

**BUSINESS INTELLIGENCE AND THE PERFORMANCE OF  
KENYA POWER**

**BY**

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NAIROBI.**

**NOVEMBER 2015**

## **DECLARATION**

This project is my original work and to the best of my knowledge has not been submitted for examination or a degree award in any other university.

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## **SUPERVISOR**

This project has been submitted for examination with my approval as the university supervisor.

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Dr Muranga. Njihia

## ABSTRACT

Imagine you are getting in to a plane for a cross Atlantic flight and you happen to notice that the pilot's dashboard has no instrumentations at all i.e. no flight path, no altitude, no fire detection, no fuel gauge. Would you board that flight or trust that pilot with your life? This is the problem present C-level management face every day and an organization's performance and ultimate survival is greatly determined by their ability to make effective decisions.

Although the opinion about business intelligence and its creation of business value is generally accepted, economic justification of investments into business intelligence systems is not always clear. Measuring the business value of business intelligence in practice is often not carried out due to the lack of measurement methods and resources. In this study we endeavor to measure this value empirically and our focus was Kenya Power (KP) a quasi government agency with a monopoly on electricity distribution whose operations directly impact almost everyone in the country. Through a questionnaire we established that considerable organizational management support is required in the choice of tool & implementation and it is equally important to ensure that the software and the vendor are very carefully selected. Unanimous feedback from the interviewee's affirmed that benefits i.e. cost reduction, employee motivation, efficiency in customer service etc therefore businesses need to utilize business intelligence tools.

We further proposed that KP should invest more in customer service & experience as well as adopt other BI enhancements like Data Warehousing and Big data solutions. Additional research will help in identifying an effective evaluation processes linking BI solutions to business output and thereby provide a numerical ROI that can support the initial investment.

## **ACKNOWLEDGMENT**

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The product of this research paper would not be possible without all of them.

## **DEDICATION**

There are so many people who have stood by me and I cannot thank you all enough. However, I will start by thanking God Almighty for the gift of life and knowledge.

I dedicate this project to the support and motivation from my father who was there for me all my life to be who I am today. I further wish to embrace my family who supported me the many nights I was in school and acceptingly understood my absence in my pursuit of education. I cannot thank you enough Lela, Elsie and Zulu. A big thank you and appreciation to my special friend who challenged me to finish this project and to my lecturers and supervisors who did not give up on me and whom, I assure, have a made a learned friend for life.

Finally but not least I also dedicate this to my mum, who left too soon, before many key changes occurred in my life. I know you are up there watching me mum. I love you and this is for you. Amen.

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## **LIST OF ABBREVIATIONS**

**BI** - Business Intelligence

**BIS** – Business Information Systems

**BPM** – Business Process Management

**BS** – Balanced Scorecard

**CI** – Competitive Intelligence

**CPM** – Corporate Performance Management

**CPU** – Central Processing Unit

**DSS** – Decision support Systems

**DW** – Data Warehousing

**IS** – Information Systems

**KM** – Knowledge Management

**KPI** – Key Performance Indicator

**KP**-Kenya Power (Formerly KPLC– Kenya Power & Lighting Company)

**OLAP** – On Line Analytical Processing

**ROI** – Return on Investment

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## **1.0: INTRODUCTION**

### **1.1 Background of the Study**

Organizations today are faced with the dual challenge of managing intra-organizational information and monitoring a vast reservoir of information from the external environment. Their survival thus requires the effective use of information and decision technologies to gather, manage, and exploit knowledge (Lih-Bin Oh and Hock-Hai Teo, 2010). Many of the technical challenges and tradeoffs of delivering information to the BI user are at least well understood, and therefore attention has shifted toward expanding the ways in which BI can be used to effectively deliver business value and wealth maximization of the firms.

An organization's performance and ultimate survival is greatly determined by the ability of its management to make effective decisions. A majority of these decisions today are based on output from computerized decision support systems (DSS). Business intelligence as it is understood today is said to have evolved from the decision support systems which began in the 1960s and developed throughout the mid-80s (Drucker, 1999). Therefore business intelligence can also be known as a computerized decision support tool.

#### **1.1.1 Business Intelligence and Business Value**

Business Intelligence (BI) is a broad category of applications and technologies of gathering, accessing, and analyzing a large amount of data for the organization to make effective business decisions. Typical BI technologies include business rule modelling,

data profiling, data warehousing, online analytical processing and Data Mining (Loshin, 2003).

Business intelligence involves the process of gathering and analyzing internal and external business information (Okkonen et al, 2002). BI is neither a product nor a system. It is an architecture and a collection of integrated operational as well as decision-support applications and databases that provide the business community easy access to business data (Moss & Atre, 2003). It generally deals with the applications, platforms, tools, and technologies that support the process of exploring business data, data relationships, and trends. BI provides an executive with timely and accurate information to better understand his or her business and to make more informed, real-time business decisions (Raisinghani, 2004). Lonqvist & Pirttimaki, (2006) describes BI as an organized and systematic process by which organizations acquire, analyze, and disseminate information from both internal and external information sources significant for their business activities and for decision-making.

In terms of business value, BI means leveraging information assets within key business processes to achieve improved business performance (Williams & Williams, 2007). One of the major objectives of computerized decision support is to facilitate closing the gap between the current performance of an organization and its desired performance, as expressed in its mission, objectives, and goals, and the strategy to achieve them (Turban, Aronson, Liang & Sharda 2007).

Business Intelligence (BI) and the many analytics systems that support demand management, predictive analytics, revenue modeling and role-based intelligence within organizations are critical for any organization to survive in today's incredibly turbulent economic environment. With increased internet usage, mobile technology and digital marketing in business environments, the ability to capture the consumer trends and behaviors has become a reality. This alone has been responsible for an exceptional level of growth in BI adoption within marketing, sales, and service organizations globally. In essence, BI has redefined the functionality components of analytics, reporting and enterprise-wide use of data intelligence and insight used for streamlining decision-making processes all together.

Organizations need to be adaptive in an ever-changing environment and use different strategies to cope with it (Porter, 1997). Organizations also need to be resilient and to constantly seeking new ways to sharpen and sustain their competitive edge. The use of Business Intelligence refers to certain skills, technologies, practices, and processes that are employed as part of supporting decision making in an organization. The applications of Business Intelligence technology have historical, contemporary and even predictive view points of the business undertakings of an organization. This technology contains certain unique functions that are intrinsic to the particular systems. The adoption of BI systems therefore is aimed at the support of better quality decision making within an organization. It can also be referred to as decision support system (DSS). According to Adelman et al. (2002), BI is a term that encompasses a broad range of analytical software

and solutions for gathering, consolidating, analyzing and providing access to information in a way that is supposed to let enterprise users make better business decisions.

### **1.1.2 Business Intelligence and Organizational Performance**

The central theme of BI is to fully utilize massive data to help organizations gain competitive advantages (Cook & Cook, 2000; Williams & Williams, 2006). Business Intelligence (BI) is a systematic process, by which knowledge needed for an organisation to compete effectively, is created, captured, and shared and leveraged (Foo et al., 2007). BI consists of a dynamic and continuous set of processes and practices embedded in individuals, as well as in groups and organisational structures. Any part of a given organisation may be engaged in several different aspects of BI that attempts to constitute a holistic view of its business productivity.

The aim of business intelligence in an organization is to work within business processes that create, and transfer knowledge throughout the organization. If knowledge is created and transferred via human experiences then these business processes must encompass an understanding of how people learn and transfer their knowledge (Efron, 2004). Business intelligence is aimed at making better business decisions and making them more quickly.

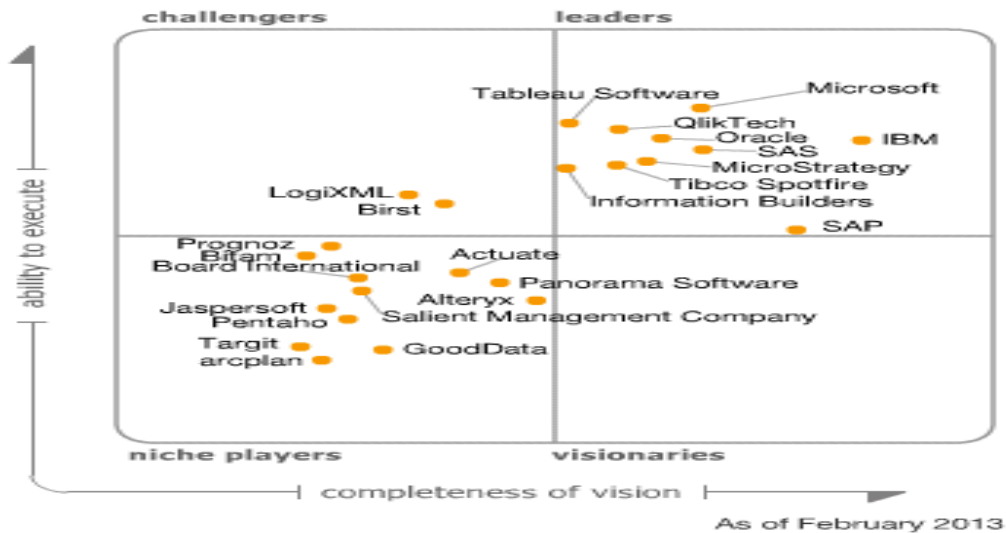
Businesses collect enormous amounts of data every day which may include information about orders, inventory, accounts payable, point-of-sale transactions, customers, demographics and a myriad of other external sources. All workers to some extent need BI. Business intelligence tools therefore, consolidate and organize data for better business decisions which gives an organization a competitive advantage in its operations.

BI helps an organization to create knowledge from a world of information (Veth, 2006). Accordingly, we believe it is a strategic necessity for organizations to assess how they can use BI to improve results and to use structured approaches to ensure that their investments in BI actually deliver business value (Williams and Williams, 2003). As promising as expanded use of BI may be, there is still the need for careful and balanced discussion of the specific business and technical preconditions for capturing the business value of business intelligence, particularly in today's tight IT investment climate (White, 2005).

### **1.1.3 Choosing Business Intelligence Solutions**

BI vendors are key players in the market expansion process through product innovation and their articulation of value propositions. Key vendor initiatives include offering pre-integrated BI product offerings generally known as packaged analytical applications, advocating expansion of the BI footprint within organizations, referred to as BI for the masses and/ or enterprise analytics; and positioning the use of their products as reflective of BI best practices.

**Figure 1: Gartner Magic Quadrant 2013**



*Gartner Magic Quadrant for Business Intelligence and Analytics Platforms ( K. Schlegel et al, 2013). Retrieved from*

[http://www.gartner.com/technology/reprints.do?id=1\\_1DYXHVT&ct=130206&st=sg](http://www.gartner.com/technology/reprints.do?id=1_1DYXHVT&ct=130206&st=sg)

As shown in figure 2 above and further explained by the authors, Gartner changed the name of this Magic Quadrant from "Business Intelligence Platforms" to "Business Intelligence and Analytics Platforms" to emphasize the growing importance of analysis capabilities to the information systems that organizations are now building. The rankings done by Gartner Inc, an independent ICT research company, greatly influence customer choice of which vendor to work with because they intrinsically evaluate each and every one of them along 15 capabilities across three categories: integration, information delivery and analysis. The results are then summed up in terms of completeness of vision and ability to execute.



Gartner describes leaders as vendors that are reasonably strong in the breadth and depth of their BI platform capabilities and can deliver on enterprise-wide implementations that support a broad BI strategy. Leaders articulate a business proposition that resonates with buyers, supported by the viability and operational capability to deliver on a global basis Gartner Magic Quadrant for Business Intelligence and Analytics Platforms (K. Schlegel et al, 2013). Locally other factors that come in to play include costs, implementation skills and experience of local vendors, politics especially in public sector, client and vendor skills, knowledge of BI tools, local user-experience etc.

#### **1.1.4 Kenya Power and Business Intelligence**

Kenya Power (KP), formerly known as Kenya Power and Lighting Company (KPLC) is a public limited liability company which transmits, distributes and retails electricity to customers throughout Kenya and is listed at the Nairobi Stock Exchange (NSE). Besides being a monopoly in Kenya KP's vision is to "provide world class power that delights customers", of which, a key pillar is the use of systems that would enhance the decision making capabilities of management at all stages of its operations.

Kenya Power is responsible for ensuring that there is adequate line capacity to maintain supply and quality of electricity across the country. The interconnected network of transmission and distribution lines covers about 47,035 kilometres. Its mandate includes the maintenance of the National Grid linked by a 220V & 132kV transmissions network, expansion of the same by constructing additional substations and increasing the efficiency of distribution in both technical and non-technical aspects. Technical

improvements include re-conduct ring of lines, installation of capacitors, and construction of additional feeders and substations. Non-technical improvements include introduction of electronic meters, improvement of meter reading accuracy, fraud control and resolution of billing anomalies, to ensure its 2,038,635 customers who consume over 6,341 Giga watts of electricity (As at the financial year 2010/11) are catered for using its 7000 employees spread over 58 branches and its heavy investment in ICT systems.

However, electricity costs are still high for the average consumer translating into higher costs of production of goods for Kenyans which brings in to sharp focus the KP systems performance. Having been listed in the Nairobi Stock Exchange KP has, as one of its mandate, to return a profit to its shareholders. Wealth maximization can only be realistically reached when operational efficiencies are achieved. Put simply KP has to reduce its running costs and increase the number profitable consumers. As a monopoly increasing costs of the electricity unit has many economical and political repercussions and is therefore not a positive option so other ways have to be explored to achieve this.

In 1999 KP invested in an Executive Information System (EIS) through Indra (formerly Soluziona), who was then implementing their ERP. This was the first and major foray for KP in the use of Business Intelligence. The EIS was based on Oracle tools namely the Oracle database, On-Line Analytical Processing (OLAP) tools, Data Mining and Oracle Express technologies. The consultant in conjunction with KP's ICT team and internal users developed a number of scripts which would extract data from various KP's applications in to a three dimensional cube. The cube would then be queried to produce

various reports based on the different dimensions/attributes of the data e.g. time, region, station, costs etc.

This system was however, complex to the computer-averse-management, targeted at that time and also cumbersome to programmers who had to manage many different complex scripts in order to extract data. Because of the complexity of the processes the data quality could also not be guaranteed thus questioning the reliability of the information in the ensuing reports. However, some departments who had not been able to get any consistent reports before like transport really appreciated this new development. It then is exciting and remains to be seen how BI relates to the performance of KP which is the basis of this study.

## **1.2 Statement of the Problem**

Although the opinion about business intelligence and its creation of business value is generally accepted, economic justification of investments into business intelligence systems is not always clear. Measuring the business value of business intelligence in practice is often not carried out due to the lack of measurement methods and resources. The true business value of business intelligence systems hides in improved business processes and thus in improved business performance (Chamoni & Gluchowski, 2004). It is important to note that many companies are at various stages of adopting various tools in BI however, there has been no concerted effort to gauge the effectiveness of the same and most research done to this stage is not conclusive or its at its early stages.

Kenya Power has been and continues to be on the front line in embracing ICT and investing heavily in it to ensure that it meets its goals and objectives. Efficient internal process contributes much towards the growth and success of any organization. As an organization grows, the amount of data required in an organization also becomes massive. Collecting and analyzing vast quantities of data can be a tedious process. Lack of availability of data in right form at the right time can result in delayed decision making. Kenya power has 58 branches and eleven divisions that use different systems to perform their duties. This has led to massive increase in data thus becoming difficult for the executive to go through all the data to make quick decisions and be able to monitor the changing trend in the organization. Due to these factors Kenya Power needs to implement the business intelligence system to help the executive make use of the growing data for easy analysis and quick decision making.

There exist pockets of BI research like one done in South Africa on effects on BI on SME's which established that "BI plays an important role in SMEs but that support and guidance can ensure that BI is used to fully exploit data for decision making" (Ponelis and Britz, 2011). Most research studies on the impact of BI adoption have been done in mainly ICT Developed countries for example one done in Sweden at Uppsala University. In this study Rahman (2012) researched on the impact of adopting BI in organizations and established that BI adoption improved the business competitive edge of the firms. Oh and Teo (2008) established that the effective use of business intelligence technologies, when combined with flexible IT infrastructure, strongly enhances the information-intensive processes of Adaptive absorptive Capacity. However, these researches were

done in Sweden and USA respectively. A myriad other research outputs on the efficacy of BI, have been undertaken by leading international research firms such as Gartner (2015) who have undertaken this on behalf of international vendors such as Oracle, IBM, Microsoft amongst others where the context has mostly been in North American and European countries.

In Kenya, companies have just started adopting BI and the impact is still not very clear as much as the current study will be based here. The closest we could establish to BI research was on Competitive Intelligence (CI). For instance; Sang (2001) did a study on “competitive intelligence practices by FM radio stations operating in Kenya”. His findings confirmed that most stations are more or less aware of CI and practice it. On the other hand Gathumbi, (2008) looked at competitive intelligence practices adopted by commercial banks in Kenya and equally came up with the same findings that use of CI has a positive impact of firm profitability. It is clear that while these researches have shed some light on CI in general, little appears to have been done on the automation of the collection of CI data, which would have had some semblance to BI. This study seeks to fill this research gap by answering the question; how does business intelligence influence the performance of Kenya power?

### **1.3 Research Objectives**

The study was guided by the following objectives.

- i. To establish how strategic business data is gathered, compiled and disseminated to decision makers as business intelligence at Kenya Power.

- ii. To establish the factors that influences the choice of business intelligence solutions used by Kenya Power.
- iii. To determine the impact of adoption of business intelligence on the performance of Kenya Power

#### **1.4 Value of the Study**

This research would be relevant as part of literature review and as foundation to the initial Business Intelligence research done in Kenya. Future researchers would also find the results a useful spring board to further expound on other measuring metrics on the efficacy of BI. Leading software vendors and developers will get a better insight at how a major organization is using BI and how best they can position and market their BI portfolio of products in Kenya.

The study would be useful in identifying areas for improvement in the use of business Intelligence at Kenya Power and in the effective performance of its operations. The Kenya Power management would find the study useful in that they will ascertain the company position in information technology and how best to improve electricity service delivery to their customers.

Future business intelligence investors would be cognizant that choice and usefulness of business intelligence tools would have an effect on their performance and will thus plan strategically how to adopt and use the same as an organizational policy.

Furthermore vendors of BI tools and ICT professional will be interested to know how BI adds value to the client and the best way to position the same.

## **2.0 LITERATURE REVIEW**

### **2.1 Introduction**

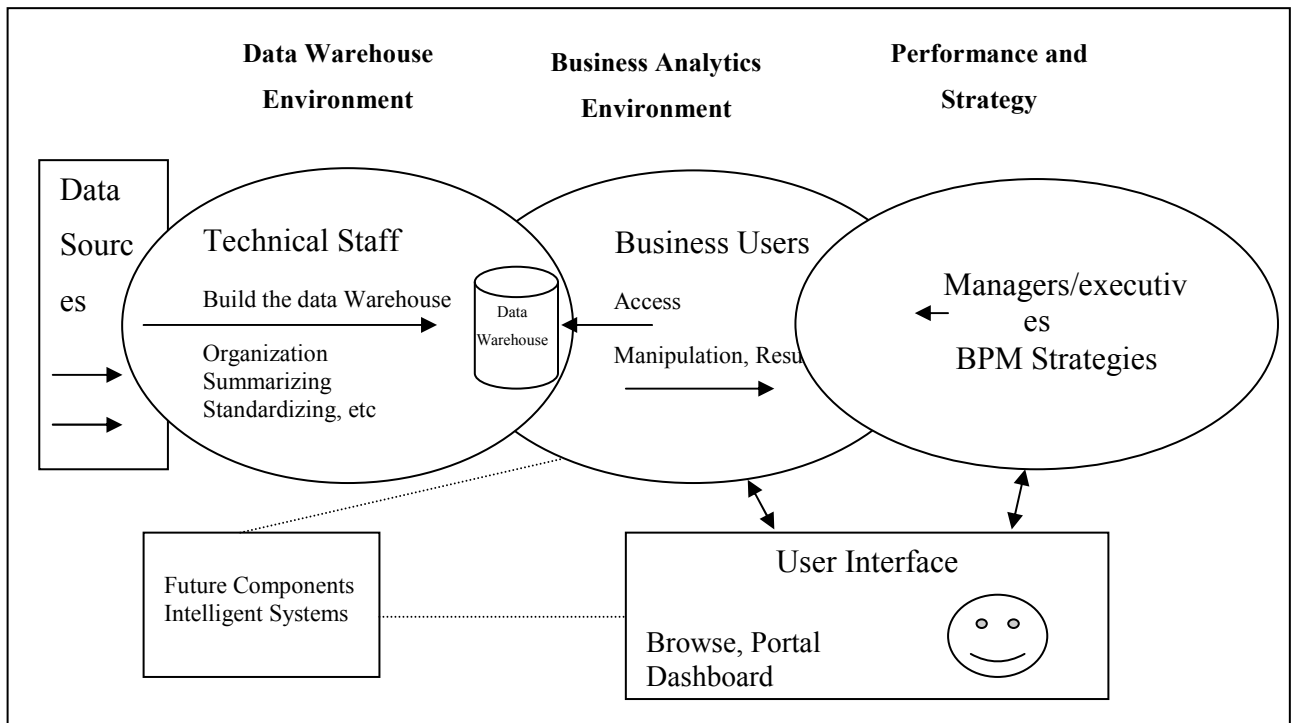
This chapter deals with the review of literature on BI. It covers types of BI tools, BI and service delivery, types of business intelligence tools and business intelligence systems and competitive advantage Creation. It also covers the impact of BI on profitability and return on investment (ROI), BI and the decision making model as well as systems theory of business intelligence.

### **2.2 Business Intelligence**

Business intelligence consists of collecting and interpreting economic information with a view to economic action, either immediate or future, and individual or collective purposes (Paturel and Levet, 1996). Business intelligence (BI) refers to skills, technologies, applications and practices used to help a business acquire a better understanding of its commercial context. Business intelligence may also refer to the collected information itself. Lee and Kim (2001) argues that there are some business objectives behind business intelligence, which include the need to improve ease-of-use and reduce the resources required to implement and use new information technologies, the need to increase revenues, reduce costs, and compete more effectively. Business intelligence systems are focused towards end user information access and delivery, and provide packaged business solutions in addition to supporting the sophisticated information technologies required for the processing of today's business information. There is need to manage and model the complexity of today's business (Cunningham, 2005).

According to Wensley (2000) Business intelligence systems provide more than just basic query and reporting mechanisms, they also offer sophisticated information analysis and information discovery tools that are designed to handle and process the complex business information associated with today's business environment.

**Figure 2: A high Level Architecture of BI**



*Turbman, Aronson, Liang, Sharda, (2003), Decision Support and Business Intelligence systems, Pages 223*

Note that the data warehouse environment is mainly the responsibility of the technical staff, while the analytical environment (also known as business analytics) is the realm of the business users. Any user can connect to the system via the user interface, such as a



browser, and top managers may use the Business Process Management (BPM) component and also a dashboard (Turbman, Aronson, Liang, Sharda, 2003).

### **2.2.1 Level of use of Business Intelligence**

There are various levels of BI ranging from the use of the tools and this are ranging from reporting to forecasting and analysis.

Business operations' reporting is the most common form of business intelligence. It is the most used in many organizations. It includes the actual stack up against the goals. This type of business intelligence often manifests itself in the standard weekly or monthly reports that need to be produced (Wensley, 2000).

Business Forecasting on the other hand involves foretelling or predicting the future using business data and analytical tool called OLAP. Companies operate in a competitive world of business and to gain a competitive edge in the market there is a need to have information about competitors and also forecast possible threats and opportunities that they may face (Wensley, 2000).

At the delivery end is the dashboard whose primary purpose is to convey the information in the simplest and easiest form. This is mostly consumed by senior management. The effectiveness of the dashboard requires a solid data warehousing or data mart backend, as well as business-savvy analysts to create the correct business models with the necessary data.

### **2.2.2 Business Intelligence, Knowledge Management and Corporate Performance Management**

Business Intelligence and Knowledge Management (KM) must be integrated in order to promote organizational learning and effective decision making, and the effectiveness of BI should be measured based on the knowledge improvement for the organization (Cook and Cook, 2000).

Nevertheless, the visions of integration of BI and KM are diversified, and issues of whether KM should be viewed as a subset of BI or vice versa are still under debate in these two well established fields (Herschel and Jones, 2005). While both KM and BI are deeply influenced by the approaches of the research and practitioner's communities, the way of integration of KM and BI seems not unique. The Balanced Scorecard (BS) tool starts with an understanding of where the organisation is today, where it wants to go to, what targets should be set, and how resources should be allocated to achieve a competitive advantage in the business. Once plans have been set, the system monitors the implementation of those plans, highlights exceptions, and provides insights as to why they occurred so that corrective measures can be taken. The system hence supports the evaluation of alternatives from which decisions can be made and closes the loop by leading back to the decision on where the organisation wants to go (Lee and Kim, 2001).

Corporate performance management at best enables management to communicate and drive strategy through the entire organisation in a way that helps management act and make decisions that support the strategic objectives and targets. It helps the organisation to focus on key issues and critical data, rather than on all the data and events that are

possible. As Paladina (2007) puts it, it delivers the right information to the right people at the right time in the right context.

The link between BI and corporate performance management is clear and simple. Business Intelligence projects tend to be cross-departmental. Therefore, even if only a specific business subject area is covered by the project, the business definitions and business rules must be standardized to be understood and valid on an enterprise level and standardized to ensure consistency and enable reuse. The management of the Business Intelligence project must ensure that there is at least an official and agreed on definition for those measurements that are part of the deliverables (that is, data models, reports, and metadata catalog).

Data Warehousing and OLAP BI tools consolidate data from a lot of different sources from different lines of business throughout the company (Adelman, Abai & Moss, 2005). The planning for the population subsystem that maps and transforms the data into the corporate-wide context that is needed in a Business Intelligence environment must consider data quality issues, which are usually discovered during this process. Resolving data quality issues and ensuring that only 100% correct, meaningful, and unambiguous data is delivered to the analysts can be a very complex and time-consuming process. Extract-Transform-Load (ETL) tools are used for this purpose.

### **2.3 Choosing Business Intelligence Tools**

The first step to evolving your BI approach is recognizing where you are on the maturity model so that you can understand the changes you need to make to increase the value BI

can provide your business (IBM Analytics model) (Biere, 2003). Major factors to consider in choosing a BI software are platform, applications, data management i.e. your organization could have data in several different databases, globalization i.e. geographical spread, scalability – as your business grows, your needs will invariably grow as well, security - your solution must ensure that authorized people have access to data as per your company policy, audit - it is also important to audit usage of the BI solution and the solution should have audit built in from the very start rather than being added as an afterthought and finally source - the selected vendor must have a proven track record and should have several successful implementations to his credit.

To conclude, implementing a BI solution is an important initiative in any organization. While considerable organizational support is required in its implementation, it is equally important to insure that the software and the vendor are selected very carefully. The implementation is complex and can pose a major challenge if legacy software is involved as well; therefore the experience level of your solutions provider is very important (Sanjay, Web Article, 2012).

#### **2.4 Business Intelligence and Corporate Performance**

The use of business intelligence (BI) to make better management decisions is becoming more prevalent in organizations of different industries. BI is an umbrella term that describes the technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help users make better decisions (Wixom and Watson, 2010). Studies have shown that companies that invested in BI and coupled it with scrupulous

practices have seen increased revenue and enormous cost savings. BI technologies are specifically designed to systematically report on performance. For example, a user might want to examine sales of a specific product then drill-down to better understand sales of this product in a specific region or over a specific time frame. This multi-dimensional exploration of performance information is complemented by tools that facilitate the distribution of online reports as well as scorecards or dashboards (Watson et al. 2006).

While reports can feature any view of the data needed by a manager, scorecards and dashboards provide summary information regarding company performance in a visual format that allows for variance analysis by decision-makers. Because BI enables exploration of performance data by end users (as opposed to the situation where users request reports from the IT department), it provides faster and more accurate access to performance measures (Müller et al. 2010). It can also facilitate analysis of the data and thus improve managers' ability to extract meaning from the information provided. It is therefore possible that BI impacts the corporate performance management cycle in a number of ways. First, it enables rapid and accurate delivery of performance information that directly impacts planning and measurement. BI may also provide additional data-manipulation functionality and thus directly impact analytics. Given the fact that the ultimate organizational performance driver is the effectiveness of operational business processes (Elbashir et al. 2008) because these processes lead directly to the accomplishment of secondary organizational objectives such as customer satisfaction or supply-chain efficiency, we position operational processes as the ultimate dependent variable.

### **2.4.1 Business Intelligence and Competitive Advantage**

The top echelons of blue chip firms the world over are increasingly recognizing the importance of Business intelligence and knowledge management as a key asset in keeping in touch with what is going on in their markets, (Vedder and Guynes, 2002). With the increase in business competition, company survival and success is now determined by its rate of learning. If it is faster than external changes, the organization will experience long-term success (Darling, 1996).

Ironically, even though as much as 68 percent of US companies have an organized approach to providing information to decision makers (Westervelt, 1996), according to Ettorre (1995), probably less than 10 percent of American corporations manage the BI process well, and effectively integrate the information into their strategic plans. The antecedents and consequences of BI dissemination have been studied by Maltz and Kohli (1996). Companies with well established BI programs on the average shows improved earnings per share compared with those without BI programs (King, 1997). Authors such as du Toit, 2003; Editors, 2004; Guimaraes and Armstrong, 1998; Davison, 2001 have outlined the benefits that can be derived from Business Intelligence. Among these are improved competitive edge and improved overall company performance, secondly essential company goals that can be brought about with effective application of Business intelligence.

More specific benefits of BI include: uncovering business opportunities and problems that will enable proactive strategies (Westervelt, 1996); providing the basis for continuous improvement (Babbar and Rai, 1993); shedding light on competitor strategies

(Westervelt, 1996); improving speed to markets and supporting rapid globalization (Batz, 1994; Ettore, 1995); improving the likelihood of company survival (Westervelt, 1996); increasing business volume (Darling, 1996); providing better customer assessment (Darling, 1996); and aiding in the understanding of external influences (Sawka, 1996). Benefits such as these provide the basis for firms to better understand the potential impact of the proposed innovations and the means by which they can be infused into the company's fabric.

#### **2.4.2 Business Intelligence and Service Performance**

Public sector executives are struggling with operational inefficiency while under pressure to improve service delivery to citizens. Business Intelligence (BI) can play a vital role in establishing, analyzing and forecasting levels of spending, resource utilization and service usage patterns so as to feedback information into decision processes for service improvement.

Data does not automatically lead to intelligence, however, nor does technology. It's important to develop an effective data management framework to deliver high quality, accurate and timely information and to improve the data shared between public sector organizations and their partners. However, too many administrators still rely on planning and budgeting processes based on the circulation of marked-up spreadsheets and reports. This haphazard data collection results in flawed intelligence that can lead to incorrect conclusions and decisions that are way off the mark. What is needed is accurate record-keeping and sophisticated analysis and reporting of activities (Hostmann, 2007).

Ensuring data integrity is the first step. This involves putting the necessary information technology structures and rules in place to make sure that the company's data is integrated, consistent and accurate. Consolidating disparate data sources and centralizing data management is the only way to provide decision makers with 'a single version of the truth'. With complete and accurate data it becomes possible to formulate predictions and make well-informed decisions. A BI model can then be created to report on key performance indicators as defined in the business plan and ensure that delivery matches output targets within a small, defined variance. This enables executives to have a clear view of the performance of their department or of individual employees (Hostmann, 2007).

One area where BI can have an enormous impact is in the monitoring of call centres and the analysis of vast amounts of call centre data. The classic case study in this regard is that of New York City. In March 2003, under the leadership of Mayor Michael R Bloomberg, NYC launched an ambitious customer service centre, designed to give citizens one point of contact with the city administration. The NYC 311 customer service centre focused on providing the public with quick, easy access to all city services and helping agencies improve service delivery by enabling them to manage their workload efficiently. The city used data from the call centre along with BI technologies to provide increased visibility into its operations. It deployed a BI tool which was able to compile data on all calls received, services selected, tickets opened and type of requests, and capture robust datasets on all activities (Hostmann, 2007).



### **2.4.3 Business Intelligence and Financial Performance**

BI can increase cost savings. At least a 1% business improvement is possible simply by applying Business Intelligence (BI). ROI calculations for a BI project can be approached in two ways: a) by measuring efficiencies in information distribution; or b) by measuring business execution improvements that result from better, faster decision-making (Harmon, 2003). The first approach is easy to measure and easy to execute, but it holds relatively small returns. The second approach is the opposite: hard to measure and hard to execute, but it offers huge returns. One can save little streamlining older reporting processes, but much greater opportunities are available when decision-making processes are significantly improved and key business processes are redefined. For example, an organization within the telecommunication industry has 15 people working full time preparing and distributing reports to users (Larivet, 2006). Of those 15 people, ten focus exclusively on difficult ad hoc reports and queries that require pulling data together from multiple sources. If a BI initiative can cut in half the time to create and distribute these reports, the cost savings would be a reduction of five personnel. These personnel could add value by being productive in other key areas (Frolick and Ariyachandra, 2006).

BI enables knowledge workers to work smarter, not harder. The fiscal impact of adding BI to the corporate decision support arsenal varies within different companies and industries. Three examples of ways in which effective BI has helped enterprises include the following: By analyzing the root causes of product failure, a major manufacturing company was able to work with its suppliers to reduce the rate of product defects by one-

quarter of 1% per day, generating savings of more than R14 million annually, not to mention having an impact on customer satisfaction (Inmon, 1999).

A large international portfolio management firm conservatively projected that by identifying and focusing on the top 20% of its clientele, transactions would increase by one-half of 1% per day, creating a daily revenue increase of R35 million. By analyzing customer behavior and developing attrition, acquisition, retention and growth models, a major international technology supplier determined that it could increase annual revenues by more than R700 million and profits by almost R70 million (Frolick and Ariyachandra, 2006). These anecdotes provide a few examples of the impact BI can have on top and bottom line revenues as well as on cost reductions. ROI analyses by BI adopters in various industries suggest that it is not unreasonable to expect a 500% or greater ROI with BI. It is indisputable that a company can gain significant business benefits through BI adoption. Outsourcing ones BI infrastructure to an experienced partner not only helps maximize ROI, but also helps one realize these returns more quickly than an in-house environment might (Inmon, 1999).

## **2.5 Theories of Business Intelligence**

The study was based on the following two theoretical foundations; systems theory of business intelligence which views organizations as complex social systems and the business intelligence decision making model which provides organizations with a sense of superiority in the competitive environment by aiding management in the decision making processes.

### **2.7.1 Systems Theory of Business Intelligence**

Systems theory of business intelligence is one of the main intellectual movements of the 20th century that arose in response to overspecialization in the sciences as a way to find a more integrated view of knowledge and the world. Systems theory attempts to describe and understand the common structure, attributes and emergent properties of all types of systems physical, biological and social by viewing them as systems per se rather than an economy or a business or a machine. A systems theory of business intelligence would position BI in the context of its surrounding system - the organizational environment in which it operates and would predict the impact of that context on BI design. This theory would give designers a tool that guides them on what BI technology can do and what it cannot do in a given environment and the risks involved (Kurtyka, 2005).

Organizations are cognitive systems in dialog with their environment. In order to learn from their experience, organizations collectively need to perform several important cognitive tasks: sense and monitor their environment for example using customer and supplier contact channels; relate the information gained from this to the operating norms that guide the business for example campaign management; detect deviations from these norms; and initiate corrective actions when deviations exceed some preset level. If these tasks are done well, a process of cybernetic information exchange is created between the organization and its overall environment. BI is more accurately described as a technical artifact that encodes a description of the business environment thus the data model. BI helps users to understand their environment in terms that are meaningful, such as key performance indicators (KPIs) and dashboards, and facilitates predicting and controlling

the business. This is built into the front-end design of the BI system as statements of purpose, scope, functionality, objectives, outputs and so forth, all of which are intended to align the BI system with the organization's strategy (Kurtyka, 2003).

### **2.7.2 The Business intelligence Decision Making Model**

The Business intelligence Decision Making Model attempts to provide organizations with a sense of superiority in the competitive environment by aiding management in the decision making processes. Despite many advantages, the companies applying such systems may also encounter problems in decision-making process because of the highly diversified interactions within the systems. Hence, the choice of a suitable BI platform is important to take the great advantage of using information technology in all organizational fields. BI in modern business cycles is the primary tool to collect and analyze information for developing a successful business strategy. Firms use BI to gain full knowledge about all the strengths and weakness of their business plans by analyzing available data. These data generally include quantities of product, customer, sales, market demand, customer service, and technical support system , that are useful in critical decision-making (Harmon, 2003).

There are primarily three types of decisions that most business organization can generate through the utilization of BI: strategic, tactical and operational. All these decisions act collectively for the growth of business. BI assist firms to make strategic decisions especially in the areas of new product development, company merger, accusation and market expansion among others. In case of tactical decision the focus of BI is more

towards the product and customer and the amount of risk associated in developing a new product or attracting new group of customers. Tactical decisions are mainly focusing on short-term goals dealing with immediate activities. In both these decision business organizations take help of operational data store and data warehouse that provides credibility and validity for analytical processing. However, human intervention is necessary for taking action. So the role of business intelligence in both these two cases is considerable less. It merely builds a data store to extract strategic business value from available data. Operational decisions deal with money transaction for example, approving or declining a specific application, pointing out fraud, and so on. In particular they address individual transaction like approving loan or not and these are more common decision taken in daily business activities. BI provides data on this decision making decision too (Stalinski, 2004).

## **2.6 Summary of Literature Review and Knowledge Gap**

This chapter covered the literature review of the study. It concentrated more in bringing out the main objectives of the study in general. The literature review pointed out that business intelligence system has been used previously in the creation of a competitive advantage for firms (Maltz and Kohli 1996; Darling 1996; Westervelt 1996; Ettorre 1995; Vedder and Guynes, 2002). At the same time BI has been shown to have a positive impact on firm profitability as well as return on investment (du Toit, 2003; Editors, 2004; Guimaraes and Armstrong, 1998; Davison, 2001). Equally BI in its decision making model has been found to assist business managers in their decision making processes through data storage and analysis.

However while this theoretical literature has demonstrated the application of BI on firm performance, there is little evidence on such application and performance outcomes in relation to Kenya and specifically in our chosen area in energy sub sector firms with special reference to KP. This therefore calls for the study to establish impact of adoption of business intelligence tool in the performance of Kenya Power ltd.

### **3.0 RESEARCH METHODOLOGY**

The Methodology to be used was constrained by the availability of information and the lack of trust by private entities to share their models of collecting competitive information however, we proceeded to determine the best way to proceed by picking an organization that would have the highest impact to most Kenyans.

#### **3.1 Research Design**

The research design was a case study because the unit of analysis is one organization. According to Yin (1994) a case study allows an investigation to retain the holistic and meaningful characteristics of real life events. It is a method of study in depth rather than breadth and places more emphasis on the full analysis of a limited number of events or conditions and other interrelations. In our case we needed an in depth understanding of the complex integration of business intelligence and the organization which could only be achieved by a case study.

#### **3.2 Case Study Selection**

Because of the complexity of actually measuring performance of business intelligence it was evident that the unit of focus would have to be a major organization impacting on as many Kenyans as possible. It would have been daunting and not to mention very expensive to gather qualitative data from such like organizations. Thus a case study of

one of them would provide an insight to many other organizations hence the choice of a case study and Kenya Power.

The lack of willingness to share information from private sector players like banks and telecommunication companies due to their competitive nature led us to pick a public sector case study and hence the choice for Kenya Power.

KP is a strategic firm in Kenya in its monopoly hold of all distribution of electricity. This position has made it an early adopter of information technology as it has invested heavily to ensure its streamlines its operational business by the acquisition of the SAP ERP running on an Oracle Database for its data. Operations in KP have a direct and strong correlation with the economic performance of the country and our ability to achieve our 2030 vision. Therefore a study on them was a major source of information on BI ICT trends in the country and their impact on performance.

### **3.3 Data collection**

An interview guide was constructed in line with the objectives and was used to collect information from the management staff of KP. Since the data sought was qualitative and the use of BI and decisions process is across many users we focused on the interviews to managers in all departments at all levels. The departments were Information Technology, Finance, Accounts Strategy, Marketing, Human Resources, Production, Customer relations, Sales and the Chief Executive office`s office. This team could give the desired data on BI. The interview guide had open-ended questions. The open-ended questions



enabled the researcher to collect qualitative data. This was used in order to gain a better understanding and possibly enable a better and more insightful interpretation of the results from the study. The interview guide designed in this study comprised of two sections. The first part will deal with research objective 1, while part two will capture objective 2. Part three of the interview guide devoted to objective 3 of the study.

### **3.4 Data Analysis**

A combination of content and statistical analysis was used to analyze the respondents' views about the impact of the adoption of business intelligence on the performance of Kenya Power Ltd. This is because the data sought is qualitative, with a small part being quantitative to measure impact. The data was then be coded to enable the responses to be grouped into various categories. Tables and other graphical presentations as appropriate were used to present the data collected for ease of understanding and analysis.

Data analysis using thematic content analysis and was used to answer the research questions. The questionnaire took in to account the decision making model in styles in order to discern the various responsibilities, needs, concerns, challenges and requirements at all decision making levels.

## **4.0: DATA ANALYSIS AND INTERPRETATION**

### **4.1 Introduction**

This chapter presents the data that was found on business intelligence and the performance of Kenya power. The research was conducted based on interview of a 10 respondents from Information Technology, Finance, Accounts Strategy, Marketing, Human Resources, Production, Customer relations, Sales and the Chief Executive office's office. Out of 10 respondents, 7 were available for interviews making a response rate of 70%. The study made use of content analysis to analyze the data through describing phenomena, classifying it and seeing how the concepts interconnect as was indicated by the respondents. This approach of analysis was preferred because it gave results that were predictable, directed, or comprehensive. Content analysis also enabled the researcher to shift through large volumes of data with relative ease in a systematic fashion.

### **4.2 General information**

The study initially sought to inquire information on various aspects of respondents' background, i.e. the respondent's gender, age, academic background and number of years worked. This information aimed at testing the appropriateness of the respondent in answering the questions regarding business intelligence and the performance of Kenya power.

#### 4.2.2 Department worked

The study further sought to establish the department that the respondents worked. The findings are as stipulated in the table below

**Table 4.1 Department worked**

<b>Department</b>	<b>Frequency</b>	<b>Percentage</b>
Information Technology	2	28.6
Strategy	1	14.3
Marketing	1	14.3
Human Resources	2	28.6
Customer relations	1	14.3
<b>Total</b>	<b>7</b>	<b>100</b>

From the findings of the study, most (28.6%) of the respondents worked in Information Technology and human resource respectively while 14.3% worked in the Customer Relations, Strategy and marketing respectively. This implies that majority of the respondents were from human resource and Information Technology departments respectively.

#### 4.2.3 Distribution of respondents by Age

The study investigated the age brackets within which the respondents were. Figure 4.2 shows the summary of the findings.

From the findings, most (42.9%) of the respondents were aged between 35-45 years, 28.6% were aged between 45-55 years while 14.3% were aged between 25-35 years and more than 55 years respectively. From the findings it's clear that majority of the

respondents are between 32-38 years thereby the expectations were that they would have significant experience.

#### **4.2.4 Highest Academic Qualification**

The study was also inquisitive to establish the highest academic qualification of the respondents. This is illustrated in Table 4.2 below.

**Table 4.2: Highest Academic Qualification**

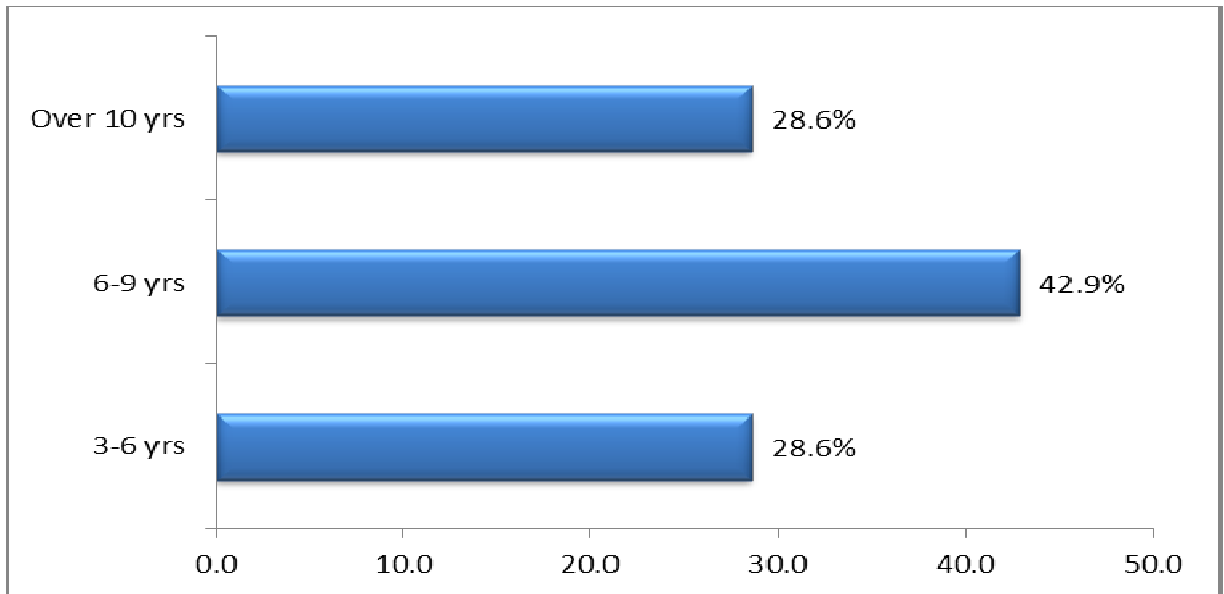
<b>Academic Qualification</b>	<b>Frequency</b>	<b>Percent</b>
College certificate	1	15.7
University degree	4	59.1
Masters	2	25.1
<b>Total</b>	<b>7</b>	<b>100.0</b>

From the study findings, majority (59.1%) of the respondents had their first degree, 25.1% had master's degree while 15.7% had college certificates. This clearly implies that majority of the respondents at Kenya power had their first degree and hence reasonably educated to give us valuable insight in to the organization.

#### **4.2.5 Number of years worked in the institution**

The study further sought to establish the duration that the staff at Kenya power had been working with the institution. This is illustrated in the figure below.

**Figure 4.1 Number of years worked in the institution**



From the findings of the study, most (42.9%) of the staff at Kenya Power had worked in the institution for 6-9 years while 28.6% had worked in the institution for between 3-6 years and over 10 years respectively. The questionnaire had four categories on length of time and respondents simply had to tick where they applied in terms of years worked. This implies that most of the respondents of this study had worked for an ample time thus they were conversant with the information that the study sought pertaining to the organization.

### **4.3 Strategic Business data**

The following information was compiled in order to probe the factors that influence the choice of information for different functions and their relevance to the business role used by Kenya Power.

#### **4.3.1 Data needed for functional roles**

The study sought to establish the kind of data needed for the respondent's functional roles. From the findings, majority of the respondents indicated that they required SAP (finance, budget monitoring, HR leave system); emails; systems performance monitoring. Others indicated performance and availability of IT systems i.e. hardware and software's while others indicated availability of sites/links; capacity utilization and growth of user needs and failure rates/repair times. One respondent for example said,

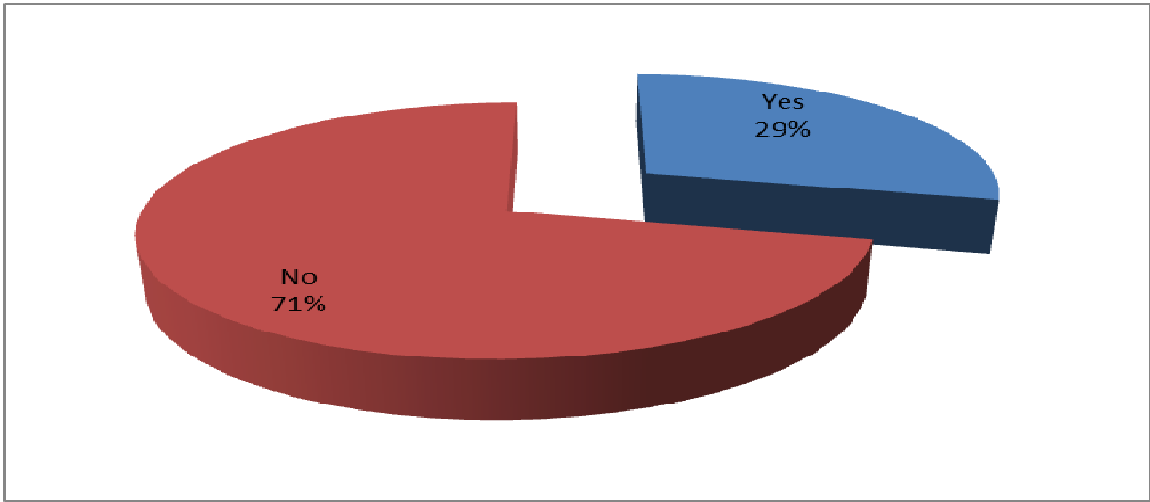
*“Some of the data I need in my functions are customer and transaction information, to drive decisions.” – Respondent 4*

Information from the customer systems i.e 'number of customers seeking support' would influence the deployment of engineers on the ground to assist with the issues arising.

#### **4.3.2 Information processing**

The study sought to establish whether information was processed by other departments before it reaches the respondents. The findings are indicated in the figure below.

**Figure 4.2 Information processing**

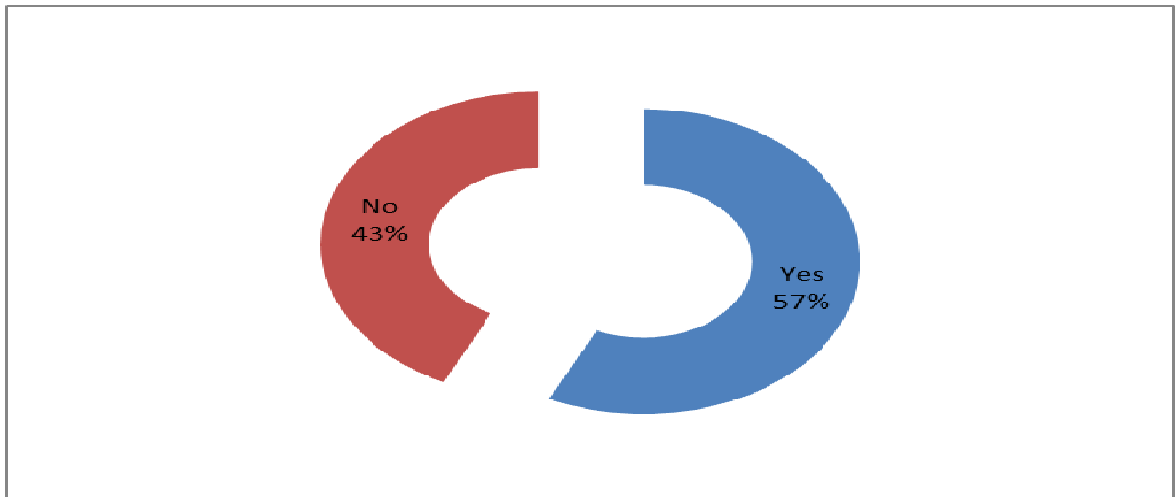


From the findings of the study, majority (71%) of the staff at Kenya Power indicated that information was not processed by other departments before it reached them. For 29% whose information was processed by other departments, they mentioned system administration and technical teams as the departments where information was processed before it reached them. This thus showed that there was low or no work flows processes to enrich the value of data between different departments.

#### **4.3.3 Information processing for onward transmission**

The study further sought to find out whether the respondents in turn processed the information for onward transmission to other users or departments. This is illustrated in figure 4.5 below.

**Figure 4.3 Information processing for onward transmission**



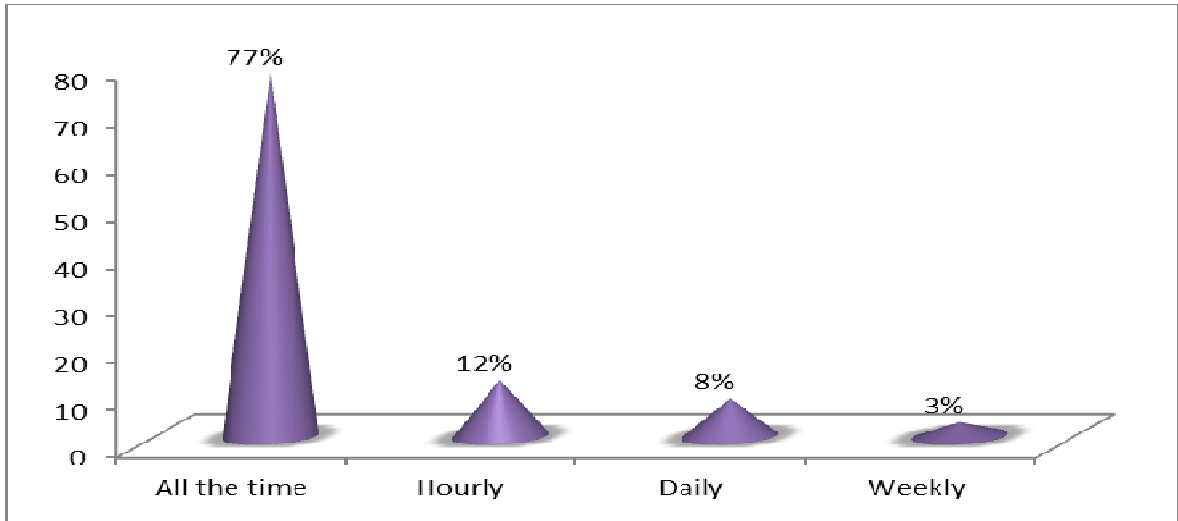
From the findings of the study, majority (57%) of the staff at Kenya Power indicated that they in turn processed the information for onward transmission to other users or departments while 43% did not processed the information for onward transmission to other users or departments. Further, the respondents indicated that they used gmail, sms and phone. This further showed that the process of data enrichment was not fully matured in on wards transmission of information.

#### **4.3.4 Frequency at which information was needed and processed**

The study sought to find out the frequency at which information was needed and processed. This is illustrated in figure below.



**Figure 4.4 Frequency at which information was needed and processed**



From the findings of the study, majority (77%) of the staff at Kenya Power indicated that the information was needed and processed all the times, 12% indicated that the information was needed and processed hourly and 8% indicated daily while 3% indicated weekly. This implies that information at Kenya Power was needed and processed all the times thereby showing a high dependency on information technology.

#### **4.4 Factors that influence the choice of business intelligence tool**

Here we sought to establish the iterations that the customer had to undergo in order to establish which would be the best tool to work with as per their requirements.

*“Tools needed: We need Commercial Network operations tools” and “Choice of tools is via Open Tenders”-Respondent 2*

Being a public entity the procurement process still has to go via open tender. The knowledge on how best to describe what KP needs ensures that respondents provide the appropriate technology.

#### **4.4.1 Further information needed to make better decisions**

Here we also sought to establish further information needed to make better decisions. From the findings majority (58%) of the respondents indicated that; structured graphical reports, timely reports, automation of the BI; data warehousing; dashboard; analytics; open system and commercial network operational tools were other information needed to make better decisions.

#### **4.4.2 Tools Needed**

We further sought to establish the tools needed to make better decisions. From the study findings, majority (64%) of the respondents indicated that they needed; bigger flat screens, commercial network operational tools; network operation center and servers; trends performance systems; variance (actual vs target) and data warehouse in order to make better decisions.

#### **4.4.3 Decision on tools to use**

Further the study sought to find out how the decision on which tools to use was made. From the findings most (45%) of the respondents indicated that this was dictated by the procurement process however individuals had preferences which they did not state.

#### **4.5 Impact on Performance**

A key part of this study was to show linkages between the use of business intelligence and the effect this had on the work output of different users in KP.

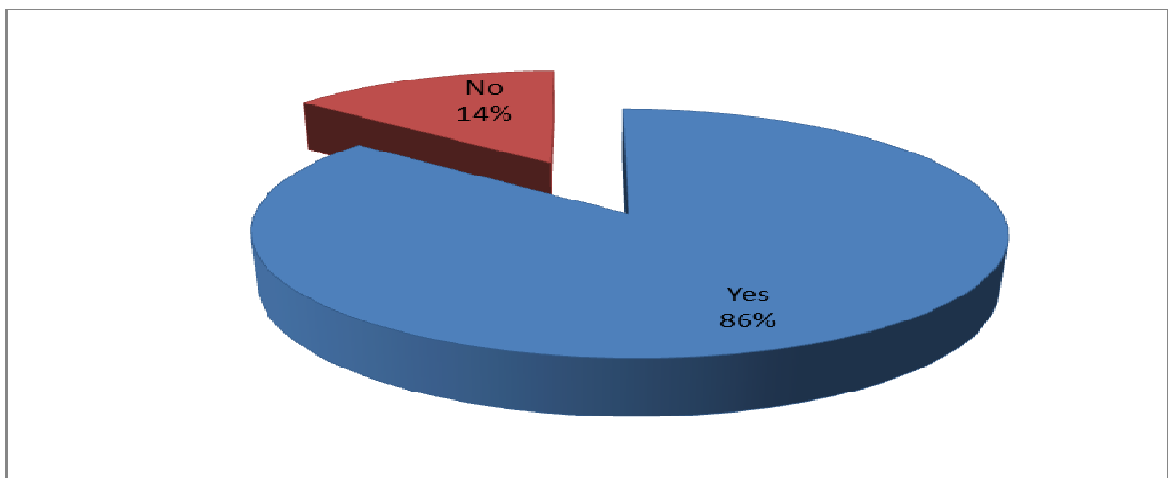
#### **4.5.1 How Information Systems support business decisions**

From the findings, majority of the respondents indicated that Information Systems support business decisions through increasing cost-savings; streamlining older reporting processes; enabling knowledge workers to work smarter, not harder; it helped the organization work with suppliers to reduce the rate of product defects; it helped in analyzing customer behavior and developing attrition, acquisition, retention and growth models and it also helps the organization realize returns more quickly than an in-house environment might.

#### **4.5.2 Is the information from the computer accurate and reliable enough to support decisions**

We undertook to establish whether the information from the computer was accurate and reliable enough to support decisions. This is illustrated in figure below.

**Figure 4.5 Is the information from the computer accurate and reliable enough to support decisions?**



From the findings of the study, majority (86%) of the staff at Kenya Power indicated that the information from the computer was accurate and reliable enough to support decisions while 14% were of a contrary opinion and required further summarization of the data.

#### **4.5.3 Impact of the information received from the computer**

Here we analyzed the impact of the information received from the computer on different organisation pillars in the organisation. The responses were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where: 1- To a very low extent, 2- To a low extent, 3- To a moderate extent, 4- To a great extent and 5-To a very great extent. The mean and standard deviations were generated from SPSS and are as illustrated in table

**Table 4.3 Impact of the information received from the computer**

<b>Statement</b>	<b>Mean</b>	<b>Std deviation</b>
Growth in customers:	3.68	0.226
Customers Service:	4.36	0.338
KP's Profitability	3.59	0.281
Staff morale:	3.64	0.303
Ease of doing work	4.46	0.911
Complexity of the job	4.23	0.678

From the study findings in Table 4.3, majority of the respondents agreed to a very great extent that ease of doing work; customers service: and complexity of the job was the impact of the information receiving from the computer, as part of daily job as indicated by the mean scores of 4.46, 4.36 and 4.23 respectively.

*“availability and percentage utilization give an indication of how healthy the infrastructure is” - Respondent 1*

*“Reliable infrastructure would mean less repairs and maintenance”- Respondent 2.*

Here the staff showed that they highly depend on the systems and thus the health and percentage uptime of the infrastructure system meant the staff were spending less time running around supporting systems that were supposed to be working.

On the other hand, most of the respondents agreed to a moderate extent that growth in customers; Staff morale; and KP's Profitability was the impact of the information received from the computer, as part of daily job as indicated by the mean scores of 3.68, 3.64 and 3.59 respectively. These findings clearly illustrate that ease of doing work; customer's service; and complexity of the job was the impact of the information received from the computer, as part of daily job.

#### **4.6 Discussions of the Findings**

We found out that staff at Kenya power need the automated enterprise resource planning tool called SAP which covered finance, budget monitoring as well as the HR leave system; emails; performance monitoring and dashboards in order to perform their roles effectively. Lee and Kim, (2001) indicated that once plans have been set, the system monitors the implementation of those plans, highlights exceptions, and provides insights as to why they occurred so that corrective measures can be taken. The system hence supports the evaluation of alternatives from which decisions can be made and enhances

future decisions based on this learned history of knowledge which the employee and hence the organisation gains from.

Further, we established that information was not processed by other departments before it reached key users. This showed a low uptake of BI tools besides the standard system administration and technical teams who massaged the systems for data throughput to users. This agrees with Lee and Kim (2001) who argues that there are some business objectives behind business intelligence, which include the need to improve ease-of-use and reduce the resources required to implement and use new information technologies, the need to increase revenues, reduce costs, and compete more effectively. Business intelligence systems are focused towards end user information access and delivery by processing of today's business information.

The study established that Information Systems do support business decisions through increasing cost savings; streamlining older reporting processes; enabling knowledge workers to work smarter, not harder; helping the organization work with suppliers to reduce the rate of product defects; helping in analyzing customer behavior and developing attrition, acquisition, retention and growth models and it also helps the organization realize returns more quickly than an in-house environment might. Paladina (2007) further says, it delivers the right information to the right people at the right time in the right context. Davison, (2001) also outlined the benefits that can be derived from Business Intelligence. Among these are improved competitive edge and improved overall company performance, secondly essential company goals that can be brought about with effective application of Business intelligence.

Further, the information from the computer was accurate and reliable enough to support decisions as at that time albeit a few concerns. Wensley (2000) indicated that business intelligence systems provide more than just basic query and reporting mechanisms, they also offer sophisticated information analysis and information discovery tools that are designed to handle and process the complex business information associated with today's business environment.

The information received from the current IT systems was fundamental in enhancing the performance of the users and directly led to an improvement in ease of doing work; customer's service; and reduction in complexity of the job. We also established that there was further improvements needed to help the staff make even better decisions and included; further automation of the BI in line with business flows; requirements of a data warehousing; need for dynamic dashboards and a more flexibility in analytics platform. It was established that more tools in the areas of trend analysis and variances (actual vs target) would augment the above.

## **5.0 CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter presents the summary of study findings, conclusions and recommendations which are provided below based on the objectives of the study.

### **5.2 Summary**

In this study we sought to establish how business intelligence influences the performance of Kenya power. The study was guided by three objectives; to establish how strategic business data is gathered, compiled and disseminated to decision makers as business intelligence at Kenya Power, to establish the factors that influence the choice of business intelligence solutions used by Kenya Power and to determine the impact of adoption of business intelligence on the performance of Kenya Power.

Regarding strategic business data, we established that staff at Kenya power used SAP ERP (finance, budget monitoring); emails; HR leave performance & monitoring and dashboards to function in their roles effectively. However, this information was not highly processed by other departments before it reached the recipients. For those whose information was processed by other departments, they mentioned system administration and technical teams as the departments where information was processed before it reached them. This means the end users were not enabled enough to manipulate the information as much as they wanted. It also showed the basic ERP automation had really been needed as most of the KP staff fully relied on the system to do their work at all times.



As related to factors that influence the choice of business intelligence solutions used, the study found out that KP being a public sector entity had to use the open tender system and thus had to be very clear in the solution they wanted. Users needed to be involved in the development of these requirements so that the final request for information captured all intrinsic users needs. However, at the time of this study users were in agreement that there was need for further information/tools needed to make better decisions which included the need for automation of the BI process; data warehousing; dashboards; analytics; open system and improvement of commercial network operational tools.

As regards the objective on the impact of adoption of business intelligence on performance, the study established that Information Systems support business decisions through increasing cost savings by automating tedious processes and streamlining older reporting processes; it enables knowledge workers to work smarter and not harder with summarized information. On the supplier front it helped KP work with suppliers to reduce the rate of product defects, ensure deliveries are done on time and effectively tracked suppliers. For KP with almost a million plus diversified amount in inventory goods this was a key win. The financial and customer relationship management applications aspect helped in analyzing customer behavior and developing attrition, acquisition, retention and growth models and it also helps the organization realize returns more quickly than an in-house environment might. The accuracy, speed and reliability of information played a big role in KP towards meeting its operational objectives and supporting business decisions.

### **5.3 Conclusions**

We conclude that there is business value in using business intelligence, which directly affects the productivity of an organization positively. From the KP perspective most of the key data in the field is either manually fed in by data entry clerks and some collected automatically straight to the central enterprise resource planning system. In the absence of this system, which is the main one, KP will virtually grind to a halt. Data collection is a key part of any business intelligence system because these are the building blocks from which intelligence can be sieved.

The choice of business intelligence tools is limited to the exposure of the key ICT and user staff on what is available from leading vendor. Sadly the eventual choice of which tools to use is determined by the winner of a tender whose outcome, most often than not, does not lead to the most experienced or mature solution in the market. Therefore proper understanding of what the market has to offer and what business users need as information should lead to the development of a comprehensive request for information document in order to win the best and most intrinsic solution.

Finally there was collective consensus that business intelligence does indeed help to increase revenues through better accounting analysis & reporting , reduce costs through better stock management, and assist the organization to compete more effectively by better business planning and customer service provision in the industry. A good business decision cannot be understated enough to move the organization forward. Implementing a BI solution is an important initiative in any organization. While considerable organizational management and otherwise support is required in its implementation, it is

equally important to insure that the software and the vendor are selected very carefully. The implementation is complex and can pose major challenges; therefore the experience level of the solutions provider is very important. All this benefits lend credence to the fact that businesses need to utilize business intelligence tools to better discern their business variables and work towards acquiring those that will coalesce different business ideas & innovations and integrate the same in to the organisations wining business fabric.

#### **5.4 Recommendations**

The research recommends that Kenya power should focus more on improving customer service because Kenya Power is customer based and by use of BI system, better and quicker decisions are made to support a better customer experience and hence heightened and orderly consumption of electricity. From the findings, performance reviews should be encouraged more often because they have an impact in identifying key data requirements to support better decisions.

From the research, the BI system enables the users to extensively drill down the data and this contributes to the overall success of the system and decision making. This means that the organization should integrate all their data and make it available to the BI system in the form of a Data Warehouse. All users should also be encouraged to use the system to increase efficiency.

This was evident because users could not process most of the information and were just consumers. In the creation of the Data warehouse key business process should be integrated in collating key data critical to the core operations of KP.

We will be able to improve individual performance planning and development done through the performance reviews conducted by managers which include values, development plans, careers aspirations and career success all based on intelligent reviews on the performance of users. Performance dashboards will enable talents reviews by panels which both rate and calibrate individual performance and potentials thereby increasing individual outputs.

The research proposes that Kenya Power management and other organizations in energy sector adopt business intelligence solutions to improve customer service delivery, improve accuracy of bills, reduce wastage/loss of materials, reduce fraud, kill illegal connections and improve overall output of the organisation.

It is recommended that further research be done on the most effective way to measure the ROI on BI use as it has been confirmed the impact is high based on this research. This is an area for further research that could lead to actual formulae that links operational variables to the performance of an organisation to establish the actual ROI figures.

### **5.5 Limitations of the Study**

One of the limitations was that, answering of the questionnaires was voluntary and this may have led to generalizing the research findings since some of the respondents answered the questions based on their opinions but not from the real happenings. We would also have preferred a bigger sample field but we were limited to users who at least were directly in contact with the BI and ERP system. At the time of the study KP was planning to procure a data warehouse and other analytics tools, the impact of this has not

been captured in this paper and would be interesting to establish the business value garnered so far. This might have affected reliability of the research findings.

Confidentiality policies of the organization would also affect the ability to collect data. The researcher assured the respondents of proprietary measures that the findings would be accorded and be used only for academic purpose and a copy would be availed to them upon their request.

### **5.6 Suggestions for Further Study**

Further research should be done on business intelligence and how it influences organizational performance. In carrying out the further research we propose that business metrics such as return-on-investment (ROI) and total-cost of-ownership (TCO) be calculated in the beginning and on project maturity to determine the actual financial impact. This study should be broadened to also determine the impact of other salient benefits like employee satisfaction, users morale and general staff productivity as they will have more information to make better decisions.

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**APPENDIX 1: RESEARCH INTERVIEW GUIDE**

**THE IMPACT OF ADOPTION OF BUSINESS INTELLIGENCE TOOLS IN THE PERFORMANCE OF KENYA POWER**

**PART A: GENERAL INFORMATION (Please tick appropriately)**

1. Gender  M  F
  
2. Which department do you work in at Kenya Power?  
.....
  
3. Which is your designation .....
  
4. Age: 25 – 35  35-45  45-55  > 55
  
5. What is your highest level of education?  
  
Diploma  Degree  Master  Doctorate   
  
Other Specify: .....
  
6. How many years have you worked in this institution?  
  
1-3 years  3-6yrs  6-9yrs  over 10yrs
  
7. What is your role in the organization and what type of decisions do you make as part of your work?  
  
.....  
.....

**PART B: BUSINESS INTELLIGENCE TOOL IN PERFORMANCE**

**(Please tick appropriately)**

**PART B: Section 1: Business data**

1. What data do you need for your functional role?

-----  
-----  
-----

-----Is the information processed by any other departments before it reaches you? Please explain

-----  
-----  
-----

----- ( Please mention the departments that assist if any)

2. Do you also in turn process this information for onward transmission to others users or departments? Please explain if use any tools for the same?

-----  
-----  
-----

----- How frequently would you need and process this information?

All the time  Hourly  Daily  Weekly

Other please explain?-----  
-----

**PART B: Section 2 - Impact on Performance**

1. How do Information Systems support your business decisions?

.....  
.....

..... Is the information from your computer accurate and reliable enough to support your decisions? Please explain why:

.....  
.....

..... What is the impact of the information you have been receiving from the computer, as part of your daily job, on the following areas?

(Please rate each section with a scale from 1 to 10. Where 1 is no impact, 5 fairly good impact and 10 highest impact)

a) Growth in customers:

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

b) Customers Service:

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

c) KP's Profitability :

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

d) Staff morale:

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

e) Ease of doing work

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

f) Complexity of the job

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

g) Other (Please specify )

.....  
.....  
.....Rate : 1 – 10 : \_\_\_\_\_.

**PART B: Section 3 - To establish the factors that influence the choice of business intelligence tool used by Kenya Power.**

1. What further information would you need to make better decisions  
-----  
-----
2. What tools do you need ?  
-----  
-----
3. Ho do you decide which tools to use ?  
.....
4. What influences the choice of tools to use?  
.....  
.....
5. Can you suggest further sources of information that you feel would also help you to make better decisions?  
.....
6. Any other comments you can make regarding the decision making process and availability of information  
.....  
.....

**THANK YOU FOR YOUR ASSISTANCE**