This was determined by asking questions based on corporate governance, the code of ethics, compliance with codes, and disclosure of compliance with corporate governance. In all these sections the company scored a 4 regardless of the department.

a) Corporate governance

Companies' direction and control are what makes up the basic tenets of corporate governance (Spitzeck, 2009). In the case of Company X, the employees are of the opinion that a company has a well-defined corporate governance which they can refer to in times of need. The corporate governance policies outline the relationship between the company and the relevant stakeholders. Indeed, it does so by specifying each role and duty of the stakeholders toward each other. In addition, the corporate governance policies do stipulate the merits, rewards and punishments employees can be subjected to in case of necessity.

b) Code of ethics

Code of ethics here refers to a thorough explanation of the company values, vision and direction to staff, translated on ethical standards (Thomsen, 2004; Reddy, 2009). The corporate governance policies are reinforced through a code of ethics. This code of ethics outlines the mission of the organisation both internally and within its social structures. The code also serves as a guide or benchmark for how employees should conduct themselves within the working environment, through an inclusion of a list that indicates what they are allowed to do and not allowed to do in the organisation. This code will thus guide employees to approach any challenges or problems they are facing or might be facing in their working environment. The code of ethics is based on Company X's six core values that include collaboration, innovation, passion, performance, excellence and leadership. Finally, the code of ethics contains a set of standards to which the employees will be held accountable.

c) Compliance with codes

Compliance with any code must carefully be monitored, both to ensure that the offenders are apprehended and to improve adherence to the standards (Adegbite, 2012). Although the investigated company does have drafted documents for its corporate governance including a code of ethics, from the employees' perspective no proper monitoring to ensure compliance to these standards and policies exists. The company does have a set of Key Performance

Objectives (KPOs) in which they review the performance of the employees for each term and assign bonuses accordingly. However, these reviews do not engage the code of ethics, or any monitoring of the employees' conduct. This is done to make the employees feel at ease and not controlled. The company wants the employees and their direct line manager to be responsible for their own work.

However, there are always some abuses; some employees will not come to work on time on a continuous basis as they are not watched, or even choose to spend the whole day on social media rather than be productive and conduct the tasks assigned to them. For those reasons, certain projects are not completed on time as certain employees are not committed to their task and work, and the projects keep on being procrastinated. Women also mentioned that the ethical code involves a certain dress code, which requires a minimal decency. They feel that it is not monitored properly as well, so sometimes men attend meetings not dressed properly or do not smell as they should. They feel this type of conduct is not professional enough from these employees.

d) Disclosure of compliance with corporate governance

From the previous paragraph it was established that the company does have a corporate governance and code of ethics well drafted and known by the relevant stakeholders within the company. However the company does not monitor the compliance to the content of these documents and for that reason there are major abuses of the system. In addition to this lack of compliance, the company does not disclose to what extent the codes are being complied with. Transparency toward this could also help remind employees and increase compliance with the relevant corporate governance documentation the company has.

e) Control environment and processes

The organisation scored average of 3 for the overall influence of a controlled environment and processes. This result was obtained by averaging results from sections on the auditing and monitoring the system's 'hotline' for reporting violations, and responses to the results of the audit. For all these sections, the average score was 3 regardless of the departments, as the employees' share the same feelings as these sections. This is explained below.

f) Auditing and monitoring of systems

The IT manager explained that the company recently added a compliance programme or procedures that include auditing and monitoring systems. As the company faced several shortcomings in their profit, they recently engaged with KPMG into performing an IT audit of all the relevant systems within the company to determine possible bottlenecks. In the past, only the financial data was submitted for auditing; now the company has decided to extend it

to all the departments, according to the IT manager. The company has recently engaged with its computer programmers and engineers to develop a dashboard which will monitor every system within the company. In that way, any relevant manager will be alerted in time on any rising problem so that it can be remedied timeously.

g) "Hotline" for reporting violations

Walsh et al. (2010) state that reporting is intended to enhance the quality of services; reports can be submitted anonymously or with confidentiality to an external and independent firm for analysis and feedback. The company has a 'hotline' for reporting violations and there is a legal department in charge of handling any such violations whatever they may be. However, the legal manager mentioned that employees do not usually like to report violations to people they know. For that reason, the legal department set up a violation line with external lawyers who are independent of the company. They do not engage in any way with the employees, but only when a complaint needs to be filed by someone within the company. That way, the employees can confidently report any violations and can remain anonymous if needs be.

h) Response to the audit results

The HR manager explained that after an audit the Board of Directors makes it their aim to monitor management's response to deficiencies and weaknesses identified in the audit. As mentioned above, the company has a KPO, or Key Performance Area (KPA) the employees must focus on in each term. So if the Board of Directors wants to monitor management's response to the deficiencies and weaknesses identified, they will include these deficiencies as a set of tasks to be resolved by management as part of their KPOs.

At the end of the term, the HR team will compare the results to the objectives sets, give them a grade that will determine the percentage of the bonuses or incentives they will receive. The HR manager is of the opinion that no employees want to forego extra money, so they usually make it their aim to achieve the objectives set in their KPO. Apart from that, there is no other source of monitoring management's responses. This KPO system is only effective to a certain extent, as it depends solely on employees' willingness to work harder to obtain some incentives, but if they did not meet their target, the HR manager explains that they will not receive their bonuses and can be subject to warnings.

i) Transparency and disclosure

Transparency and disclosure have a near influence on the company, as they scored a 3. The result was obtained by combining and averaging results from sections on the basis of the preparation of financial statements, the disclosure major of material events, and the information disclosure policy. For any of these sections the company scored an average of 3. The explanation of these results is clearly evident below.

j) Basis of preparation of financial statements

The financial manager explained that compilation of the financial statements is a difficult process in Company X. As the company conducts business in several countries, they have to comply with several bodies or revenue authorities. They do comply with rules in Nigeria, Kenya, South Africa and the United States. For that reason they have to draft statements according to the US GAAP, or the South African IFRS. That is why they hire chartered accountants in these countries to make sure that they comply with all the rules and regulations in these different countries.

k) Disclosure of material events

In the financial statements the company discloses major transactions. However, they have a lot of inter-company and related party transactions, off-balance sheet activities, and other material events (according to the pre-set level of materiality). They report these transactions in notes to the financial statements, with an explanation of any single transaction.

l) Information disclosure policy

The company has a written information disclosure policy that seeks to make all material information (financial and nonfinancial) fully, timely, and equally available to the relevant stakeholders. The financial director makes a presentation at the end of each term when she portrays the financial state of the company. However, as for written financial statements, after they are audited by KPMG they are sent to the relevant stakeholders including the Board of Directors and revenue authorities, and potential investors. The employees do not have a direct line of access to the final financial statements as these are guarded by the finance department, and forbidden to be discussed with the rest of the company.

5.4.3.4 Summary: Norms and Sanctions as corporate governance

Norms were referred above as rules and agreements drawn from the recursive interaction between actors, further grounded on personal knowledge and awareness of what can be sanctioned; and this constrains behaviour within conventional boundaries (Pinsonneault & Pozzebon, 2001). Corporate governance was thus used as an embodiment of norms, meant to discipline the behaviour of the organisation. And as it contains rules the organisation must comply with, it can be used in the process of legitimating the working practices.

With regards to Company X, the corporate governance documents are documents that include all the tolerated behaviour within the organisation. Hence from these documents, employees know which rules they have to comply to, and their behaviour is disciplined by these documents. However if there are any rules of compliance, there must also be

punishment for breaching these rules. In Company X, there are not enough processes in place to monitor compliance to the corporate governance, so employees are left to make decisions at their own discretion without any retaliatory measures, which is not ideal. The next section of this research will deal with the last modality of structuration, interpretive schemes (represented by policies and procedures)

5.4.4 Interpretive Schemes and Communication as Policies and Procedures

5.4.4.1 Background

The previous section discussed facilities as the ERP system, corporate governance as norms, and this section will discuss policies and procedures as interpretive schemes on the basis of Table 5.3. Structure of signification produces meaning through semantic codes, interpretive schemes and discursive practices which enable communication. Giddens (1984) furthers this view by stating that the agent is able to handle and understand structure through interpretive schemes (Lamsal, 2012). Interpretive schemes are used by agents and drawn from the rules and codes to construct meaning and make sense of interaction. Shared meaning is a vital characteristic of the creation and recreation of the societal conduct, which is conversely moulded through these very interactions (Barratt-Pugh, 2007).

While interacting with other agents, actors derive meaning from norms, resources and interpretative schemes. Indeed, interpretative schemes can be uttered as vehicles included within actors' stock knowledge for the communication of meaning (Pinsonneault & Pozzebon 2001; Broger, 2011). In terms of organisational practices, the interpretive schemes permit the access of the structure of the enterprise to create continuing, and transformative structural patterns. Policies and procedures in an organisation determine the 'why' practices are conducted and how they should be conducted; this is why policies and procedures are used as interpretive schemes to constitute meaning and knowledge of practices within the organisation. The transformational process will thus be defined in the Actor's stock of knowledge through the interpretive schemes vested in policies and procedures.

Although policies and procedures are related, they are not the same (Wolosz, 2007; Fitsimmons, 2011). Procedures outline the application of policies, while policies stem from answering the question 'why' in the organisation. Policies will thus enact meaning in relations to the organisational values and industry best practices; procedures will display how those values are expressed practically in the day-to-day functioning of the organisation. Furthermore, procedures are some sort of working instruction associated with the company's policy, and how these policies are instigated. Finally, policies can be illustrated as theoretical guidance with procedures and the enactment of that theory to tasks and problems (Wolosz, 2007; Fitsimmons, 2011).

Policies stem from laws, regulations, and industry best practices. Good policies should ensure that the values held within the organisation are the basis of the decision-making process (Wolosz, 2007; Fitsimmons, 2011). Policies and procedures should then be available for the relevant stakeholders and equally applicable to all the stakeholders. Also, policy must adequately convey rudimentary values linked to the problem that the policy is supposed to deal with. Finally policies and procedures must be documented, and compliance to these policies should be document as well (Wolosz, 2007; Fitsimmons, 2011).

In relation to Company X, the level of influence of policies and procedures was determined by adding and averaging the results of these policies and procedures on a departmental level. The final result was a near influence which is a 3. The explanations of these results per functions on the company are expressed below.

5.4.4.2 Finance Functions

For this section, only answers from employees in the finance department were considered as the rest of the departments were not necessarily aware of the policies in place in other departments because they do not affect them directly. So, taking into consideration the 15 structured questionnaires from finance department employees, policies and procedures scored a high influence (as they scored a 4). This result was obtained by combining and averaging the results of the sections on transaction recording, supporting documents, and policies and procedures. All these sections were deemed to have a high influence, as the department rated them at 4. The explanation of these results is made in the sections below.

1) Transaction Recording

It was mentioned above that transaction recording had high influence as it scored a 4 for this section. The transaction recording section was determined by querying the policies and procedures for routine financial management, related administrative activities and controls regarding the preparation and approval of financial transactions. To each of these sections, the department scored a 4.

a) Policies and procedures for routine financial and administrative activities

There are policies and procedures covering all routine financial management and related administrative activities. However, not all the routines are necessarily documented but are agreed upon within the relevant departments. Within the department there is a list that is sent out at the beginning of the month outlining the task of each of the employees and when they

are to complete their tasks. But there are no definite written policies or procedures that define how they must perform their work.

However, interaction between the finance department's employees and the rest of the company is documented to a certain extent. This ensures that the rest of the company knows what they must do in the completion of financial management tasks, and that there is something that can be used as a benchmark when complaints arise. For example, the company has written policies that specify deadlines for which the employees must submit their expense reports, and what can be documented, what can be included in the invoices, and to what they must attach the expense claim. If all the requirements are not met, the expense claim will not be reimbursed.

b) Policies and procedures for preparation and approval of financial transactions

There are policies and controls in place regarding the preparation and approval of financial transactions and these transactions are correctly made and adequately explained. This is done through the ERP system (Oracle financials). Any financial transactions that must be conducted must go through the procurement or purchasing module. The employee requesting the funds must create a purchase requisition that will go through an approval chain. The approval chain includes the financial controller, the managers that need to be aware of the transactions conducted, and the senior management that has the relevant authority to approve the transactions. Once the purchase requisition is approved, it is transformed into a purchase order.

That purchase order will then be captured as an invoice and be paid. After the transactions are paid, they are reviewed by the financial controllers and directors. Several reconciliations are conducted to ensure that all transactions are accounted for, and were approved. The system explained above is automated. However, this deals well with transaction conducted within the company. For the transactions with external parties, several systems are used for interactions, and they function in silos. So the transactions have to be performed manually as the main aspect of the ERP system is the Oracle Financials. All the systems such as Admin Pages, Pastel Payroll, or Salesforce, must feed data into the Oracle system. This data will thus be used for billing and invoicing customers from the Oracle system. As they function in silos, they lead to manual activities.

2) Supporting Documents

The supporting documents were deemed to have influence as they have rated a 4. These results were determined through the average of the sections on existing policies on supporting document retention and segregation of duties, for which they scored a 4.

Only relevant accounting and supporting documents are retained on a permanent basis in a defined system which grants access to authorised users. The documents are stored in a finance folder located on one of the company's servers. The access to a server requires logging into the company's network first, and then there is a master password for access to the finance drive. Only relevant employees have access to the share. The bookkeepers also try to maintain hard copies in addition to the soft copies already available on the drive. They usually maintain all these documents for auditing purposes, as the regulation states they must keep the documentation for a five-year duration.

3) Segregation Of Duties

The finance department makes an effort regarding the segregation of duties. This is done by splitting all the financials and accounting tasks within groups of the department. Although the accounting and supporting documents are retained on a permanent basis, they are not necessarily kept in a defined system that allows for a segregation of duties. In fact, they are kept on the same drive, and all the employees within the finance department have access to them as they share the password. Initially, it was done like that to increase collaboration, but as far as segregation of duties goes it is not optimal.

4) Policies And Procedures

For this section the organisation scored a 4 as the finance department considered it to be high influence. Results of the section on policies and procedures for staff accountability, for new accounting principle and for conflict of interest were added and averaged to determine the level of influence of policies and procedures. All these sections were rated high influence enough and are explained below.

a) Policies and procedures for staff accountability

As mentioned above, there are adequate and written policies to guide activities and ensure staff accountability. Nevertheless, these policies mainly exist when transactions are conducted between finance department employees and the rest of the staff; within the financial department itself, policies are there but not written. Employees are aware of their tasks, but there is no legal written document binding them to their tasks. So they solely rely on the automation of the ERP system to influence the way transactions are conducted.

b) Policies and procedures for new accounting principle

There are no existing procedures ensuring that only authorised persons can alter or establish a new accounting principle, policy or procedure to be used by the entity. Chartered accountants attend accounting and taxation conferences to learn about the development of accounting or taxation rules and principles. If something needs to be amended they will discuss the implications amongst themselves. However, they will still need the oral approval of the financial director, as none of these processes are conducted in writing.

c) Policies and procedures for conflict of interest

The company is subdivided into several companies, as it conducts its business in several countries in the world. Several issues exist in the fact that they conduct a lot of intercompany and related parties' activities. Hence, they have agreed upon, but not documented, policies and procedures. These policies and procedures aim to define a conflict of interest and related party transactions (real and apparent) and provide safeguards to protect the organisation from them. One of the reasons they are not documented (concerning the intercompany transactions) is that errors concerning these transactions can be limited through enforcing the transactions within the system itself.

5.4.4.3 IT function

As for the finance department, only answers from the IT department employees were accepted here. This is due to the fact that the rest of the departments were unaware of the policies drawn in that department. The answers from the 15 structured interviews conducted in the IT department rated its policies and procedures as a near influence. This result was established on the basis of the several sections discussed below.

a) Disaster recovery plan (drp)

A disaster recovery plan is a business management strategy for security as it aims at quick restoration of services due to failure or catastrophe caused by a natural disaster or by men (Brysona et al., 2002; Richardson, 2005). The plan will minimize the possible damage through detecting, selecting and safeguarding the most valuable assets of the company requiring protection (Brysona et al., 2002; Richardson, 2005).

Company X recently faced a denial of service (ddos) attack, which is a denial of legitimate use of a service or system (Mirkovic & Reiher, 2004). When it happened, no transaction could be conducted as the company has a strong reliance on IT systems. Because of this attack, the company developed and documented a disaster recovery plan for processing critical jobs in the event of a major software failure.

The disaster recovery plan includes things such as accessing the latest backed up versions of the software. Aspects of all the company IT infrastructures are backed up in a reasonable time. They have redundancy for some servers where two different servers are remotely located and mirror each other. This is to ensure continuity in case one server fails. However, for hardware failure in case of natural disasters for example, there are no such policies or any plan.

b) The disaster recovery plan update and testing

As there are new employees, new hardware and software, best practices require that the disaster recovery plan be tested on a regular basis, and be updated accordingly. For these reasons, organisations conduct various tests to determine if they can recover data, restore critical applications and resume services after a major interruption.

Since the ddos attack, the only part that is routinely tested is the system's ability to withstand a ddos attack, and the ability of the business to recover after that. They will try to perform some kind of 'dummy' of ddos attacks for example to make sure that the system can cope with any level of transaction.

c) Change management

Vora (2013) emphasises the need for a change management process to ensure reaping enough benefits from it. He mentions that documented change must happen, where the initiator of the change will motivate for it, before going through an approval process. Once change is completed, there must be monitoring afterwards. In the case of Company X, there is a documented change management procedure in place.

The company has a group called the change advisory board (CAB). This group is composed mostly of IT managers with representatives of each of the departments. They meet on a regular basis and discuss any potential changes that are requested. In fact, to request any changes within the system, any employee must log a ticket on the company internal system in reference to the department that is supposed to conduct the change. During the CAB meeting, they will access all the tickets and determine if the changes are really needed with reference to a risk assessment and overall impact on the company.

If they agree on the imminent need of the changes, the CAB then prioritises the changes. It will also engage with the relevant stakeholders of the project, such as the requestor, to confirm that the change request has been approved. They will also initiate communication with the department in charge of making that change to specify the task and duties, with any timeline if there is any. The CAB will also ensure that every change requested is completed

as required and in a timeous manner. It is important to take note that this entire process takes place within the company internal system called Mantis.

d) Security control

Not since the IT audit conducted last year did the company conduct a real and complete risk assessment and security controls on existing software and hardware. Management tried to respond to the insufficiencies mentioned during the audit. However, there is not a dedicated department or team that is in charge of dealing with risk management within the team. Hence, the organisation does not document security controls according to risk.

The company does not maintain written procedures relating to controls over the physical security of the computer equipment, nor with the employees interacting with it. For example, it is a convention that employees must access the server room with shoes on their feet. However, as some employees do not wear shoes on their way to work, they sometimes enter these rooms at their own risk as there are no written guidelines guarding them from doing so.

Each team in charge of software has a duty to maintain written policies or procedures related to the security controls over the access to the systems. However, there is not a system in place to enforce that the teams are actually doing as required. Nevertheless, some employees document these security controls as part of their own knowledge management system to which they can refer in time of need.

e) Incident Reporting

Incident reporting is necessary for any risk and quality management within an organisation. To address deficiencies effectively, there must be an incident reporting system within any organisation (Basu et al., 2009; Walsh et al., 2010). Company X has a policy, although not written, for problem or incident reporting. They have required any manager in charge of software to enact an incident-reporting document. In that document, the manager will mention what incident the software faced, what steps were taken to solve the problem, and the steps that will be taken to ensure that the problem will not occur again in the future and to ensure continuity. Since it is not a written policy, it is not always followed through by the relevant teams.

There are no documented procedures for identifying and classifying problems (e.g. usability or interfaces). Problems are reported through a Mantis ticket if it is noticed by an employee outside the department supposed to fix the problem. Within the department itself there are no documented procedures for identifying and classifying problems. Only a few employees keep

track of the problem they faced by documenting the solution that can be useful for future use, as a part of their knowledge management system.

f) Application Acquisition

As far as a written policy on application acquisition is concerned, there is none that guides the process of acquiring an application. However, there is an agreed-upon procedure that is used if there is a need for a new application. The employee will create a requisition in which he motivates the need for the new application. He or she will then build an approval chain, including the managers with the necessary authority to approve the acquisition. Here, the approval of the requisition is not based on the financial means but on the actual need of the new application. Within the requisition system there is a request information option. The manager can thus obtain more information which will help them make their decisions, such as choosing to reject the purchase if it does not make any financial or technological sense to the company.

g) Telecommunication Policy

The company does not have a written policy relating to the use of telecommunication. Employees basically have the choice to 'telecommunicate' in any way they choose. This is to offer some type of liberty over the way employees decide to manage their computer equipment and how comfortable they are with the means of communication that will assist them in their work. This free, slack attitude is not free of risk but seems to be effective within the working environment. The IT department will only question any such technology use for telecommunication if they are required to set it up.

5.4.4.4 HR Function

In terms of policies, the HR team is the one that has the most policies, as employees constantly need to refer in the enactment of work and non-work related activities. As their policies involve all the company, unlike the finance and IT departments, all the departments were asked to participate in this section of research. 50 respondents were approached on this section across the selected departments as per Table 5.2. The HR function policies and procedures were deemed to have a high influence on the organisation, as they were rated at 4. The sections on recruitment and selection, training and development, employee relations and compensation, and benefit were all rated as high influence. These results were added and averaged to determine the level of influence of the HR function on the organisation.

a) Recruitment and selection

The HR department has several policies on recruitment and selection. They have a policy to deal with recruitment. This policy includes a manager formerly requesting the need to fill a position, and the financial people approving the need for that new recruit. Also, when the recruitment is approved, the HR department will first try to recruit internally or ask for a referral, from which the employee will receive a referral fee if their reference is accepted. Once employed, the employee must go through a probation period of three months in which their abilities to perform the job are assessed. During that period the employee will not receive the bonus that is given to employees every three months.

b) Training and development

The company has a compliance programme or procedures that include the training and development of employees. The HR department has a budget for every department to ensure that they can go on training to better their skills. Requests for training as well are made through a requisition in which the employee or his manager creates the requisition in which he motivates the need for training.

c) Compensation and benefits

Also, the HR department has a policy to deal with the working-time policy; in this policy, the department stipulates what are the formal and official working hours. They also have an overtime policy in which they specify that overtime must be approved by the manager, and will not be reimbursed. Rather, the overtime will accumulate, and will be taken as leave.

As for the leave, there are also policies split in normal leaves and sick leaves. Any leave request (whatever the category) must be entered into the leave system whether retro or proactively and approved by a manager. This process must be followed to ensure that the leave will be paid out. Vacations are submitted to the same procedure, but the employees must make sure they have enough leave days available. If they do not have enough leave days, their vacations will be counted as unpaid leave, but they must first be approved by their manager.

d) Employee relations

The company does not have a communication policy or a problem-resolution policy. They deal with these issues as they come. The company has a personal appearance policy which requires employees to be casual. Also, the HR department has a conflict of interest policy, which requires employees to report any kind of conflict they might have to the legal team. That legal team is charged to deal with any sexual harassment as per the sexual harassment policy. In addition, the sexual harassment policy includes a line for reporting any misconduct

to lawyers that are independent of the company. This is conducted in that manner so that employees can feel at ease in case they do not feel comfortable or feel that the current legal team will have their judgment compromised.

5.4.4.5 Sales & Marketing Function

The marketing and sales departments were also based on answers from employees from this department alone (15 employees). The sales and marketing function was deemed to have a near influence on the department and organisation. This was based on the answers on the below sections on marketing, marketing channels and sales. These three sections rated a near influence, and minimal explanations were given by the department as they were not willing to discuss their trade secrets.

a) Marketing

The company has a documented marketing and sales strategy. This strategy is a type of plan that will include the goals of the department. It will include all the financial planning, and the revenue expected from a product. For example, the marketing and sales strategy includes forecasts in which they show when the company expects to break even with a product. So, the content of the marketing and sales strategic plan will thus be used as a benchmark to determine how well the product is doing, and if there is any need to reconsider.

b) Policies and procedures for market research

The company conducts market research before launching a product. The company does so by approaching any potential customers to already define the need for their products. The results of the market research will determine where the company wants to take its products. Sometimes, this market research will even go as far as to determine the whole strategy of the company, including where top management will want to commit its resources to maximize profit.

c) Marketing channels

The company has specific marketing promotional channels which make use of online marketing resources as well. There is no social media plan and policy for customer relationship management for now.

d) Sales

There is a written policy involving sales processes involved in selling products. Sales agents must follow processes in the way they conduct their sales, which seems to be effective for the company. Also, the company has had to draft policies for account management to guide

this process. The policies include things such as the maximum amount of money that can be spent while taking out a customer or potential customer.

5.4.4.6 Network Function

The level of influence of the network function was determined by the IT department employees (15 employees). It was rated a near influence (3), because network policies should be made available to all the employees. In the case of Company X, they are mainly known to the IT department and other departments' management. This near influence was established based on the sections below that scored a near influence as well.

a) Acceptable use of network services and network authorisation procedures

There is no network policy that includes the acceptable use of network services and network authorisation procedures. Employees have to approach the relevant department regarding any issue they have. The mail client is thoroughly monitored to ensure continuity but does not have restrictions in place for the numbers of emails sent (assists in preventing spam). Employees are given full liberty to send emails to whoever and where they want; they must just be professional in choosing the content of their emails to make sure they are not offensive to anyone.

b) Network monitoring

There is no policy for employees' Internet access monitoring, nor does the company maintain written policies or procedures related to the security controls over access to the Internet and the use of Internet resources. There is a software package available on request for monitoring system and user activity. Employees use the Internet as they please, and the company expects them to behave in a professional manner. However, when employee performances come into questioning, the manager can request the network department to specifically track the Internet usage of an employee. This would be done in an attempt to determine how much work-related activities the employee is conducting to try and explain his failure to meet targets.

5.4.4.7 Summary: interpretive schemes and communication as policies and procedures

Actors use interpretative schemes, norms and sanctions while interacting with other agents, to derive meaning. Indeed, interpretative schemes can be expressed as vehicles included within actors' stock knowledge for the communication of meaning (Pinsonneault & Pozzebon 2001; Broger, 2011). In terms of organisational practices, the interpretive schemes permit the access of the structure of the enterprise to create continuing, and transformative structural patterns. Policies and procedures in an organisation determine the 'why' practices are

conducted and how they should be conducted; this is why policies and procedures are used as interpretive schemes to constitute meaning and knowledge of practices within the organisation.

In the case of company X, there was no adequate knowledge on all the policies within the organisation. When there was supposed to be procedures to follow, there were not enough written policies to provide some sort of know-how for employees within these situations. These led to employees conducting certain tasks in their preferred manner, as there was no written manual to refer to.

5.5 ENACTMENT OF TRANSFORMATION-IN-PRACTICE

Actors conduct transformation by relying on the properties or concepts of transformation, those offered by its fundamental materiality, those established by best practices in any transformational projects, and those developed by actors through previous transformation projects. This is due to the fact that agents continuously create and recreate these actions. Although agents mobilise their assumptions, skills, knowledge, and power; expectations about the transformation from prior interactions, the primary source, should be the corporate strategy as illustrated in the Conceptual Framework presented in Figure 5.1 above.

So Companies such as Company X rely on Corporate Strategy to 'structure' the practice of transformation within the organization. That is why transformation-in-practice has been defined as provisions of strategy instantiated in transformation or strategic objectives instantiated in transformation.

This means that Agents or employees can establish signification, emotional and intellectual connexion with transformation and its enactment, stemmed from referring the Corporate Strategy. In this manner, people's usage of transformation becomes structured by prior interactions, knowledge, signification, behaviours, control relations, rules, and the transformational objects available to them through Strategy. Such structuring sanctions a particular set of rules and resources in practice that then serves to structure forthcoming transformational use as actors carry on with the transformation in their ongoing practices. Hence, over time, they produce and reproduce structure of transformation in practice.

The Conceptual Framework defined as Figure 5.1 showed that any such transformation would have to be conducted through the modalities of structure represented by the Infrastructure of the Organisation. The previous Sections discussed how the Strategy was utilised in Company X to drive the transformation through ERP System (Facilities and

Power), Corporate Governance (Norms and Sanctions), Policies and Procedures (Interpretive Schemes and Communication).

In addition to all the above, it is important to emphasise the need for communication of the Strategy to the Actors, through focus groups for instance, as suggested by the Conceptual Framework. For Strategy to be effective, it has to be communicated to employees. In the Case of Company X, they attempt to communicate their Strategy to employees. The communication takes place during the Friday staff meetings or sometimes during a private function at the beginning of the financial year. However, in terms of focus groups, only managerial individuals meet to discuss the Strategy weekly, every Monday morning after it has been laid out, discussed and updated by the Executives.

It is the convention within Company X that after these managerial meetings that each manager communicates the outcomes to the employees within their reporting structure. Nevertheless, the employees interviewed declared that this seldom takes place. They agreed to receive strategic directives during Meetings, but the presentation of any such strategy is only discussed at the beginning of the financial period. In addition, there are no documents covering these strategies available to employees so that they can refer to them after the meetings. Therefore most of the employees do not feel like they have enough grip on the strategy, hence, it cannot be said to be structuring the working practices of employees, let alone the transformational process.

In this also important to note that Human interaction with transformations is basically repeated so that, even as users produce transformation-in-practice through their current use of a transformation, they are also influenced by prior transformation practices previously enacted. Ongoing performing of a transformation-in-practice emphasises it, so that it becomes normalised and repetitive, a practical and customary reaction to recurring use of a transformation within the necessities of the institutional contexts. Because the Strategy is not well communicated to the employees in the case of Company X it cannot constitute a basis of habitual, interpretative means while performing the transformation. Recurrent practices of transformation would thus not be replicated so that it turns into common practices.

5.6 CONCLUSION

The structuration theory was used as a lens to determine the role of business informatics on business transformation. The research was conducted on the basis of the modalities as explained by Giddens (1984). Interpretive schemes are used by agents to enact meaning, usually through communication. Facilities are used to enact power on the agent. Finally

norms are used as guidelines to guide behaviour, and sanctions are derived from that. In this research, policies and procedures were used as means of interpretive schemes, as policies deals with the 'why' of any practices within the organisation (Fitsimmons, 2011). ERP as it integrates business processes was used as facilities to enact power on employees through enforcing employees to follow business processes via the system (Alam et al., 2006). Finally, corporate governance, as it disciplines the behaviour of corporate actors, was used as norms of compliance (Ajit et al., 2014).

Interpretive schemes and communication as Policies, Procedures: Actors use interpretive schemes, norms and sanctions while interacting with other agents, to derive meaning. Indeed, interpretative schemes can be expressed as vehicles included within actors' stock knowledge for the communication of meaning (Pinsonneault & Pozzebon 2001; Broger, 2011). In terms of organisational practices, the interpretive schemes permit the access of the structure of the enterprise to create continuing, and transformative structural patterns. Policies and procedures in an organisation determine the 'why' practices are conducted and how they should be conducted; this is why policies and procedures are used as interpretive schemes to constitute meaning and knowledge of practices within the organisation.

In the case of company X, There was no adequate knowledge on all the policies within the organisation. When there was supposed to be procedures to follow, there was not enough written policies to provide some sort of know-how for employees within these situations. This led to employees conducting certain tasks in their preferred manner, as there was no written manual to refer to.

Facilities and Power as Information Systems and organisational structure: facilities are used "to allocate resources enacted in the wielding of power, and produces and reproduces social structures of domination" (Rose & Hackney, 2003; Poole & McPhee, 2005). Facilities are the means to achieve intended or desired outcomes and to exert power (Veenstra et al., 2014). Actors are to use facilities, represented by the ERP to exercise power through enforcing employees to follow business processes, as ERPs are built on the basis of the business processes.

In the case of Company X, the systems used by the company were good enough taken individually. This means that these systems enforced employees to follow business processes to a certain extent within the department in which they are intended for use. However, employees do not conduct their activities on a departmental level only, but also have to conduct enterprise-wide transactions as part of share services. The issues stem from

enterprise transactions, as the systems are not integrated and function in silos. This means that there is no information flow between the systems, leading to data inconsistencies and lack of integrity.

Norms and Sanctions as Governance: Norms were referred in this research as rules and agreements drawn from the recursive interaction between actors, further grounded on personal knowledge and awareness of what can be sanctioned; and this constrains behaviour within conventional boundaries (Pinsonneault & Pozzebon, 2001). Corporate governance was thus used as an embodiment of norms, meant to discipline the behaviour of the organisation. And as it contains rules the organisation must comply with, it can be used in the process of legitimating the working practices.

With regards to Company X, the corporate governance document is a document that includes all the tolerated behaviour within the organisation. Hence from these documents, employees know which rules they have to comply to, and their behaviour is disciplined by these documents. However if there are any rules of compliance, there must also be punishment for breaching these rules. In Company X, there are not enough processes in place to monitor compliance to the corporate governance, so employees are left to make decisions at their own discretion, which is not ideal.

Enactment of Transformation-in-Practice through Corporate Strategy: Actors conduct transformation by relying on the properties or concepts of transformation, those offered by its fundamental materiality, those established by best practices in any transformational projects, and those developed by actors through previous transformation projects. This is due to the fact that agents continuously create and recreate these actions. Although agents mobilise their assumptions, skills, knowledge, and power; expectations about the transformation from prior interactions, the primary source, should be the corporate strategy as illustrated in the Conceptual Framework presented in Figure 5.1 above and presented and discussed in focus meetings.

Employees interviewed within Company X reported that they did not grasp the strategy completely because it was not effectively communicated to them. The employees admit to receiving strategic directives during Meetings, but the presentation of any such strategy is only discussed at the beginning of the financial period. In addition, there are no documents covering these strategies available to employees so that they can refer to them after the meetings. Therefore most of the employees do not feel like they have enough grip on the strategy, hence, it cannot be said to be structuring the working practices of employees, let alone the transformational process.

Recommendations for the shortcomings mentioned above are made in the next chapter. However, Company X provides IT-related services in 220 countries, which constitutes an inherent challenging infrastructure, ergo, they need to rely on strong business informatics concepts. Any transformation initiatives will have to be led by business informatics concepts enabled projects such as integration of the systems driven by sound business management strategy and technology and used within the organisation. This is in concordance with the work conducted by Twum-Darko (2014). Therefore, the degree of readiness for any such of organisation can be determined through the transformation-in-practice in Figure 5.2 below which originated from the conceptual framework and that has been revised to become a general framework that can be applied across the board.

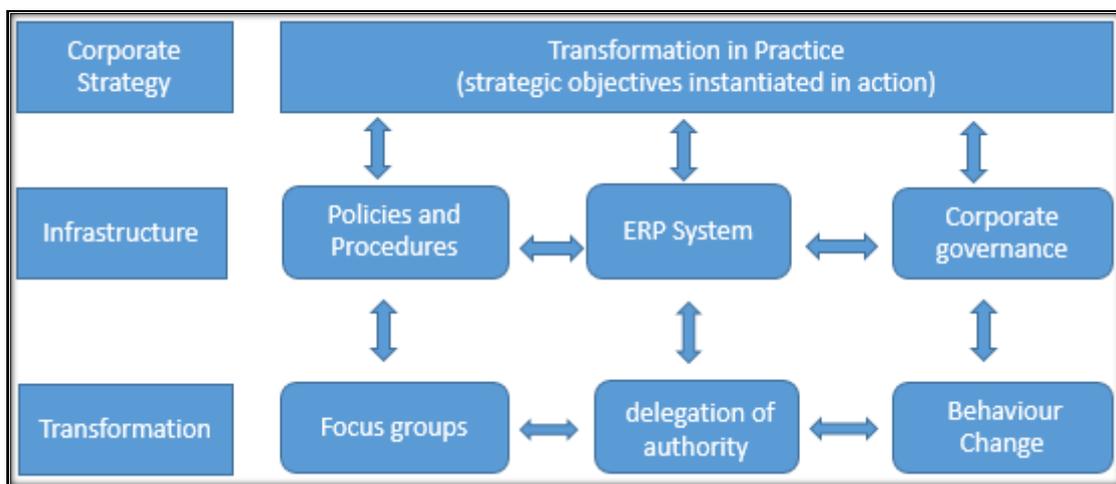


Figure 5.2: General Framework

Chapter 6 : CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

As discussed in Chapter 1, and elaborated in the subsequent chapters, the core of this research is to determine how the concepts of business informatics were and/or can be leveraged by the selected business organisation in the process of transformation. Chapter 5 discussed the results of the fieldwork and the analysis and interpretation of the results. The initial framework was discussed and revised as a general framework.

This chapter explains how the research questions were answered, and the extent to which they addressed the objectives of the research. This Chapter therefore concludes the research report as follows:

- (a) Overview of the chapters;
- (b) Research questions revisited;
- (c) Research contributions;
- (d) Recommendations;
- (e) Limitations of the research and future researches. .

6.2 OVERVIEW OF RESEARCH

Chapter 1 discussed the background to the research problem. It alluded to the fact that business needs to adapt to contemporary business environments leading to expansion and to mostly allowing it to survive. The chapter explained adaptation to be possible through the leveraging of new trends in technology in the form of business transformation. The case of Company X was taken to address the problem statement. Company X has many data inconsistencies and lacked data integrity due to a number of systems functioning in silos.

The chapter also discussed business transformation as a way of ensuring business continuity and success. This was done through defining business transformation and explaining the necessity for business needs to expand and survive. Several value deficiencies leading to business transformation were explained, including the technological deficiencies which were deemed as one of the reasons leading to the need for business informatics. The chapter also described the concepts of business informatics including the part relevant to influence on transformation. Finally, the chapter gave an overview of the rest of the thesis.

Chapter 2 discussed the theoretical underpinning of the research. Given the background and the problem statement, the position was that the phenomenon is a social reality that involves sociotechnical processes and as such it can be studied through the lenses of a social theory. Giddens' (1984) structuration theory and in particular the dimensions of duality of structure was found to be appropriate to understand and interpret the phenomenon. Therefore the chapter provided an overview of structuration theory and explained its application in this research. This led to the development of a conceptual framework adapted from Orlikowski's (2000) duality of technology that underpinned the identification and selection of literature to review as well as the design of the data collection instrument.

It was argued and confirmed in the chapter the position of Giddens (1984) that structure and agency are mutually dependent; thus agent will continuously create, recreate social structures, and during interaction, structure is also affected by agency.

In Chapter 2, the dimensions of the duality of structure: signification, domination and legitimation were explained. The theory relationship with the research was described as (1) Signification which is associated with the procedures that produce meaning through the use of an interpretive scheme; (2) Legitimation was referred as the norms and resources that guide and 'legitimate' action, while (3) Domination was referred to as the use of resources (facilities) to enact power or domination on the agent. However as agents do not enact actions in a vacuum, the underlying modalities of the dimensions of structure were explained. The modalities were defined as the bridge between the knowledgeable capacities of social actors and the structural features of social systems in the enactment of social performance.

At the initial stages of Giddens' (1984) structuration theory, there was no mention of technology, as in this research, which is one of the key role-players of business transformation. The chapter also acknowledged other concepts of structuration theory in the field of information systems research such as the adaptive structuration theory, the duality of technology and the concept of technology-in-practice.

The concept of transformation-in-practice adapted from Orlikowski's (2000) duality of technology was used in the problem conceptualization. The argument was that transformational principles are only accessed by agents in the process or practice of transformations. As transformation is not conducted in vacuum, the modalities were defined. Policies and procedure were used as interpretive scheme to entrench signification. The facilities used to enact domination and power (by compelling employees to follow processes that are internally built) was identified as the ERP system. Finally, the norms which defined the behaviour and sanctions were defined as corporate governance. From all these

concepts, an initial framework for analysis was enacted that guided the design of the data collection instrument, analysis and interpretation of the results.

The next chapter (Chapter 3) provided the background to current literature relevant to the concepts of the “*role of business informatics in business transformation.*” The concepts of business transformation and business informatics were defined. An explanation of how business informatics influence business transformation was given and the underpinning theory - structuration theory – helped to understand the transformation process.

Furthermore, Chapter 3 described business transformation as a necessary change in managing business strategic objectives and vision to align people, processes and technology initiatives. It was also established that through transformation any business is able to compete and survive within its environment. Some of the factors leading to business transformation, such as competition, stakeholder expectations, restructuring, and performance decline, were identified and their influence were analysed. The chapter also emphasised the fact that transformation affected processes, people, technology, policies, vision, and/or any other business component. This led to the assertion that business transformation was conducted through business processes, hence, business processes were defined as well in the context of transformation.

The concept of business informatics was further described as an integrated approach that integrates the concepts of computer science and software engineering principles with business administration and management principles for business transformation. Thus, expounding on the concept of Business informatics and its components, computing, business management, information system, and methodology, the concept of ERP was established as the information system. Business management was described as the strategic plan, which underpins the formulation of corporate governance and policies and procedures.

The chapter asserted that an organisation’s sustainability and achievement of competitive advantage, require continuous rethinking of its strategies, to transform processes, and adapt to current trends in its environment. The chapter established that the information system component of business informatics concept can assist with business transformation. Since an information system was conceptualized as the ERP, it was thus identified as necessity for transformation. Other components of business informatics already alluded to were deemed necessary for transformation as well.

Given current literature relevant to the role of business informatics in business transformation, the chapter argued that ERP as the information system can make use of social media and cloud computing platforms as means to transform business. It was further argued Integration of the corporate information such as ERP with social media platforms such as Facebook and Twitter to ensure an effective collaboration between employees, and effective customer-relationship management.

Cloud computing as a platform for the ERP was argued as an important characteristic for improved business transformation. Thus cloud computing capability to share and pool IT resources together on demand through a network infrastructure was argued as a necessity for a reduced management effort when dealing with customers and particularly where service level agreements are in place. Given the existing and relevant literature, it was further argued that cloud computing was necessary for business transformation as it has the capability to plug in any business logic for organisational flexibility, elasticity, increased robustness of activities, and increased revenues through the reduction of production costs.

Chapter 3 also established that business informatics included business management principles required in the transformation; the concepts of strategic management, corporate governance, policies and procedures were defined. Strategic management was referred to as the plans of top management to develop and maintain a competitive advantage, whereby a successful business strategy cannot be easily replicated by its competitors, enabling the achievement of the organisation's mission. A few strategic models were introduced such as telecommuting, Bring Your Own Device, and the work-life balance.

Chapter 3 additionally defined corporate governance and policies and procedures as emanating from the strategy. Corporate governance was further defined as the norms to guide and control the organisation. Policies were defined as a framework of the values of the organisation, while procedures will be their application. Together, policies and procedures will thus constitute a sound environment that will assist in an effective transformation.

Chapter 4 discussed the research approach that assisted in answering the main research question which was formulated as:

How can business informatics concepts help business organisation in the process of transformation?

This chapter discussed the research methods that were used for data collection and analysis. It also discussed the scope of the research design and highlighted the research limitations.

The research approach, methodology, and design chosen for the research, was compared to the existing research traditions. In addition, the philosophical assumptions underlying this research were explained along with their implications. The research paradigm on which this research was based was deemed an interpretive approach, while the research strategy was based on a single case study which explored in-depth the research phenomenon. The research adopted a single case study in an organisation, Company X, which was later categorised into four units of observation. The sources of information stemming from these units were discussed, and they included observation and semi-structure interviews.

The data collection techniques applied for this research was semi-structured interviews, a review of documentations, and observations. Company X was selected as a case study, and the units of analysis included the finance, HR, IT and HR departments. The semi-structured interviews were conducted on 50 employees within these units of observation, while observations were made during the period of September 2014 to May 2015.

The research used (as per Chapter 5) the structuration theory for the development of the conceptual framework and for the analysis and interpretation of the collected data. Chapter 5 presented the results of the fieldwork conducted. It first presented how the research was conducted, and then presented the findings and finish with the interpretation of the results through the lens of the structuration theory. The research was conducted on the basis of the modalities as explained by Orlikowski (2000) and Giddens (1984). The modalities of structure which acted as corporate logical infrastructure included interpretive schemes, facilities and norms. Interpretive schemes were used by agents to enact meaning, usually through communication. Facilities are used to enact power on the agent. Finally norms are used as guidelines to guide behaviour, and sanctions are derived from that.

In this research, policies and procedures were used as means of interpretive schemes, as policies deals with the 'why' of any practices within the organisation (Fitsimmons, 2011). Because ERP integrates business processes, it was used as facilities to enact power on employees through the enforcement of business rules (Alam et al., 2006). Finally, corporate governance was used to discipline the behaviour of corporate actors, and enforce the norms of compliance (Ajit et al., 2014).

Interpretive schemes and communication as Policies, Procedures: Actors use interpretative schemes, norms and sanctions while interacting with other agents, to derive meaning from. Hence, interpretative schemes can be expressed as vehicles included within actors' stock knowledge for the communication of meaning (Pinsonneault & Pozzebon 2001;

Broger, 2011). In terms of organisational practices, the interpretive schemes permit the access of the structure of the enterprise to create continuing, and transformative structural patterns. Policies and procedures in an organisation determine the 'why' practices are conducted and how they should be conducted; this is why policies and procedures are used as interpretive schemes to constitute meaning and knowledge of practices within the organisation.

In the case of company X, there was no adequate knowledge on all the policies within the organisation. When there was supposed to be procedures to follow, there was not enough written policies to provide some sort of know-how for employees within these situations. This led to employees conducting certain tasks in their preferred manner, as there was no written manual to refer to.

Facilities and Power as Information Systems and organisational structure: facilities are used

“to allocate resources enacted in the wielding of power, and produces and reproduces social structures of domination” (Rose & Hackney, 2003; Poole & McPhee, 2005).

Facilities are the means to achieve intended or desired outcomes and to exert power (Veenstra et al., 2014). Actors (employees as per this research) are to use facilities, represented by the ERP to exercise power through enforcing employees to follow business processes, as ERPs are built on the basis of the business processes.

In the case of Company X, the systems used by the company were good enough when the individual systems were considered. This means that these systems enforced employees to follow business processes to a certain extent within the department in which they are intended for use. However, employees do not conduct their activities on a departmental level only, but also have to conduct enterprise-wide transactions as part of share services. The issues stem from enterprise transactions, as the systems are not integrated and function in silos. This means that there is no information flow between the systems, leading to data inconsistencies and lack of integrity.

Norms and Sanctions as Governance: Norms were referred in this research as rules and agreements drawn from the recursive interaction between actors, further grounded on personal knowledge and awareness of what can be sanctioned; and this constrains behaviour within conventional boundaries (Pinsonneault & Pozzebon, 2001). Corporate governance was thus used as an embodiment of norms, meant to discipline the behaviour of

the organisation. And as it contains rules the organisation must comply with, it can be used in the process of legitimating the working practices.

With regards to Company X, the corporate governance document is a document that includes all the tolerated behaviour within the organisation. Hence from these documents, employees know which rules they have to comply to, and their behaviour is disciplined by these documents. However if there are any rules of compliance, there must also be punishment for breaching these rules. In Company X, there are not enough processes in place to monitor compliance to the corporate governance, so employees are left to make decisions at their own discretion without proper retaliatory measures, which is not ideal.

Enactment of Transformation-in-Practice through Corporate Strategy: Actors conduct transformation by relying on the properties or concepts of transformation, those offered by its fundamental materiality, those established by best practices in any transformational projects, and those developed by actors through previous transformation projects. This is due to the fact that agents continuously create and recreate these actions. Although agents mobilise their assumptions, skills, knowledge, and power; expectations about the transformation from prior interactions, the primary source, should be the corporate strategy as illustrated in the Conceptual Framework and presented and discussed in focus meetings.

Employees interviewed within Company X reported that they did not grasp the strategy completely because it was not effectively communicated to them. The employees admit to receiving strategic directives during Meetings, but the presentation of any such strategy is only discussed at the beginning of the financial period. In addition, there are no documents covering these strategies available to employees so that they can refer to them after the meetings. Therefore most of the employees do not feel like they have enough grip on the strategy, hence, it cannot be said to be structuring the working practices of employees, let alone the transformational process.

Recommendations for the shortcomings mentioned above were made in Section 6.5. However, Company X provides IT-related services in 220 countries, so they have a strong reliance on elements of business informatics. Any transformation initiatives would have to be led by informatics-enabled projects such as integration of the systems used within the organisation. Therefore, the degree of readiness for any such organisation can be determined through the transformation in practice in Figure 6.1 below, which was the initial conceptual framework and that was revised to become a general framework that can be applied across the board.

Chapter 6 was a conclusive episode of the thesis. Hence, it gave an overview of the content of the previous chapters. The research questions defined in Chapter 1 were revisited, and answers were provided on the basis of the research content. Research contributions were also given on a theoretical, methodological and practical level. Finally the chapter was closed with recommendations made to Company X along with limitations and further research.

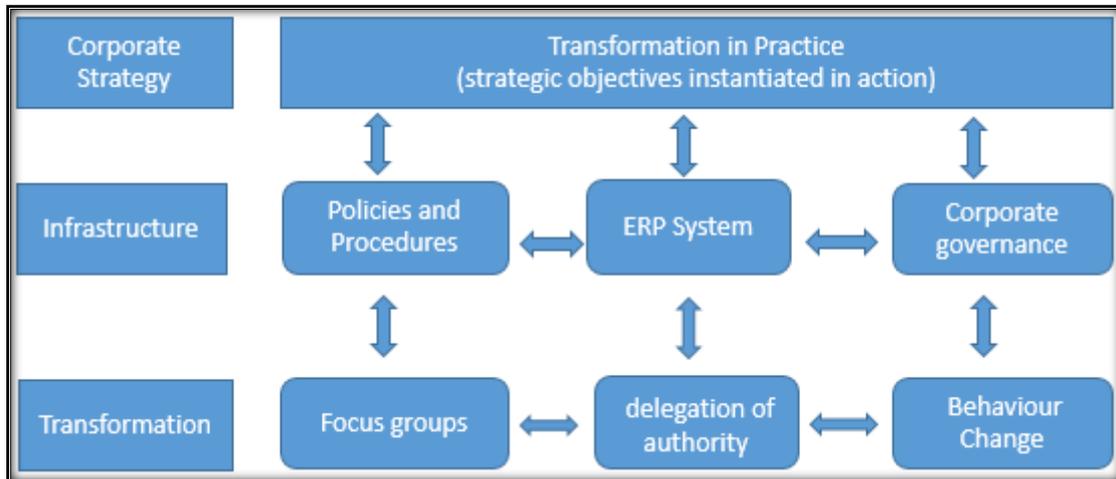


Figure 6.1: General Framework

6.3 RESEARCH QUESTIONS REVISITED

The research recognised Company X's multiple sources of revenue which led to the duplication of data entry which is the cause of errors in the reporting of official revenue numbers. There is no central repository available from which accurate data can be accessed and used for reporting, business analytics or forecasting. In this regard, the investigated company cannot achieve greater and long-term business sustainability as it is unable to transform the business by adapting to new trends in business informatics. The problem was answered through the stated research questions as provided in the following section.

6.3.1 Research Question1: why conduct business transformation in an organisation?

Section 3.2 of Chapter 3 discussed several reasons pertaining to the transformation of a business. The factors cited included competition, stakeholder expectation, restructuring, performance decline, and technology which are briefly discussed below:

1. **Competition:** new entrants can affect a business or industry as they can join the industry with new products and services. This will foster existing businesses to innovate or reinvent in order to survive. Also, even between existing organisations, there might be a common need to survive or to expand with the aim of gaining a bigger market share. In those situations as well a business might need to transform itself.

2. **Stakeholder expectation:** the various constituents that have interest in the business can exert direct pressure on a business that can lead to the transformation. The constituencies can be customers increasing their demand of the product, or even new laws and regulations that can lead to restructuring (Morgan & Page, 2008).
3. **Restructuring:** restructuring in this research study refers to the shift within management team power; a change in senior management (often happening to deal away with performance decline) can often be seen as a change of strategies which might end up changing the whole organisation (Morgan & Page, 2008).
4. **Performance decline:** when faced with performance decline, organisations often choose to rejuvenate the way business is conducted (Morgan & Page, 2008). This is another factor leading to business transformation.
5. **Technology:** technology is also at the forefront of business-transformation triggering as it is constantly changing at a fast adoption rate.

This research took the case of Company X to justify the need for transformation. The organisation is in a competitive industry (SMS and IT services), so it has to constantly improve itself to survive as competition is rough. Also, the architecture of the technology used is stopping the company from reaping the full benefits from it, and improve its performance. It was explained in Chapter 1 and the subsequent chapters that the company has several systems functioning in silos, while all the tasks are not fully automated.

Because of the above challenges faced by the investigated company, the company faces data inconsistencies, lack of data integrity, and data duplications. These issues in the quality data, stemming from unintegrated platforms, affect the reporting processes, which in turn have further impacts on the organisation performance. In other words, data transformation leads to information, and information is vital to the decision-making process. For these reasons, an organisation will need to transform and to realign its technological architecture.

6.3.2 Research Question 2: Why are business informatics concepts relevant in helping business transformation?

Sections 3.4 of Chapter 3 and Section 1.3 of Chapter 1 state that business informatics is used to implement solutions tailored to the business problem. It assists in aligning the corporate goals and strategy with the business processes and information technology (Helfert & Duncan, 2007). This approach to business solution is an integrated view rather than a silos approach. This means that business informatics is a methodological approach

that can be enacted in the process of transformation. In addition, business informatics integrates fields such as computer science, technology, software engineering and business management principles.

Throughout the years, technologies have been investigated that could drive business transformation; this is why it is important to emphasize that the technology being discussed here refers to the appropriateness of technology. This means the technology of investigation has to be the best possible option from which the business will derive maximum utility.

Section 3.4 in Chapter 3 explains that business transformation can be achieved through various components of business informatics, and one of these components is the information system. Technology leaders are the newest trends to retain customers and increase market share. Brand leaders, process simplifiers and social integrators are all customer-facing value propositions that can be addressed through an effective customer relationship management or even informed relationship with customers through social media. Another way through which business informatics (technology) can assist the transformation of a business is through cloud computing.

Finally, Sections 3.4 and 3.7 state that business management principles are also components of business informatics that can assist with the business transformation. With regard to this research and in relation to the initial conceptual framework discussed in Chapter 2, business management was represented by policies, procedures, and corporate governance. It was established in these sections that business management principles would constitute the basis of a sound environment which is necessary for a business transformation.

6.3.3 Research Question 3: What are the challenges when conducting business transformation?

The research was established on the basis of the structuration theory that transformation could not be conducted in vacuum. In fact it has to be conducted through the modalities, including interpretive schemes, facilities, and norms. So an effective transformation must have facilities in place, norms and interpretive schemes. Facilities were represented as the ERP system, norms as corporate governance and policies and procedures as interpretive schemes. In other words, challenges in conducting business transformation could be determined through analysing the effectiveness of ERP, corporate governance, and policies and procedures.

The investigated company was taken as a case to determine the challenges arising from transformation. On the ERP level, they have multiple systems that are functioning in silos. These systems are making the work of the agent or user of the systems difficult. The silos systems are the root cause of data inconsistency, duplication and lack of integrity. The access control and authorisation also were not fully in place to foster a transformation. Finally, the system did not fully cater with the collaboration needs of employees as the systems functioned in silos. Policies and procedures, along with corporate governance, have to be in place to provide a sound business environment in which transformation can thrive. They provide the organisation with a necessary framework that guides behaviour and practices within the organisation.

6.4 RESEARCH CONTRIBUTIONS

This section will discuss the contribution this research has made to the disciplinary knowledge in relation to the theoretical, methodological along with practical knowledge generated through the application of business informatics in the business transformation through the structuration theory.

6.4.1 Theoretical Contributions

Theoretical contribution in this research refers to how the underpinning theory helped to achieve the final results. Indeed, the theory assisted in the problem conceptualization to create an initial framework that guided the selection of literature and design of the data collection instruments. It further assisted in the interpretation of the problem and the interpretation and analysis of data. The structuration theory, more specifically, technology in practice, was the underpinning theory of the initial framework. The theory was used through the framework to serve as the lens through which the role of business informatics on business transformation was determined. Therefore, the theoretical contributions for this research were the utilisation of structuration theory to derive a general framework that guided the research into determining the role of business informatics within a transformation (the framework is shown in Figure 5.1 above).

The general framework and the concept of transformation in practice (explained in Chapter 2) can summarise the research and could also serve as a guide to enact transformation within any organisation. The general framework resulted from analysis and interpretation of data emanating from Company X, the case study of this research and also the concept of transformation in practice established in Chapter 2. It is important to note that although the framework can be used as a model or standard in the practice of transformation, success cannot be guaranteed, but it will increase the possibility of attaining it.

6.4.2 Methodological Contributions

The methodological contributions in this research refer to how the research philosophy and methods selected helped in teasing out the problem. Hence, in Chapter 4, the research strategy of a single case study was selected and argued, along with ontological and epistemological underlying assumptions of interpretive research. Strongly influenced by technology, Company X was chosen to be the case study, while the four units of observation were the finance, IT, HR, sales and marketing departments. Semi-structured interviews, observations and documentation were used as data collection tools. In addition, Chapter 2 discussed the initial framework which was used to analyse and interpret the results of the fieldwork in Chapter 5.

Therefore the methodological contributions in this research arise from the utilisation, application and the combination of structuration theory, through an initial framework of analysis, presented in chapter 2, and research methods to analyse the role of business informatics in business transformation. The research methodology used was instrumental in teasing out the problem and could serve as an example for other researchers.

6.4.3 Practical Contributions

The aim of this research was to interpret the aspects of business informatics that can be leveraged or are being leveraged to transform businesses and what are or have been the challenges thereof. The aim was achieved through an in depth literature in Chapter 3. Several aspects of business informatics were explained in Chapter 3 and it was also shown how they contribute to the business transformation.

In addition, the general framework was developed in Chapter 5 as Figure 5.1 and was derived from the concept of transformation-in-practice explained in Chapter 2. The contribution is meant to be normative, as the general framework is normative in nature. However, despite the normative nature of the output, it was to address any potential issue in the process of transformation. The general framework can be used as a guide to facilitate transformation within a business when aligning different technological platforms, people and processes.

6.5 RECOMMENDATIONS

It was established in Chapter 1 that the investigated organisations had many systems that were functioning in silos due to their lack of integration. So it seemed that integration would be the answer to this situation. However, integration appeared to make systems rigid in the long run as once systems are integrated, it is difficult to upgrade to a new version of a system, for example. In addition, as the company is looking to obtain the best possible architecture while cutting down on cost as explained in Chapter 5.

The platform recommended by this research would thus be cloud computing. Chapter 3 defined several advantages to moving to the clouds, including the capability to connect in any infrastructure, the low cost and the lack of in-house support needs. A request for a proposal was made on behalf of Company X to Oracle Corporation that shows the difference in cost between remaining with the application-based ERP instead of moving to the cloud. Table 6.1 shows the price in Rand of maintaining an application-based ERP system.

	PRICE	YEAR 1	YEAR 2	YEAR 3	TOTAL COST 3 YEARS
5 SUBSCRIPTIONS/LICENSES	891820	891820			891820
ANNUAL SUPPORT PLANNING ON PREMISES		196200	206010	216310.5	618520.5
TOTAL COST STAND-ALONE		1088020	206010	216310.5	1510340.5

Table 6.1: ERP Based application (5 licences)

Table 6.2 below shows the cost of maintaining a cloud-based ERP system. When comparing the difference between the two options, the difference is enormous. The savings from moving to the clouds at year 3 would be R1 066 122.335 (1540340.5 - 444218.165). That is a considerable saving. This is without taking into consideration the cost of the ERP support team. Indeed, on the cloud, there is no need for in-premises support as the cloud is directly maintained by the vendor.

From this, it is safe to say that the organisation should move to the cloud. In fact, application-based ERPs are good for a company of a size of 1000 employees to 5000 or even more, because they can recoup the cost on the number employees. However, for a company like Company X, which has only 180 employees, it is better to move to the cloud. In

fact the cloud is getting prominence now because of its ease of use and lower prices especially for smaller scale companies (Roontga, 2014).

	PRICE	YEAR 1	YEAR 2	YEAR 3	TOTAL COST 3 YEARS
5 SUBSCRIPTIONS/ LICENSES	262300	262300	0	0	262300
ANNUAL SUPPORT PLANNING ON PREMISES		57706	60591.3	63620.865	181918.165
TOTAL COST STANDALONE		320006	60591.3	63620.865	444218.165

Table 6.2: Cost of moving ERP to the cloud

Also, as mentioned in Chapter 3, it is necessary for Company X to make all the necessary conditions prior to deciding to migrate to the cloud. Important considerations are to be made on the integration of this Oracle cloud-based ERP solution with the rest of the systems such as Admin Pages and Salesforce. Chapter 3 highlighted a few ways through which any such integration could be conducted. The chapter mentioned the data warehouse architecture along with the toolkit and data virtualization. Once Company X decides to move to the cloud, they should probe the viability of these data integration tools. However, as explained in Chapter 3, these tools can also be used to solve the current integration issues regardless of their migration to the cloud.

In case the migration to the Oracle E-business suite in the cloud is the chosen option, Oracle provides a comprehensive data-integration tool. The tool will allow Company X to integrate its Oracle tool with the other existing applications to avoid an infrastructure working in silos. The solution offers several tools that are readily available to assist with the integration of heterogeneous systems.

These tools can be used separately or tightly together to produce a complete integration tool. It is important to note that recommendations in this research are made towards Oracle-related infrastructure. This is due to the fact that the company is already leveraging an Oracle solution. The most effective tools to be used for integration will thus stem from Oracle's wide array of solutions.

Following are some data-integration solutions that can be leveraged as a whole or in part for data integration. Oracle (2015) enunciates the following tools:

- **Oracle Data Integrator** can provide Company X with stellar performance bulk data movement and transformation through disparate data sources. Indeed, unlike traditional ETL tools, the Oracle data integrator utilizes a next-generation Extract Load and Transform (ELT) technology that supplies sophisticated performance with less onerous cost structures and ownership. This tool can also be incorporated with the other Oracle data integration tools mentioned below.
- **Oracle GoldenGate** can provide the possibility to Company X to replicate, compare and integrate in real time, data emanating from diverse sources. The technology enables instantaneous business intelligence that will foster the business decision-making process. The tool also offers query offloading to take full advantage of the online transaction processing (OLTP) performance, reduction of the downtime data migration, disaster recovery, and 'active-active' database synchronisation for uninterrupted accessibility.
- **Oracle Enterprise Data Quality** to enhance business insight, the tool offers an exhaustive, reliable and efficient approach to integrating master data with applications. Incomparable user friendliness, impressive data profiling, matching and monitoring of capabilities are some attributes offered by the technology.
- **Oracle Enterprise Metadata Management:** to investigate, examine, and administer an organisation's metadata; the tool can assist in extracting metadata from the Oracle and third-party technologies.
- **Oracle Data Service Integrator provides:** as Chapter 3 discussed, data virtualisation is a solution to the data integration issue. With the underlying intent to offer access to single layers or views of heterogeneous sources, this tool offers data virtualisation services to extract, combine and manage federated data services.
- **Oracle Big Data Preparation Cloud Service:** the tool delivers an interactive palette of services that streamline, automate and steer the data breakdown, preparation, enhancement, and administration with minimal human interference. Finally, Figure 6.2 below gives a summary of all these tools and how they can be intertwined together to produce a comprehensive data integration tool.

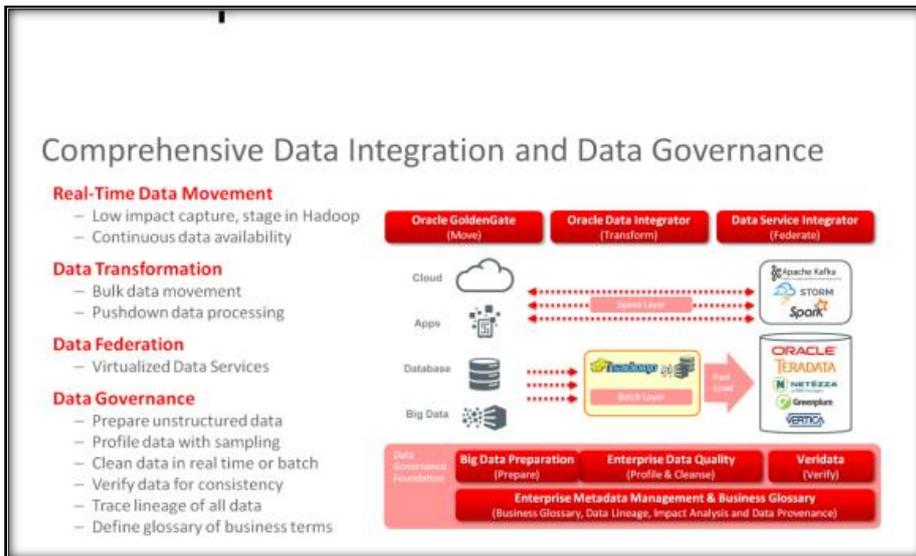


Figure 6.2: Oracle Data Integration Tools (Source: Oracle, 2015)

Also, from Chapter 5, it was established that the system in place did not permit easy collaboration between employees and that there were no clear social media policies. The research recommends a social media policy and an integration of social media with the available ERP system to improve collaboration. Chapter 3 elucidated on the matter of a mashup that can be used to integrate platforms such as Facebook and Twitter within the ERP itself. This will enable better communication between employees, and improved customer relationship management.

Finally, the research discussed in Chapter 3, several strategic management models such as work-life balance, telecommuting and Bring Your Own Device (BYOD). Chapter 3 explained that they can be integrated in any strategy to aid the company in differentiating the way it conducts business activities.

6.6 LIMITATIONS AND FURTHER RESEARCHES

Several limitations were discovered that will point to further researches. Limitations stemmed from the fact that the research was conducted on a single case study. From the results of that case study, the general framework was put forward; as it was enacted on the basis of results of the case study, it seems like one case study is not enough to generalise the results. Also, the research was conducted in the context of one region where Company X has its operations; this does not guarantee that the research could be extended to other locations. In that regard, further research can be conducted to verify the normative general framework enacted here. The research will have to be conducted on several companies and, ideally, in several countries to ensure the applicability of the framework.

Also, this research studied the role of business informatics in business transformation by using the lens of structuration theory. However, in the structuration theory there is a concept of unintended consequences which implies that knowledgeability of social agents can sometimes be mistakenly perceived as actors being in charge of action. To pre-empt that misconception, Giddens (1984:8) elaborates that there are unacknowledged and unintended consequences, as illustrated in the stratification model of the agent diagram.

According to Giddens:

"the consequences of what actors do, intentionally or unintentionally, are events which would not have happened if that actor had behaved differently, but which are not within the scope of the agent's power to have brought about (regardless of what the agent's intentions are)" (Giddens, 1984:11; Lamsal, 2012).

Therefore, business informatics has the capability to help in business transformation, unintended consequences arise when in the routinized practice of transformation as business informatics become affected as well. A further research will need to be conducted to explain how business informatics can be affected during the business transformation.

Finally this research aimed to determine the role of business informatics in business transformation. A general framework was derived to guide the practice of transformation using business informatics. However, as technology and organisation's regulations are constantly evolving, continuous development may need to be conducted on the general framework to ensure that it is in line with these changes and ensure also its successful implementation.

6.7 SUMMARY

This chapter was a conclusive episode of the thesis. Hence, it gave an overview of the previous chapters. The research questions defined in Chapter 1 were revisited, and answers were provided on the basis of the research content. Research contributions were also given on a theoretical, methodological and practical level. Finally the chapter was closed with recommendations made to Company X along with limitations and further research.

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APPENDIX A: RESEARCH QUESTIONNAIRE

RESEARCHER DETAILS	
Name:	
Surname:	
Student number:	
E-mail:	
Contact number:	

STUDY-LEADER DETAILS	
Name:	Dr Michael
Surname:	Twum-Darko
E-mail:	DarkoM@cput.ac.za

RESEARCH TITLE
The role of business informatics in business transformation in a selected company in the Western Cape.

ETHICAL CONSIDERATIONS
All participants in this research study will do so, on a voluntary basis. In essence, the identity of respondents will be kept anonymous and all information provided by the respondents will strictly be used for the research purposes and will be treated with the utmost confidentiality.

HOW TO COMPLETE THIS SURVEY
In order to complete the questionnaire, the participant should tick the relevant check boxes and/or answer some open questions.

PRIMARY OBJECTIVE OF THE SURVEY

Business informatics, according to Chauchat et al. (2011) is an emerging discipline that combines various aspects of business management, information technology and informatics. Informatics is broadly defined as the science of processing information, thus, increasingly; it involves processing and analysing information digitally, with the aid of computers. Therefore the aim of the research is to determine what aspects of business informatics can be leveraged of or is being leveraged to transform businesses and what are or have been the challenges thereof.

INFORMED CONSENT

Please note that if there is anything in this research study which you do not understand, you will be more than welcome to contact the researcher and/or supervisor as indicated on this front page. Furthermore, should you decide to withdraw from this research study at any time you would so wish, you may do so at any time without prejudice.

Name of participant

Signature of Participant

Date

<u>1. (ERP System)</u>					
<u>1.1 Access control</u>					
The system includes password security	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The passwords are changed on a regular basis	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Departing employees' access is terminated on a timeous manner	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Authorization is required for access to sensitive data	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Access rights are reviewed periodically	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>1.2 Level of Authorization</u>					
The ERP system encompass all aspects of the hierarchy of the company	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The ERP system cater to the need of all departments of an organization	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Only limited people have authority to conduct and certain transactions	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>1.3 Coercion</u>					
The system enforces employee to follow processes to complete their works.	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The system ensures data validation	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The system ensures that transactions are approved by managers with relevant authority	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>1.4 Self interest</u>					
The system allow for data sharing between employees	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
It is easy to collaborate using the system	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree

<u>2. Corporate Governance</u>	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>2.1 Ethical Behaviour</u>					
a) The company have a charter or according to local legislation,:	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
b) the protection of shareholder rights and the equitable treatment of shareholders;	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
c) distribution of authority between the Annual General Meeting of Shareholders, the Board of Directors and the executive	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
d) Information disclosure and transparency of the company's activities.	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>2.2 Standards and policies</u>					
The company has a corporate governance and/or policies	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The company has a code of ethics	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
There are procedures for monitoring compliance with codes and/policies	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The company discloses the extent to which it is complying with its corporate governance policies and procedures	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>2.3 Control Environment and Processes</u>					
The company has a compliance program or procedures that include auditing and monitoring systems, and a company "hotline" for reporting violations	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The Board of Directors monitor management's response to deficiencies and weaknesses identified in the Audit	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>2.4 Transparency and Disclosure</u>					
The financial statements prepared in keeping with internationally recognized accounting standards (e.g., IFRS or U.S. GAAP)	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The company discloses major transactions, related party transactions, off-balance sheet activities, and other material events	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree

The company has a written information disclosure policy that seeks to make all material information (financial and nonfinancial) fully, timely and equally available to all stakeholders?	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
<u>3.policies and procedures</u>	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
3.1 Finance Function					
Transaction recording					
There are written policies and procedures covering all routine financial management and related administrative activities.	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
There are policies including controls in place, regarding the preparation and approval of financial transactions and that these transactions are correctly made and adequately explained	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Payments					
There is a policy for invoice-processing procedures	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Supporting documents					
All accounting and supporting documents are retained on a permanent basis in a defined system that allows authorized users easy access?	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
All accounting and supporting documents are retained on a permanent basis in a defined system that allows Segregation of Duties	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Policies And Procedures					
There are an adequate policies and procedures manual to guide activities and ensure staff accountability	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Procedures exist to ensure that only authorized persons can alter or establish a new accounting principle, policy or procedure to be used by the entity	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Policies and procedures clearly define conflict of interest and related party transactions (real and apparent) and provide safeguards to protect the organization from them?	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree

3.2 It Function					
Disaster Recovery Plan					
The company has a documented disaster recovery plan for processing critical jobs in the event of a major hardware or software failure	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The disaster recovery plan been updated and tested on a regular basis.	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Change management					
A documented change management procedure exist	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Stakeholders are identified and communications prior to change requests?	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Security control					
Risk assessment is conducted and security controls documented according to risk	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The company maintains written procedures relating to controls over the physical security of the computer equipment	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The company maintains written policies or procedures related to the security controls over access to the systems	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Incident Reporting					
The company has a written policy for Problem/incident reporting	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
There are documented procedures for identifying and classifying problems (e.g. usability or interfaces)	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Application acquisition					
There is a written policy for acquisition of new application	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Telecommunication					
The company has a written policy for telecommunication	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
3.3 HR Function					
Recruitment and selection					
The company has a policy to deal with	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Recruitment	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Sexual harassment policy	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree

Probation policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Training and development					
The company has a compliance program or procedures that include the training and development of employees.	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Compensation and benefits					
The company has a policy to deal with	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Working time policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Vacation policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Leave policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Overtime policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Employee relations					
The company has a policy to deal with	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Communication policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Problem resolution policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Personal appearance policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Conflicts of interest policy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
3.4 Sales & Marketing					
Marketing					
The company has a documented marketing strategy	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
The company conducts a market research before launching a product	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Marketing channels					
There are specific marketing promotional channels	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Online marketing resources are being used	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
There is a social media plan and policy for customer relationship management	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
Sales					
There is a written policies involving Sales processes involved in selling products	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree
There are policies for account management	1	2	3	4	5
	Strongly disagree	disagree	Average	Agree	Strongly agree

3.5 Network Function					
There is a network policy that includes the acceptable use of network services and network authorization procedures.	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
There is network segmentation	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Restrictions are in place for numbers of email sent (assists in preventing spam)?	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
Network monitoring					
Employees internet access is monitored	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
The company maintains written policies or procedures related to the security controls over access to the Internet, use of Internet resources (e.g., electronic mail), etc.?	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree
There is a software package for monitoring system and/or user activity	1 Strongly disagree	2 disagree	3 Average	4 Agree	5 Strongly agree

APPENDIX B: QUOTATION FOR COMPANY X

Reverse Auctioning – In South African Rand



Option 1 -Standalone					
Sourcing Optimization	Price	Year 1	Year 2	Year 3	Total 3 year cost
5 Subscription/licenses *	891 820	891 820		0	891 820
Annual support planning on premise **		196 200	206 010	216 310.5	618 520.5
Total Cost Standalone		1 088 020	206 010	216 310.5	1 510 340.5

* Sourcing optimization includes 5 licenses of each, EBS Sourcing + EBS Sourcing Optimization + EBS ISupplier Portal

**Annual support increase by 5% per annum (Budgetary average increase). Fusion accounting hub do not require support. Support and free upgrades/updates are included in the subscription price.

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Reverse Auctioning – In South African Rand



Approximate Savings ZAR 502 272 with Global Accounting Hub promotion on license and support.

Promotion	Price	Year 1	Year 2	Year 3	Total 3 year cost
Sourcing Optimization					
5 Subscription/licenses*	262 300	262 300	0	0	262 300
Annual support planning on premise **		57 706	60 591.3	63 620.865	181 918.165
Total Cost		320 006	60 591.3	63 620.865	444 218.165
Fusion Accounting Hub					
10 Subscription/licenses	225 540	225 540	225 540	225 540	676 620
Global Promotion (first 6 months free)	-112 770	-112 770			-112 770
Total Cost		112 770	225 540	225 540	563 850
Total Bundle Cost		432 776	286 131.3	289 160.865	1 008 068.165

* Sourcing optimization includes 5 licenses of each, EBS Sourcing + EBS Sourcing Optimization + EBS ISupplier Portal

**Annual support increase by 5% per annum (Budgetary average increase). Fusion accounting hub do not require support. Support and free upgrades/updates are included in the subscription price.

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November 2015

