A STUDY OF USING INFORMATION TECHNOLOGY GOVERNANCE AS A TOOL FOR ACHIEVING BUSINESS OBJECTIVES – A CASE STUDY

BY

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DECLARATION

I, Osden Jokonya, declare that this thesis is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete reference.

O. Jokonya

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ABSTRACT

The objective of this research is to establish how Information Technology (IT) Governance supports business objectives in an organization. The relationship between IT Governance and organization business objectives continues to interest academics and practitioners (IT Governance Institute, 2003). Like governance generally, IT governance is about the decision rights and accountabilities that encourage desirable behavior in the use of IT. A major challenge of IT governance is resolving boundaries and scope between the organization and its business units. Investment in IT has in recent years become a strategic organizational choice, yet there exists little understanding of IT governance's contribution to business objectives (IT Governance Institute, 2003).

A case study research approach was used to get an in-depth understanding of IT governance in a single organization with many business units. The organization that was selected for this purpose is RioZim Limited (formerly Rio Tinto Zimbabwe), a mining company situated in Zimbabwe. Using a field survey of business and IT executives, this study examined how IT governance is contributing towards business objectives. Data was collected from all business units on various IT issues and business objectives. The questions that were asked centered on IT governance practices based on responsibility and authority for IT decision making. Some IT governance issues explored in the study include stakeholder involvement in decision making on major IT domains. The research examined how IT Governance is supporting the business objectives.

The results suggest that RioZim's IT governance does not adequately support business objectives. The study revealed that business objectives should drive IT governance. IT governance should be the responsibility of executives and all business units. The results of the study will add to the literature in demonstrating the importance of IT governance in supporting business objectives. It provides an assessment tool to business executives for evaluating their IT governance and it also provides guidelines for developing effective IT governance that supports business objectives.

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INTRODUCTION

1.1 Background to the Study

Today, corporate executives and boards of directors are looking at Information Technology as they would any other business unit, and they are now expecting the same level of efficiency, reliability and economic return from Information Technology as they do from other parts of the organization. The main reason for this is that the IT department has moved from being a commodity service provider to a strategic partner where IT is viewed as a tool for increasing business growth rather than just an expense (Weill, 2004).

This research focuses on the contribution of IT governance to organizations in achieving their business objectives. The study will focus on areas where IT can make a contribution to an organization in achieving its business objectives. A case study approach was used.

A literature search was conducted using a variety of methods: a search using tertiary institution literature sources, obtaining relevant literature that was referred to in books and journal articles, and Internet search. The search was limited to the research key words, "Information technology", "Strategy", "IT governance" and "business objectives". Search engines Yahoo and Google were used for the Internet search as they enabled the researcher to locate current and up to date items. The literature search showed how the research relates to previous researches.

This chapter is divided into a statement of the research problem, the research question, justification of the study, research objectives, research design and methodology, and limitation of the study.

According to Checkland and Holwell (1998), the terms Information System (IS) and Information Technology (IT) are often used interchangeably. Borrowing a concept from

economics, IS is demand oriented, that is, it defines the organization's demand for information and systems to support and enable the strategy of the business. Anand and Mendelson (1997) use the term IS to refer to the organization's information structure. IT is the supply side which is concerned with how that demand is to be met. It includes not just the technologies but also corporate data, IT competencies and skills to maintain the technology (Earl & Sampler, 1998; Feeny & Willcocks, 2000). Yet, while recognizing the distinction between IS and IT there must also be a governance structure put in place in order to manage the different aspects of information and systems requirements between the corporate and the business units.

According to Ward and Peppard (2003), the position of the IT resources in the organizational structure has been problematic since computing began. Peterson, O'Callaghan and Ribbers (2000) add that, as business environments continually change and new technologies evolve rapidly, how to govern IT for sustained innovation remains an enduring and challenging question. Most organizations in all sectors of the industry are fundamentally dependent on their information systems. According to Rockart (1988), IT has become intertwined with business. IT is reducing communication and transaction costs and promoting new structures and processes. In industries such as mining, the existence of an organization crucially depends on the effective application of IT.

According to the IT Governance Institute (2003), IT is a major component of capital spending by large organizations. According to Weill and Broadbent (1998), the IT governance process describes the mechanisms that enable business and IT executives to integrate business and IT decisions. Ross and Weill (2004) note that organizations with better than average IT governance policies can realize at least a 20 % higher return on assets than organizations with weak governance. The IT Governance Institute (2003) adds that an effective IT governance structure is the single most important predictor of whether an organization will derive value from IT or not.

According to the IT Governance Institute (2003), the current trends suggest that IT governance must become both more coordinated and more transparent. This is especially

important because in more companies, IT and the business are becoming one. To optimize the business outcome of IT, IT governance must reflect and incorporate business language, priorities, and processes to obtain buy-in from the business-side leadership. IT governance must also include an engaging, meaningful and transparent way for business-side leaders to participate. It must speak the language of the business in describing how IT can improve the operating margin and return on investment, and how it can help achieve the company's strategic priorities sooner rather than later.

IT Governance Institute (2003) research indicates that, organizations with above average IT governance performance also had superior profits as measured by a three-year industry-adjusted return on assets. The differences varied according to the strategy of the organization, but the organizations with above average governance had returns on assets more than twice that of the organizations with poor governance. Governance was not the only factor, but good governance often comes with effective management practices in all areas (Weill & Ross, 2004).

1.2 Background of the organization

RioZim (formerly Rio Tinto Zimbabwe) is a global company operating in a very competitive mining industry. After the restructuring of Rio Tinto Zimbabwe, Rio Tinto sold its 56% stake in Rio Tinto Zimbabwe and ceased to become an ordinary shareholder in Rio Tinto Zimbabwe. It was then proposed that Rio Tinto Zimbabwe should change its name to RioZim Limited. RioZim is one of the most diversified mining companies in Zimbabwe. According to the company Financial Director, RioZim is involved in the mining and processing of minerals which include gold, nickel, copper, coal and other platinum group minerals (internal document)

RioZim has four business units: Harare Head Office, Msasa Research and Development, Renco Mine and Empress Nickel Refinery (ENR). Head Office is responsible for coordinating the various business units through shared services. Empress Nickel Refinery produces high quality nickel and copper metal from matte from Botswana Copper Limited (BCL) in Botswana. Renco Mine is one of the biggest gold mines in Zimbabwe

with an average annual production of 1 000kg and employing about 1250 people. Msasa Business Unit is responsible for research, development and exploration (Internal Document).

1.3 Research Problem

Increasingly, today's corporations and public sector organizations are dependent upon IT, not just to support the traditional activities of the business but also to enable them to extend into new areas. In many companies, IT has moved from providing largely back office support to becoming the prime facilitator and enabler of the total business. In many sectors such as mining, that dependence is becoming total.

The behavior of the equity markets and changes in corporate IT spending have been closely linked in the past few years such as the internet boom. Exuberant expectations of the potential benefits of IT related spending went hand in hand with the late 1990s stock market boom, and retrenchment of IT spending was a central element of many companies' response to the stock market slide of 2000-2003 (IT Governance Institute 2005c). With previous studies by ING in 2004 indicating that IT related business investments have the potential to deliver far greater returns than almost any other conventional investment, the temptation to increase expenditure on IT is inevitable (IT Governance Institute, 2005a).

Expenditure on IT and its supporting activities has grown to the extent that, within many businesses, the level of IT related costs is second only to that of staff costs (IT Governance Institute 2005b). Investments in IT are growing, and business managers often worry that the benefits of IT investments might not be as great as expected. The same worry applies to the perceived ever-increasing total cost of the IT department, if there is no clear evidence of the value derived from the cost. In order to address concerns of business and IT executives about IT expenditure, performance measures should be in place to demonstrate the effectiveness and business value of IT. IT performance management should enable the business and IT to fully understand how IT is contributing to the achievement of business objectives.

Governance has become important in the IT world because IT expenditure have become so large in many organizations. However, centralizing all IT decisions is not the solution, because business units need a voice in decision making. Striking a balance between corporate and business unit needs is a major emphasis in IT these days. Another reason for the rising importance of governance is the issue of creating an IT portfolio that is in step with business needs. In most organizations, executives have far more opportunities than they can fund, therefore, they must find a way to prioritize the possibilities to best support their business' strategic objectives (Weill, 2004).

Corporate objectives and the objectives of business units are not always the same. The difference results in different IT contributions being required. This research then looks at how IT governance can assist organizations in achieving their business objectives. The research takes cognizance of the fact that business units and corporate objectives are not always the same. The research furthermore investigates knowledge of business objectives from business units and corporate and areas IT can help to achieve those objectives. The foregoing is an indication of the importance of effective IT governance and the role it can play in organizations.

1.4 Justification of the study

According to the IT Governance Institute (2002) the use of IT has the potential to be the major driver of economic wealth in the 21st century. While IT is already critical to organizational success (Griffiths & Remenyi, 2003), it provides opportunities to obtain a competitive advantage and offers a means for increasing productivity. Leveraging IT successfully to transform the organization and create value-added products and services has become a universal business competency (Guldentops, 2003). As the importance of IT continues to grow and firms attempt to balance the benefits of entrepreneurship and time-to-market with the advantages of centralized control and standardization, the need for effective IT governance will also grow.

In addition, today's corporate executives and boards of directors are looking at IT as they would do to any other business unit, and are now expecting economic return from IT as they do from other parts of the organization. At the same time, technology professionals are taking responsibility for producing fast, cost-effective, reliable business results. They are shifting their focus from completing IT projects to delivering business outcomes. According to the IT Governance Institute (2003), an estimated 68% of corporate IT projects are neither on time nor within budget and they do not deliver the originally stated business goals. They claim that during the last two years, $100 billion to $150 billion of US IT projects have failed.

The IT Governance Institute (2003) maintains that over 75 % of businesses today have ineffective IT governance. Weill and Woodham (2002) are clear in noting that one size does not fit all. Effective IT governance requires the harmonization of business objectives, IT governance styles and business performance goals. Weill and Woodham (2002) argue that effective IT governance encourages and leverages the ingenuity of a firm's entire staff complement in using IT, and not just the leaders, while still ensuring compliance with the firm's overall vision and principles. They state that effective IT governance must reflect individual companies' structures, goals, and styles. Thus there is a need to align IT investments with business priorities, execute them as efficiently as possible, and attain full visibility and control over initiatives and operations.

Lanowitz and Light (2004) maintain that, as IT aligns more closely with the line of business, IT governance becomes increasingly important to the delivery of insight and updates regarding the utilization of resources. Ross and Weill (2002), add that the IT department should be held responsible for delivering systems that are on time and on budget and that have the potential to be both useful and used. However, only business executives can be held responsible for making the organizational changes needed to generate business value from the new system. Until executives accept this responsibility, companies cannot hope to eliminate complaints about having spent too much money for too little value.

Ross and Weill (2002) claim that although senior managers need to ensure that IT spending and initiatives are aligned with and further the company's strategy and goals, such decisions are best made with input from both business units and IT executives. The best course is shared responsibility for IT governance between leaders on the business and IT sides. That is why more companies are setting up IT governance structures that follow principles similar to those used for financial governance. This helps everyone understand, for example, how software applications should be implemented. In the same way they understand how cash flow is managed across the company. The key is to ensure that IT-related decisions embody consistent principles about the role IT plays in the company.

All the issues described above point out that the critical dependency on IT calls for a specific focus on IT governance. This is needed to ensure that the investments in IT will generate the required business value. This study looks at some important existing theories (Hodgkinson, 1996; Kakabadse & Kakabadse, 2001), models and practices on IT governance and its structures, processes and relational mechanisms. While many researchers have highlighted the importance of IT governance for modern organizations, no research has looked at the contribution of IT governance to achieving business objectives. Focusing on IT governance to achieve business objectives can assist organizations in spending capital on projects with high returns.

This research used a case study research methodology in order to obtain a rich, in-depth picture of the topic under study which would not be possible through other research methodologies. Various research instruments such as interviews, document reviews and questionnaires were used to overcome the possible short comings of using only one instrument. The research findings will help business leaders in appreciating the role IT governance can play in their organizations in achieving their business objectives. From an academic perspective the research will contribute to the existing body of knowledge in the study area and stimulate further research.

1.5 Research objective

The objective of the study was to find out how IT governance can help RioZim achieve their business objectives. In order to achieve the research objective, this research study focused on answering the research questions posed in the next chapter. In addition the study intended to find out how IT issues are being addressed in the organization's four strategic business units.

1.6 Research Design and Methodology

A case study research design was chosen in order to develop theoretical propositions as well as to develop a rich understanding of a complex and contemporary phenomenon within its natural setting. The case study research approach allowed the researcher to take advantage of unique case features and opportunities for triangulation (Eisenhardt, 1989). Several research methods were used to conduct the study: they included interviews, document review and questionnaires. This helped to cover weaknesses inherent in using only one method (Yin, 1994).

The study used both qualitative and quantitative approaches for obtaining information from the organization that was the subject of the study. The qualitative approach provided flexible and responsive interaction between interviewer and respondent(s), allowing meanings to be probed and the topics to be covered from a variety of angles as well as allowing the interviewer to clarify questions to respondents (Sykes, 1991). To cover the weaknesses of quantitative survey questions, some open-ended qualitative questions were also included (Yin, 1994).

The data collection process was undertaken in phases using interviews, structured questionnaires, observations and document collection. This approach allowed a detailed study of the case with an opportunity for requesting feedback from the study participants. From a case study methodology perspective, a structured interview allowed multiple data sources, and improved construct validity and reliability (Easterby-Smith, Thorpe & Lowe, 1991; Eisenhardt, 1989; Yin, 1994).

Data collection utilized both quantitative and qualitative techniques including observations (actions, meetings, decisions and critical incidents), questionnaires, documentary evidence and interviews of participants. The combination of multiple data sources and data collection methods allowed for triangulation and the assessment of convergent validity (Yin, 1994). Given the sensitive nature of the data, confidentiality and anonymity were assured.

The quantitative data were analyzed using SPSS (a Statistical Package for Social Sciences). Data from the questionnaires were coded and entered into SPSS for analysis. The quantitative data were not subjected to significance tests. Frequencies and cross-tabulations were produced from coded data and were used to write up the results of the study.

1.7 Limitations of the study

While every effort was made to collect all required information, this was not possible in some cases due to confidentiality and unavailability of the information, consequently the accuracy of the information may have been affected. Since the case study is based on a mining organization, the results may not be applicable to other organizations in different industries. However, with the organization having diverse business units, the results may indicate similarities with other organizations in other industries. The primary drawback of case study research is that the results cannot be generalized.

1.8 Structure of the Study

The research report consists of five chapters.

Chapter 2 – Background literature
This chapter provides a detailed theoretical background of the study discussing theories and models that are available. It also discusses major IT decisions within organizations and business objectives that are supported by various IT governance models. A framework is developed for use in the case study.

Chapter 3 – Methodology
This chapter provides detailed information on the research strategy, methodology and methods. It justifies why the methodology is suitable for this particular type of study.

Chapter 4 - Results
A detailed review of the case study is presented using the framework developed in Chapter 2. This review helps to determine the organization's business objectives and IT governance model based on the decision making mechanism within the organization.

Chapter 5 – Conclusion
A conclusion is drawn from the research questions and objectives. Information from the previous chapter is evaluated against the model from the literature review in order to draw conclusions from the study.

1.9 Summary

This chapter laid the foundation for the research report. The research was justified, definitions were presented, the methodology was briefly described and justified, the report was outlined, and the limitations were stated. A brief overview of the research methodology and the objectives and value of the study was also provided.

The next chapter will cover the literature review on the subject under study as a way of identifying research studies already done with regard to the contribution of IT governance in business objectives.

CHAPTER 2

BACKGROUND TO THE LITERATURE

2.1 Introduction

Every year, information technology becomes more tightly woven into daily business objectives, making business technology optimization essential for business success. According to Weill (2004) the benefits and value of effective IT governance are great, but to get there takes effort and drive. Simply implementing new technology is not enough. Team behavior has to change as well. IT is critical for business leaders to be full engaged in the implementation of IT Governance in order for organizations to achieve business objectives.

This research focuses on how information technology governance can contribute to achieving business objectives in an organization. Addressing diverse business unit IT needs in an organization is a challenge where often there are more opportunities than the organization can fund. The biggest problem is that corporate and business units often have different business objectives derived from the nature of their functions.

Various search engines were used to search for relevant literature on the research study. They included Yahoo, Google and journal sites. Key words used to search the relevant literature were "IT Governance", "business objectives", "strategy", "Information Technology". The literature search helped to show how the research relates to previous research as well as provide fresh insights.

This chapter examines the literature that presents information and theories about the research topic. The chapter is made up of four main sections: Information Technology, IT Governance, IT decision making and Business objectives. The Information Technology section looks at literature on the impact of IT in the various industries in terms of strategy and competitiveness. The IT governance section looks at literature on various models and

how they contribute to different scenarios in the organization. IT decision looks at literature on how decisions are made on five IT Domains. Lastly the literature on the various business objectives and how they can be achieved is discussed.

2.2 Information Technology

Information Technology (IT) is a broad subject concerned with technology and other aspects of managing and processing information, especially in large organizations. IT deals with the use of electronic computers and computer software to store, process, and transmit information. In the competitive market, real-time systems are information technologies, which provide real time access to information or data. The ability of a company to process its data in a real time context increases the competitiveness of the company.

According to Weill and Ross (2004), over the past decades, the IT department within an organization has moved from being a commodity service provider to a strategic partner, where IT is viewed as a tool for increasing business growth rather than just as an expense. Information technologies are becoming increasingly more responsible for driving organizational direction. A study by the Boston Consulting Group (2004) highlights that opportunities still exist in most organizations to expand IT's value substantially. However, seizing these opportunities will take a coordinated push from both the IT and the business sides of the organization.

There are various factors that affect the business value of IT. Venkatraman, Henderson and Oldach (1993) argue that the difficulty in realizing value from IT investments is firstly caused by the lack of alignment between the business strategy and the IT strategy of the organization that is making investments. A study by Lighthouse Global in 2004 for IT Governance Institute identified the need to align IT and business strategies, and to ensure that IT investments are properly prioritized according to the business needs as the most important factors in achieving IT related business success (IT Governance Institute, 2005). Strong IT governance contributes toward the achievement of proper alignment between IT and business strategy.

Secondly the difficulty in realizing value is caused by the lack of a dynamic administrative process to ensure continuous alignment between the business and IT domain. The most important factor is the alignment between IT and business processes, organization structure and strategy. IT governance requires significant engagement of senior management to ensure that IT delivers value to the business. This value is not achievable or sustainable without alignment (IT Governance Institute, 2005).

IT Governance Institute (2005a) highlighted that the involvement of IT in strategy formulation is a two way process. There has to be confidence that IT can support and enable the resultant strategy but, at the same time, IT capabilities and opportunities must provide essential input to what that strategy should be. In traditional businesses, historically, IT had a supporting rather than an enabling role. Nowadays few business strategies can afford to ignore IT. Only by developing such an understanding will there be any clarity of the extent to which IT and business process alignment contributes to long-term sustainable organizational success (IT Governance Institute, 2005a).

2.2.1 Impact of IT in the Industry

Mckenna (1997) claims that life in the high tech information age is a real-time experience were events occur in real time. Pricing will become variable, changing with each transaction, often exhibiting first degree price discrimination. Customers expect immediate service customized to their needs, and will be prepared to pay a premium price for it. Mckenna (1997) claims that the new basis of competition will be time-based competition. In industries with high technology content, technical standards will become established and give the dominant firm a near monopoly.

Many articles on managing IT have been published, with examples of the opportunities that result from the impact of IT on industries. Notable examples are American Airlines and their Sabre Reservation System, and American Hospital Supply with their order entry distribution system (Robson, 1994). An awareness of possible impacts allows an organization to identify its own strategically significant opportunities. This type of

analysis requires managers to identify and classify the strategic opportunities that IT presents to their organizations. Earl (1989) suggests that this analysis will serve as an awareness raising activity by making management far more conscious of past and currently exploited opportunities and also as part of establishing the organization's position with respect to the business importance of IT.

Ward (1987) is one of the many writers who took examples of past opportunities that IT has provided and from them generated a classification set of what he refers to as opportunity areas. Benjamin, Rockart, Morton and Wyman (1983) also offer a system of categorizing the impact of IT. From the empirical evidence of the effect of IT a model is derived which suggests that IT may be significant in one of four ways, as illustrated in Figure 2.1 below:

Internal	Improve traditional ways
External	Alter traditional ways

Figure 2.1: Business Impact of IS/IT (Source: Robson, 1994)

The approach to the competitive market place (external) and the approach to operations (internal) can both offer two types of strategic opportunity, either by significantly improving the traditional ways of operating or by making significant changes to the way of doing business. Robson, (1994) suggests that this matrix be used by an organization to uncover the strategic opportunities presented by IT.

Silk (1991) classifies the generic impact which he refers to as benefit classes. These classes are efficiency, effectiveness and competitive advantage. An efficiency impact is felt where IT has made savings on other resources. The organization is doing the same job as it did but IT allows it to be done in a less expensive way. This impact reduces costs. An effectiveness impact would occur when IT makes other resources more

effective. IT allows the organization to do a better job than the one it was doing before. This impact improves the Return on Assets for those other resources. A strategic advantage impact can be detected where IT has changed some aspect of what the business does, by improving the business. This results in growth, defined as an increase in revenue or throughput or profit or whatever the relevant indicator is for the given organization, as set out in Figure 2.2.

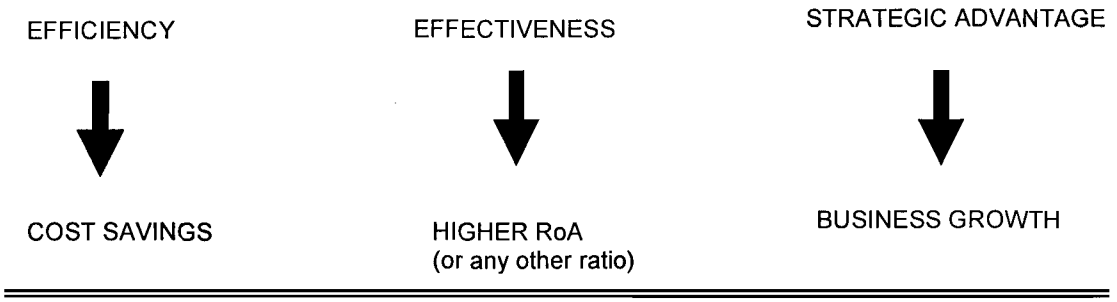

Figure 2.2: Impact of IS/IT (Source: Robson, 1994)

Being aware of the past and current impacts of IT allows one to analyze the categories they fall into which can give a useful tool for clarifying chaos; however, the models are non-prescriptive. The problem is that whilst any generalized model of the strategic impact of IT sounds useful it is difficult to make the step from the past stories into future plans. The opportunities described in those past stories are no longer strategic even if they were consciously chosen as such (Robson, 1994).

2.2.2 Business Portfolio Analysis

Portfolio analysis allows parts of the whole to be treated in different ways, be those parts strategic business units, products, or systems. Different strategies can be developed that acknowledge the different positions or potential. According to Guldentops (2003), the IT Portfolio has the potential not only to support existing business strategies, but also to shape new strategies. In this mindset, IT becomes not only a success factor for survival and prosperity, but also an opportunity to differentiate and to achieve competitive advantage. IT can offer a means for increasing productivity.

Guldentops (2003) indicates that leveraging IT successfully to transform an organization and create products and services which add value has become a universal business competency. According to Venkatraman (1999), in this view, the IT department moves from a commodity service provider to a strategic partner. According to Weill (2004) most of today's market leaders are emerging from major consolidation projects and re-engineering initiatives, all of which had a decided cost-reduction focus. The majority of these projects have large IT components, most often Enterprise Resource Planning (ERP) software initiatives that are designed to automate the newly engineered business processes and deliver a consistent view of all information across the corporation.

Applegate *et al.* (1999) derived a way of classifying organizations by their needs for information technology. This matrix separates businesses according to different degrees to which the organization is functionally dependent upon IT. The areas to which IT developments will create a competitive edge include Strategic, Turnaround, Factory and Support segments. Similarly systems can be positioned with respect to the importance they hold to the business under review. Figure 2.3 illustrates the strategic importance of IT.

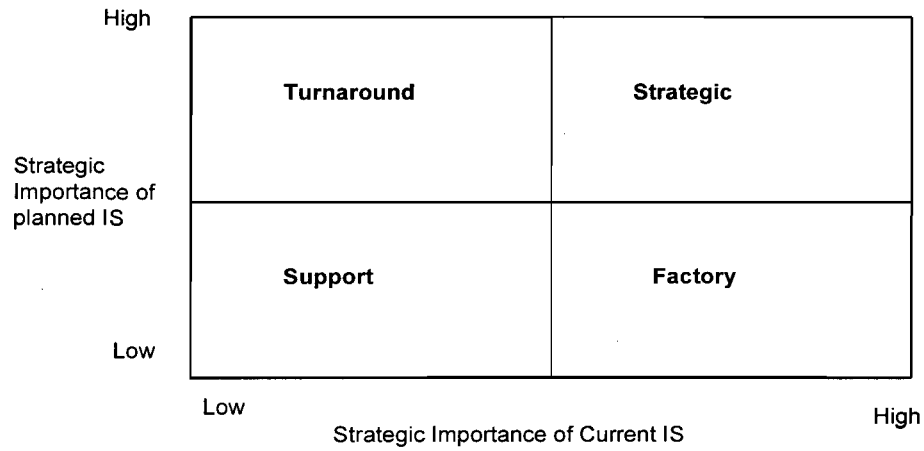

Figure 2.3: Strategic Importance Matrix (Source: Applegate *et al.* 1999)

Businesses in the Strategic segment currently depend upon IT for their competitive position and expect to continue to do so. Businesses in the Turnaround segment predict that their competitive well-being will depend upon IT in the future, although that is not currently the case. Businesses in the Factory segment competitively depend upon IT but do not expect that importance to remain in the future. For businesses in the Support segment, current IT is not competitively important, although IT may ease their operation, and they do not expect that to change in the future. This model provides a valuable tool in ensuring that IT strategies reflect real business value (Applegate, *et al.* 1999).

2.2.3 Impact of IT on Core Operations and Core Strategy

According to the IT Governance Institute (2003), the goal for technology use strongly influences the approach to IT governance. Two key dimensions must be considered: the impact of IT on core operations and the impact of IT on core strategy. These dimensions help frame the decisions that executives make in organizing and managing IT. The first dimension assesses the impact of IT on core operations. In some organizations a reliable, zero-defect operation of IT is critical to performing core value activities inside the organization and across the global industry. Failure for even a few seconds can bring the entire industry to its knees. In other firms, the impact of a day long IT failure would be much less immediate and severe.

The second dimension assesses the strategic impact of IT on the core strategy of an organization. In some organizations, a steady stream of technological innovations drives strategy evolution. In these organizations IT activities are tightly linked to the strategy of the organization and IT investment decisions are made in the boardroom by those charged with assuring the success and survival of the organization. In other organizations, IT priorities are targeted towards incremental, operational improvements that may improve an organization's cost profile but do little to change its position or power in the industry. The Strategic grid defines four categories of IT impact that help determine the approach used to identify opportunities, define and implement IT-enabled business initiatives, and organize and manage IT assets and professionals (Applegate *et al.* 1999).

2.2.4 Strategic Competitive Analysis of IT Opportunities

The industry analysis technique analyses future IT opportunities rather than the past effect or current situation. Read, *et al.* (2001) suggests that the strategic importance of IT could be assessed by the value creation of revenues from the delivery of products and services to customers that exceed cost of the delivery process. In essence, the impact of IT on value creation in an organization can happen, either through increasing revenues at marginal cost, or through reducing cost at marginal changes in revenue thus enhancing operating profits.

The most widely quoted framework for thinking about the strategic use of IT is the competitive force by Michael Porter quoted in (McNurlin & Sprague, 2004). Porter believes companies must contend with five competitive forces as shown in Figure 2.4. The model can be used to assess whether IT can influence the relative power of the five forces that affect an organization's overall profitability. Once the relative power of the five forces has been assessed, it is possible to analyze the opportunities to use IT.

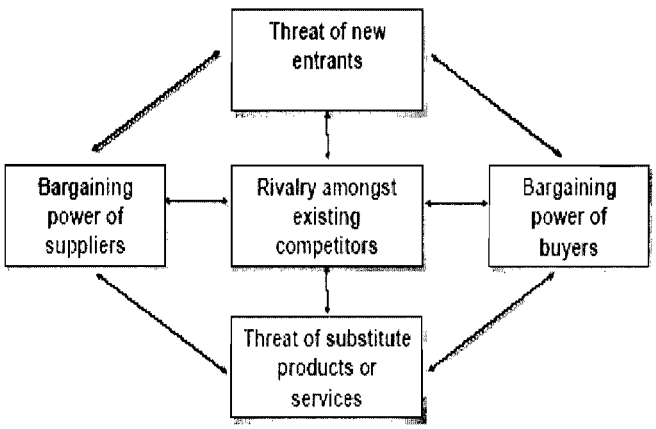

Figure 2.4: Porter's Five Forces Model quoted in (McNurlin & Sprague, 2004)

Based upon the Porter five forces model, an understanding of the business strategy gives insight into the strategic opportunities for using IT in support of the strategy. The organization can question how IT can help to advance the chosen strategy; that is to

permit lower costs or to differentiate products and services or, very rarely, both. The Porter model concentrates upon how the competitive environment affects the organization and how the competitive strategies are the means by which that organization alters the relative power in its favour. Use of the model will show where IT can give good returns on investment and highlights trends which pose significant opportunities or threats.

The highest level at which the concept of a generic business strategy can be meaningfully applied is at the strategic business unit level, although it is by no means always clear nowadays what is meant by strategic business unit level. In an era of shifting corporate groups and increasing business autonomy many elements of the corporate whole may be following different business strategies. Figure 2.5 indicates how IT can support different strategies within an organization.

LOW COST STRATEGY IT Application	**Business Area**	**DIFFERENTIATION STRATEGY IT Application**
Process Control Systems Stock Planning and Control Systems	Manufacturing	Total Quality Management Systems Progress Tracking Systems
Project Control Systems CAD Systems	R & D	Public research data access systems Dispersed research communication systems and e-mail
Sales call prioritizing systems Advertising & promotions tracking systems	Sales	Easy order entry and order query systems Total customer care systems Pricing Systems
Planning and Budgeting Systems Cost Control Systems	Finance	Business integration office automation systems

Figure 2.5: IT Support to Low Cost or Differentiation Strategies (Source: Robson, 1994)

Robson (1994) suggests that if the business strategy is viewed as an information set of managerial variables such as a mission, objectives, strategies, willingness to accept change and important constraints, the strategic IT planning is the process of turning this

business organizational set into the IT strategy set comprising the IT objectives, constraints and strategies. Obviously this technique must start by sorting out the business strategy set. By positioning an organization in a given segment, advice can be read off as to where IT is going to be critical to business activities. This model can be used to provide measures of the business importance of IT but, more usefully, it can refine the crude view into a more detailed picture of where and how IT can have impact on the business.

Porter (1985) suggests that all organizations have an internal value chain and in turn belong to an overall industry value system. The value chain model builds upon the process part of the analysis of information intensity. With this model IT opportunities can be identified by analysis of value chain activities and linkages. As part of an opportunity framework this technique is now used to identify the opportunities to enhance the internal value chain or access a greater share of the total profits available in the industry value system. Figure 2.6 illustrates areas in which IT can contribute in a value chain.

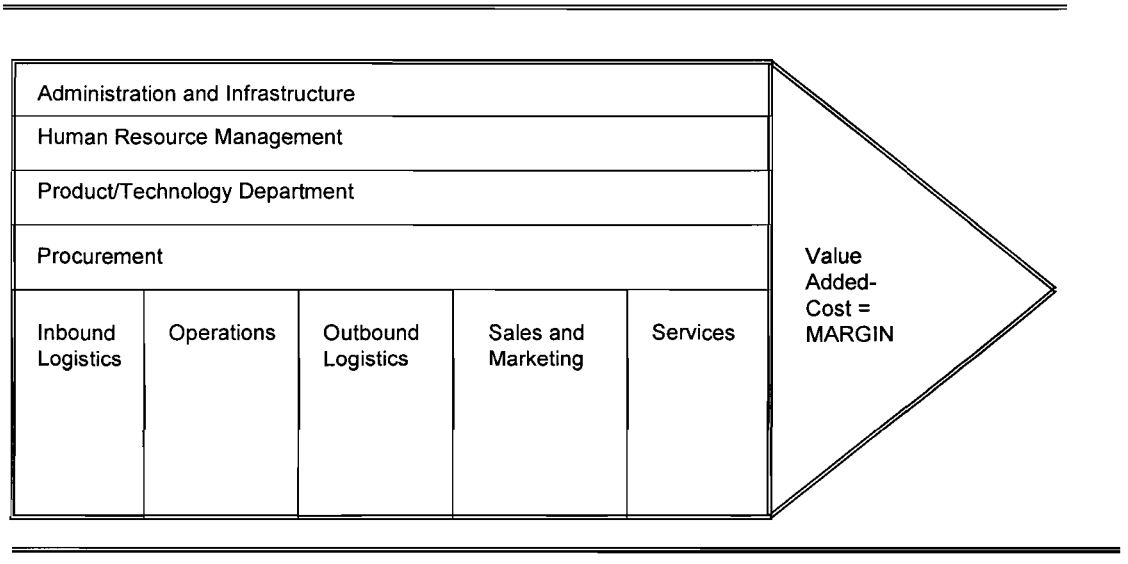

Figure 2.6: The Value Chain (Fleisher & Bensoussan, 2003)

Porter distinguishes between those internal activities that are primary and those that support them. Looking at what IT can contribute by way of support activities increases

the efficiency of the organization. Analysis of the nature of the value chain for an organization and consideration of the current impact of IT can give a picture of the business importance of IT and the potentially strategic opportunities for the future. Fleisher *et al.* (2003) highlighted that the value chain analysis provides a depth of insight into competitive strategy and is a widely used planning technique.

Whilst literature from the previous sections has highlighted the importance of IT and the contribution IT can make in organizations, without effective IT governance the benefits will remain a dream. This aspect is discussed in the sections that follow.

2.3 IT Governance

Ross and Weill (2004) define IT governance as the decision rights and accountability framework for encouraging desirable behavior in the use of IT. IT governance is seen as a framework that ensures that information technology decisions consider the business goal and objectives. Just like the ways in which corporate governance aids the organization in ensuring that key decisions are consistent with corporate vision, values and strategy, IT governance ensures that IT related decisions match companywide objectives.

According to the IT Governance Institute (2003), IT is a major component of capital spending by large organizations. It might thus be expected that IT governance, the corporate governance of IT, should be a significant concern of boards. The discipline of information technology governance derives from corporate governance and deals primarily with the connection between business focus and IT management of an organization. According to Weill and Broadbent (1998), the IT governance process describes the mechanisms that enable business and IT executives to integrate business and IT decisions, implement and monitor decision implementation, and learn from their effectiveness.

The IT Governance Institute (2003) claimed that the need for the introduction of IT governance principles stems directly from the recognition of the importance of the corporate governance framework. As one of the main resources of any organization,

information must be given special attention by the executive team, and the information technology must be managed with as much scrutiny as financial or human resources. IT can no longer be considered a separate and distinct discipline if organizations are to succeed. IT Governance must be extended to provide the leadership, organizational structures and processes that ensure that the organization's IT supports the organizational strategies and objectives.

The IT Governance Institute (2003) added that much of the complexity of IT governance arises from conflicting pressures of dealing with different and vitally concerned stakeholder groups, business executives, IT executives and users. All have conflicting goals, interests, and incentives. The need for better management of IT is one of several reasons organizations around the world are taking a new look at IT governance. IT has become a support and strategy tool, and few business processes can function without its support.

IT governance has become one of the most important issues of the 21st century with those organizations that get it right being able to realize the potential value from information technology (IT Governance Institute, 2003). IT governance highlights the importance of IT related matters in organizations and requires that strategic IT decisions are to be made by the board, rather than handled by IT managers. According to Van Grembergen (2004) the primary goal for information technology governance is to assure that the investments in IT generate business value and mitigate risks associated with IT.

The IT Governance Institute (2003) stressed that organizations are increasingly becoming aware that data, information and knowledge are core organizational resources. IT governance provides a framework within which organizations can establish direction, control and accountability for the management and use of information resources. IT is positioned to help organizations to achieve their business goals; however, organizations should demand traceable benefits from IT. The IT Governance Institute (2003) claimed that only one third of IT spending improves business performance and estimates that poor IT governance costs industry billions of dollars each year. Furthermore, 50-90% of IT

projects run over time, over budget or fails to meet productivity or efficiency expectations (IT Governance Institute, 2005a).

With the growing demands for transparency and compliance, the IT manager has increasing accountability for the integrity and consistency of information handling within the organization. Therefore, boards and executive management need to extend governance to IT and provide the leadership, organizational structures and processes to ensure IT sustains and expands organizational strategies and objectives. According to the IT Governance Institute (2003), organizations that actively design top level IT governance structures make and implement better IT related decisions. In many organizations, it is difficult to get IT governance right as both business and IT governance are poorly understood.

Research by the Boston Consulting Group (2004) found that companies that are most successful in addressing IT complexity share a number of attributes. Most critically they have gained broad buy-in from their business leaders at the corporate and business unit level. To help reach this consensus, they have established business and IT interfaces and an IT governance structure that allow the business and IT sides to have fact based discussions on the potential value added, as well as the tradeoffs, implicit in deciding where that position is.

2.3.1 IT Governance Function

According to the IT Governance Institute (2003) study, most organizations have not been very effective at IT governance because many executives do not make decisions about IT. So the IT department is forced to make decisions regarding priorities and investments. IT governance provides a structure for ensuring that decisions about IT support business objectives. It ensures that the right projects get the funding they need to address competitive threats or pursue new opportunities. It ensures that the IT organization and the lines of business share accountability for IT investments and it provides a framework for measuring IT effectiveness.

IT governance is becoming an important issue for organizations trying to leverage IT to provide a competitive advantage for companies. Business leaders have made numerous attempts to increase the understanding of how IT operates, how IT can be used to leverage the business and provide a competitive advantage for their organizations. While IT offers organizations many opportunities to enhance or transform their products and services, such efforts require co-operation between the organization's technology and the business specialists. It is often the case that the ways in which the organization utilizes the IT and the impact IT has on an organization's performance have been carefully guided by IT governance policies and procedures (IT Governance Institute, 2003). Ross and Weill (2004) note that organizations with better than average IT governance policies can realize at least a 20% higher return on assets than organizations with weak governance.

2.3.2 IT Governance Models

The position of the main IT resources of the organization in the organizational structure has been problematic for decades, but problems have been compounded as IT has pervaded and affected many parts of the business. Davenport, Eccles and Prusak (1992) see the positioning of IT activities from a political point of view. They suggest that all these types of positioning are actually power battles between various parties with specific interests. They distinguish these approaches to managing information politics, with power varying from corporate to business units.

Historically, most IT governance could be characterized as either centralized or decentralized in organization structures. While centralization and decentralization were viewed as essentially opposite organizational structures, they are, in fact, different manifestations of the same structure hierarchy in which decisions made at the top of the organization were carried out at lower levels. Centralization and decentralization pose significant trade-offs in terms of their costs and benefits. Thus, the degree to which any firm is centralized or decentralized depends upon which of the benefits offered the most value.

Depending on an organization's business, scope and IT maturity, centralized, decentralized or federated responsibility for strategic IT matters is suggested. Well defined control of IT is the key to success. The IT Governance Institute (2003) highlights that excessive IT complexity has been brought up mostly from decentralized IT governance processes. As organizations try to link their IT more closely to the business, they have decentralized authority and handed decision making rights for IT investments to the individual business units. This decentralization has resulted in business units making choices that optimize the impact on their business units while ignoring the impact on the broader organization. The result has been either strong business unit IT departments and weak corporate structures, or weak IT organization across the board. Until organizations address this complexity, they may find it difficult to rationalize IT.

According to Brown (1998), centralized IT governance is likely to be used by organizations that compete in single or related businesses and that seek IT cost efficiencies as well as cross unit synergies. The main advantage of centralized IT governance is that it provides centralized control of information technology resources. The bureaucracy and inflexibility of centralized IT governance creates inefficiencies. The bureaucracy can also affect innovation.

Decentralization gives individual business units autonomy over their own IT resources. According to Brown (1998), organizations that use decentralized IT decision making are likely to be firms with highly autonomous business units that compete in unrelated businesses. Decentralization pushes decision making to business units. When both fast and responsive provision of a service is required, then decentralization is the most appropriate method of delivering the service.

According to Weill and Broadbent (2003), while the debate is generally portrayed as alternating between centralization and decentralization, the middle ground has become an appealing alternative. The federal structure is often seen as capturing the benefits of both centralization and decentralization. With such a structure, the business units receive a

responsive service from decentralized IT functions, while at the same time a corporate IT function provides group-wide IT services and exerts some degree of central leadership and control of IT activities.

Federal IT governance is an approach to information management based on consensus and negotiation on the organization's key information elements and reporting structures. According to Ward and Peppard (2003) steering committees appear to be an obvious necessity in managing IT resources. Gupta and Raghunathan (1989), referring to a large survey of US companies, conclude that steering committees are one of the most effective ways of improving an organization's IT planning, by assisting in the integration of the IT function with business and by coordinating planning activities.

Figure 2.7 shows the federal IT organization with shared responsibilities between the corporate and business units. A corporate IT unit has primary authority and responsibility for IT infrastructure resource decisions, while business units have primary authority and responsibility for other IT resource decisions for their respective units. The corporate IT unit also typically has an oversight role for the decentralized resources, as well for any multi-divisional systems (Hodgkinson, 1996).

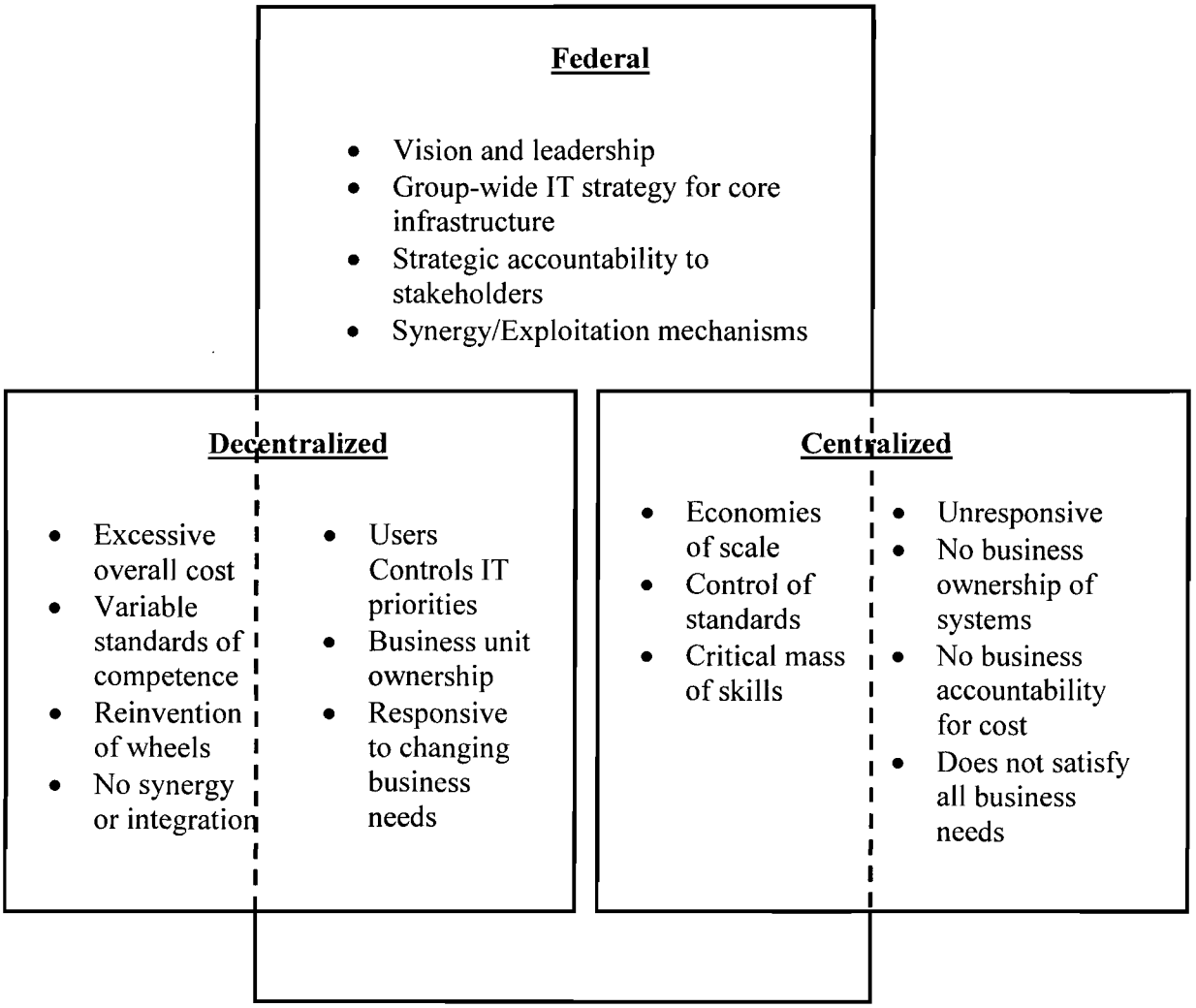

Figure 2.7: The Federal IT Organization (Source: Hodgkinson, 1996)

Owing to new customer demands and global competition, organizations are combining the cost efficiency and tight integration afforded by centralized IT governance with the creativity and customer intimacy afforded by decentralized IT governance. According to Ross and Rockart (1999), many firms are adopting federal IT governance models in which they push out decision making to local sites. In the federal IT governance model business units at the customer interface become accountable for meeting customer needs, while the corporate unit takes the coordinating role. The role of the corporate unit in these

organizations is to specify and develop the core competencies which enable the firm to foster a unique identity and generate economies of scale (Ross & Rockart, 1999).

McNurlin and Sprague (2004) note that global markets have forced firms to reduce cycle times and to present a single face to, and have a single view of, global customers. As a result firms have found it increasingly important to garner the benefits of centralization and decentralization simultaneously. Ross and Rockart (1999) add that, rather than relying on a hierarchical process to coordinate the interdependencies of teams, the federal model utilizes shared goals, dual reporting relationships, incentive systems that recognize competing objectives, and common processes.

The models mentioned above are ways of dealing with IT and the information resource of the organizations. These may be seen as rational organization design questions which depend on environmental issues such as size, diversity and other organizational properties (Fielder & Grover, 1996). IT governance demands careful thought about who makes decisions and how those decisions are made, particularly for issues such as IT infrastructure, IT principles, IT architecture, IT application and IT investment. An effective IT governance structure is the single most important predictor of whether an organization will derive value from IT.

Whilst literature (Ross *et al.*, 1999; Van Grembergen, 2004) from the previous section highlighted how IT governance can help organizations to develop a framework for decision making, the next section focuses on the impact of IT decision making on IT resources in the organization. If a company does not make correct decision within the IT domains it does not get a return on IT investment.

2.4 IT Decision Making in an Organization

According to Weill (2004), in deciding on the organization of IT resources, the key questions are what aspects of IT are best managed centrally and which are best devolved. Furthermore, should IT activities be managed by the specialist IT functions or should they be managed by business management themselves. In addressing these questions the

organization needs to define authority, responsibilities, policies, coordinating mechanisms and control procedures. In short, the organization must put in place guidelines for decision making and define mechanisms to achieve coherence across the range of decision areas.

Organizations make major IT decisions on five IT domains namely,

- IT principle
- IT architecture
- IT infrastructure,
- IT application and
- IT investment.

Source: Weill (2004)

IT principles are high level statements about how IT is used in the business (Broadbent & Weill, 1997). IT architecture is an integrated set of technical choices to guide the organization in satisfying business needs (Ross, 2003). IT infrastructures are the base foundation of IT capability (Subramani & Broadbent, 2000). Business applications are specific business needs for purchased or internally developed IT applications (Earl, 1993). IT investments are decisions about how much and where to invest in IT including project approvals and justification techniques (Devaraj & Kohli, 2000; Ross & Beath, 2002).

2.4.1 IT Principles

According to Broadbent and Weill (1997) IT principles are high level statements about how IT is used in the business. Agarwal and Sambamurthy (2002) maintain that, the strategic role of IT is to facilitate innovative business strategies and processes. Peppard and Ward (1999) indicate that, where an IT function is perceived as making a valued-added contribution to the business and where there is a close relationship between the IT function and the rest of the business, IT has a significant positive impact on business performance. If the relationship is poor, the organization is probably faced with a long struggle, first of all, to improve the perception of IT and second to get business managers

involved in IT decision making. It is advantageous to have an objective view of the current role and contribution of IT in the business, the role and contribution of the IT function itself, and of the perception of this from the rest of the business.

Earl (1996) notes that it is the organizational issues in the strategic management of IT that matter most and that what distinguishes organizations that are successful with IT is not technical sophistication, but how they manage IT. According to Marchand, Kettinger and Rollins (2000) organizations must emphasize the importance of a strong business/IT relationship and instill appropriate behaviors and values regarding information and its use in the organization.

McHugh, Merlin and Wheeler (1995) argue that with today's development in IT, it would be possible for an organization to go beyond Business Process Re-engineering (BPR) within the organization. They put forward the concept of a networked organization, which is a set of companies that acts organically and in an integrated way. Each company in the network provides a different process capability that represents the core competence of the company. Ross *et al.* (1996) and Bharadwaj (2000) argue that, for an organization to apply IT to enhance competitiveness in its industry, it must develop an effective IT capability. Figure 2.8 presents a model adopted from Morton (1991) summarizing the different levels of IT deployment and the potential business impact.

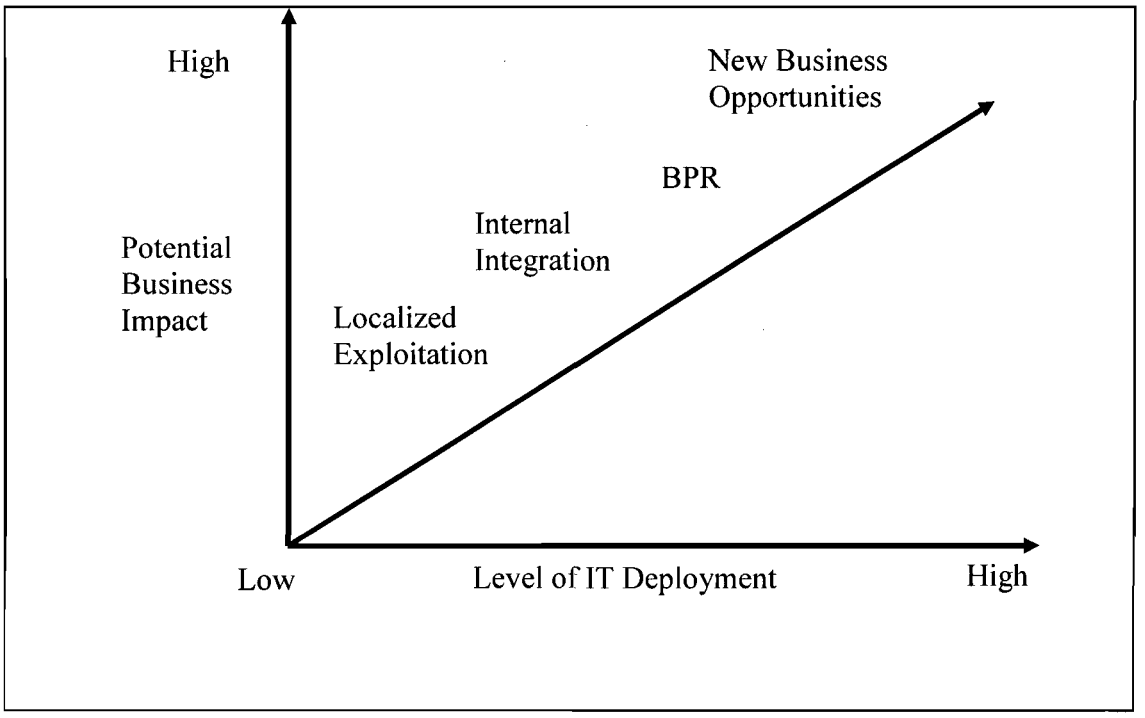

Figure 2.8: Maturity levels of IT deployment (Source: Morton, 1991)

2.4.2 IT Architecture

According to Weill and Vitale (2002), the term IT architecture lacks a universally accepted definition. More often IT architecture refers to an organization's list of technology standards. According to Sauer and Willcocks (2002), the power of IT architecture lies in synergy: aligning business goals (established and anticipated) and IT needs and resources. They highlight that the role of IT architecture is to bring order to the otherwise chaotic world of IT by defining a set of guidelines and standards and then adhering to them.

The development of IT architecture standards is a critical step in changing the way technology is selected and deployed in the organization. Effective IT architecture makes the deployment of new technologies and product offerings simpler, more efficient, more predictable and, perhaps most important of all, less risky. In a time of highly constrained IT budgets and personnel resources, IT architecture can be the key to continued profitability (Weill & Vitale, 2002).

A properly applied architecture methodology rationalizes IT investments, reduces risk, finds best ways to extend IT, and promotes flexibility and interoperability. IT architecture helps to simplify decision making and, when supported by a strong IT governance process, ensures that individual business goals, as well as the enterprise goals are met. Business units can make decisions on standards and negotiate funding models for the shared infrastructure, including replacing and upgrading technologies before they become obsolete (Sauer & Willcocks, 2002).

IT architecture provides the strong foundation that organizations need efficiently to address and support present and future business demands. The enterprise-wide application of sound architectural principles ensures that organizations can deliver the functionality its customers are demanding today, and still be prepared to simply and inexpensively deploy new products and services tomorrow (Weill & Vitale, 2002).

2.4.3 IT Infrastructure

Duncan (1995) defines IT infrastructure as the set of IT resources that makes feasible both innovations and the continuous improvement of IT systems. IT infrastructure is viewed as the technology framework that guides the organization in satisfying business and management needs. According to Davenport (1998) IT infrastructures are increasingly shaping the process strategy, despite a fairly common belief that strategy ought to shape the IT infrastructure.

Ward and Peppard (2003) found that firms that seize the opportunities of packaged infrastructures without being controlled by them can greatly increase organizational capabilities through software. IT infrastructure is expected to provide a stable and robust platform for dynamic organizational processes, but rapidly changing technologies and customer demands have challenged the organization's ability to develop stable and reliable infrastructures.

Different levels of management and users perceive the value of IT infrastructure differently, as illustrated in Figure 2.9. Figure 2.9 also shows that the higher one goes in

the measurement hierarchy, the more dilution occurs (i.e. the less influence IT management can exercise). This also means that measuring the impact of an IT investment is much easier at the bottom of the hierarchy than at the top. However, successful investments in IT infrastructure have a positive impact on all four levels of the business value hierarchy. Furthermore, there is an increasing separation between the creation of value and its subsequent realization. Therefore, it is important not only to focus on measurements based on value realization, but also to take into account the organization's performance in creating value.

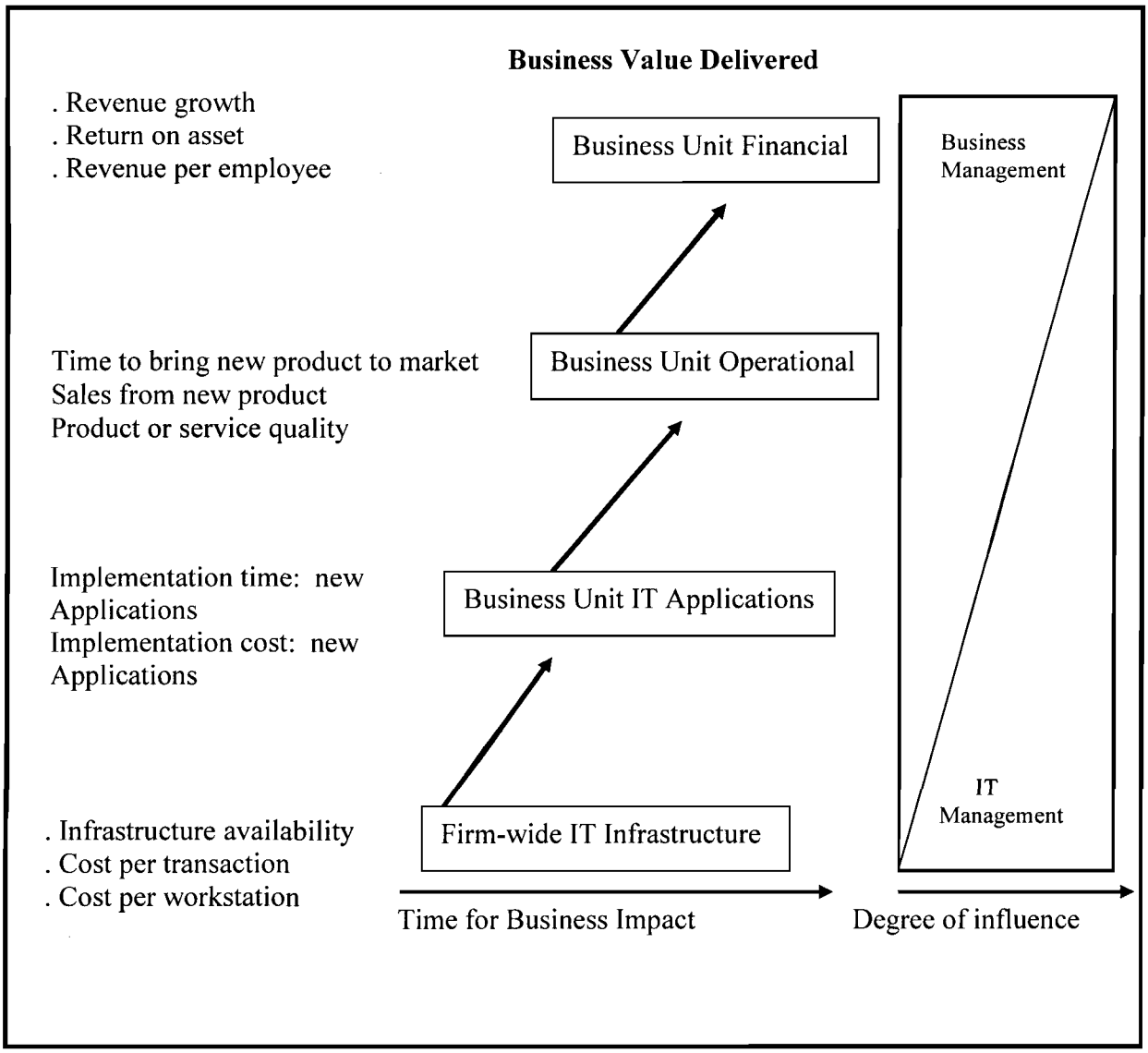

Figure 2.9: Views of IT Value (Source: Weill & Broadbent, 1998)

Broadbent (1998) found that firms in industries where products changed quickly had more extensive IT infrastructure capabilities. Funding for shared infrastructures demands that management considers investments with longer payback periods than other classes of applications (Weill & Broadbent, 1998; Ross & Beath, 2002).

2.4.4 IT Business Applications

The last decade has witnessed an unparalleled growth in investment in IT applications (Weill & Broadbent, 1998; Ross & Beath, 2002). Applications that produce benefits by business integration or sharing of assets require strong business coordination, competent IT management and sustained investment in resources. The mainstream academic literature has documented numerous studies (Brynjolfsson and Yang, 1996; Kohli and Devaraj, 2002) that examine the relationship between investments in technology and payoffs realized in terms of enhanced organizational performance (Ward & Peppard, 2003).

IT enabled initiatives, from business process re-engineering to enterprise resource planning (ERP), have elevated the importance of investing strategically in IT applications. According to Ward and Peppard (2003), ERP systems are configurable information systems packages that integrate information and information based processes within and across functional areas in an organization. Ross and Beath (2002) add that the internet alone has created a vast set of opportunities to re-engineer processes, introduce online products and services, approach new customer segments, and redo business models. But while opportunities seem boundless, the resources required by these investments, capital, IT expertise, management focus, and capacity for change are severely limited.

The need for data sharing varies widely with the nature of a company's activities. A conglomerate usually needs less data sharing across the firm than does a functionally organized, one-product organization. Most organizations, however, need companywide, fully interoperable e-mail and financial systems. All these applications employ database

components. Increasingly, enterprise-wide interoperability and data exchange are part of new IT projects. Only centralized IT governance can cost-effectively develop and distribute such systems to users, or coordinate distributed IT projects in a way that assures interoperability. The benefits of central IT governance are long term cost avoidance and technological risk reduction. The downside of this approach, however, is lack of short-term responsiveness to local business issues and problems.

2.4.5 IT Investment

Investments in IT are growing extensively, and business managers often worry that the benefits of IT investments might not be as great as expected (IT Governance Institute, 2005b). The same worry applies to the perceived ever-increasing total cost of the IT department, without clear evidence of the value derived from it. Good IT performance management should enable the business and IT to fully understand how IT is contributing to the achievement of business goals (IT Governance Institute, 2005b). The relationship between investment in IT and its effect on organizational performance continues to interest academics and practitioners. A surge in the number of studies (Weill & Broadbent, 1998; Ross & Beath, 2002) that examine the IT payoff is a testimony to this challenge (Devaraj & Kohli, 2000).

Detailed firm-level studies by Brynjolfsson and Hitt (2002), present results indicating a positive relationship between technology and performance. Other firm-level studies by Devaraj and Kohli (2000) found evidence of the positive effect of IT capital and labour on outcome measures among hospitals. Many organizations view investment in IT as a way to combat competition by improving productivity, profitability and quality of operations. With increased investments in technology comes the responsibility to provide economic justification.

Today, more than ever, IT executives encounter the justification issue because of senior management's insistence that the investment be properly utilized. Traditional business case approaches to IT investment attempt to identify projects with best profit potential. The strategic importance of IT, however, has forced organizations to weigh the returns on

individual investments against demand for organization-wide capabilities. Organizations must assess opportunities to leverage existing systems and infrastructures to create new capabilities (Devaraj & Kohli, 2000).

Typical return on investment analysis is often not meaningful in evaluating infrastructure investment since it does not measure unquantifiable benefits of strategic systems. New methods for justifying IT investment which identify and quantify the intangible benefits are needed. Organizations need to understand the context in which the evaluation is taking place and then apply the appropriate technique (Brynjolfsson, 1993; Haynes *et al.*, 2000).

Measuring IT performance should be a key concern of business and IT executives as it demonstrates the effectiveness and added business value of IT (IT Governance Institute, 2005b). Traditional performance methods such as analysis of return on investment capture the financial worth of IT projects and systems, but reflect only a limited (tangible) part of the value that can be delivered by IT. The more sophisticated IT balanced scorecard is an evaluation method that incorporates tangible and intangible values. Use of an IT balanced scorecard is one of the most effective means to aid board and management to achieve IT and business alignment (IT Governance Institute, 2005b).

According to Ross and Beath (2002) organizations should make four distinct types of IT investments: transformation, renewal, process improvements, and experiments. Although the four types of IT investment are conceptually distinct, in practice they can be difficult to distinguish. A successful experiment may prompt a process improvement or process improvement initiatives may begin leveraging a transformation long before the experiment is complete. Ross and Beath (2002) argue that even when they occur simultaneously, organizations should distinguish these investments from one another, because these investments will deliver different values to different parties. This is highlighted by Figure 2.10 which indicates different returns from various IT investment portfolios:

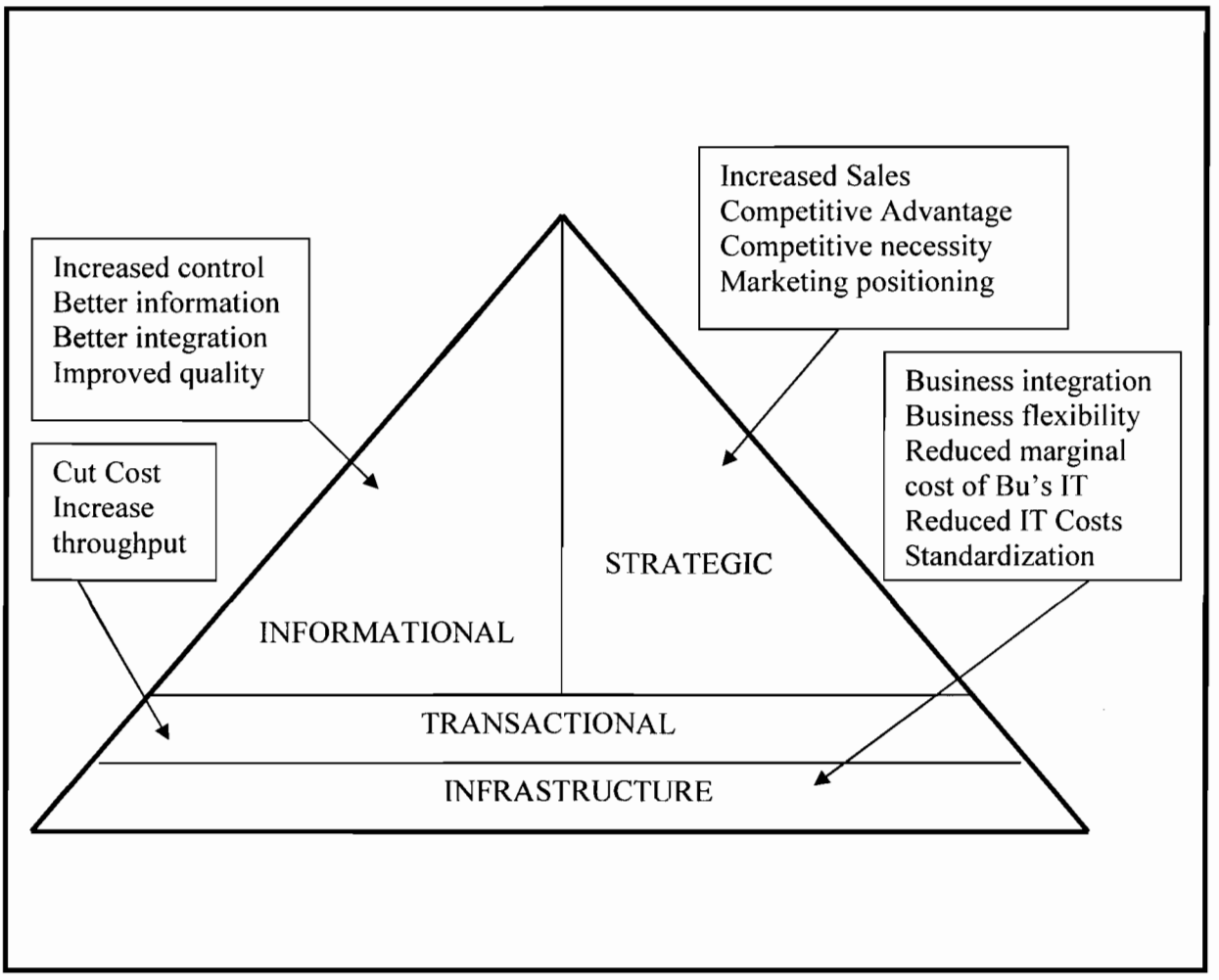

Figure 2.10: Rethinking IT as an Investment Portfolio (Source: Weill *et al.* 1998)

Whilst the previous section focused on who should make decisions on the five major IT domains, the following section focuses on how the decision rights and accountability should be formulated, and on some organizational features of the business objectives which can be supported by IT governance.

2.5 Objectives

Organizations recognize that short-term profit maximization is rarely the best approach to achieving sustained corporate growth and profitability. A key element in any business planning process is to set business objectives. These are usually described by reference to

profitability, growth, market share and social responsibility. Objectives must reflect the values held by the organization, its management and major shareholders. Figure 2.11 below shows the relationship between business objectives and IT activities. To achieve business objectives, the organization measures the performance of IT activities. According to Weill (2004), the best IT governance is the one that is closely linked to corporate business objectives.

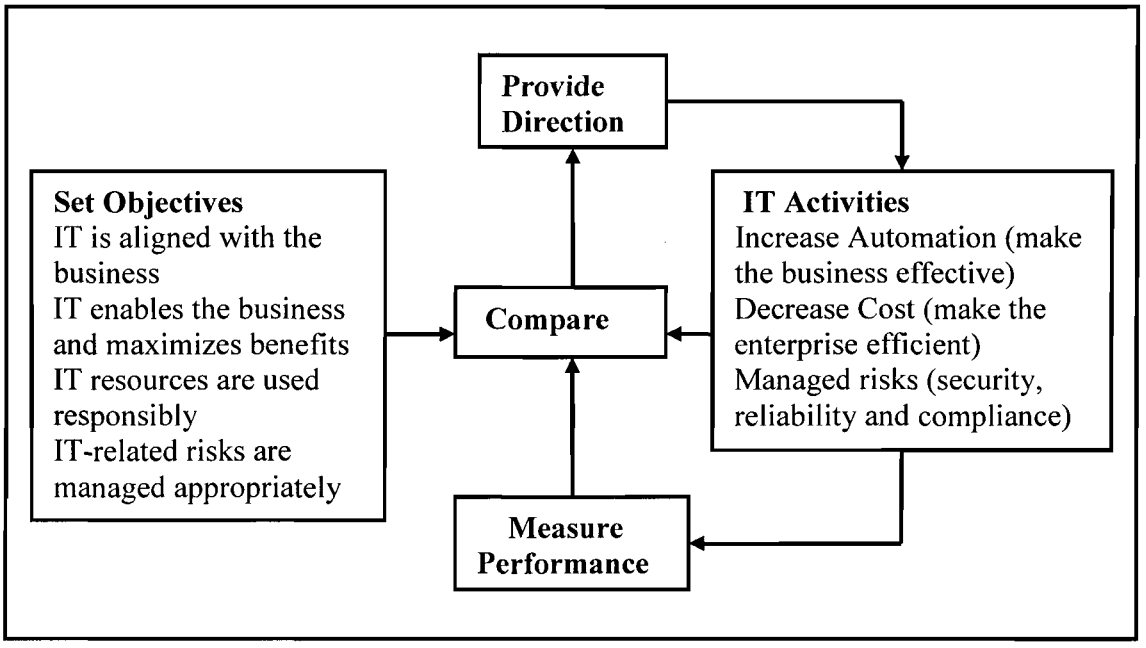

Figure 2.11: IT Governance Framework (Source: IT Governance, 2003)

Organizations first set their business objective which is aligned with IT. Some of the organization's business objectives include the use of IT to enable the organization to exploit business opportunities and maximize IT benefits. These objectives can be achieved through using IT resources responsibly and managing IT related risks appropriately. IT activities increase automation, decrease cost and manage risk. The organization will need to compare the set of objectives and IT activities to provide direction and measure performance. The role of IT governance should therefore be to support business objectives (IT Governance, 2003).

2.5.1 Profit Business Objectives

The ability of any organization to operate in the long run depends on attaining an acceptable level of profits. Strategically managed organizations characteristically have a profit objective, usually expressed in earnings per share or return on equity. Managers constantly try to improve the productivity of their systems. Organizations that can improve the input-output relationship normally increase profitability (Robson, 1994). Therefore, organizations always state an objective for productivity. Commonly used productivity objectives are the number of items produced or the number of services rendered per unit of output. However, productivity objectives sometimes are stated in terms of desired cost decreases. For example, objectives may be set for reducing defective items, customer complaints leading to litigation, or overtime. Achieving such objectives increases profitability if unit output is maintained (Robson, 1994).

According to Weill (2004) profit business objectives tend to have a more centralized IT governance approach where business leaders make decisions on IT principles, IT architecture and IT investments. Some organizations make use of senior business management committees involving the Chief Information Officer (CIO) to achieve cost control and standardization. The corporate IT plays an important coordinating role because it is one of the few groups that interact with all business units and can thus see firm-wide opportunities for sharing and re-use across business units, business processes and regions.

Weill and Broadbent (1998) highlight that properly implemented shared infrastructure encourages collaboration, re-use of intellectual capital, and implementation of best practices across the organization. Most importantly, shared infrastructure can help businesses control costs. IT expenses which were previously scattered and hidden in pockets throughout the organization become more visible and easier to manage, allowing the allocation of increasingly scarce resources to the highest priorities.

2.5.2 Growth Business Objectives

One measure of corporate success is relative dominance in the marketplace. Larger organizations commonly establish an objective in terms of competitive position, often using total sales or market share as measures of their competitive position. An objective with regard to competitive position may indicate an organization's long term priorities. Competitive positioning, however, may sometimes result in an organization subordinating its main objective (Strickland & Strickland, 2001).

Organizations decide whether to lead or follow in the marketplace. Either approach can be successful, but each requires a different strategic posture. Therefore, many organizations state an objective with regard to technological leadership. Organizations recognize their responsibilities to their customers and to society at large. In fact, many organizations seek to exceed the demands made by stakeholders. They work not only to develop reputations for fairly priced products and services but also to establish themselves as responsible corporate citizens (Hitt, Ireland & Hoskisson, 2003)

According to Weill (2004) growth business objectives have IT governance structures that strive to balance the dominant entrepreneurial needs of the operational units within the organization. The idea in growth business objectives is to empower the operational units to be innovative and not to be concerned about standardization that can come later. Decentralization encourages innovation through motivation and elimination of bureaucracy.

2.6 Research Question

The literature review of the study has shown that it is important to examine whether IT Governance can contribute to achieving business objectives within organizations. According to the literature, today's corporations and public sector organizations are becoming dependent upon IT, not just to support the traditional activities of the businesses but also to enable them to extend into new areas. IT Governance is an essential component of ensuring that value is obtained from investment in information technology. It involves selecting investments and managing them from inception to final

retirement. As with any aspect of governance, without leadership, commitment and support from the top, it is unlikely to realize success.

Although in theory IT Governance can assist an organization to achieve business objectives, this is not the case for many organizations. Whether the case organization can benefit from IT Governance is the research question of the project. In addition the main research of the study will also provide answers to the following research questions:-

- Are IT contributions the same for various business units and departments in the same organization?
- Are business units' users aware of their business objectives and the importance of IT in achieving them?
- Do business units know the value of IT committees for achieving their business objectives?
- Are the business units within an organization able to identify areas in which IT can help to achieve their business objectives?

2.7 Summary

Despite increasing recognition that IT and business are indivisibly linked, consolidating across business IT process and applications remains an on-going challenge for many organizations. The resulting IT complexity not only drives up redundancy and cost, but is also detrimental to the organization's competitive advantage. In order to address this challenge, since business and IT are increasingly interdependent environments, important responsibilities should fall within both camps. Business management cannot realistically formulate strategies without sufficient knowledge of the underlying IT issues and expect technology to deliver differentiation. In other words, business management cannot afford not to involve IT in business planning.

The following chapter will look at how the research was conducted based on the research strategy, approach and methodology of a case study. The reason for selecting a case study approach, its strengths and weaknesses will be highlighted. A discussion of how the data were collected and analyzed will be presented.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The previous chapter reviewed literature on the subject under study, namely, how IT governance can assist organizations to achieve their business objectives. Whilst the reviewed literature may not be exhaustive it gave an insight into challenges many organizations are facing in getting value from IT investments. The literature also showed how organizations have become dependent on IT for competitive advantage and achieving their business objectives.

This chapter provides detailed information on how the research was conducted on the organization that was the subject of the case study. It also highlights the research approach, strategy and methodology that were used to carry out the study. In addition, instruments used in the research, how they were used, their strengths and weaknesses are also discussed. Lastly the method used for analyzing the data, as well as the credibility and limitations of the study are also discussed in detail.

For the purposes of the research, a distinction was made among research approach, research strategies and research methods (Robson, 2002). The study adopted an interpretive research philosophy because the social world of business and management is far too complex to lend itself to the application of definite laws as in the case with physical sciences. Therefore, unless other philosophies are used the rich insight into this complex world would be lost. Not only are business situations complex, they are also unique. They are a function of a particular set of circumstances and individuals.

3.2 Research Approach

The case study approach was found to be more appropriate for the study of a single organization with many business units. The approach is more suitable when working with a variety of data collection methods in order to establish different views of a

phenomenon. This study used both qualitative and quantitative research approaches. The qualitative approach was particularly concerned with the context in which events were taking place (Robson, 2002).

According to Sykes (1991) the main reason for the potential superiority of qualitative approaches for obtaining information is that the flexible and responsive interaction which is possible between interviewer and respondent(s) allows meanings to be probed, the topics to be covered from a variety of angles and questions made clear to respondents. This is how the research topic was studied, with multiple views being taken of the subject and multiple data collection instruments being adopted. The literature review concentrated on the research methods, research philosophy, and research design (Yin, 1994). A variety of literature was reviewed, including books, journals and newspapers. The literature could be categorized into two types; academic and non-academic, which broadly speaking differentiated between sources that could inform and sources that would trigger further research.

The research used triangulation by data type. Although the research adopted a mainly qualitative approach to data collection this does not mean that quantitative data were excluded. The different types of data appeared appropriate for different purposes. Quantitative data collection was treated as part of a multi-method approach to data collection. According to Miles and Huberman (1994), this may be contrasted with quantisizing where qualitative data are converted to quantitative data, and with linking data types, where direct links are made between qualitative and quantitative data from the same sources.

Some of the quantitative data used in the research were obtained from primary document sources such as company accounts and a variety of secondary documentary sources including official reports. For example, figures extracted from the company accounts and statistics generated longitudinal indicators of changes covering periods before study. The fieldwork was done from December 2005 to April 2006. The first fieldwork included structured interviews with company directors and senior managers using interview

protocol (Appendix A). The list of questions asked during these interviews was useful to design the questionnaires which were used to collect data from heads of departments from the four strategic business units.

3.3 Research Strategy

Melin (1985) stresses that research strategy was regarded as a pattern in a stream of actions with strategic implications. The research strategy was therefore the resultant mix of research intentions, opportunities, accidents, actions, philosophy, analysis and choice. Finally, the research method was taken to mean the systematic application of data collection instruments. As a consequence, the choice of research method was regarded as between case study, archival analysis, history and survey, with each method based on data collection instruments, interviews, observation and questionnaires.

There are several definitions of a case study; however Benbasat, Goldstein and Mead (1987) present a comprehensive definition that draws from a variety of sources. They define a case study as a research approach that examines a phenomenon in its natural settings, employing multiple methods of data collection to gather information from one or few entities (people, groups, or organizations), on a phenomenon that is not clearly evident at the outset. Robson (2002) defines a case study as strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its life context. Consequently, one of the values of the case study approach was the opportunity for complex, in depth research not possible through other methods such as the survey. However, unlike the survey, one of the challenges of the case study method was its lack of routine, a factor which has led some practitioners to regard the case study as the most demanding form of investigation (Yin, 1994).

A case study research strategy was chosen in order to develop theoretical propositions in order to develop a rich understanding of a complex and contemporary phenomenon within its natural setting. Studies of governance practice are hard to carryout, because of the difficulty of obtaining interviews with directors of major companies, hence a case study was chosen based on the accessibility of the case organization. A case study helped

to collect rich descriptive data on how IT governance can assist organizations to achieve business objectives and it also allowed the researcher to take advantage of unique case features and opportunities for triangulation.

Although it has been claimed that all research can be enhanced by the use of multiple data collection instruments, this claim is believed to be particularly true of the case study approach (Yin, 1994). Indeed, the use of multiple sources of evidence in the case study is regarded as a strength which other research methods do not have. Stoecker (1991) argues that some of the main criticisms of the case study method, such as a perceived weakness when compared with quantitative methods, can be answered by the application of a variety of instruments. A combination of methods (triangulation) was therefore used to avoid reliance upon a single method. According to Denzin (1970) the rationale for this strategy is that flaws of one technique are often the strengths of another, and by combining methods, observers can achieve the best of each, while overcoming their unique deficiencies. Consequently, a multidimensional picture could be taken of a complex phenomenon.

Bryman (1988) states that within a case study a wide range of different people and activities are invariably examined so that the contrast with survey samples is not as acute as it appears at first glance. The single case may in fact encompass a number of settings, where for example it involves a study of a large organization with sites across the country, or even around the world. RioZim has four strategic business units which are different from each other: they are mining, refinery, exploration and head office. The four strategic business units are unique in terms of their IT needs.

3.3.1 Site Selection

The site of the case study was chosen for its main activities, which dealt with IT governance issues and application within various business units in an organization. The selection also considered the question of access as being among the main criteria for choosing the case organization. The case site was selected based on a combination of accessibility (to business executives and business managers), interest (in the issues of IT

governance) and diversity (diversity of business units in size and operation). The sampling frame was the current population of executives, business unit managers and functional heads within the organization's four strategic business units. The research collected the primary data from 30 respondents who represented the total population of heads of departments and sections from RioZim's four strategic business units. Accessibility was made easier since the researcher had previously worked for RioZim.

3.4 Data Collection Method

The first visit covered structured interviews with directors and senior managers who were encouraged to provide expansive answers to a number of open questions. The interviews included all directors and senior managers of strategic business units. This part of the fieldwork was consequently used to identify and develop themes and patterns which could be compared with the results from the literature review and questionnaires distributed to heads of departments. It also provided a means to develop a broader understanding of IT governance issues in RioZim from the executive perspective (Saunders, Lewis & Thornhill, 2003).

Besides from structured interviews, data were also gathered from a variety of sources (primary and secondary) including internal company reports and minutes from meetings and official reports. However, it should be noted that the interviews at this stage of the research were largely exploratory in nature. This proved to be a valuable approach in identifying a number of important issues which could be covered in the questionnaires to follow. It also prompted the researcher to open a research day-book in which notes, ideas, and questions were routinely recorded (Saunders, Lewis & Thornhill, 2003)

The second fieldwork was based on questionnaires distributed to heads of departments of the four strategic business units. This was consistent with the research approach and with a desire to explicitly study the context of IT governance in the organization. One of the major challenges experienced by many researchers is how to ensure that the data collected will enable the research question(s) to be answered and objectives achieved. According Cooper and Schindlier (2001) investigative questions are the questions that

need to be answered in order to address satisfactorily each research question and to meet each objective. For this study the investigative questions were generated with regard to the research questions and objectives. The fieldwork helped identify the variables needed to collect data to answer the research questions.

Research methods demand a consistency between the types of research problem and the phrasing of the fundamental research questions. The research problem was split into a number of questions which were subsequently assessed using a pretest, and modified before the survey. Given the sensitive nature of the data, confidentiality and anonymity was assured. Each of the research methods discussed above uses one or more techniques for collecting empirical data. These techniques range from interviews, observations, questionnaires to documents.

3.4.1 Interviews

The main qualitative research tool used for investigating is the interview, a data collection instrument which has been described by Yin (1994) as the essential source of information for the case study method. According to Healey and Rawlinson (1994) the interview is regarded as a data collection instrument which can produce a richness of data unobtainable through other means. Healey (1991) also makes the point that the interviewer has more control over who answers the questions in comparison with a questionnaire which may be passed on from one person to another.

Saunders, Lewis and Thornhill (2003) found that managers are more likely to agree to be interviewed, rather than complete a questionnaire, especially where the interview topic is seen to be interesting and relevant to their current work. An interview protocol was used as an effective interview tool for conducting interviews (Appendix A). The interviews targeted company executive directors and strategic business unit managers. Interviews commenced with objective questions, with questioning being mainly open-ended and aimed at developing a relationship. Three directors and eight managers were interviewed. Interviewees were asked question which relate to their role in IT issues in the organization.

Amongst the problems encountered were asking respondent questions which were not relevant to their experience or the expertise of the individual. It was therefore decided to revise the approach to the case study questioning by making interviews semi-structured, with specific preparation being made for each separate interview. Whyte (1982) maintains that even unstructured interviews should be structured towards the research problem. Consequently, the process of interviewing was as carefully organized as was the content of the interviews.

The advantage of the flexible approach was the ability to incorporate emergent issues during the interviews. Although the majority of the issues had already been identified through the literature review, some became evident as interviews progressed. A further outcome of the semi-structured approach was that follow-up interviews could be used to clarify queries from initial meetings, to cover topics which had not been previously discussed, to explore emergent issues in more detail, and to track the changing interpretations of the individual over time (Saunders, Lewis & Thornhill, 2003).

Besides pre-specified items, the interviews also included exploratory questions covering historical developments of IT in the organization. On site interviews were conducted with corporate and strategic business unit managers. Interviewees were asked to focus on specific issues, but also encouraged to expand their comments into areas of personal interest concerning IT governance in the organization. Steps were taken to ensure that the interview data collected could be verified to the greatest extent possible (Robson, 2002)

At the beginning of each interview the respondent was reminded that information was being collected by the researcher for study purposes. They were promised that their contribution would remain confidential. Furthermore, they were informed that any opinion which emerged from the research would not be directed at individuals or groups of individuals. The relationship between the researcher and the respondent was consequently based on trust. Questions were posed in a neutral way, with interventions well timed and phrased.

The researcher was aware of the potential biases of the case study interviewing (Saunders, Lewis & Thornhill, 2003). The negative aspects of bias were managed in a number of additional ways. For instance, efforts were made to avoid phrasing questions in a leading way. Steps were also taken to demarcate volunteered information, to search for contrary evidence, and to compare interview data with observation. This allowed the interviews to be rated in terms of effectiveness, value of information obtained and areas requiring clarification.

3.4.2 Observation

The research used observation to develop a greater understanding of RioZim's physical environment. Patton (2002) suggests that a common mistake among observers is to take the physical environment for granted. During the fieldwork the researcher had a chance to observe IT projects which were taking place. The two projects were the upgrade of the Enterprise Resource Planning system and implementation of a planned maintenance system. The researcher had the opportunity to observe how meetings were conducted, who were involved, and who made the decisions. Taken on their own, these observations provided useful sources of information. However, whilst it was both undesirable and impossible to filter out these influences, it was important to take a more systematic approach to observation.

The researcher regarded observation as an unobtrusive measure because observations were being made without the knowledge of those being observed. Observation was regarded as just one data collection instrument. This meant that observation became part of an iterative cycle of combining and comparing data from a variety of sources. This was consistent with the nature of the investigation which was sensitive to the emergence of data. The research was consequently able to harness the rigor of combining observation with other data collection instruments.

3.4.3 Questionnaires

According to Tull and Hawkins (1993), a questionnaire is simply a formalized set of questions for collecting information. Wright and Crimp (2000) add that it is an

indispensable tool for the researcher to examine attitudes and facts, since the results are critical to the research outcome. This approach was intended to allow respondents to reply in their own terms without predetermining the content of their contribution.

Ghauri, Gronhang and Kristianslund (1995), note that there are many factors that will affect the results of a questionnaire: the questions must be asked in very simple and concise language, everyone must be able to understand the question in the same manner, each question should deal with only one dimension, there is no escape route in the questions, questions should be placed in the right order, and the layout of the questionnaires should look neat and tidy. Considering these factors the questionnaire was designed for the study.

Patton (2002) argues that data collected in this way is affected by the respondent's ability to communicate in writing, the inability to probe or review contributions' and the reliance on respondents' providing full information. The survey was based on the use of structured questionnaires which contained both closed and open-ended questions. There were twenty-two questions which were divided into three sections.

The first section refers to the demographic data questions one and two (business unit and department). The second section covered business objectives and IT governance issues. The last section covered benefits associated with IT for each department. Questionnaires were targeted at all functional heads in all business units. The IT Department helped in distributing questionnaires to various department heads. Questionnaires were found to be appropriate due to the large number of targeted respondents in the organization.

The focus was to find out the involvement of heads of departments in IT governance issues through a questionnaire. The questionnaires were primarily intended to generate their views of the research problem. Each questionnaire included written requests for information and requests for responses.

3.4.4 Documents

Besides interviews and a literature review, further dimensions of data were obtained through the analysis of documents. For the purposes of this research, two types of documents were identified; primary documentary data produced by RioZim, and primary documentary data produced about the sector. Both internal documents and external reports were collected. Internal documents included executive memos, business plans, IT plans, IT investment procedures, project manuals, minutes of meetings, reports, internal surveys, financial reports, company newspapers and memoranda. These documents were obtained from numerous sources.

Scott (1990) suggests four criteria for assessing the quality of documents: authenticity, credibility, representativeness and meaning. Documents were only one in a number of distinct data collection instruments and were regarded in terms of their representation of particular meanings rather than in terms of presenting facts. Document authenticity was largely assessed on the basis of comparison with other sources of data.

The documentary evidence made an important contribution to the representation of management perceptions. The organization's business plan provides information on the business units and organization business objectives. Minutes of meetings were used to verify whether what management said during interviews was correct. Furthermore, the documents allowed indirect access to other information which may otherwise have been inaccessible to the researcher.

It was more difficult to assess whether or not the documents were representative (Scott, 1990). It was also difficult to determine what constituted a document. For example, one of the main ways of communicating information was via the electronic mail which meant that there were no printed copies of messages. In addition, the organization's management controlled which documents the researcher saw. Consequently, the documents used in this research were not regarded as being totally representative. However, they were regarded as having been representative in terms of illustrating different and potentially inaccessible perspectives of organization information.

Documents were considered within the context in which they were produced and how they contributed to the longitudinal nature of the research. This was the case with the organization's business plans for the previous years. Documents were therefore primarily regarded as an important way of supplementing other instruments. However, their contribution was controlled by triangulating documentary data with data collected by other instruments.

3.5 Data Analysis

Patton (2002) suggests that there are no formal, universal rules to follow in analyzing, interpreting, and evaluating qualitative data. However, Altheide and Johnson (1994) argue that there should continued be concern about producing texts that explicate how one claims to know what one knows. One of the potential dangers of adopting a predominantly qualitative research approach would lie in not explaining how the researcher turned the raw data into findings. This research has attempted to outline the process of developing a mass of raw data gathered during the survey into the more theoretical framework contained in the study.

Pattern matching was used to analyze qualitative data (Yin, 1994) which involved reading respondents' comments (questionnaires and interview transcripts). The range of responses was described and narrative was used to illustrate both the typicality and diversity of responses. A statistical package called SPSS (a computerized software package) was used to analyze the quantitative data. The data were analyzed by counting the frequency with which certain features occur among participants' responses. The summarized data were then subjected to a variety of statistical measures to identify patterns or trends (descriptive statistics) and assessed to determine what inferences could be made from the data about the general population (inferential statistics) (Ghauri *et al.*, 1995).

The researcher took the view that analysis is the process of bringing order to the data, organizing what there is into patterns, categories and basic descriptive units.

Interpretation involved attaching meaning and significance to the analysis, explaining descriptive patterns and looking for relationships and linkages among descriptive dimensions. The raw data were sorted chronologically in order to obtain meaning from the data. Cross-tabulations, correlation and analysis of variance were used to compare trends across strategic business units and departments. This helped to reveal differences of importance of IT between strategic business units. The approach to analysis was therefore intensive and comparative (Ghauri *et al.*, 1995).

3.6 Credibility of the Research Findings

According to Easterby-Smith *et al.* (1991) academic research is frequently assessed on the basis of questions regarding objectivity, validity, reliability and generalizability. Kirk and Miller (1986) argue that this theory is believed to derive from quantitative research which makes it difficult to apply in the context of qualitative research.

3.6.1 Objectivity

The objectivity of the research was dealt with in a number of ways. The researcher tried to present as full as possible a description of the methods used in the study. The data were subjected to competing explanations, most notably in the application of different theories of IT governance. By addressing such issues the researcher sought to reduce any potential bias in the work. This means that the researcher presupposed that the reality is socially constructed and interpreted. The researcher tried to represent the social world constructed by those researched, and to highlight the influences on the way in which this had been interpreted by the researcher. As a result of this effort, the reader should be better placed to make his/her own interpretation of the research findings (Patton, 2002).

3.6.2 Reliability

Reliability in the case study is concerned with demonstrating that the procedures in the study can be repeated with the same results. As has been outlined previously, the research was based on a number of fundamental research questions which linked the fieldwork and theory. These questions were used to maintain the focus of the work, while at the same time allowing relevant issues to be encompassed during the fieldwork. Efforts were made to collect data from a variety of data sources and using a variety of data collection

instruments which would be consistent with the research questions. Furthermore, data were assessed on a number of dimensions including the degree to which meaning was shared between the researcher and the respondent, and consistency with data gathered through other means.

3.6.3 Validity

The internal validity of the findings was taken to mean the degree to which the findings have meanings for those interested in them. Triangulation was used extensively to synthesize multiple perspectives and clarify meanings. Construct validity was supported through the use of multiple sources of evidence, the use of key informants to review the case study report, and by maintaining a chain of evidence. In addition, findings were drawn from the case which covered a number of different contexts. Furthermore, efforts were made to identify disconfirming evidence, and to interrogate the data using rival explanations. Finally, where areas of uncertainty arose, these were noted and identified in the text. Consequently, the issue of credibility was addressed in terms of description, interpretation and theory.

3.7 Ethical Consideration

Conducting a research study requires ethical considerations. Disclosure or leakage of the confidential information gathered from participants by researchers may give rise to irreparable injury to the parties involved. Prior to conducting the research study permission to conduct research was granted by the organization. This had important implications for the negotiation of access to people, the organization and the collection of data.

Access to staff requires permission from their manager. The researcher requested permission from the responsible managers to access the research population in the organization. In one instance where the business manager had changed, the researcher had to renegotiate access permission before conducting the survey. By seeking permission to conduct the research, the researcher was able to secure practical help and advice to access the research population. The researcher also considered other ethical implications of the research, namely confidentiality and anonymity of the respondents,

which could potentially have negative implications for the respondents directly or indirectly.

3.8 Summary

This chapter highlighted how the research was conducted in terms of the research approach, strategy and methodology. A case study approach was used in the study due to its superiority of depth for an individual organizational study. This afforded the opportunity of triangulation in terms of data collection methods (questionnaires, interviews, observations and documents) and data type (qualitative and quantitative).

This chapter also highlighted how the data were analyzed to produce results for the next chapter, by mentioning weaknesses, strengths and limitations of the tools used to conduct the study. Ethical considerations were also covered to show how they can impact on a research study. The research design and methodology thus provided detailed information on how the research systematically accumulated and analyzed data to derive the research findings presented in the following chapter.

The next chapter will present patterns of results and analyses them for their relevance to the research questions. Frequency summary tables and tables of statistical data are presented. The next chapter also provides some comments with regard to research findings in the context of the research question and literature.

CHAPTER 4

ANALYSIS OF THE FINDINGS

4.1 Introduction

This chapter presents the detailed findings of the research. The data collected from the Research Questionnaire (Appendix B), interviews and source documents is analyzed by means of frequency tables and cross-tabulations. Only valid and complete responses were keyed into the SPSS software and the results presented do not include invalid data such as incomplete questionnaires. The data were subjected to various statistical tests. The findings of frequency, cross-tabulations and statistical tests are interpreted and some comments presented.

Correlation was used to assess the strength of relationship between variables and to identify association. Correlation also helped to answer the likelihood of the relationship occurring by chance alone. The findings were limited to demonstrate that there is an association between variables. One–way ANOVA was used to test for differences among independent groups, namely business unit function (Administration and Operation) and Department function (Administration and Technical). The data for the two variables were recoded to produce two groups. The one-way analysis of variance helped to assess the effect of group on knowledge of business unit objectives and areas IT can help achieve business objectives.

The research is focused on how IT governance can assist organizations in achieving their business objectives. The results of the research will help organizations in investing in IT projects that support their business objectives at business unit level and corporate level although their objectives may be different.

4.2 Background information

The results of this study were based on the interviews conducted, document reviews of the organization's business, observations, and questionnaires administered to the organization's strategic business units. The organization's four strategic business units are Head Office, Msasa, Empress Nickel Refinery (ENR) and Renco Mine. The interviews targeted senior managers and directors whilst questionnaires targeted heads of departments.

4.2.1 Demographic Variables

This section presents the frequencies of the demographic variables of the respondents in terms of age, sex, level of education and occupation.

	Frequency	Percentage
18-30 years	1	3
Above 30 years	29	97
Total	30	100

Table 4.1: Age of respondents

Table 4.1 shows the age of respondents. The majority (97%) of the respondents were more than thirty years old. Only 3% of the respondents were between 18 and 30 years. The high number of respondents above 30 years is attributed to the fact that the research targeted heads of departments and sections in the organization. Experience and education are often the prerequisites for these positions.

	Frequency	Percentage
Male	27	90
Female	3	10
Total	30	100

Table 4.2: Gender of respondents

Table 4.2 shows the gender of respondents. The majority (90%) of the respondents were male compared to only 10% female respondents. The gender imbalance can be explained by the fact that most mining environments are dominated by males. Very few women are attracted to working in the mining environment. Further analysis revealed that all the women were working for the administrative business units not operational sections.

	Frequency	Percent
College Diploma	5	17
Bachelor's degree or higher	25	83
Total	30	100

Table 4.3: Education level of respondents

Table 4.3 shows the education level of respondents. The majority (83%) of the respondents has a bachelor's degree or higher as their level of education. 17% of the respondents has college diplomas. Education and experience are most often prerequisites to be head of department or section.

	Frequency	Percent
Accountant	4	13
Personnel Officer	4	13
Administrator	1	3
Engineer	7	23
Geologist	1	3
Safety Officer	1	3
Metallurgist	4	13
IT Administrator	3	10
Purchasing Officer	3	10
Surveyor	1	3
Miner	1	3
Total	30	100

Table 4.4: Occupation of respondents

Table 4.4 shows the occupation of the respondents. 23% of the respondents were engineers, either mechanical or electrical engineers. Accountants, Personnel Officers and Metallurgists had each 13% of the respondents. IT Administrators and Purchasing Officers had each 10% of the respondents. The remainder, Geologist, Safety Officer, Surveyor and miner had each 3% of the respondents.

4.2.2 Description of variables

Business Unit	Frequency	Percentage
Head Office	6	20
Msasa	8	27
ENR	9	30
Renco Mine	7	23
Total	30	100

Table 4.5: Respondents of RioZim by business units

Table 4.5 shows numbers of respondents per business unit. The research collected the primary data from 30 respondents which represented the total population of heads of departments and sections from RioZim's four strategic business units.

	Frequency	Percentage
Administration	10	33
Technical	20	67
Total	30	100

Table 4.6: Respondents by departments

Table 4.6 indicates that 33% of the respondents were from administration and 67% of the respondents were from technical departments. This was after the data was regrouped based on technical and non technical employment. The distribution was based on the research design which had the objective of being representative of all department and section in the organization.

	Frequency	Percentage
Yes	24	80
No	6	20
Total	30	100

Table 4.7: Knowledge of business unit's objectives

Table 4.7 indicates that most respondents (80%) said that they were aware of their business objectives compared to 20% who did not know. After the respondents were probed to explain their business unit objectives, the number of respondents who could explain decreased from 80% to 73%. This means that some respondents who said that that they knew their business unit's objectives actually did not know them. Without the use of follow-up questions it would have been difficult to determine whether respondents were being truthful or not. Although the responses on objectives were evenly distributed most of the respondents mentioned increasing production as their main business objective.

	Frequency	Percentage
Yes	29	97
No	1	3
Total	30	100

Table 4.8: Respondents' views on the importance of IT in achieving business objectives

Most of the respondents (97%) said that they considered IT to be important in achieving their business objectives. Only 3% said they did not. Asked to explain the importance of IT in achieving their business objectives, 27% said it is essential for communication, 30% said IT is important for information availability and decision making, whilst 20% mentioned that it helps in improving productivity. The rest of the respondents mentioned information sharing and data acquisition. There was 10% no respond.

	Frequency	Percentage
Yes	1	3
No	11	37
Not Sure	**18**	**60**
Total	30	100

Table 4.9: Existence of IT committee in the organization

Table 4.9 indicates that most respondents (60%) were not sure if an IT committee existed and 37% of the respondents said they do not have an IT committee. 3% said the organization has an IT committee. Interviews conducted with the directors revealed that the organization does not have an IT committee but directors at times met to discuss IT issues within the organization. However, there were no minutes to indicate that IT issues were being discussed as per their claims. All respondents said they were not members of an IT committee.

	Frequency	Percentage
Yes	17	57
No	13	43
Total	**30**	100

Table 4.10: Membership of other committees in the organization

Table 4.10 indicates that whilst the organization does not have an IT committee, 57% of the respondents were members of other committees in the organization. 37% of the respondents were members of the Health, Safety and Environment (HSE) committee. Only 43% of the respondents do not belong to any committee. The remaining 20% of the respondents were evenly distributed among other committees.

	Frequency	Percentage
Yes	10	33
No	7	23
N/A	13	44
Total	30	100

Table 4.11: Discussion of IT issues in committee meetings

Table 4.11 shows that 33% of the respondents said that they discuss IT issues in their meetings whilst 23% said they do not discuss IT issues. The remainder did not belong to any committee hence it was not applicable. However, the fact that 44% did not belong to any committee, is an indication that most of the respondents who belong to a committee discuss IT issues at their meetings.

	Frequency	Percentage
Yes	27	90
No	3	10
Total	30	100

Table 4.12: Benefit of IT committees to the organization

According to table 4.12 most of the respondents (90%) said IT committees are of benefit to the organization whilst 10% said they do not think IT committees can be of benefit to the organization. Most of the respondents said IT committees can help in discussing IT issues thereby involving users and also helping in raising awareness on the capability of information technology.

	Frequency	Percentage
Yes	13	43
No	17	57
Total	30	100

Table 4.13: IT department meeting user's needs

Table 4.13 shows that most respondents (57%) said that their IT needs are not being met by the IT department, while 43% of the respondents agreed that their IT needs are being met by the IT department. Hardware, software and training are the major areas which respondents highlighted as not being adequately addressed by the IT department.

	Frequency	Percentage
Yes	8	27
No	22	73
Total	30	100

Table 4.14: User involvement in IT decisions

Table 4.14 indicates that most respondents (73%) said that they are not consulted in IT decision making whilst only 27% of the respondents said they are consulted in IT decision making. Those who agreed are consulted on specialized systems such as SCADA and PLC systems. Most of the respondents (36%) from technical departments said they want to be consulted on applications, hardware and training.

	Frequency	Percentage
Yes	**28**	93
No	2	7
Total	30	100

Table 4.15: Perception of user involvement in IT issues

According to Table 4.15 the majority of the respondents (93%) said users should be involved in IT issues within the organization whilst only 7% said no. About 45% of those who said users should be involved in IT issues highlighted that user involvement will benefit the organization by having systems that meet users' needs. User involvement ensures that their needs are being taken into account and will result in improved IT delivery.

	Frequency	Percentage
Inventory and cost tracking	11	37
Cost control	13	43
Productivity	18	60
Process Controls	15	50
Inefficient business process	11	37
Equipment utilization	12	40

Table 4.16: Areas IT can help improve in business units departments

Table 4.16 shows that when users were asked to rank five important areas where IT can assist their business units, 37% of the respondents said IT can assist in improving inventory and cost tracking. 43% of the respondents said IT can help to improve cost control in their departments. Most of the respondents (60%) said IT can help their departments to improve productivity. Half of the respondents indicated that IT is important in improving process controls within the organization. 37% of the respondents said IT can help in improving the business process, while 40% of the respondents said IT can help their departments to improve equipment utilization.

4.2.3 Cross-tabulation by business units

This section shows the results by cross-tabulation of respondents' answers by business unit. This was important to establish the relationship between the respondents' answers and the business unit. This helped to establish whether the respondents' answers were influenced by the business unit.

Business Unit	Percentage		Total
	Yes	No	
Head Office	67	43	100
Msasa	88	22	100
ENR	89	11	100
Renco	71	29	100

Table 4.17: Knowledge of business unit objectives by business units

Table 4.17 shows the results after categorizing by using cross-tabulations. 67% of the head office respondents knew their business objectives compared to 88% for Msasa respondents, 89% respondents for ENR and 71% respondents for Renco Mine. ENR and Msasa had the highest percentage of respondents who knew their business unit objectives.

Business Unit	Percentage		Total
	Yes	No	
Head Office	100	0	100
Msasa	100	0	100
ENR	**89**	11	100
Renco	100	0	100

Table 4.18: Importance of IT in achieving business objectives by business unit

Table 4.18 shows the results of cross-tabulation of departments and the importance of IT in achieving business objectives. When asked whether they consider IT important in achieving their business objectives, 100% of head office, Msasa and Renco respondents said they consider IT important in achieving their business objectives. ENR had 89% of the respondents who said IT is important in achieving their business objectives.

Business Unit	Percentage		Total
	Yes	No	
Head Office	50	50	100
Msasa	75	25	100
ENR	67	33	100
Renco	29	61	100

Table 4.19: Membership of committee by business unit

Table 4.19 shows respondents' answers through cross-tabulation by membership of committees. Half of head office respondents are members of a committee compared to 75% of Msasa respondents. 67% of ENR respondents and 29% of Renco respondents said

they were members of a committee. Msasa and ENR are the business units with highest number of respondents who belong to a committee.

Business Unit	Percentage		Total
	Yes	No	
Head Office	67	33	100
Msasa	100	0	100
ENR	89	11	100
Renco	100	0	100

Table 4.20: Benefit of IT committee to the organization by business unit

Table 4.20 shows respondents' answers on IT committee benefits to the organization categorized by business unit. All of Msasa and Renco respondents said IT committees can be of benefit to their organization. Head office and ENR had 67% and 89% who said they think IT committees can be of benefit to their organization. The results show that most respondents take IT committees to be of benefit to the organization.

Business Unit	Percentage		Total
	Yes	No	
Head Office	50	50	100
Msasa	13	87	100
ENR	44	66	100
Renco	71	29	100

Table 4.21: IT needs by business unit

Table 4.21 shows the respondents' answers to IT needs being met by the IT department categorized by business unit. Half of head office respondents said their IT needs are being met by the IT departments compared to 13% for Msasa, 44% for ENR and 71% for Renco. Renco has the highest percentage of respondents whose IT needs are being met by the IT department. Msasa has the lowest percentage of respondents whose IT needs are being met by the IT department.

Business Unit	Percentage		Total
	Yes	No	
Head Office	33	77	100
Msasa	0	100	100
ENR	22	88	100
Renco	57	43	100

Table 4.22: IT decision making by business unit

Table 4.22 shows respondents' answers on user involvement in IT decision making by business unit. 33% of head office respondents are consulted on IT decision making issues compared to non for Msasa. Only 22% of ENR respondents said they are consulted on IT decision making issues whilst 57% of Renco respondents said they are consulted. Renco has the highest percent of respondents who are consulted on IT decision issues whilst Msasa has no respondents who are consulted.

Business Unit	Percentage		Total
	Yes	No	
Head Office	100	0	100
Msasa	88	12	100
ENR	89	11	100
Renco	100	0	100

Table 4.23: Perception of user involvement in IT issues by business unit

Table 4.23 shows respondents' answers on their perception of user involvement in IT issues by business unit. One hundred percent of head office and Renco respondents said user departments should be involved in IT issues, while 88% and 89% of Msasa and ENR respondents respectively said users should be involved in IT issues in the organization.

4.2.4 Areas IT can help improve in business units

This section shows the results from respondents in areas IT can contribute to achieve business objectives. The results are categorized by business unit.

Business Unit	Percentage		Total
	Yes	No	
Head Office	67	33	100
Msasa	13	87	100
ENR	33	67	100
Renco	43	57	100

Table 4.24: Inventory and cost tracking by business unit

Table 4.24 shows respondents' answers to a question about IT's contribution on inventory and cost tracking. The majority (67%) of the head office respondents said IT can improve inventory and cost tracking compared to 43% for Renco respondents. Msasa had the fewest (13%) respondents who said IT can improve inventory and cost tracking followed by ENR respondents (33%).

Business Unit	**Percentage**		Total
	Yes	No	
Head Office	67	33	100
Msasa	38	62	100
ENR	22	88	100
Renco	57	43	100

Table 4.25: Cost control by business unit

Table 4.25 shows respondents' answers on IT's contribution to cost control by business unit. Most (67%) of the head office respondents said IT can improve cost control compared to 57% of the Renco respondents, 38% of Msasa respondents and 22% of the ENR respondents.

Business Unit	Percentage		Total
	Yes	No	
Head Office	**67**	**33**	100
Msasa	63	37	100
ENR	56	44	100
Renco	57	43	100

Table 4.26: Productivity by business unit

Table 4.26 shows respondents' answers on IT's contribution to productivity by business unit. The majority (67%) of head office respondents said IT can help improve productivity in the business unit compared to 63% of Msasa respondents, 56% of ENR respondents and 57% Renco respondents. Most business units' respondents consider IT important to improve productivity in their business units.

Business Unit	Percentage		Total
	Yes	No	
Head Office	33	67	100
Msasa	**50**	**50**	100
ENR	56	44	100
Renco	57	43	100

Table 4.27: Improve process controls by business unit

Table 4.27 shows respondents' answers on IT's contribution to process controls by business unit. Only 33% of head office respondents said IT can help improve process controls compared to half of Msasa respondents. Most (56%) of ENR respondents and 57% of Renco respondents said IT can help improve process controls. Only head office has less than half (33%) of its respondents who think IT can help improve process controls.

Business Unit	Percentage		Total
	Yes	No	
Head Office	17	83	100
Msasa	**50**	**50**	100
ENR	22	22	100
Renco	57	43	100

Table 4.28: Inefficient business processes by business unit

Table 4.28 shows respondents' answers on IT's contribution to improving inefficient business processes. Most (57%) of Renco respondents said IT can help improve business processes compared to 50% of Msasa respondents, 22% of ENR respondents and 17% of head office respondents

Business Unit	Percentage		Total
	Yes	No	
Head Office	17	83	100
Msasa	13	87	100
ENR	67	33	100
Renco	**0**	**100**	100

Table 4.29: Early detection of potential production problems by business unit

Table 4.29 shows respondents' answers on IT's contribution in early detection of potential production problems. Most (67%) of ENR respondents said IT can help in early detection of potential production problems compared to 13% for Msasa respondents, 17% of head office respondents and none for Renco. The reason why ENR has the highest percentage is that it is the only location with an automated manufacturing plant, hence the importance of early detection of potential problems.

Business Unit	Percentage		Total
	Yes	No	
Head Office	33	43	100
Msasa	**38**	62	100
ENR	56	44	100
Renco	29	71	100

Table 4.30: Equipment utilization by business unit

Table 4.30 shows respondents' answers on IT's contribution to equipment utilization by business unit. Most (56%) of ENR respondents said IT can improve equipment utilization compared to 38% for Msasa respondents, 33% for head office respondents and 29% for Renco respondents. The higher percentage for ENR is attributed to the fact that IT is used for running the plant and planned maintenance system.

4.2.5 Cross tabulation by departments

After the different departments were reclassified into only two departments, namely the technical and administration departments, cross-tabulations were done to see whether these departments had an influence on the respondents' answers. This was quite important since the literature review revealed that different departments view IT differently. After the recode 33% of the respondents were from administration and 67% from technical departments.

Department	Percentage		Total
	Yes	No	
Administration	60	40	100
Technical	90	10	100

Table 4.31: Business unit objectives by department

Table 4.31 shows respondents' answers on business objective knowledge by department. Most (60%) of the respondents from the administration departments said they know their business objectives compared to 40% who said they do not know their business

objectives. The majority (90%) of the respondents from the technical departments said they know their business objectives compared to 10% who said they do not know their business objectives. The results show that a higher percent of technical staff know their business objectives based on their answers.

Department	Percentage		Total
	Yes	No	
Administration	90	10	100
Technical	100	0	100

Table 4.32: IT importance in achieving your business objectives by department

Table 4.32 shows respondents' answers on IT's importance in achieving business objectives. All of the respondents from the technical departments said they consider IT important in achieving their business objectives compared to 90% of the respondents from the administration departments. Only 10% of the respondents from administration departments said they do not consider IT important in achieving their business objectives.

Department	Percentage		Total
	Yes	No	
Administration	**30**	70	100
Technical	80	20	100

Table 4.33: Membership of committees in the organization by department

Table 4.33 shows respondents' answers on membership of committees in the organization by department. Only 30% of respondents from the administration departments said they belong to a committee compared to 80% of respondents from the technical departments. The results show that technical departments have more committee members than do administration departments.

Department	Percentage		Total
	Yes	No	
Administration	90	10	100
Technical	90	10	100

Table 4.34: Benefit of IT committee to the organization by department

Table 4.34 shows respondents' answers on IT committee benefits to the organization by department. Most respondents (90%) from both administration and technical departments think that IT committees can be of benefit to the organization compared to 10% of the respondents from both who said they do not think IT committees can be of benefit to the organization. The results seem to support the literature review which indicated that committees are important for IT decisions in organizations.

Department	Percentage		Total
	Yes	No	
Administration	50	50	100
Technical	40	60	100

Table 4.35: IT needs by department

Table 4.35 shows respondents' answers on IT needs being met by the IT department. Half of the respondents from administration departments said that their IT needs are being met by the IT department compared to 40% respondents from technical departments. The results show that administration departments have a higher percentage of respondents whose IT needs are being met by the IT department.

Department	Percentage		Total
	Yes	No	
Administration	100	40	100
Technical	90	10	100

Table 4.36: Perception of user involvement in IT issues by department

Table 4.36 shows respondents' answers on user involvement in IT issues by department. All (100%) of the respondents from the administration departments said user departments should be involved in IT issues, compared to 90% of respondents from the technical departments.

4.2.6 Areas of IT Contribution

Department	Percentage		Total
	Yes	No	
Administration	60	40	100
Technical	30	70	100

Table 4.37: Inventory and cost tracking by department

Table 4.37 shows respondents' answers on IT's contribution in inventory and cost tracking. The majority (60%) of the respondents from the administration departments said IT can help in improving inventory and cost tracking compared to 30% of respondents from technical departments.

Department	Percentage		Total
	Yes	No	
Administration	60	40	100
Technical	35	65	100

Table 4.38: Cost control by department

Table 4.38 shows respondents' answers on IT's contribution in cost control by department. Most (60%) of the respondents from the administration departments said IT can help improve cost control compared to 35% of respondents from the technical departments.

Department	Percentage		Total
	Yes	No	
Administration	50	50	100
Technical	**65**	**35**	100

Table 4.39: Productivity by department

Table 4.39 shows respondents' answers on IT's contribution to productivity. Half of respondents from the administration departments said IT can help improve productivity compared to 65% respondents from technical departments. The results show that productivity is important for both administration and technical departments.

Department	Percentage		Total
	Yes	No	
Administration	50	50	100
Technical	50	50	100

Table 4.40: Process controls by department

Table 4.40 shows respondents' answers on IT's contribution in process controls by department. Half of respondents from the administration and technical departments respectively said IT can help improve process controls in the organization compared to half who said IT did not contribute in process controls.

Department	Percentage		Total
	Yes	No	
Administration	40	60	100
Technical	35	65	100

Table 4.41: Inefficient business processes by department

Table 4.41 shows respondents' answers on IT's contribution in improving business processes by department. 40% of the respondents from the administration departments

said IT can improve inefficient business processes compared to 35% of the respondents from the technical departments who said IT can improve inefficient business processes.

Department	Percentage		Total
	Yes	No	
Administration	10	90	100
Technical	35	65	100

Table 4.42: Early detection of potential production problems by department

Table 4.42 shows respondents' answers on IT's contribution in early detection of potential production problems. Whilst 35% of respondents from the technical departments said IT can improve early detection of potential production problems, only 10% of respondents from the administration departments said IT can improve early detection of potential problems. Early detection of potential production problems is the responsibility of the technical departments.

Department	Percentage		Total
	Yes	No	
Administration	60	40	100
Technical	29	71	100

Table 4.43: Reduce unscheduled machine downtime by department

Table 4.43 shows respondents' answers of IT's contribution to reduce unscheduled machine downtime. About 29% of the respondents from the technical departments said IT can help to reduce unscheduled machine downtime compared to 60% respondents from the administration departments who said IT can help reduce unscheduled machine downtime.

Department	Percentage		Total
	Yes	No	
Administration	20	80	100
Technical	**50**	50	100

Table 4.44: Equipment utilization by department

Table 4.44 shows respondents answers on IT's contribution to improve equipment utilization. Only 20% of respondents from the administration departments said IT can improve equipment utilization compared to 50% of respondents from the technical departments. The results show that IT is important to technical departments for improved equipment utilization.

4.2.7 Correlation

	Are you aware of your business unit objectives?	
Do you consider IT important in achieving your business objectives?	Pearson Correlation	.392*
	Sig. (2 – tailed)	.032
	N	30

Table 4.45: IT importance in achieving business objectives

Table 4.45 indicates that there is a positive correlation between knowledge of business unit objectives and those who consider IT to be important in achieving business objectives (.392*), this suggests that those who know their business unit objectives support that IT is important in achieving those objectives (*. correlation is significant at the 0.05 level). This means that knowledge of business unit objectives is important in considering IT important in achieving those objectives. The results suggest that when respondents have knowledge of business unit objectives they consider IT important in achieving their business objectives.

	Do you consider IT important in achieving your business objectives	
Improve quality levels and reduce defects	Pearson Correlation	.371*
	Sig. (2 – tailed)	.043
	N	30

Table 4.46: IT importance in improving quality levels and reduces defects

Table 4.46 shows that there is a positive correlation (.371*) between achieving business unit objectives and improving quality levels, and reducing defects (* correlation is significant at the 0.05 level). The results show that respondents consider IT important in achieving business unit objectives of improving quality levels and reduce defects.

	Are you aware of your business unit objectives	
Improve inefficient business processes	Pearson Correlation	.467**
	Sig. (2 – tailed)	.009
	N	30

Table 4.47: Improve inefficient business process

Table 4.47 indicates that there is a positive correlation (.467**) between knowledge of business unit objectives and improving inefficient business process (** correlation is significant at the 0.01 level). The result shows that improving inefficient business processes is achieved with knowledge of business unit objectives. In order to improve the inefficient business processes it is necessary to know the business unit objectives.

	Business Unit	
Improve control of labour costs	Pearson Correlation	.418*
	Sig. (2 – tailed)	.021
	N	30

Table 4.48: Improve control of labour costs

Table 4.48 shows that there is a positive correlation (.418*) between business units and improving control of labour cost (* correlation is significant at the 0.05 level). The results suggest that some business units consider IT important in achieving the objective of improving control of labour cost. This can be based on the difference in the nature of business units. In operational business units with employees paid daily, clocking systems can be important for the business units to control labour cost. Without proper integrated systems and processes business units will end up paying ghost workers.

	Do you consider IT important in achieving business unit objectives	
Improve control of labour costs	Pearson Correlation	.415*
	Sig. (2 – tailed)	.023
	N	30

Table 4.49: Improve Control of labour costs

Table 4.49 indicates that there is a positive correlation (.415*) between IT's importance in achieving business objectives and improving control of labour costs (* correlation is significant at the 0.05 level). The results suggest that IT is considered important in achieving business objectives since it assists in improving control of labour costs in the business units. The results suggest that those who consider IT important for the organization to achieve business objectives believe it can improve control of labour costs.

	Are you aware of your business unit objectives	
Improve inefficient business processes	Pearson Correlation	.411*
	Sig. (2 – tailed)	.024
	N	30

Table 4.50: Improve inefficient business processes

Table 4.50 shows that there is a positive correlation (.411*) between those who think IT can improve inefficient business process and those aware of their business unit objectives (* correlation is significant at the 0.05 level). Those who knew their business unit

objectives believe that IT is important to improve inefficient business process. The results suggest that IT is important in achieving business unit objectives through improving inefficient business process.

	Are you a member of any committee	
Improve inefficient business processes	Pearson Correlation	.541*
	Sig. (2 – tailed)	.002
	N	30

Table 4.51: Membership of committee

Table 4.51 indicates that there is a strong positive correlation .541*) between membership of committees in the organization and improving inefficient business processes (* correlation is significant at the 0.05 level). Most members of a committee believe that IT is important in improving inefficient business process within the organization. The results suggest that members of committees are more aware of IT contribution in improving inefficient business process than those who are not members of any committee.

4.2.8 Analysis of Variance

		Sum of Squares	df	Mean Square	F	Sig.
Are you aware of your business unit objectives?	Between Groups	5.952	1	5.952	.003	.958
Improve Inventory and cost tracking	Between Groups	2.381	1	2.381	.010	.923

Table 4.52: ANOVA by business unit function

According to the results from Table 4.52 there are major difference between Administrative business units and Operational business units in terms of knowledge of business unit objectives shown by an F value of (0.003). In addition there were differences on perception on the contribution of IT in achieving business objectives on inventory control shown by an F value of (0.010). The F value shows a statistic which indicates if there is a significant difference among three or more sample means. The

degrees of freedom indicated the effective number of observations which contribute to the sum of squares in the analysis. The large effect leads to significance shown by the *F*–test. The results suggest that there a variation of awareness of business unit objectives and IT improving inventory control which is based business unit function. The result shows that IT has different contribution to different business units.

		Sum of Squares	df	Mean Square	F	Sig.
Improve process controls	Between Groups	1.667	1	1.667	.049	.826
Improve inefficient business processes	Between Groups	1.667	1	1.667	.035	.853

Table 4.53: ANOVA by department function

According to Table 4.53 there are major differences on perception on IT contribution to business objectives by department function on two variables. The differences were on improving process controls shown by an F value of (0.049) and improve business process shown by an F value of (0.035).The F value shows a statistic which indicate if there is a significant difference among three or more sample means. The degrees of freedom indicated the effective number of observations which contribute to the sum of squares in the analysis. The large effect leads to significance shown by the *F*–test. The results suggest that there is variation of in perception about IT contribution to improving process controls and inefficient business process based on department. This means that it contribution is not the same for all departments.

4.3 Summary

The researcher collected primary data from 30 respondents in the organization using survey questionnaires. The study shows that IT governance has a role to play in achieving business objectives in an organization. The results show that there are different perceptions of the contribution of IT based on business units and departments. This means IT has different contributions at business unit and departmental level. The cross-tabulations showed that there is a difference in the importance of IT governance by business unit and department.

The results indicate that there are major differences in groups based on business unit function and department function. The results also indicate that IT contribution to business unit objectives can be different among business units and departments because they may have different business objectives. Administrative business units tend to have more administrative business objectives whilst operation business unit objectives are based on the nature of their operation. This also applies to technical and administrative departments.

Business unit and department function have an effect on the perception of IT's contribution to business unit objectives. In order to benefit from IT investment the organization should involve business units and departments in IT decisions since the perception of IT's contribution differs from department and business unit. Furthermore, each business unit and department viewed IT's contribution based on their business objectives.

The next chapter will discuss the findings of the current chapter within the context of the literature. Findings of each research question are summarized and explained within the context of this research. In addition the implications of the research for further understanding of the research problem are explored.

CHAPTER 5

CONCLUSION

5.1 Introduction

The previous chapter presented the detailed findings of the research based on the data collected using various research instruments. In addition results from the data analysis were presented. This chapter will present a detailed summary of the research based on the research objectives, reviewed literature, methodology and findings of the previous chapters. A brief statement of the research question and a summary of how the question has been addressed are also presented. From the findings of the research, the managerial implications are explored. Finally, the limitations and the scope for further research are discussed.

The original purpose of the research was to investigate whether IT governance can contribute to achieving business objectives in organizations. Although the literature review indicated that IT governance can add more value in IT investments, whether business units in organizations agreed was another question. The researcher addressed the question in several phases.

Firstly, the researcher analyzed the importance of IT in the organization by business unit and department. Variables that were used to indicate the IT contribution in the organization were extracted from the literature analysis. However, there were some weaknesses the research caused by sample size. Some departments had fewer respondents which affected the statistical results.

Furthermore, based on the literature review of IT governance, much attention was paid to the nature of the industry and the different contributions that IT can make in those organizations, as this may have some effect on the level of IT contribution in the

organization. Secondly, a research methodology was designed. Thirdly, the data collected were analyzed and interpreted.

5.2 Conclusions about Research Questions

This section presents the findings obtained from each research question which was posed in Chapter 2 and which formed the basis of this research project.

5.2.1 Are business units' users aware of their business objectives?

The results of the study have shown that respondents are aware of their business units' objectives. According to Table 4.7 the majority of the respondents (80%) knew their business objectives. In addition 97% of the respondents consider IT important in achieving their business objectives.

Although the results showed that respondents believe that IT can contribute to achieving their business objectives, the results varied by business unit and department. This is an indication that business units and departments have different views of IT contribution. This agrees with the literature review which indicated that IT is viewed differently by different business units. Ross and Beath (2002) argue that organizations should distinguish IT investments from one another. Even though they may be simultaneous, these investments will deliver different values to different parties.

In addition, most of the respondents (60%) mentioned increasing production as the main business objectives. This supports Guldentops (2003) who highlighted that IT can offer means of increasing productivity besides supporting and shaping new strategies.

5.2.2 Do business units know the value of IT committees?

Whilst the organization does not have IT committees the results from the analysis of Table 4.12 showed that business units view IT committees as important in achieving their business objectives. Respondents mentioned that IT committees help them to discuss IT issues thereby involving users in IT decision making. The results agree with the literature that committees are important for IT decision making in an organization.

Ward and Peppard (2003), note that steering committees appear to be an obvious necessity in managing IT resources. Marchand *et al.* (2000) add that organizations must emphasis the importance of a strong business/IT relationship and instill appropriate behaviors and values regarding information and its use in the organization.

Gupta and Raghunathan (1989) conclude that steering committees among the most effective ways of improving an organization's IT planning, by assisting the integration of the IT function with business and by coordinating planning activities. Business units indicated that user involvement will benefit the organizations to have systems that meet users' needs.

Whilst the results from the study show that business units feel they should be involved in IT issues most business units' members are not consulted. This implies that measures that are taken by the IT committee may have less buy-in from those affected because they may not necessarily be aligned to users' needs. Hence some well-meaning investments may result in what are termed "white elephants".

Ward and Peppard (2003) indicates that, where IT function is perceived as making a value-added contribution to the business and where there is a close relationship between the IT function and the rest of the business, IT has a significant positive impact on business performance.

5.2.3 Areas IT can help improve in business units

The results of the study showed that business units can identify areas that IT can help to achieve their business objectives. According to table 4.16, most respondents indicated that productivity and cost control are areas that IT can help improve in order to achieve their business objectives. Whilst respondents were able to identify areas IT can help achieve their business objectives, further analysis using cross tabulation revealed that areas differ by business unit and department. Results showed a positive correlation between business and control of labour cost.

This agrees with the literature which says that IT can help achieve business objectives. According to the literature IT can be used to support organizational strategy such as low cost strategy or differentiation strategy. This supports Guldentops' (2003) view that IT can offer means of increasing productivity besides supporting and shaping new strategies.

Applegate, McFarlan and McKenney (1999) add that IT can be positioned with respect to the importance it holds in the business under review. They add that organizations must classify their needs for information technology. IT can contribute to the opportunities surrounding products and services, markets and economics of production. Porter's five forces can also be used to provide measures of the business importance of IT but, more usefully, can provide a more detailed picture of where and how IT holds most business importance.

5.3 Managerial guidelines

For organizations to benefit from IT investment they must implement IT governance structures. The structure will assist to give decision rights in matters relating to IT in the organization. In order to involve business in IT issues organizations should establish IT committees which will provide a platform for discussing IT issues in the organization. IT committees will help in identifying users' needs which may vary per business unit.

5.4 Conclusions about the Research Problem

The results of the study have shown that IT governance can help organizations to achieve their business objectives through user involvement. By involving business units in IT decision, organizations can identify areas where IT investment can contribute more in achieving their business objectives (Table 4.12). Based on the findings of the study organizations can invest in IT based on the contribution of IT to the business objectives.

The above is supported by Argarwal and Sambamurthy (2002) who say that the strategic role of IT is to facilitate innovative business strategies and processes. The IT Governance

Institute (2003) highlighted that those organizations that actively design top level IT governance structures make and implement better IT related decisions. Boston Consulting Group (2004) added that successful companies have established business and IT interfaces to help reach consensus.

Decisions concerning IT investment based on user contributions can assist organizations to avoid initiating projects with little return. Since no one solution fits all, a business unit's IT opportunities have to be identified individually as shown by the results in Table 4.21, which indicates that IT makes different contributions to different business units and departments.

5.5 Managerial Implications

Although the research cannot claim to be fully representative of all companies, given that it was based on only one organization, its depth of investigation into IT governance's contribution to business objectives serves as testimony to the relevance of the research project.

From a managerial perspective, business leaders need to understand the value of the contribution of IT governance in achieving their business objectives. Organizations should pay attention to how IT governance can help them in achieving their business objectives through business unit involvement.

According to the literature review, IT governance can add value to IT investments in organizations taking into account that there are different levels of contributions which are based on the nature of the business unit and department objectives. However, the results of the data analysis indicate that most respondents in the study believe that IT governance is important in achieving their business objectives. They highlighted that IT is important to provide up to date information for decision making.

Furthermore, business units and departments have different perceptions about IT's contribution to their business objectives. As observed from the study and literature, some

departments or business units need IT more than others. Nevertheless, the results of the data analysis have shown that all business units agree that IT governance can make a major contribution to their business objectives.

The results of the data analysis have shown that there are significant differences between business units regarding the contribution of IT governance in achieving their business objectives. The differences are based on the nature of the core business of the strategic business's operation. Organizations should therefore address IT issues at different levels if they are to realize high returns on IT investments. With IT providing a competitive advantage to many industries, organizations should address the needs of business units or departments individually. This is more critical if the organization has diverse business units. Failure to do so may result in missed opportunities in IT investment. In addition, organizations should involve users in IT decisions if they are to gain more from IT investments.

5.6 Research limitations

The results of this research project should be interpreted and accepted with caution because of certain limitations.

- Firstly, the research project is based on a case study and the sampling method of the project is a convenience sample. The use of a case study raises problems with the generalization of the results. For example, results from the case study may only be applicable to the organization in question. While the researcher tried to be representative as far as possible in terms of business units departments, this was not possible because some business units did not have certain departments. However, to try to alleviate the problem, departments were recoded into two types, namely technical and administrative departments.

- Secondly, there are conceptual limitations in the research. Before the research conclusion is accepted, the researcher would have to be sure that no other variables

caused the differences in responses. There may be other variables which affected the respondent's answers, such as level of education and length of service of the respondent in the organization. More care should be taken in using questionnaires since the response may not come from the intended respondent.

- Thirdly, there are several limitations that will limit the application of the research results. In the first place, the respondents may not have been of the same seniority in terms of the organizational structure although the term head of department or section can be applicable to all. Furthermore, the research did not account for the difference in technological use of the business units.

- Lastly, there were differences between technical and administrative staff in terms of knowledge, but the project did not consider the differences in detail.

5.7 Further research

To overcome the limitations of the project, further research is necessary. Firstly, IT's governance contribution to business objectives should be explored further. Secondly, businesses should be investigated using a larger sample size, for example, many organizations in different industries. Thirdly, the question of whether business units' involvement can be successful in diverse organizations should be explored. In addition, the influence of other variables such as location and level of education should be explored. Lastly, some departments should be investigated separately, and further research will show results more appropriate for each department.

5.8 Final remark

The final conclusion to this study is that IT governance is essential for any organization to realize a fair return on investment on IT expenditure.

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APPENDIX A: Interview Protocol

Interview Protocol for Executive and Senior Management

Name_____ **Interviewer**_____ **Date**_____

1. What is your specialty?
2. How many years in the present position?
3. How many years experience with this company?
4. What are management's objectives for investing in IT?
5. How often does the executive discuss IT issues?
6. Do you have IT steering committee at executive level or management level?
7. What role does the committee play with regards to IT?
8. How often does the committee meet?
9. What are fundamental roles of senior management in IT governance?
10. How is the IT expenditure compare to the industry average?
11. How does management consider information and technology implications to their business strategies?
12. What criteria/method does the organization use to approve new information technology project?
13. Who has primary authority and responsibility for business applications decisions in business units?
14. Who has primary authority and responsibility for IT infrastructure decisions?
15. Who has primary authority and responsibility for IT investment decisions?
16. How are the decision made on IT capital investments?
17. What approaches is the organization to IT investment?
18. How does the organization approach the problem of justifying IT investments?
19. What is your perception towards IT and its potential impacts and role?

APPENDIX B: Research Questionnaire

FOR OFFICE USE ONLY: Respondent Code: _____

VOLUNTARY QUESTIONNAIRE FOR UNIVERSITY STUDENTS

"When it is legitimate to deceive others, and when it is not."

Researcher: Osden Jokonya

Supervisor: Prof. Sam Lubbe

School: Graduate School of Business

University of KwaZulu-Natal

Note to the respondent

- We need your help to understand how people use deceptive communication, which forms of deception are acceptable, and which are not.
- Although we would like you to help us, you do not have to take part in this survey.
- If you do not want to take part, just hand in the blank questionnaire at the end of the survey session.
- What you say in this questionnaire will remain private and confidential. No one will be able to trace your opinions back to you as a person.

How to complete the questionnaire

- Please answer the questions as truthfully as you can. Also, please be sure to read and follow the directions for each part. If you do not follow the directions, it will make it harder for us to do our project.
- We are only asking you about things that you and your fellow students should feel comfortable telling us about. If you don't feel comfortable answering a question, you can indicate that you do not want to answer it. For those questions that you do answer, your responses will be kept confidential.

- You can mark each response by making a tick or a cross, or encircling each appropriate response with a PEN (not a pencil), or by filling in the required words or numbers.

Thank you very much for completing this questionnaire.

Part 1: Permission to use my responses for academic research

I hereby give permission that my responses may be used for research purposes provided that my identity is not revealed in the published records of the research.

Initials and surname _____ Postal address: _____

_____ Postal code: _____

Contact numbers: Home: _____ Cell: _____

Signature: _____

This survey is being carried out to find how IT Governance can assist organizations in achieving their business objectives.

All the information you provide will be treated in the strictest confidence.

The questionnaire should take about 20 minutes to complete. Try to complete the questions at a time when you are unlikely to be disturbed. Also, do not spend too long on any one question. Your first thoughts are usually the best. Your answers are essential in building accurate picture of the issues that are important to improving IT governance.

Part 1: Personal Details

1. What is your age?

Tick	
	18 – 25 years
	26 – 30 years
	Above 30 years

2. What is your Gender?

Tick	
	Male
	Female

3. What is your level of education?

Tick	
	High School
	College Diploma
	Bachelor's Degree or higher

4. What is your occupation?

Tick	
	Accountant
	Personnel officer
	Administrator
	Geologist
	Safety Officer
	Metallurgist
	IT Administrator
	Purchasing Officer
	Surveyor
	Other _____

5. What is your location?

Tick	
	Head Office
	Msasa
	ENR Kadoma
	Renco

6. What is your department?

Tick	
	Administration
	Personnel
	Purchasing
	Engineering
	Production
	Mining
	Surveying
	Laboratory
	Health Safety & Environment
	Other_____

7. Are you aware of your business units and department business objectives?

Yes	No

8. If your answer question above is yes, please briefly state them

_____

_____

9. Do you consider information technology to be important in achieving your business objectives?

Yes	No

10. If your answer above is yes, please explain briefly_____

11. Does your organization have an IT committee?

Yes	No	Not Sure

12. If your answer above is yes, are you a member of the committee?

Yes	No

13. If your answer question 7 is yes, how often does the IT committee meet to discuss IT issues? _____

14. Are you a member of any committee in you organization?

Yes	No

15. If your answer is yes, what committee? _____

16. If your answer is yes to question10, do your discuss IT issues?

Yes	No

17. Do you think IT committees can be of benefit to your organization? Yes/No

Yes	No

18. If your answer above is yes, please explain how? _____

_____

19. Are your information technology requirements being met by the IT Department?

Yes	No

20. If you answer is no, which areas are not being met? _____

_____

21. Are you consulted in any of the information technology decision issues?

Yes	No

22. If your answer is yes, which IT areas do you have decision/input? _____

_____

23. If you answer is no, which areas of IT do you think you should be consulted on?

_____

_____

24. Do you think user departments should be involved in IT issues?

Yes	No

25. If you answer is yes, what benefit can the company gain from user involvement?

26. From the following can you rank the top fives areas were Information Technology can assist you department to achieve their objectives?

• Improve inventory and cost tracking	
• Improve Turnover Tracking	
• Improve cost control	
• Improve gross margins and cash flow	
• Improve higher returns in assets	
• Improved turn-around-times (TATs)	
• Improved productivity	
• Improve process controls	
• Improve quality levels and reduce defects	
• Improve inefficient business processes	
• Improve early detection of potential production problems	
• Reduced unscheduled machine downtime	
• Improve equipment utilization	
• Improve environmental controls	
• Improve waste management	
• Help to resolve environmental issues	
• Improve control of labour costs	

• Help government and labour legislation	
• Help resolve labour issues	
• Others (specify)	

27. If you have any other suggestions or comment on IT Issues in the organization, please describe them.

_____

_____

End!

I hope you find completing this questionnaire enjoyable and thank you for taking the time to complete this questionnaire. Please return the completed questionnaire to IT Department.

APPENDIX C: Fieldwork Timetable

	Date	Group Interviewed	No. Interviewed
1st Preliminary Fieldwork	16/12/2005	Directors & Managers	10
Questionnaires	18/03/2006	Head of Departments	30

APPENDIX D: Frequency Tables

Frequency Table

What is your location?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Head Office	6	20.0	20.0	20.0
	Msasa	8	26.7	26.7	46.7
	ENR	9	30.0	30.0	76.7
	Renco	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

What is your department?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administration	10	33.3	33.3	33.3
	Technical	20	66.7	66.7	100.0
	Total	30	100.0	100.0	

Are you aware of your business unit objectives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	24	80.0	80.0	80.0
	No	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

If your answer above is yes, explain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No respond	8	26.7	26.7	26.7

Meet production targets	1	3.3	3.3	30.0
To produce copper. nickel & by products more efficiently	4	13.3	13.3	43.3
Provide Engineering Services to the Group	4	13.3	13.3	56.7
Stimulate company growth from new mineral discoveries	1	3.3	3.3	60.0
Improve productivity at locations	1	3.3	3.3	63.3
Minimize Plant Downtime	1	3.3	3.3	66.7
To analyze samples accurately and timeously	1	3.3	3.3	70.0
Availability & effective use of IT systems	1	3.3	3.3	73.3
To provide services to other departments	4	13.3	13.3	86.7
Control cost, cash flow & working capital	2	6.7	6.7	93.3
Administration of raw materials & finished goods	1	3.3	3.3	96.7
Secure data for organization	1	3.3	3.3	100.0
Total	30	100.0	100.0	

Do you consider IT important in achieving your business objectives

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Yes**	29	96.7	96.7	96.7
	No	1	3.3	3.3	100.0

	Total	30	100.0	100.0	

If your answer is yes, explain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0**	3	10.0	10.0	10.0
	essential in maintaining communication in today's business	8	26.7	26.7	36.7
	improve productivity	6	20.0	20.0	56.7
	Information sharing	2	6.7	6.7	63.3
	Data acquisition & analysis	2	6.7	6.7	70.0
	Information availability for decision making	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

Does your organization have an IT committee?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	1	3.3	3.3	3.3
	No	11	36.7	36.7	40.0
	Not Sure	18	60.0	60.0	100.0
	Total	30	100.0	100.0	

If your answer above is yes, are you a member of the committee?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**No**	2	6.7	6.7	6.7
	N/A	28	93.3	93.3	100.0

	Total	30	100.0	100.0	

How often does the IT committee meet to discuss IT issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Not Applicable**	30	100.0	100.0	100.0

Are you a member of any committee in your organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	17	56.7	56.7	56.7
	No	13	43.3	43.3	100.0
	Total	30	100.0	100.0	

If your answer is yes, what committee?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Not Applicable**	13	43.3	43.3	43.3
	HSE Steering Committee	8	26.7	26.7	70.0
	ISO 14001 HSE Engineering	3	10.0	10.0	80.0
	Exploration Review Committee	1	3.3	3.3	83.3
	GTS, Finance	1	3.3	3.3	86.7
	Various projects committees	1	3.3	3.3	90.0
	Cash flow & Capital Projects committee	1	3.3	3.3	93.3
	Procurement	1	3.3	3.3	96.7
	Production	1	3.3	3.3	100.0

	Total	30	100.0	100.0	

If your answer is yes, do you discuss IT issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	33.3	33.3	33.3
	No	7	23.3	23.3	56.7
	Not Applicable	13	43.3	43.3	100.0
	Total	30	100.0	100.0	

Do you think IT committees can be of benefit to your organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	90.0	90.0	90.0
	No	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

If your answer above is yes, please explain how?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5	16.7	16.7	16.7
	In raising awareness in the capabilities and use of IT	5	16.7	16.7	33.3
	Discuss IT issues and share ideas	12	40.0	40.0	73.3
	We involve IT in all our programs for easy access to information	3	10.0	10.0	83.3
	Systems meet users needs	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

Are your IT needs being met by the IT Department?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	13	43.3	43.3	43.3
	No	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

If your answer is no, which areas ae not being met?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N/A	10	33.3	33.3	33.3
	Lack of hardware, software and training	8	26.7	26.7	60.0
	Lack of training and support	7	23.3	23.3	83.3
	Lack of stable connectivity	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

Are you consulted in any of the IT decision issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	26.7	26.7	26.7
	No	22	73.3	73.3	100.0
	Total	30	100.0	100.0	

If your answer is yes, which IT areas do you have decision/input?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N/A	22	73.3	73.3	73.3

	Scada Computers and PLC network	1	3.3	3.3	76.7
	Applications, Hardware and Network standards	5	16.7	16.7	93.3
	Purchasing, staffing, training & strategy	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

Which areas of IT do you think you should be consulted on?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10	33.3	33.3	33.3
	Application Software	10	33.3	33.3	66.7
	hardware, software and training	5	16.7	16.7	83.3
	Whenever new systems are put in place	2	6.7	6.7	90.0
	Planned Maintenance	1	3.3	3.3	93.3
	Training	1	3.3	3.3	96.7
	Wide area networking	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

Do you think user departments should be involved in IT issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	28	93.3	93.3	93.3
	No	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

If your answer is yes, what benefit can the company gain from user involvement?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4	13.3	13.3	13.3
	user have ideas	1	3.3	3.3	16.7
	The needs of individual should always be taken into account	14	46.7	46.7	63.3
	will result in improved IT delivery	1	3.3	3.3	66.7
	Help meet users needs	10	33.3	33.3	100.0
	Total	30	100.0	100.0	

Improve Inventory and cost tracking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	63.3	63.3	63.3
	1	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

Improve Turnover Tracking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	28	93.3	93.3	93.3
	1	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

Improve Cost Control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	17	56.7	56.7	56.7

	1	13	43.3	43.3	100.0
	Total	30	100.0	100.0	

Improve gross margins and cash flow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	86.7	86.7	86.7
	1	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

Improve higher returns on assets

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	86.7	86.7	86.7
	1	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

Improve turn around times

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	76.7	76.7	76.7
	1	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

Improve productivity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	40.0	40.0	40.0
	1	18	60.0	60.0	100.0

	Total	30	100.0	100.0	

Improve process controls

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0**	15	50.0	50.0	50.0
	1	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

Improve quality levels and reduce defects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0**	24	80.0	80.0	80.0
	1	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

Improve inefficient business processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0**	19	63.3	63.3	63.3
	1	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

Improve early detection of potential production problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0**	22	73.3	73.3	73.3
	1	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

Reduce unscheduled machine downtime

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	73.3	73.3	73.3
	1	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

Improve equipment utilization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	18	60.0	60.0	60.0
	1	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

Improve environmental controls

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	30	100.0	100.0	100.0

Improve waste management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	28	93.3	93.3	93.3
	1	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

Help to resolve environmental issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	96.7	96.7	96.7

	1	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

Improve control of labour costs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	25	83.3	83.3	83.3
	1	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

Help resolve labour issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	96.7	96.7	96.7
	1	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

others specify

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	96.7	96.7	96.7
	1	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

Any other suggestions or comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	80.0	80.0	80.0
	IT personnel are to low, should be integrated with	1	3.3	3.3	83.3

	instruments				
	Users needs train on systems	1	3.3	3.3	86.7
	IT department must consult user departments	1	3.3	3.3	90.0
	Lack of support from IT	2	6.7	6.7	96.7
	IT structure needs review to involve top managers	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

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UNIVERSITY OF
KWAZULU-NATAL

16 FEBRUARY 2007

MR. O JOKONYA (202525839)
GRADUATE SCHOOL OF BUSINESS

Dear Mr. Jokonya

ETHICAL CLEARANCE APPROVAL NUMBER: HSS/0750/06M

I wish to confirm that ethical clearance has been granted for the following project:

"A study of using information technology governance as a tool for achieving business objectives – A case study"

Yours faithfully

Ximba

.....

MS. PHUMELELE XIMBA
RESEARCH OFFICE

cc. Faculty Officer (Christel Haddon)
cc. Supervisor (Prof. S Lubbe)

P O BOX 3066
Assagay
3624
5 December 2006

To whom it concerns.

PROOFREADING DISSERTATION

A study of using information technology governance as a tool for achieving business objectives – a case study

Student: Osden Jokonya

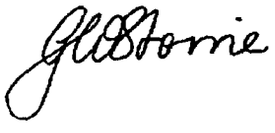
Student number: 202525839

I have proof read the dissertation correcting errors of spelling, grammar and syntax, and suggesting improvements in punctuation.

I have also pointed out where the meaning is not clear and in some cases have made suggestions to correct the lack of clarity.

Where the format is not consistent I have pointed this out.

Gavin Storrie



B A (Hons) UED

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