Sustainable Use of Business Intelligence Tools at Coca-Cola Kisii Bottlers (K) Limited

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ABSTRACT

Computer Based Information Systems in organizations gather and store voluminous electronic data that can be a useful resource in supporting management decision making. Business Intelligence (BI) tools provide a means of unifying and sifting vast amounts of such data so as to glean insights that are handy in management decision making. This project aimed at finding a sustainable solution to the underutilization of Business Intelligence tools to support decision making from the volumes of existing electronic data in organizations. The study assessed the challenges in the use of Business Intelligence tools and sought to generate Key Performance Indicators that can be tracked to enhance the use of BI tools. Data was collected through the use of interviews, and thematic analysis method was used to analyze the responses obtained. Purposive sampling method was used to get respondents, drawn from business and Information Technology functions of the studied organization. Whereas this study was confined to specific company in the soft drinks industry, the findings can be of relevance to a wider group of related organizations in the industry and beyond. The study has generated an in-depth understanding of the issues related to the use of Business Intelligence tools and hopes to improve the existing policies related to use of Business Intelligence in organizations. The findings will therefore facilitate better management decision making and consequently better realization of organizational goals.

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO BUSINESS INTELLIGENCE

BI encompasses a range of business applications such as data mining, querying, analysis, and management reporting. Business Intelligence software is therefore software that enables users to obtain enterprise-wide information more easily. Such products are considered a step up from the typical decision support tools because they more tightly integrate querying, reporting, OLAP, data mining and data warehousing functions (TechWeb encyclopedia, 2008). The purpose of BI is to improve the effectiveness of business decision making through provision of historical, current, and predictive views of business operations, most often using data that has been gathered into a data warehouse or a data mart, and occasionally working from operational data. (Information Builders, 2007).

Whereas BI encompasses the whole range of technologies, applications and practices for the collection, integration, analysis, and presentation of business information, Enterprise reporting (ER) forms just part of it (Gibson, Arnott & Jagielska, 2004). Enterprise reporting is a means by which companies attempt to sift the vast amounts of electronic data collected to glean insights that are handy in management decision making (Information Builders, 2007). The recent wide-use of computer-based information systems to convert, store, protect, process, transmit and retrieve information in this digital age is growing rapidly and is widely being used by businesses to gain an edge on competition. This has lead to companies continuously collecting large amounts of electronic data, and in various formats, through ERPs and/or other computer-based information systems. The intricately growing voluminous electronic data possessed by companies has called for systematic implementation of appropriate mechanisms to facilitate derivation of meaningful information for management decision making out of the large amounts of electronic data.

1.2 BACKGROUND TO THE SOFT DRINKS BOTTLING INDUSTRY IN KENYA

The soft drinks industry comprises companies that manufacture nonalcoholic beverages and carbonated mineral waters or concentrates and syrups for the manufacture of carbonated beverages (Robert F. Barratt, 2007). The soft drinks industry may also be regarded as the non-alcoholic beverages industry. The name "soft drink" specifies a lack of alcohol by way of contrast to the term "hard drink". (Robert F. Barratt, 2007).

The Soft drinks industry can trace its history back to the mineral water found in natural springs before scientists soon discovered that gas carbonium or carbon dioxide was behind the bubbles in natural mineral water (Angua, 2009). Naturally occurring bubbling or sparkling mineral waters have been popular for thousands of years. Development of the first man-made sparkling or carbonated water is credited to Joseph Priestley who invented a method of "pushing" carbon dioxide into water by dissolving it under pressure, thus creating fairly long-lasting bubbles. The technique led to development of the soft-drink industry (Robert F. Barratt, 2007). Most soft drinks are still carbonated to give drinks a "tangy bite" and to stimulate the tongue. Furthermore, because scent is an important part of taste, the flavors carried as vapors in the bubbles enhance taste (Robert F. Barratt, 2007).

The soft drinks bottling industry in Kenya consists of a number of players, and Coca-Cola is the most dominant of all the local and international companies in the soft drinks bottling industry currently operating in Kenya (Euromonitor, 2008). Other main active companies in the soft drinks bottling industry include; East African Breweries Limited (EABL), Softa bottling company Ltd. (SBCL) a subsidiary of Kuguru Food Complex Ltd. (KFCL) and Milly Fruits Processors (MFP). The Coca-cola multinational soft drinks bottling company comprises the following franchise firms within in the country; Mt. Kenya bottlers, Nairobi Bottlers, Coastal Bottlers, Kisii Bottlers, Equator Bottlers and Rift Valley Bottlers (Business Daily, 2008). These firms are run independently and have specific areas where they distribute their products and therefore the companies do not compete with one another in the distribution of their products. The products

distributed by the Coca-Cola Company include; Coke, Sprite, Fanta, Stoney, Ginger Ale. Other products sold by this company except sodas include; Dasani water and Sunflower juice (Company profile- Kisii Bottlers (K) Ltd., 2008).

East African Breweries Limited (EABL), which is a the main player in the hard drinks industry, is another player in this industry that has continued its onslaught on the soft drinks market with the launch of a second soft drink brand, Alvaro, on March 2008 (Euromonitor, 2008). The move, follows its launch of non-alcoholic Malta Guinness a few years back, and sets the stage for an aggressive numbers war with the global soft drinks giant, Coca-Cola, and the locally owned Softa Bottling Company Limited and Milly Fruits Processors (Euromonitor, 2008).

Kuguru Food Complex Ltd. (KFCL) is the manufacturer of Softa and is the first indigenous Kenyan company to make carbonated soft drinks. The company's product, Softa, was launched in August 1998 to rival products of the then already well established soft drinks company Coca-Cola. The most popular products of this company are Softa Orange and Babito Blackcurrant (Softa, 2008).

Milly Fruits Processors (MFP) producing juice from raw materials that are easily available is located only near the main Mombasa-Malindi highway in Kilifi District. Local farmers supply the raw materials needed in the processing of products that are manufactured at the factory. Milly Fruit Processors are the manufacturers of pure fruit Products like Picana Mango, Picana Passion, Picana Orange, Picana Mango Passion, Picana Mango Orange and Pineapple Squashes (Milly Fruit Processors, 2001).

1.3 BACKGROUND TO THE KISII BOTTLERS (K) LIMITED (COCA-COLA) COMPANY

Kisii Bottlers (K) Ltd. is one of the Coca Cola Company's franchise companies in the larger Coca – Cola Africa and it specifically lies under the Coca – Cola East Africa administrative region. It is one of the currently existing six bottling companies in Kenya and is situated in the

western region of the country. Others include; Nairobi Bottlers, Equator Bottlers, Rift Valley Bottlers, Mount Kenya bottlers and Coastal Bottlers. The company's initial capital base was obtained from the Industrial Commercial Development Corporation (ICDC), which owns the majority of the shares (Kisii Bottlers (K) Ltd., 2008).

The buildings at Kisii Bottlers (K) Ltd. were completed in 1988 and production started on 18th June 1989, serving market regions that were initially served by Equator Bottlers Ltd., another Coca-Cola franchise company. The region was big for the Equator Bottlers, and thus the product was not penetrating to interior areas and the Coca-Cola Africa Company proposed the location of another plant so as to reach all customers. Industrial and Commercial Development Corporation (I.C.D.C.) took up the offer of establishing Kisii Bottlers (K) Ltd. (Kisii Bottlers (K) Ltd., 2008)..

Coca-Cola Kisii Bottlers (K) Ltd. like other Coca-Cola franchise companies has a heavy distribution channel, intended to get as much of her products as possible to customers, resulting in the collection of a lot of relevant electronic data that is a key resource for decision making. The sales section of Kisii Bottlers (K) Ltd. which has the biggest proportion of the entire staff capacity handles vast amount of electronic data which calls for effective utilization of it to understand critical details related to sales.

1.4 STATEMENT OF THE PROBLEM

The recent high rates of investment on Business Intelligence by world leaders in Information Technology also suggest that Business Intelligence in general and enterprise reporting specifically have an indispensable role to play in supporting management decision making in organizations. Underutilization of enterprise reporting to support management decision making in Kisii Bottlers (K) Ltd. and similar companies may be associated with some limiting factors in the processes of the adoption of the enterprise reporting systems, and in the continuous use of those systems. A study into adoption and use of ER systems in the Coca-Cola Company is essential to guarantee effective and sustainable adoption and use of enterprise

reporting in the company under study by having a means of continually dealing with challenges, thus eliminating shortcomings of use of ER systems.

1.5 AIM

The aim of the research was to investigate the challenges facing adoption and/or use of enterprise reporting at Kisii Bottlers (K) Ltd. with a view to finding a sustainable solution.

1.6 OBJECTIVES

The objectives of the research were:

1. To critically assess the current situation of enterprise reporting in the company.
2. To identify any challenges faced in the adoption of ER systems and their continuous use.
3. To determine appropriate Key Performance Indicators and Service Level Agreements that can be tracked to enhance adoption of ER systems and their continuous use.
4. To determine a systematic solution to track the identified KPIs and SLAs in adoption of ER systems and their continuous use.

1.7 RESEARCH QUESTIONS

The research questions that the study sought to answer were:

1. What is the current situation in the utilization of enterprise reports, and other electronic data resources?
2. What are the factors determining the current status in the adoption and use of ER systems?
3. What are the challenges facing adoption and/or use of ER systems?
4. How do the identified challenges limit adoption and use of ER systems?
5. Which Service Level Agreements (SLAs) and Key Performance Indicators (KPIs), related to the factors limiting the adoption and use of ER systems, are important to track?

1.8 ASSUMPTIONS

The assumptions of the research include:

1. That Kisii Bottlers (K) Ltd. had electronic data resources that could allow enterprise reporting and/or had the capability of generating electronic data in formats that could allow enterprise reporting.

2. That adoption and use of Enterprise Reporting at Kisii Bottlers (K) Ltd. could be enhanced through systematic means.

1.9 SIGNIFICANCE OF THE STUDY

While this study was confined to Kisii Bottlers (K) Ltd. only, its findings can be of relevance to a wider group of related organizations. Thus this study hopes to create an in-depth understanding of the issues related to adoption and use of ER systems and make a contribution to the existing knowledge on ER and BI in business. The study also hopes to reveal useful information that is handy in shaping policies of IT management in order to facilitate better adoption and use of ER for realization of organizational goals.

1.10 LIMITATIONS

The researcher relied on information obtained from informants in the selected functions of the organization, without carrying out a personal assessment of the company's reporting systems which could provide more information relevant to the research. The inability to access these sources of information was due to the confidentiality associated with them. This, however, did not greatly affect the research as probing was used during interviews to get most of the information that would have been got more easily and accurately through personal assessment of the company's reporting systems.

CHAPTER TWO: LITERATURE REVIEW

This chapter contains two sections. The first section covers the theoretical framework upon which the study is based and the second section covers reviews of studies and other literature related to the research and their findings.

2.1.1 SYSTEMS THEORY

The research is guided by systems theory. Systems theory is a framework by which one can analyze and/or describe any group of objects that work in concert to produce some result. This could be a single organism, organization or society, or electro-mechanical or informational artifact (Klein, Julie Thompson, 1990).

The main argument behind systems theory is that a system consists of various components or sub systems that must function together for the systems to deliver the anticipated result. If a sub system fails, the whole system is put in jeopardy. A system is therefore a group of cooperating components that must work harmoniously to accomplish an intended purpose (Klein, Julie Thompson, 1990). In the context of this research, the systems are the integrated computer based management information systems in organizations that gather, store, process, evaluate, and distribute needed, timely, and accurate information to management decision makers (Mark Kelly 2001). This timely distribution of accurate and needed information to decision makers described above forms part of the ultimate purpose of the computer based management information systems in organizations, called reporting. Reporting is therefore a fundamental component of computer based information management systems and without which the whole management information system is put at jeopardy and will fail to deliver on its purpose. In this regard, reporting is viewed as a key component of an entire information system and under utilization of it will cause a gap in the whole management information system, causing the whole system to fall short of its realization of delivering information to

decision makers and denying an organization an edge in the realization of its organizational objectives (Mark Kelly 2001).

The reporting components of management information systems also consist of units that must work cooperatively to achieve the intended purpose of delivering timely and needed information to decision makers. In the context of this study, the components are based on data transformation from when it is captured, as raw data, until when it is useful information for decision making.

2.1.2 GENERAL REPORTING SYSTEM MODEL

An Enterprise Reporting System (ERS) consists of components that together make up the reporting system and a generic pattern common across all organizations and technology architectures looks like the one shown below (Gregory Hill, 2008).

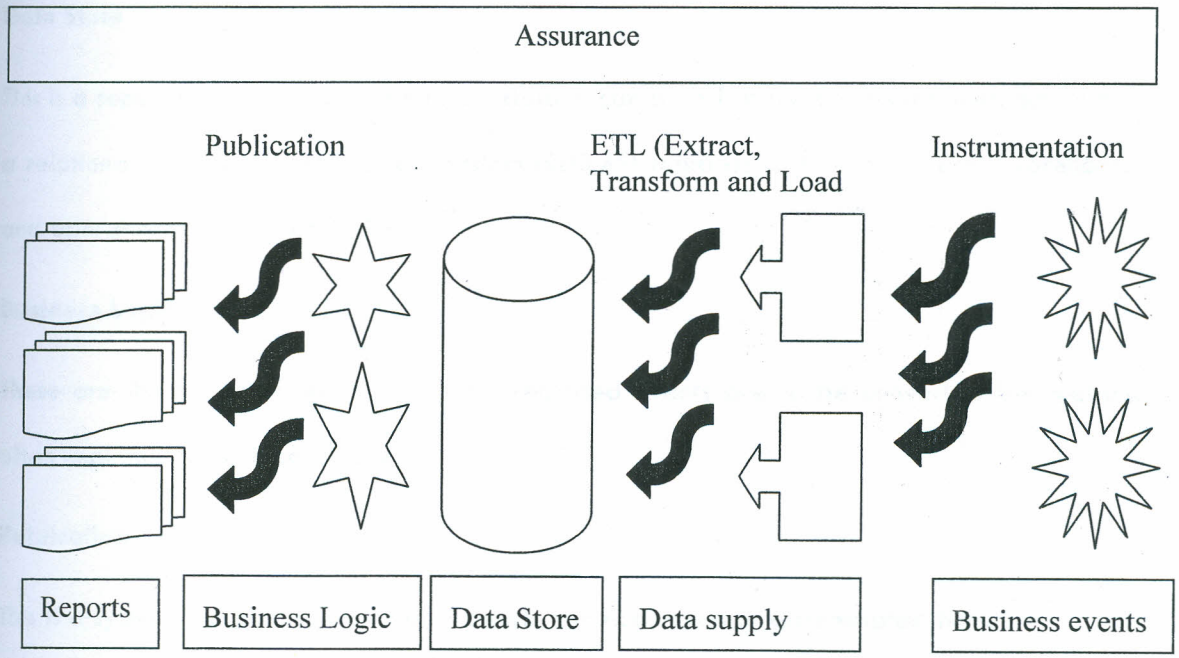

Fig. 2.1: A graphical modification of Gregory Hill's Enterprise Reporting Model

2.1.2.1 Definition of terms in the Gregory Hill's ER Model

Instrumentation

This includes devices that measure some aspects of the real-world as events and record those aspects.

Data Supply

This includes systems that take the recorded events and deliver them reliably to another system for storage.

ETL (Extract, Transform and Load)

This is the process where the recorded events are checked for quality, put into the appropriate format (transform) and inserted into the data store (load).

Data Store

This is a repository for the data and metadata. It can be a flat file or spreadsheet, but usually a relational database management system (RDBMS) setup as a data mart, data warehouse, and operational data store (ODS).

Business Logic

These are the explicit steps for how the recorded events are to be converted into metrics, often implemented in a script query.

Publication

This is a system that builds the various reports and hosts them or disseminates them.

Assurance

Any ER system must offer a quality service to its user base. This includes determining if and when the right information is delivered to the right people in the right way.

2.1.3 THE NEED FOR FASTER ACCESS TO BUSINESS INFORMATION

A lot of money has been spent on enterprise applications such as Oracle and Siebel to replace legacy applications, improve efficiencies and gain greater competitive advantage and a lot more have been spent installing and customizing these applications to meet each company's unique business requirements (Management Guide – Business Intelligence, Butler Group, 2001). Above and beyond the improved efficiencies, a much greater potential lies within this substantial investment and remains largely untapped. ("Frontline Decision-making," Forrester Report, June 1999). According to Forrester Research, the next wave of competitive advantage will come from empowering front line decision makers with the information that lives within these powerful systems.

Similarly, Butler Group believes that business intelligence (BI) arises from the synergy between decision makers and the tools they employ. True BI systems include not just the tools and technologies that support quality decision-making, but also the decision makers themselves. Once data is obtained from a variety of sources and integrated with other relevant data the derived information must be delivered to the decision maker in a way that can be meaningfully used and analyzed and when business users can begin to obtain rapid answers to their questions, business intelligence becomes a strategic weapon (Management Guide – Business Intelligence, Butler Group, 2001).

A faster-paced market, a shifting business model, and an investor community that demands timely information on a company's status are only a few of the concerns faced by today's executives and managers. With mergers, acquisitions and new business initiatives, the need for access to vital information only increases. The amount of data stored will continue to escalate, along with the number of users and their increased requirements for the use of that data. According to a META Group analyst, "Enterprises having difficulty coping with three terabytes of data today need to quickly find solutions for dealing with 300 terabytes of data tomorrow." (Clements, David, 2001). To optimally guide the corporate ship on the right

direction, one factor will remain paramount: the need for data. Users will always overwhelm the IT department in their search for answers to business questions unless a cost-effective solution which enables users to help themselves is present.

2.1.4 PURPOSE OF ELECTRONIC REPORTS IN ORGANIZATIONS

Enterprise reporting is generally categorized under three main categories based on the level of detail of the information the reports display and how much integrated the information is with other information. The main categories include; Metric Management, Dashboards, and Balanced Scorecards (Gregory Hill, 2008).

2.1.4.1 Metric Management Reports

Metric Management reporting is the kind of reporting that focuses on business performance management through outcome-oriented metrics. These can be Service Level Agreements (SLAs) for external management and Key Performance Indicators (KPIs) for internal management (Gregory Hill, 2008). These KPIs are financial and non-financial metrics used to help an organization define and measure progress toward organizational goals (Gibson, Arnott & Jagielska, 2004). SLAs on the other hand are formally negotiated agreements between two parties. SLAs serve as a contract between customers, or between service providers. They record the common understanding about services, priorities, responsibilities, guarantee, and depending on the organization, those metrics may include cost, time, requirements, risk, customer satisfaction, or other measures critical to the management team (Carl Pritchard, 2004). Typically, these KPIs and SLAs are agreed targets to be tracked against over a period of time (Gregory Hill, 2006). The tracking reflects the business performance based on the set goals, targets, checks, and balances that continuously determine decision-making (Carl Pritchard, 2004).

2.1.4.2 Dashboard Reports

Dashboard reports are reports to senior management that provide an at-a-glance perspective on the current status of an undertaking in the context of predetermined metrics for that undertaking (Joel Litherald, 2007). Dashboards provide management with a quick understanding of the current posture of an undertaking, without a detailed explanation of the causes or solutions. A popular idea is to present a range of different indicators on the one page but this approach should allow managers to customize their dashboard view, and set targets for various metrics (Gregory Hill, 2006). It's common to have visible signals, sometimes using colors such as Red or green, to draw management attention to particular areas regarding goals, targets, checks, and balances defined for performance (Gregory Hill, 2008). A dashboard is operational and reports information typically more frequently and usually with measures. Each dashboard measure is reported with little regard to its relationship to other dashboard measures (Business Technology Group, 2008). Dashboard measures do not directly reflect the context of strategic objectives. This information can be more real-time in nature, like an automobile dashboard that lets drivers check their current speed, fuel level and engine temperature at a glance (Business Technology Group, 2008). It follows that a dashboard should ideally be linked directly to systems that capture events as they happen, and it should warn users through alerts or exception notifications when performance against any number of metrics deviates from the norm or what is expected.

2.1.4.3 Scorecard Reports

Scorecards on the other hand present an integrated view of success in an organization. They chart progress toward strategic objectives. A scorecard displays periodic snapshots of performance associated with an organization's strategic objectives and plans measures (Business Technology Group, 2008). It measures organizational activity at a summary level against pre-defined targets to see if performance is within acceptable ranges. Its selection of KPIs helps executives communicate strategy to employees and focuses users on the highest

priority projects, initiatives, actions and tasks required to execute plans (Business Technology Group, 2008). Scorecard KPIs ideally should be derived from a strategy map rather than just a list of important measures that the executives have requested to be reported. Scorecard KPIs should have cause-and-effect linkages like statistical correlations. Directionally the employee-centric innovation, learning and growth perspectives, the KPIs should reveal the cumulative build of potential to realized economic value (Gregory Hill, 2008).

2.1.5 USE OF ENTERPRISE REPORTING IN ORGANIZATIONS

ER that is viewed as a part of BI is an important growth area in information technology, and as such, warrants academic attention. Despite the current IT slowdown in industry, ER software vendors continue to report substantial profits (Chen 2002; Lei 2002; Whiting 2003).

Enterprise Reporting is designed to support the process of decision-making and is not a new technology but a natural outgrowth of a series of previous systems designed to support decision making (Gray, 2003, p. 10). After spending years and possibly millions of investment money in ERP-style systems, many companies now store vast amounts of transactional data. The role of ER is to extract the information deemed central to the business, and to present or manipulate that data into information that is useful for managerial decision support (Business Objects, 2007). In their simplest form, these tools permit a decision maker to access an up-to-date, often consolidated, view of business performance (Business Technology Group, 2006).

The unmet needs that dashboards and scorecards are created to address often serve as the catalyst for line-of-business managers asking for them to be created in their organizations. Yet to get a report created, line-of-business managers nearly always must rely on their Information Technologies department to analyze the underlying processes that the dashboard will be used to provide information for, then a systems analysis and development plan must be created to integrate systems that may not be interlinked or integrated today (Hedgebeth, 2007). This second step is essential for getting the necessary data into a single system of record (Pestorius, 2007) so that the necessary metrics and KPIs can be calculated and then

published into the reports. Software companies that produce BI applications and tools have continually been adding to the feature set of integration utilities, beginning to offer Business Process Management (BPM) and Business Process Re-engineering (BPR) workflow tools that are used to streamline the underlying processes dashboards and scorecards are used for reporting from (Burns, 2005).

As a result of these developments in integration functionality, feature sets, and the use of BI applications to streamline processes through BPM and BPR functions, the costs of BI applications that are used for creating reports has dropped significantly in the last three years (Gantovich, 2007) and this has made it possible to create reports relatively quickly. The integration of BPM, BPR and BI, including the ability to quantify the pay-off of redefining key processes that accounting, financial, operations, marketing, sales and service departments of an organization rely on is becoming the new standard by which companies measure their dashboard and scorecard projects (Floyd, 2003).

The underlying platforms used for supporting BPM and BI integration also include portal-based technologies at the presentation layers of their architectures, which also minimizes the time required on the part of IT management staffs to implement dashboards and scorecards on the part of line-of-business managers (Politiano, 2007). Examples of these platforms includes Microsoft's SharePoint Services platform, oracle's Fusion platform that incorporates that company's acquisition of Hyperion BI applications, and SAP's NetWeaver Service-Oriented Architecture (SOA), all of which support analytics functionality as a foundational part of their architectures (Howson, 2007).

Dashboards are proliferating throughout organizations globally due to the economies of BI applications and the opportunity IT departments see for being able to re-define processes that have been in need of improvement (Williams, 2007). The impact of this proliferation of dashboards within many organizations is an accentuated level of accountability and performance measurement, in addition to urgency around tactics that increase the KPIs

performance of interest in the short term (Dover, 2004). The competitive advantage that emanates from the rapid ROI which is attainable through the development, deployment and use of dashboards are discussed in the following section of this paper, yet the immediate gain is averting risks from making decisions based on incomplete or inaccurate information versus the use of real-time data.

Increasingly organizations are realizing that they key to remaining competitive in the modern marketplace includes maximizing one's internal resources. More and more organizations are adopting more diverse work populations offering a comprehensive resource of knowledge and data that may ultimately improve organizational efficiency and growth. What better way to track internal resources than through comprehensive ER that enable quick reports of key business units. Business Intelligence is modernizing the way that people not only share information within the organization but also the way that managers are "managing" their human capital and resources (Academon, 2006).

Enterprise reporting applications have the potential to dramatically improve productivity, reduce costs, and increase efficiencies in both front- and back-office business units, including sales, customer service, marketing, manufacturing, engineering/design, accounting, and human-resource organizations. But to be truly effective, these applications need to present users with key information from their own data sources, as well as from related internal and external applications (MicroStrategy, 2008).

2.1.6 USE OF BUSINESS INTELLIGENCE IN ORGANIZATIONS

As business profits decline, organizations are recognizing that the provision of quality information is a key to gaining competitive advantage. Supported by increasing improvements in storage, data warehousing and OLAP solutions, the BI market is expected to continue to rise into the coming years and forecasts predict the BI field will grow at 23% annually (Darrow, 2003).

Vitt et al (2002) describe BI as a relatively new area in computing; however, Luhn (1958) provided a definition of BI more than 40 years ago, with his selective dissemination of information (SDI) technique. Vitt et al do acknowledge however that the term is multifaceted and is 'used by different pundits and software vendors to characterize a broad range of technologies, software platforms, specific applications, and processes'.

BI is an approach to management that allows an organization to define what information is useful and relevant to its corporate decision making. (Vitt, 2002, p.13). According to Whitehorn there is little consensus on a definition for BI; often it depends on who is defining it, and frequently, what they are selling. For instance, 'Business Intelligence: The IBM Way' has a very specific focus on data warehousing and on-line analytical processing (OLAP) (Whitehorn & Whitehorn, 1999). Not surprisingly, IBM's product suite (IBM Visual warehouse and DB2 OLAP server) fits in perfectly with their BI focus. Whilst acknowledged that there is little academic research on BI (Grey, 2003; Jagielska et al 2003), there is a growing body of literature, largely vendor and industry focused. This literature tends to centre BI as the query, reporting and analysis functions of decision support systems, although these vendor definitions sometimes include analytical applications. This view is also supported by a number of the top BI vendors (Business Objects, 2003; Cognos, 2003; MicroStrategy, 2003; SAS, 2004).

There has been an overwhelming interest over the last year (2007) on providers of IT services. IBM has acquired its longtime business partner and business intelligence (BI) software pioneer Cognos for $5 billion in cash. This was followed by Oracle's $3.3 billion buyout of Hyperion in February the same year and SAP's acquisition of Business Objects for $6.8 billion in October the same year. Also, Cognos had acquired privately held Celequest Corporation, a provider of operational business intelligence solutions based in Redwood City, California earlier. These deals leave MicroStrategy and SAS as the last remaining standalone BI players. These business activities surrounding BI indicate the world's recent interest in this area of computing (Times online, 2007).

Bill Inmon, sometimes called the father of the data warehouse concept, defined it as follows: "A data warehouses organizes and stores the data needed for informational, analytical processing over a long time perspective (Richard J, 2002). A data warehouse is a subject-oriented, integrated, time-variant, non-volatile collection of data supporting management's decision-making process (Business Objects, 2007).

2.1.7 ADOPTION AND USE OF INFORMATION TECHNOLOGY

Improved information technology is critical to the success of any company. Information technology growth over the last two decades has grown in many sectors and industries which deal with the economy and infrastructure, and is affecting many areas of decision- making and organizational development (Kamel, 2000). Information and communication technologies are now the building blocks for socioeconomic development, and therefore nations around the world are attempting to capitalize on the capabilities of this technology to support planning, development, and growth processes (Wachira, 2008). Developing nations have tried to invest in its information infrastructure with a focus on developing information and management support systems for the decision-making process in both the government and the private sector with emphasis on using management support systems such as decision support systems and executive information systems to meet socioeconomic development objectives (Richard J, 2001).

Information technology provides companies with the ability to process large amounts of information and do so in a way which presents the information in a clear and concise manner to employees (Business Objects, 2005). Anticipated benefits of implementing an information technology system include improvements in productivity, better profit performance, and a higher degree of accuracy among information within the firm. The ability to share information among employees is also enhanced (IBM, 2005). Most information systems allow multiple users to access information at the same time, and with flexibility. So employees can write reports and make modifications to their portions of the system quickly and easily. When this is the

case, the benefit to organizations can include higher morale as well as higher productivity (Business Objects, 2007).

Information Technology has emerged as a basic fact of life in the business strategies of major corporations (iTechs, 2006). Information Technology facilitates the convergence of communications, computers, and information. Although Information Technology has traditionally been focused on internal operations (e.g., administrative and backroom functions), its emphasis is increasingly shifting to external operations and creating connections that benefit the customer (Richard J, 2002). No industrial sector will be more profoundly affected by this trend than the financial industry. Business analysts agree that Information Technology is much more important today than it was in the past. At present, companies typically spend about 6 percent of their total revenue on Information Technology (Haapaniemi, 1996, p. 24). Technology now allows information handling to be decentralized via the use of networks and personal computers. Thus the location of the hardware itself is no longer critical. This trend is criticized by some information specialists, who fear that too much control is being given to end users and other specialists regard decentralization as an opportunity, partly because it makes end users more accountable (Richard J, 2002). A new era of participation has dawned for specialists in the Information Technology field.

It is largely assumed that the advances in information technology realized in the latter half of the 1900s resulted in productivity gains in the workplace. Computers were able to perform millions of calculations far faster and with greater accuracy than their human counterparts, and the World Wide Web makes it possible to communicate with individuals throughout the world. There have, in fact, been significant increases in productivity in various work functions, but there are also disadvantages in relying too heavily on technology (Richard J, 2002).

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

This chapter details the methodology that was used in the research. It discusses the study population, sampling techniques, procedures used in data collection, data processing and analysis, dissemination of research findings and ethical consideration in the research.

3.1 RESEARCH DESIGN

Qualitative case study method was used in the research. Case study method was preferred in the research in order to have a more in depth understanding of the subject area under study in the selected organization. The study followed a multi-informant design. These designs are proposed as a source of research triangulation for extracting improved contextual information (Earl, 1993). The multi-informant design is used to highlight perceptual differences between key participants across different areas within an organization (Tai and Phelps, 2000; Chan, 2002; Pervan, 1998). Within this IT research, Multi-informant design was used to obtain varying opinions amongst IT professionals and business management persons in the company under study about adoption and use of ER systems.

3.2 STUDY POPULATION AND SETTING

The target population comprised of soft drink companies in Kenya. The study drew upon three constituencies: Business management, IT management and operational level of the Kisii Bottlers Kenya Ltd., which is one of the six Bottling companies under the Coca-Cola umbrella company in Kenya. Obtaining data from key participants from both business and IT functions enabled an analysis of any difference in perceptions across roles. The participants targeted were considered key to the function under examination.

3.3 SAMPLE SELECTION AND PROCEDURES

The business demographic consisted of Managing Directors, Human Resource Managers, Chief Financial Officers, Production Managers, Sales Managers and other significant employees. The IT sample was made up of System Administrators and other important IT decision-makers.

The operational level employees sample consisted of sales persons, clerks, accountants, stores personnel, secretaries, among other employees who directly or indirectly worked with the enterprise's information systems. Purposive sampling method was used to obtain the study sample. Respondents from the business demographic were purposively selected to include only the business managers who worked within the company's premises and who were available to provide the required information. This excluded business managers who worked away from the company's premises in the field. The IT sample included all the persons in the IT management level who were on duty during the time of the research. Respondents from the operational level were selected purposively to include the employees who were available to provide the required information. Respondents comprised the following; two (2) professionals in the IT services provision category, which was different from the proposed five (5). Ten (10) business managers and thirty (30) operational level employees as proposed in the proposal. The total number of respondents was forty two (42) in number.

3.4 DATA COLLECTION PROCEDURES AND INSTRUMENTS

3.4.1 DATA COLLECTION INSTRUMENTS

Interviews were used by the researcher to collect data from the different categories of respondents in the study. Interviews were most appropriate in this research as they helped the researcher get more useful information in the entire process of data collection through probing. Also it allowed the researcher to clarify unfamiliar terminology to respondents to ensure that the respondents understand well what is asked of them.

3.4.2 PRE TESTING OF THE INSTRUMENTS

Pre-testing was done three weeks before the actual data collection exercise on the following respondents from Equator bottlers Ltd.: two (2) professional in IT department three (3) business managers and three (3) operational level employees. These respondents are assumed to have similar characteristics as the selected respondents in the company under study. Pre-testing

sought to assess the validity and reliability of the research instruments and to assess the possible length of time required to conduct the interviews.

The researcher first wrote a letter to Equator Bottlers (K) Ltd. requesting for permission to carry out a pilot study in order to revise the designed interview schedules before collecting data from the selected respondents.

The information collected by the researcher during the pilot study, led to the elimination of the following questions; 3, 10, 11, 18, 20, 21, 22, 23 from the original interview schedule for Business managers. These questions were eliminated from the original interview schedule because they proved too technical for that category of respondents during pilot study. Question 19 in that interview schedule was also rephrased to read better and to derive the right information from that category of respondents. All these changes were reflected in the actual interview schedule that was used to collect information from the company under study.

3.5 DATA PROCESSING, PRESENTATION AND ANALYSIS

The researcher ensured that data processing was done before its analysis so as to correct possible errors such as eliminating unusable data, interpretation of ambiguous answers and verifying contradictory data from related questions. Data acceptability was first verified and data organized appropriately, before analysis of the collected data was done. Data analysis was based on the objectives of the study and content analysis method was employed in analyzing the open questions in the interviews, to make inferences from the responses of the forty two (42) respondents by objectively and systematically identifying specific characteristics of messages. Presentation of data was achieved through the use of frequency and percentage tables.

3.6 ETHICAL CONSIDERATIONS

The researcher took into account ethical considerations while carrying out the study. The following aspects were considered key in observing ethics in the research.

3.6.1 Confidentiality

All confidential information of the studied company that could portray the company negatively or be used maliciously by others directly or indirectly to the disadvantage of the studied company was not published in the thesis.

3.6.2 Consent

Consent was sought from management to get information from key informants before any information was solicited from Respondents. All key informants were also well informed about the research and consented in giving the required information.

3.6.3 Risks

The research did not in any way expose respondents to physical, psychosocial or other risks associated with participation in the study.

3.6.4 Benefit

There were no direct individual participant benefits from the study. The researcher did not also carry out the research in a manner that could lead to undue financial or non financial benefits. The company under study and the soft drinks industry at large and academia stand to benefit from the results of the research through the means of dissemination highlighted hereunder.

3.7 DISSEMINATION OF RESEARCH FINDINGS

The research findings shall be disseminated through the complete thesis which shall be made available at Maseno University and at the Ministry of Science and Technology for perusal by interested persons in academia and industry. Sections of the thesis that are relevant to the studied company shall also be made available to the company to necessitate any progressive actions by the company.

Sections of this thesis shall also be translated into publications and conference papers that

shall hopefully be presented in relevant conferences.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

The researcher ensured that processing of data was done before its analysis so as to correct possible errors such as eliminating unusable data, ambiguous answers and verifying contradictory data from related questions. Data acceptability was verified and data organized appropriately, before the analysis. Data analysis was based on the objectives of the study, and content analysis method was employed in analyzing the questions in the interviews, to make inferences from the responses of the forty two (42) respondents by objectively and systematically identifying specific characteristics of messages. Presentation of data was achieved through the use of frequency and percentage tables. Statistical Package for Social Sciences (SPSS Version 11.5) was used to generate statistics such as frequencies and percentages and present them in tabular form and to for some of those aspects for ease of inference of some quantifiable aspects of the research.

4.1 CURRENT STATUS IN THE USE OF ER SYSTEMS IN THE COMPANY

Objective one (1) of the study sought to critically assess the current situation of enterprise reporting in the company. To meet this objective, the following research questions were used;

i) What is the current situation in the utilization of enterprise reports, and other electronic data resources?

ii) What are the factors determining the current status in the adoption and use of ER systems?

Appendix 02, questions one (1) to five (5) and Appendix 03, question one (1) to question six (6) represent the questions used to collect information to meet the above mentioned objective.

4.1.1 CURRENT SITUATION IN THE UTILIZATION OF ELECTRONIC DATA RESOURCES

Respondents gave information relating to the electronic information resources that aided decision-making processes in the company and the following were identified as the main electronic information resources; Enterprise reports, spreadsheets, word documents and web documents. The information collected from respondents was summarized as shown in the table below;

Table 4.1: Electronic information resources of the company

Information resources	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Enterprise reports	2	100%	10	100%	24	80%	36	86%
Spreadsheets	2	100%	10	100%	20	67%	32	76%
Word documents	2	100%	6	60%	18	60%	26	62%
Web documents	2	100%	7	70%	10	33%	19	45%

4.1.1.1 Enterprise reports

The research findings indicated that the respondents that constituted the IT management staff, Business managers and operational level employees category utilized all the varied forms of electronic sources of information for decision-making in the company albeit different frequency.

Respondents reported that they relied on enterprise reports more as compared to the other electronic information resources because enterprise reports were easy to use and provided

more accurate information since they depended on databases that were systematically populated with relevant data about key functions of the company using reliable means. Some respondents however reported that identification of the appropriate reports for particular needs was sometimes a problem. They reported that training of report users was useful and informing the users of the various reports available, and the reports' possible purposes and areas of application was necessary.

4.1.1.2 Spreadsheets

Respondents utilized spreadsheets as electronic information resources for providing information for decision making in the company. Spreadsheets were reported to be preferred because they were the best in providing decision-making information from ad hoc analyses of manually collected data from the field. The outputs of these analyses were well presented summary information that managers utilized in decision making. Spreadsheets were reported to have a limitation of persistence in that information on spreadsheets was rarely re-used since spreadsheets were mostly constructed to derive particular information for a particular purpose or timeline.

4.1.1.3 Word documents

Respondents also utilized word documents as electronic information resources for decision making in the company. The main such documents cited by respondents included word document reports produced for management on particular issues, prepared and presented by hand or via email to the relevant persons. Other such documents cited were guidelines from the authorities on how certain things were to be done such as soft copy letters sent detailing issues arising and possible remedies.

4.1.1.4 Web documents

Respondents also utilized web documents as electronic information resources. Such documents included informative web pages from the World Wide Web which that were useful in aiding

in decision making in the company. The respondents in this category however reported that this was the least commonly used electronic information resource among all the information resources.

4.1.2 THE FACTORS DETERMINING THE STATUS OF ADOPTION AND USE OF ENTERPRISE REPORTING SYSTEMS

Respondents were asked to give information relating to the factors that determined the current situation in the use of the ER systems in the company from the time of adoption of the ER systems up to date. The collected information was analyzed under the following key stages of the reporting cycle that were identified by the respondents to have an overall influence on reporting in the company; Report design and development, report generation, report distribution and report revision.

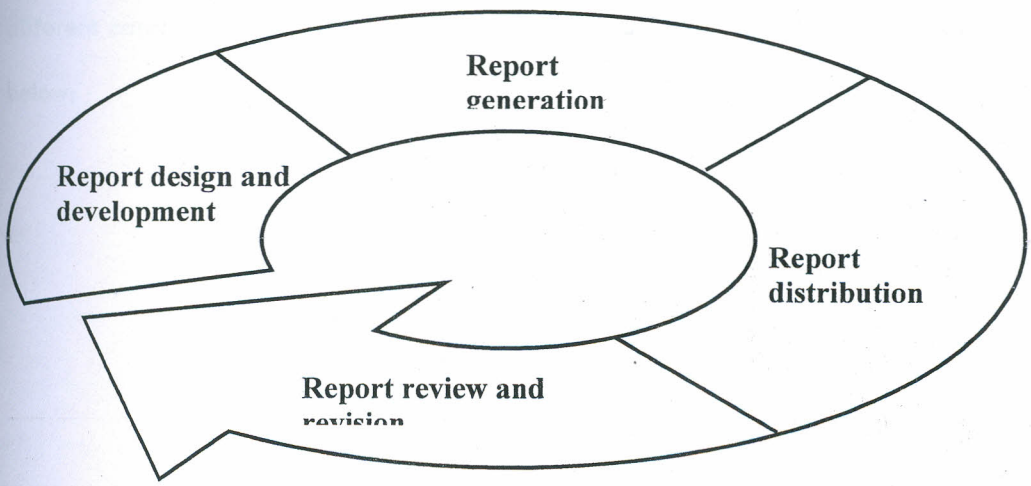

Fig. 4.1: A graphical model of the report cycle: Researcher's conceptualization

4.1.3 FACTORS INFLUENCING DESIGN AND DEVELOPMENT OF ER SYSTEMS

Findings revealed that the design and development processes of ER systems in the company had an influence on the overall status in the adoption and use of ER systems. Report design and development of ER systems was understood by majority of respondents to mean the creation of conceptual reporting solutions and transformation of the conceptual solutions into executable reports.

The design and development of the original reports of the company were based on a borrowed conceptual model from a sister franchise company, but a number of customizations were reported to have been made over time to meet the specific reporting needs of the company's report users. Continuous review and revision of report designs in the company over time was therefore the means by which the company improved the quality of her reports. Quality of the report design and development was reported by respondents to be measured mainly by the relevance of the information displayed on the reports, how well the relevant information was presented on the reports and in what format.

It was reported that the design and development of reports in the company was influenced by a number of factors. These factors identified by respondents include; user involvement, management support and developers' competence. The information collected from the different categories of respondents about these aspects is summarized as shown in the table below;

Table 4.2: Factors influencing design and development of reports

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
User involvement	2	100%	8	80%	25	83%	35	83%
Developers competence	2	100%	10	100%	28	93%	40	95%
Management support	2	100%	7	70%	22	73%	31	74%

The research findings indicated that the respondents that constituted the IT management staff category, Business Managers category and other employees in the operational level category cited user involvement, competence of developers, and management support as main factors that influenced design and development of ER systems in the company albeit varied frequency. These factors in turn had an influence in the overall status in the adoption and use of ER systems.

It was reported that the original reports having been based on an existing conceptual model of another franchise company, user involvement at that initial stage was minimal. User involvement only came in to shape the reports to meet the information needs of report users based on the limitations they faced while using the reports through review and revision of the reports.

Respondents reported that developers' competence determined how well user requirements were captured and met in the developed reports. In this regard developers' competence had a major role to play in determining the quality of the reports.

Respondents reported that management support influenced the amount of financial resources available for the design and development which also determined the level of expertise that was put to use in the design and development of the reports. A part from financial support, the respondents reported that management support extended further to include any other influence that management could exert on the processes of the design and development of company's reports like; tactful supervision of the design and development progress and internal personnel management relevant in the design and development of the reports.

4.1.3.1 Factors influencing generation of reports

Findings revealed that the report generation processes of reports in the company had an influence on the overall status in the use of ER systems in the company. Report generation was understood by majority of respondents to mean the production of viewable reports from stored electronic data at a particular time by running the report designs against that data.

It was reported that the generation of reports in the company was influenced by a number of factors. These factors identified by respondents include; frequency of report generation, promptness of report generation, format of generated reports and mode of administration of report generation. The information collected from the different categories of respondents about these aspects was summarized as shown in the table below;

Table 4.3: Factors influencing generation of reports

Major factors	IT management staff	Business Managers	Other employees	Total

	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Frequency	2	100%	8	80%	18	60%	28	67%
Promptness	2	100%	9	90%	20	67%	31	74%
Format of reports	1	50%	6	60%	18	60%	25	60%
Mode of administration	1	50%	7	70%	15	50%	23	55%

The research findings indicated that the respondents that constituted the IT management staff category, Business Managers category and other employees in the operational level category cited frequency of report generation, promptness of report generation, format of generated reports and mode of administration of report generation as the main factors that influenced the overall current status in the generation of reports.

Findings indicated that generation of reports by users in the company was not regular but random instead. The reports in the company were categorized on the basis of how regular they were intended to be generated at design but the actual generation of the reports depended purely on the need of the report users rather than at a routine periodic time interval. The categories of the company's reports according to the designs included; daily, monthly, quarterly and annual. The reason for the irregular generation of reports as reported by respondents was that reports were generated to serve a particular need as opposed to a regular routine thing regardless of whether or not the information would be useful at that time or not. Respondents reported that a regular pattern of generation of reports would be essential so as to maximize information utilization and not to miss out on any piece of information that would be useful.

Respondents indicated that promptness of the report generation processes was a main factor that influenced the current overall status in the use of ER systems. Findings indicated that a speedy process of generating reports led to timely utilization of information thus better decisions.

Respondents also indicated that the format of generated reports was a main factor that influenced the current overall status in the use of ER systems. Findings showed that the format of the generated reports was report viewer and this was reported to be sufficient. Respondents reported that diversity of report formats was necessary to increase the usability of reports in available diverse report formats like printed reports on paper were suitable for managers who would work in the field away from company premises in places where computers could not be easy to use.

It was reported that administration of the report generation processes was a main factor that influenced the current overall status in the use of ER systems. The mode of administration of the report generation processes was reported to be self-administration; this was reported by this category of respondents to be suitable as it eliminated involvement of people that would lead to overheads. Self administration was reported to make generation of reports speedy hence better utilization of available information on reports. Report users therefore determined when to generate reports or when reports were to be generated for them. It was also expressed that a different mode of administration where an autonomous party administered report generation could also be advantageous since it could make report generation more organized and lead to better utilization of infrastructural resources since generation could be done at night when the network infrastructure is not strained.

4.1.4 FACTORS INFLUENCING DISTRIBUTION OF REPORTS

Research findings indicated that report distribution processes influenced the overall status in the adoption and use of ER systems. Distribution of reports was understood by majority of

respondents to be the process of delivery of the generated reports to the intended users in the right form use by the intended users using a specific medium.

It was reported that the distribution of reports in the company was influenced by a number of factors. These factors identified by respondents include; medium of report distribution, promptness in report distribution and mode of administration of report distribution and output format of distributed reports. The information collected from the different categories of respondents about these aspects was summarized as shown in the table below;

Table 4.4: Factors influencing distribution of reports

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Medium	2	100%	10	100%	20	67%	32	76%
Promptness	2	100%	6	60%	18	60%	26	62%
Mode of administration	2	100%	7	70%	10	33%	19	45%
Output format	2	100%	7	70%	10	33%	19	45%

The respondents reported that the medium through which reports were distributed was a main factor that influenced the current overall status in the use of ER systems. Research findings indicated that the medium of distribution of reports in the company was a local area network. This medium was reported to be an appropriate medium for report distribution because it enabled all report users anywhere in the company to access reports easily and quickly as long as they had a connection to the server, via the network.

Respondents reported that the level of promptness of the report distribution process was a main factor that influenced the current overall status in the use of ER systems. The current level of promptness of report distribution was reported to be associated with the fact that report users accessed the generated reports by themselves in the company making distribution initiation speedy.

Respondents reported that the mode of administration of distribution of reports was a main factor that influenced the current overall status in the use of ER systems. The mode of administration of the report distribution was reported to be self; this was reported to be suitable as it did not require anyone in between to facilitate distribution of reports. This made distribution of reports a speedy process since reports users obtained reports for themselves from the servers.

It was reported that the output format of the distributed reports was a main factor that influenced the current overall status in the use of ER systems. Findings showed that the format of the generated reports was report viewer and this was reported to be sufficient. Respondents reported that diversity of report formats was necessary to increase the usability of reports in diverse available report formats like printed reports on paper were suitable for managers who would work in the field away from company premises in places where computers could not be easy to use.

4.1.5 FACTORS INFLUENCING REVIEW AND REVISION OF REPORTS

Research findings indicated that report review and revision processes influenced the overall status in the use of ER systems. Review of reports was understood by majority of respondents to mean the assessment of report designs in an effort to identify possible improvements that can be incorporated to improve the reports. Revision of reports on the other hand was understood by respondents to mean modification of the reports to meet the needs of the report users in a better way as per the review of those reports. The continuous review and revision of report designs in the company over time was reported to improve the quality of reports, by modifying the information content of the reports and the way the information was presented.

It was reported that the review and revision of reports of reports in the company was influenced by a number of factors. These factors identified by respondents include; user involvement, management support and developers' competence. The information collected

from the different categories of respondents about these aspects was summarized as shown in the table below;

Table 4.5: Factors influencing review and revision of reports

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
User involvement	2	100%	8	80%	25	83%	35	83%
Developers competence	2	100%	10	100%	28	93%	40	95%
Management support	2	100%	7	70%	22	73%	31	74%

Respondents cited user involvement, competence of developers, and management support as main factors that influenced review and revision of ER systems in the company which in turn had an overall influence in the adoption and use of ER systems.

Respondents cited user involvement as a main factor that influenced review and revision of ER systems in the company. User involvement was handy in shaping the reports to meet the information needs of report users based on the limitations that report users faced in the use of the reports. The users' suggestions were collected and implemented to meet their reporting needs.

Respondents cited developers' competence as a main factor that influenced the review and revision of ER systems in the company. This category of respondents reported that developers'

competence determined how well user requirements were captured and met in the developed reports.

Respondents cited management support as a main factor that influenced review and revision of ER systems in the company. This category of respondents reported that management support determined how much financial assistance report review and revision got and other non financial assistance such as other influence that management could exert on the processes of the review and revision of company's reports like; tactful supervision of the review and revision progress and internal personnel management relevant in the review and revision of the reports.

4.2 CHALLENGES IN THE ADOPTION AND USE OF ER SYSTEMS

Objective two (2) of the study sought to identify any challenges faced in the adoption of ER systems and their continued use. To meet this objective, the following research questions were used;

i) What are the challenges facing adoption and/or use of ER systems?

ii) How do the identified challenges limit adoption and use of ER systems?

Appendix 02, questions six (6) to fourteen (14) and Appendix 03, question seven (7) to question seventeen (17) represent the questions used to collect information to meet the above mentioned objective.

Respondents were asked to give information related to the challenges in the adoption and use of reports in the company, and information was collected and discussed.

4.3 CHALLENGES FACING ADOPTION & USE OF ER SYSTEMS

The collected information was discussed under the aspects of the reporting cycle in the graphical model of reporting in Fig 02. These aspects were; design and development of reports, generation of reports, distribution of reports and review and revision of reports.

4.3.1 THE CHALLENGES IN THE DESIGN AND DEVELOPMENT OF REPORTS

The following factors had been identified as influencing the design and development of reports; user involvement, developers' competence and management support. Based on these factors, respondents were asked to give information about the specific challenges associated with those factors and information collected was as analyzed as follows;

4.3.1.1 User involvement

Research findings indicated that user involvement faced a number of challenges, and the identified main challenges reported by respondents included; inadequate user commitment, developers' negative attitude and inadequate management commitment.

The information collected from respondents was summarized as shown in the table below;

Table 4.6: Challenges associated with user involvement

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
User commitment	2	100%	8	80%	21	70%	31	74%
Developers attitude	2	100%	9	90%	21	70%	32	76%
Management commitment	2	100%	5	50%	18	60%	25	60%

Respondents reported that report users lacked motivation in participating in the requirements collection by developers. This exercise was perceived by some report users as not being a priority. Business managers expressed that the stringent procedures and questions used to gather information about their reporting needs was time consuming. Other employees also agreed that the exercise wasn't interesting as it consumed their time that they would rather use to attend to other company tasks. The inability to involve the report users led to design and development of reports that did not accurately meet the actual reporting needs of the actual users.

Findings indicated that developers' negative attitude negatively impacted on user involvement in the design and development of reports. Developers for instance indicated that they found user involvement in the design and development processes time consuming and preferred to formulate user reporting needs without thoroughly involving the users. Respondents indicated

that developers thought that the report users did not understood their needs well or they could not communicate their needs clearly in a time saving manner.

Findings indicated that management's inadequate commitment negatively impacted on user involvement in the design and development of reports. Respondents reported that management needed to do more in facilitating user involvement by creating time for involvement rather letting it up to the report users to create their own time to do a thorough assessment of their reporting needs and communicate them to the developers or IT department.

4.3.1.2 Developers' competence

Research findings indicated that developers' competence faced a number of challenges, and the identified main challenges reported by respondents included; poor choice of software tools for the design and development of reports, limited expertise on design and development of reports and inappropriate design and development procedures.

The information collected from respondents was summarized as shown in the table below;

Table 4.7: Challenges associated with developers' competence

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Software choice	2	100%	10	100%	20	67%	32	76%
Skills	2	100%	10	100%	24	80%	36	86%
Procedures	2	100%	6	60%	18	60%	26	62%

Findings indicated that choice of wrong software for design and development of reports was a challenge as it led to inability for the reports to be maintained in case the developers' for one reason or another was not available to maintain them.

Findings indicated that inadequate skills, both technical and non technical, on the part of developers could lead to low quality reports that did not meet the report users' reporting needs.

Findings indicated that ineffective design and development procedures led to low quality reports that did not meet the reporting needs of users. Ineffective procedures would also lead to time wastage and stalled design and development of reporting systems.

4.3.1.3 Management support

Research findings indicated that management support faced a number of challenges, and these identified main challenges reported by respondents included; improper management policy on IT investment, management attitude on reporting and financial limitations. The information collected from respondents was summarized as shown in the table below;

Table 4.8: Challenges associated with management support

Major challenges	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
IT policy	2	100%	10	100%	24	80%	36	86%
Finance	2	100%	6	60%	18	60%	26	62%
Management attitude	2	100%	10	100%	22	73%	34	81%

Research findings indicated that problems in the policy on IT investment posed a challenge on design and development of ER systems, because policy guided the design and development procedures of ER in the company.

Research findings indicated that inadequate financial support limited design and development of enterprise reports that adequately met the report users' needs.

Management attitude was reported to be a challenge in the design and development of enterprise reports. Managements' understanding of the power of reporting in the company was reported to important in order to facilitate more use of enterprise reports in the company at large.

4.3.2 CHALLENGES IN THE GENERATION OF REPORTS

The following factors had been identified as major factors influencing the generation of reports; frequency of report generation, promptness of report generation, format of generated reports, mode of administration of report generation. Based on these influential

factors, respondents were asked to give information about the specific challenges associated with those factors and information collected was as follows;

4.3.2.1 Frequency of report generation

Research findings indicated that frequency of report generation faced a number of challenges, and these identified main challenges reported by respondents included; users' attitude about the importance of report information, inaccessibility to the reporting system by less privileged employees and infrastructural inadequacies.

Table 4.9: Challenges associated with report generation frequency

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
User attitude	2	100%	10	100%	20	67%	32	76%
Access limitations	2	100%	10	100%	21	70%	33	79%
Infrastructure	2	100%	10	100%	17	57%	29	69%

Research findings indicated that user attitude about the importance of report information was a challenge in the generation of reports for use in supporting decision making. Users reported that they were prompted to generated reports if they knew the reports could contain the information they were in need of and their attitude about the usefulness of the reports determined whether or not they would generate reports.

Research findings indicated that access limitation to the reporting systems was a challenge to the generation of reports. All reports users had unequal access to the reporting system and relied to access certain information through other report users. This delayed the process of generation of reports as the actual reports users had no direct access to the reporting systems.

Research findings indicated that infrastructural limitations were a challenge in the generation of reports. Power outages network failures among others were reported to hamper generation of reports.

4.3.2.2 Promptness of report generation

Research findings indicated that promptness of report generation faced a number of challenges, and these identified main challenges reported by respondents included; users' attitude about the importance of report information, inaccessibility to the reporting system by less privileged employees and infrastructural inadequacies.

Table 4.10: Challenges associated with promptness of report generation

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Access limitations	2	100%	10	100%	20	67%	32	76%
Infrastructural limitations	2	100%	6	60%	18	60%	26	62%

Research findings indicated that access limitation to the reporting systems was a challenge in the generation of reports. Lack of access affected the promptness of report generation and delayed use of required information.

Research findings indicated that infrastructural limitations were a challenge in the generation of reports. Infrastructural limitations influenced the report generation process thus causing lack of promptness in the report generation process.

4.3.2.3 Format of generated reports

Research findings indicated that format of generated reports faced a number of challenges, and these identified main challenge reported by was ease of use and compatibility of format with other data in different format.

Table 4.11: Challenges associated with format of generated reports

Major factor	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Ease of use	2	100%	10	100%	24	80%	36	86%
Compatibility	2	100%	8	80%	24	80%	34	81%

Research findings indicated that the format of generated reports was a challenge in the generated reports. Inappropriate format affected the usability of the reports by users.

Research findings indicated that compatibility of information outputs was a challenge in integrating report information with other information in different formats. Compatibility was essential and lack of it made reports un usable in some areas where needed.

4.3.2.4 Mode of administration of report generation

Research findings indicated that mode of administration of reports faced a number of challenges, and these identified main challenges reported by respondents was lack of discipline in generating reports.

Table 4.12: Challenges associated with mode of administration of report generation

Major factor	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Lack of discipline	2	100%	7	70%	24	80%	33	79%

Research findings indicated that lack of discipline in report generation affected the use of reporting information by report users.

4.3.3 CHALLENGES IN REPORT DISTRIBUTION

The following factors had been identified as influencing the distribution of reports; medium and mode of administration of report distribution. Based on these influential factors, respondents were asked to give information about the specific challenges associated with those factors and information collected was as follows;

4.3.3.1 Medium of report distribution

Research findings indicated that the medium of report distribution posed a number of challenges, and the identified main challenge reported by respondents was reliability of the medium.

Table 4.13: Challenges associated with medium of report distribution

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Medium reliability	2	100%	10	100%	20	67%	32	76%

Reliability of medium was reported to be a challenge in realizing effective distribution of reports.

4.3.3.2 Mode of Administration of Report Distribution

Research findings indicated that the administration mode posed a number of challenges, and these identified main challenges reported by respondents included; lack of discipline.

Table 4.14: Challenges associated with mode of administration of report distribution

Major factor	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Lack of discipline	2	100%	10	100%	24	80%	36	86%

Respondents reported that lack of discipline in report generation affected the use of reporting information by report users.

4.3.4 CHALLENGES IN THE REVIEW AND REVISION OF REPORTS

The following factors had been identified as influencing the review and revision of reports; user involvement, developers' competence and management support. Based on these influential factors, respondents were asked to give information about the specific challenges associated with those factors and information collected was as follows;

4.3.4.1 User involvement

Research findings indicated that user involvement faced a number of challenges, and the identified main challenges reported by respondents included; inadequate user commitment, developers' negative attitude and inadequate management commitment.

The information collected from respondents was summarized as shown in the table below;

Table 4.15: Challenges associated with user involvement in report review and revision

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Motivation of users	2	100%	8	80%	21	70%	31	74%
Developers attitude	2	100%	9	90%	21	70%	32	76%
Management commitment	2	100%	5	50%	18	60%	25	60%

Respondents reported that report users lacked motivation in participating in the requirements collection by developers. This exercise was perceived by some report users as not being a priority. Business managers ranking managers particularly expressed that the stringent procedures and questions used to gather information about their reporting needs was time consuming. Other employees also agreed that the exercise wasn't interesting as it consumed their time that they would rather use to attend to other company tasks. The inability to involve the report users led to review and revision of reports that did not accurately meet the actual reporting needs of the actual users.

Respondents reported that developers found user involvement in the review and revision processes time consuming and preferred to formulate user reporting needs without thoroughly involving the users. Respondents indicated that developers thought that the report users did not understood their needs well or they could not communicate their needs clearly in a time saving manner.

Respondents reported that management needed to do more in facilitating user involvement by creating time for involvement rather letting it up to the report users to create their own time to do a thorough assessment of their reporting needs and communicate them to the developers or IT department.

4.3.4.2 Developers' competence

Research findings indicated that developers' competence faced a number of challenges, and the identified main challenges reported by respondents included; limited expertise on review and revision of reports, inappropriate review and revision procedures.

The information collected from respondents was summarized as shown in the table below;

Table 4.16: Challenges associated with developers' competence in report review and revision

Major factors	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
Skills	2	100%	10	100%	24	80%	36	86%
Procedures	2	100%	6	60%	18	60%	26	62%

Respondents reported that inadequate skills on the part of developers could lead to low quality reports that did not meet the report users' reporting needs.

Respondents reported that ineffective procedures led to low quality reports that did not meet the reporting needs of users.

4.3.4.3 Management support

Research findings indicated that management support faced a number of challenges, and these identified main challenges reported by respondents included; improper management policy on IT investment, management attitude on the essence of reporting and financial limitations. The information collected from respondents was summarized as shown in the table below;

Table 4.17: Challenges associated with management support in report review and revision

Major challenges	IT management staff		Business Managers		Other employees		Total	
	Two (2)		Ten (10)		Thirty (30)		Forty two (42)	
	No.	%	No.	%	No.	%	No.	%
IT policy	2	100%	10	100%	24	80%	36	86%
Management attitude	2	100%	10	100%	22	73%	34	81%
Finance	2	100%	6	60%	18	60%	26	62%

Respondents reported that problems in the policy on IT investment posed a challenge on review and revision of ER systems because policy guided the review and revision procedures of ER in the company.

Management attitude was reported to be a challenge. Managements' understanding of the power of reporting in the company was reported to facilitate more use of ER in the company.

Respondents reported that inadequate financial support limited adoption and use of ER systems that met the report users' needs.

4.4 KPIs AND SLAs IN THE ADOPTION AND USE OF ER SYSTEMS

Objective three (3) of the study sought to determine appropriate Key Performance Indicators and Service Level Agreements that can be tracked to enhance adoption of ER systems and their continuous use. To meet this objective, the following research question was used;

i) Which Service Level Agreements (SLAs) and Key Performance Indicators (KPIs), related to the factors limiting the adoption and use of ER systems, are important to track?

Appendix 02, questions fifteen (15) to twenty four (24) and Appendix 03, questions eighteen (18) to question thirty one (31) represent the questions used to collect information to meet the above mentioned objective.

Under report design and development, findings indicated that the percentage number of relevant report users consulted during the design and development stage of the reporting system was identified as a performance indicator of the level of user involvement in the design and development of reports. Report findings also indicated that the level of satisfaction of the IT department or any other relevant authority on the competence of the developers of reports and the management support in the design and development of reports was a useful performance measure of the management support in the design and development of reports.

Under report generation, findings indicated that the level of satisfaction of the IT department or other relevant authority on the frequency of report generation, promptness of report generation, format of generated reports, and mode of administration of report generation are useful performance indicators of the overall performance of report generation.

Under report distribution, report findings indicated that the level of satisfaction of the IT department or other relevant authority on the medium of report distribution, the mode of report distribution are a useful performance indicators of the overall performance of report distribution.

Under report review and revision, findings indicated that the percentage number of relevant report users consulted during the review and revision stage of the reporting system was identified as a performance indicator of the level of user involvement in the review and revision of reports. Report findings also indicated that the level of satisfaction of the IT department or any other relevant authority on the competence of the developers of reports and the management support in the review and revision of reports was a useful performance measure of the management support in the review and revision of reports.

4.5 POSSIBLE BENEFITS OF SYSTEMATIC SUPERVISION REPORTING

Objective four (4) of the study sought to assess the possible benefits of systematic tracking of the identified KPIs and SLAs in adoption of Enterprise Reporting and its continuous use. To meet this objective, the following research question was used;

i) How is a reporting system a practical solution to the identified factors limiting adoption and use of ER systems?

Appendix 02, questions twenty five (25) to twenty seven (27) and Appendix 03, question thirty two (32) to question thirty four (34) represent the questions used to collect information to meet the above mentioned objective.

Under design and development of reports, findings indicated that tracking the number of report users consulted during design and development of the reports could assist in making decisions about possible adjustments to involve more and relevant report users to facilitate better design and development of reports. Report findings also indicated that tracking the level of relevant competence of the developers in design and development of the report could assist in taking appropriate actions in the involvement of the right persons in the design and development of reports. Report findings also indicated that tracking the level of management support in design and development of reports could assist in sensitizing the management on

what could be done to support the processes of design and development of reports among others.

Under report generation, report findings indicated that tracking the frequency aspects of report generation by report users would enable make statistical assessment of report utilization and make appropriate decisions that could encourage report utilization. It was also found that tracking the level of satisfaction of the aspects of the mode of administration of report generation in the company would also enable management to make appropriate decisions about the mode of administration of report generation so as to counter any report administration challenges.

Under report distribution, findings indicated that tracking the level of satisfaction of the medium of distribution of reports could enable management and make appropriate decisions about the medium so as to have in place the most reliable medium for report distribution that will encourage use of enterprise reports. Tracking the level of satisfaction of the mode of administration of report distribution in the company would also enable management make appropriate decisions about the mode of administration of report distribution to encourage the use of reports in the company.

Under review and revision of reports, findings indicated that tracking the number of report users consulted during review and revision of the reports could assist in making decisions about possible adjustments to involve more and relevant report users to facilitate better review and revision of reports. Report findings also indicated that tracking the level of relevant competence of the developers in review and revision of the report could assist in taking appropriate actions in the involvement of the right persons in the review and revision of reports. Report findings also indicated that tracking the level of management support in review and revision of reports could assist in sensitizing the management on what could be done to support the processes of review and revision of reports among others.

4.6 REPORTING SYSTEM TO ENHANCE ADOPTION & USE OF ER

Objective five (5) of the study sought to design and develop a systematic supervision reporting system to enhance adoption of ER systems and their continuous use.

To accomplish this objective, the following research question was used;

i) How can the SLAs and KPIs be systematically tracked in form of a supervision reporting system to promote the adoption and use of ER systems?

This objective was achieved through systematic design and development of a supervision reporting system for tracking KPIs and SLAs discussed under objective four (4) above. Chapter 5 – Design and Development of the ER solution details the entire design and development of the ER solution.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

It was found out that the main electronic information resources of the company are reports, spreadsheets, word documents and web documents. Electronic reports were the most popularly used of all the cited electronic information resources by all the categories of report users. This revealed the influence that reports had in management decision making.

Original adoption of ER systems and the current use of those systems depended on a number of factors that influenced the current situation in the use of ER systems. In the original design and development of reports, respondents cited user involvement, management support and developers' ability as the major factors that played a part in determining the current status of the use of ER systems in the company.

In relation to report generation, frequency of report generation, promptness of report generation, format of generated reports and mode of administration of report generation played a part in determining the current status of the use of ER systems in the company. Medium of report distribution, promptness in report distribution and mode of administration of report distribution played a role in determining the current status of the use of ER systems in the company.

Review and revision of reports were determined by user involvement, management support and developers' competence.

The challenges associated with user involvement in the design and development of ER systems included; inadequate user commitment, developers' negative attitude and inadequate management commitment. The challenges that were associated with developers competence: in the design and development of ER systems were; poor choice of software for the design and development of reports, limited expertise on design and development of reports,

inappropriate design and development procedures. The challenges associated with Management support in the design and development of ER systems included; users' attitude about the importance of report information, inaccessibility of the reporting system by other employees and infrastructural inadequacies.

The challenges associated with the report frequency in the generation of reports included; users' attitude about the importance of report information, inaccessibility to the reporting system by less privileged employees and infrastructural inadequacies. The challenges associated with promptness of report generation in the generation of reports included; users' attitude about the importance of report information, inaccessibility to the reporting system by less privileged employees and infrastructural inadequacies. The challenges associated with the format of generated reports included; ease of use and compatibility of format with other data in different format. The challenge associated with mode of administration in the generation of reports was inadequate discipline in the generation of reports.

The challenge associated with the medium of report distribution in the distribution of reports was the reliability of the medium. The challenge associated with the mode of administration in the distribution of reports was lack of discipline in generating reports.

Findings indicate that the key things to be tracked to enhance the design and development of reports include; percentage number of relevant report users consulted during the design and development of reports, the level of relevant competence of the developers of reports, the level of management support in the design and development of reports.

Findings indicate that the key things to be tracked to enhance the generation of reports include; Level of satisfaction of the frequency of report generation, the level of satisfaction of the promptness of report generation, the level of satisfaction of the format of generated reports, the level of satisfaction of the mode of administration of report generation.

Findings indicate that the key things to be tracked to enhance the distribution of reports include; the level of satisfaction of the medium of report distribution, and the level of satisfaction of the mode of report distribution.

Findings indicate that the key things to be tracked to enhance the review and revision of reports include; percentage number of relevant report users consulted during the design and development of reports, the level of relevant competence of the developers of reports and the level of management support in the design and development of reports.

5.2 CONCLUSIONS

Given the importance of enterprise reporting on management decision making, demonstrated by reliance on reports in spite of the existing challenges facing use of reports, it is essential for the company under study to implement mechanisms to improve the adoption and use of reporting. All the aspects of enterprise reporting that face challenges and are of essence to track need to be monitored to allow appropriate actions by relevant authorities in order to improve adoption and use of reporting.

5.3 RECOMMENDATIONS

In the light of the findings, the study recommends the following;

1. In order to derive the right information from the company's electronic data resources, there is a need to improve the storage mechanisms of data in the company for ease of access through data warehousing.

2. There is need to provide training to report users and other relevant persons on their role in the different aspects of enterprise reporting in order to tap their influence to promote adoption and use of enterprise reporting.

3. There is a need to improve the effectiveness of the IT department by striving to possess diverse skills that are relevant to business intelligence and enterprise reporting such as programming, data warehousing, and database administration among others.

4. Tracking the critical aspects of the reporting is necessary as a means to provide useful information to the relevant persons in the organization to take appropriate action to promote adoption and use of ER systems in the company.

5. There is a need for policy formulation and implementation relating to design and development of reports, generation of reports, distribution of reports, review and revision of reports, in a manner that promotes adoption and use of ER systems according to the expectations of such authority as the department of IT in the company.

5.3.1 RECOMMENDATIONS FOR FURTHER RESEARCH

1. A research on the cost evaluation of enterprise reporting and business intelligence services in the soft drinks industry and in other organizations would give a true reflection of the value of BI and ER.

2. A research into the use of artificial intelligence to determine failings in the different aspects of the use of BI tools in and offer suggestions on appropriate steps to improve adoption and use of ER systems.

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