

DESCRIPTIVE BUSINESS INTELLIGENCE ANALYSIS: CUTTING EDGE STRATEGIC ASSET FOR SMES, IS IT REALLY WORTH IT?

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Abstract

The purpose of this article is to provide a framework for understanding and adoption of Business Intelligence by (SMEs) within the Zimbabwean economy. The article explores every facet of Business Intelligence, including internal and external BI as cutting edge strategic asset. A descriptive research methodology has been adopted. The article revealed some BI critical success factors for better BI implementation. Findings revealed that organizations which have the greatest success with BI travel an evolutionary path, starting with basic data and analytical tools and transitioning to increasingly more sophisticated capabilities until BI becomes an intrinsic part of their business culture and ROI is realized. Findings are useful for managers, policy makers, business analysts, and IT specialists in dealing with planning and implementation of BI systems in SMEs.

Key Words: Cutting Edge, Business Intelligence, Asset, Strategic

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1. Introduction

Leading organizations of all kinds are seeking new, smarter ways to improve performance, grow revenue, develop stronger customer relationships and increase workforce effectiveness – and they expect individuals in every role to contribute to these outcomes (Negash, 2004). Business intelligence (BI) is the only key factor in achieving such results because it supports informed decision making at every level, enabling managers, executives and knowledge workers to take the most effective action in a given situation (Chen, Chiang, & Storey, 2012). Business intelligence (BI) software connects people with information when and where they need it, and provides capabilities far beyond spreadsheets to deliver a true picture of the business. The SME e-Access and Usage survey which was carried out by the Research ICT Africa (RIA) Network in 14 African countries between the last quarter of 2005 and the first quarter of 2006 revealed ICT is the best vehicle for information systems management (Unwin, 2005). Its primary objective is to understand the impact of ICTs on private sector development, and how ICTs can contribute to a vibrant SME sector and economic growth in the context of developing economies (Unwin, 2005). The countries covered included Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. SMEs account for the employment of at least 57% of

the productive population in Zimbabwe and the entire sub-Saharan Africa. The current formal unemployment rate in Zimbabwe is approximately 80% (Robertson, Smith, and Tunzelmann, 2009). This figure is fast increasing due to the shrinkage in the formal sector, subsequent retrenchments and the outpouring of graduates from tertiary institutions joining employment seekers while the formal sector can only absorb 20 000 graduates or less annually (Ndlovu & Ngwenya, 2003).

Robertson et al (2009) stipulates that with 80 percent formal unemployment and shrinking productivity, few of the 2 million young people and graduates who turned 18 years, since 2000 found jobs with a regular income, training, advancement or career prospects in SMEs. Small and medium-sized enterprises (SMEs) are the life blood of global economy. Nearly ninety-five (95) per cent of the enterprises in most economies belong to the group SME (Ebrahim, Ahmed, & Taha, 2010). In Zimbabwe, an MSME Policy and Strategy Framework has defined small and medium enterprises as those who are registered in terms of their legal status' and 'employing anywhere between six to <100 workers' (Zimbabwe, 2008: 20). The official definition of SMEs in Zimbabwe includes heterogeneous, formal enterprises and informal businesses which are complemented by estimates of the size of the informal economy. Just like the rest of the world, number of employees, total assets, sales and investment levels are commonly used yard-sticks.

Various activities of SMEs include village handicraft makers, restaurants, computer software, shops, and many sophisticated skills that drive different markets. Zimbabwe defines SMEs according to a lower limit of 5-10 employees and an upper limit of 50-100 employees for a small organisation. Medium enterprises were defined to have lower and upper limits of 100 and 250 employees (Ndlovu & Ngwenya, 2003). The EU describes an SME as a company that has fewer than 250 employees and has either an annual turnover not exceeding €50 million or an annual balance sheet total not exceeding €43 million (Perrini, 2006). But (Olawale, & Garwe, 2010) stipulates that one of the primary causes of failure in these small enterprises is lack of information systems (business intelligence) that is the ability of an organization to collect, maintain, and organize knowledge wishing to stay in business they have to compete in a different way (Negash, 2004). Innovativeness and competitiveness of SMEs can be increased by means of information technology implementation. Enterprise that made use of information technology oriented investments obtained substantial profits (Negash, 2004).

Unfortunately, information technology related solutions are mainly oriented in large enterprises and corporations but not in SMEs. Putting the latest information technology related solutions into practice of SMEs is frequently much delayed in comparison with large enterprises or does not happen at all (Olawale, & Garwe, 2010). As a result, SMEs are not as competitive in the market as large enterprises and their development is questionable. Business Intelligence (BI) as a concept provides a means to obtain crucial information to improve strategic decisions and therefore plays an important role in current decision support systems in SMEs (Baars, & Kemper, 2008) and is about creating value for organizations based on data or, more precisely, facts. Business intelligence enhances decision-making capabilities for managerial processes for instance planning, budgeting, controlling, assessing, measuring, and monitoring and to ensure critical information is exploited in a timely manner (Baars, & Kemper, 2008). According to Baars, & Kemper, (2008), the data warehouse industry – as the technological basis of BI – has reached full maturity and acceptance in the business fraternity. The pursuit of improving financial results, as well as production capacity or sales figures, results in several (ad-hoc) decisions, impacting the operational, tactical and strategic levels hence the need for business intelligence systems. Bierly, Kessler, & Christensen (2000) defined knowledge as a clear understanding of information; transformation from data (raw facts) to information (meaningful, useful data) is specified as the process of gaining knowledge. Usage of gained or extracted knowledge to establish and achieve goals, set by an organization, is described as wisdom or business intelligence.

The ability to import data seamlessly from as many sources as possible and to offer an integrated view over them without the need to define a-priori schemas offers flexibility and removes barriers in terms of what analyses are possible and what they can reveal (Westerski, 2013).

Given the dearth of literature on Business Intelligence in Zimbabwean SMEs this article saves a documentary overview of Business Intelligence as a cutting edge strategic asset. It is against this backdrop that the article seeks to discover whether it is worthwhile having business intelligence systems adopted by SMEs in Zimbabwe. The main purpose of this article is to capture the essence of what the literature says about BI and its role in decision-making in SMEs in general and in particular, to find out the expectations and empirical observations of the use of the BI output in decision-making in SMEs, to explore every facet of Business Intelligence, including internal and external BI and the tangible/intangible aspects leading to a competitive advantage in SMEs.

Internal Business Intelligence (BI) refers to the protection and utilization of internal data and external BI refers to the gathering of data and information about the competition (Wright, 1999). External Business Intelligence involves a company's attempts to gain information about a competitor to gain an advantage. Many researchers have identified numerous barriers/inhibitors confronting small and medium enterprises (SMEs) in their quest to adopt and assimilate electronic (e)-commerce applications in their operations (see for example, (MacGregor, & Vrazalic, 2005) and prescribed a plethora of solutions to make SMEs competitive.

To the best of my knowledge no research has been done in this area, "Descriptive Business Intelligence Analysis: Cutting Edge Strategic Asset in SMEs in Zimbabwe". A documentary analysis review of some of the most cited pieces of peer reviewed articles on this topic will be unraveled to see how BI has contributed to organizational growth in countries outside Zimbabwe, and again how it has cut costs in those companies. The reason is to find whether it is worth applying in Zimbabwean economy. The findings are then used to recommend stakeholders of SMEs in Zimbabwe to adopt the Business Intelligence strategy. In view of this background, the article is to contribute to literature on business intelligence espousal and utilization by SMEs, predominantly giving an answer to the question: "Is business intelligence really worth it as cutting edge strategic asset in Zimbabwean SMEs". The answer will be arrived at by conducting a descriptive documentary analysis of text around the topic. The findings will contribute to the sea of knowledge as no such research has been done in Zimbabwe and again the results obtained may be useful for managers, policy makers, business analysts, and IT specialists in

dealing with planning and implementation of BI systems in SMEs.

2. Descriptive Research Methodology: Documentary Analysis

For the purpose of this article a descriptive research methodology has been adopted, because it is restricted to factual registration and that there is no quest for an explanation why reality is showing itself this way (Tsang, 1997). In principle, descriptive research is not aiming at forming hypotheses or development of a theory (Creswell, 2002). Through document analysis, descriptive research is about describing how reality is in the business ecosystem. With descriptive research in its purest form explaining and evaluating is left to the reader or to other disciplines (Krathwohl, 1993). Document analysis is the systematic exploration of literature from various disciplines, IT, business, entrepreneurship psychology, or other artefacts such as films, videos and photographs. Hanson et al., (2005) argued that documents are unobtrusive and can be used without imposing on participants; they can be checked and re-checked for reliability. This methodology emphasizes an integrated view of speech/texts and their specific contexts. Texts in documentary analysis can be defined broadly as books, book chapters, essays, interviews, discussions, newspaper headlines and articles, historical documents, speeches, conversations, advertising, theater, informal conversation, or really any occurrence of communicative language (Robson, 2002).

Two criteria pivoted the selection criteria of literature that serves as the bedrock for this article. First, the selected literature for review needed to explicitly describe or explain the business intelligence inaccessible terms and also the literature from the texts needed to be general and all encompassing. General texts according to Robson (2002) are respected journals and sections of journals focusing on these disciplines for entrepreneurship, IT and business intelligence served as secondary sources for this article. Keywords such as intelligence, business, SMEs, cutting edge, were used to query databases such as Web of information systems, JSTOR (a digital library founded in 1995 and originally containing digitized back issues of academic journals, and it now includes books and primary sources, and current issues of journals), and UNISA Electronic Databases such as Sage Journal, EBSCO, SABINET

3. Literature Review on Business Intelligence

3.1 The Evolution of Business Intelligence

Business intelligence is not just a modern idea. In his famous treatise "The Art of War, Sun Tzu says,

"...what enables the wise commander to strike and conquer, and achieve things beyond the reach of ordinary men, is foreknowledge (Parry-Giles, & Parry-Giles, 1999). Now this foreknowledge cannot be elicited from spirits..." (Parry-Giles, & Parry-Giles, 1999). Although the term 'business intelligence' has been in use since 1800, (Lin, Michel, Aiden, Orwant, Brockman, & Petrov, 2012), it was used in scientific context for the first time in an article by Hans Peter Luhn, an IBM researcher, in 1958 (Gibson, Arnott, Jagielska, & Melbourne, 2004). In his article, Luhn (1958) described an "automatic method to provide current awareness services to scientists and engineers" (p. 314) who needed help to cope with the growth of scientific and technical literature (Gibson, et al, 2004). While Sun Tzu is not the father of business intelligence, his concept that foreknowledge breeds success applies directly to BI. Modern BI uses computers to gain foreknowledge by processing and analyzing information in support of business decisions. In the 1980's before BI was BI it was called Executive Information Systems (EIS), in the 1990's, it was Online Application Protocol (OLAP), followed by scorecards, dashboards, KPIs (key performance indicators), and real time alerts through business activity monitoring (Gibson, et al, 2004).

The term BI was coined by Gartner (Dresner, 1989) as an umbrella term to describe the set of concepts and methods used to improve business decision-making by using fact-based support systems. In the 1990s, information technologies (IT) evolved to enable resource wide applications such as Customer Relationship Management (CRM), Enterprise Resource Programs (ERP) and Supply Chain Management (SCM) that help streamline many large and medium sized businesses to make them competitive (Dresner, 1989). In addition, in the late 1990s, IT enabled the process of data warehousing, especially for transaction-intensive industries such as financial, retail and telecommunications (Kotrlik, & Williams, 2003). As a result, there are vast amounts of information stored in company computers about all aspects of the business. Regardless of the moniker we give BI, it is certain that it is here to stay. Research on business intelligence originates from the term as introduced in 1989, by Howard Dressner, regarding business intelligence to describe concepts and methods to improve business decision making by using fact-based support (Negash & Grey, 2008).

From a historical standpoint the underlying concept of business intelligence is not new. Since ancient times, humanity has developed processes, techniques and tools for collecting and analyzing intelligence to support decision making, especially during times of war (Rutkauskas, 2008). Ancient military organizations developed tactics and methods to collect and develop intelligence although these were more in terms of what we today call "industrial espionage", that is illegal and unethical methods to

collect intelligence about other organizations (Calof and Wright 2008).

3.2 Business Intelligence: Definitions & Approaches

The BI literature lacks a universally accepted definition of BI (Ponelis, & Britz, 2013). The definitions range from one-dimensional definitions, in which BI is viewed as a set of technologies or as a process, to multidimensional definitions, in which BI is viewed as a process, a set of technologies and a product (a detailed discussion about the BI definitions is provided in chapter two). In line with the multidimensional view, Davenport (2006) defines BI as a term which encompasses a wide array of processes and software to collect, analyze, and disseminate data, all in the interest of better decision-making." In the same way, Wixom and Watson (2010) define BI in their paper as: "a broad category of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help its users to make better decisions." A literature review around the theme business intelligence (BI) shows "division" in endeavor to define this concept or division in attempts at defining this concept: Technical and managerial approaches, tracing two broad patterns: The managerial approach sees BI as a process in which data gathered from inside and outside the company are integrated in order to generate information relevant to the decision-making process. The role of BI here is to create an informational environment in which operational data gathered from transactional systems and external sources can be analyzed, in order to reveal "strategic" business dimensions. The BI literature lacks a universally accepted definition of BI (Ponelis, & Britz, 2013). The definitions range from one-dimensional definitions, in which BI is viewed as a set of technologies or as a process, to multidimensional definitions, in which BI is viewed as a process, a set of technologies and a product (a detailed discussion about the BI definitions is provided in chapter two). In line with the multidimensional view, Davenport (2006) defines BI as a term which encompasses a wide array of processes and software to collect, analyze, and disseminate data, all in the interest of better decision-making. According to Hannula et al, it is the Systematic business information acquisition and analysis.

In addition, it is also called Competitive Intelligence, Corporate Intelligence, Market Intelligence, Market Research, Data Warehousing, and Knowledge Management. Howard Dresner (1989) proposed "business intelligence" as an umbrella term to describe "concepts and methods to improve business decision making by using fact-based computerized support systems." It was not until the late 1990s that this usage was widespread.

Ranjan, (2009) defined Business intelligence as the process of taking large amounts of data, analyzing that data, and presenting a high-level set of reports that condense the essence of that data into the basis of business actions, enabling management to make fundamental daily business decisions. Ranjan, (2009) view BI as way and method of improving business performance by providing powerful assists for executive decision maker to enable them to have actionable information at hand. BI tools are seen as technology that enables the efficiency of business operation by providing an increased value to the enterprise information and hence the way this information is utilized. Wang, Carley, Zeng, & Mao, (2007) define BI as "The process of collection, treatment and diffusion of information that has an objective, the reduction of uncertainty in the making of all strategic decisions." Experts describe Business intelligence as a "business management term used to describe applications and technologies which are used to gather, provide access to analyze data and information about an enterprise, in order to help them make better informed business decisions." Tvrdikova (2007) describes the basic characteristic for BI tool is that it is ability to collect data from heterogeneous source, to possess advance analytical methods, and the ability to support multi user's demands. Zeng et al. (2007) categorized BI technology based on the method of information delivery; reporting, statistical analysis, ad-hoc analysis and predicative analysis. The concept of Business Intelligence (BI) is brought up by Gartner Group since 1996. It is defined as the application of a set of methodologies and technologies, such as J2EE, DOTNET, Web Services, XML, data warehouse, OLAP, Data Mining, representation technologies, etc, to improve enterprise operation effectiveness, support management/decision to achieve competitive advantages. Golfarelli et al. (2004) defined BI that includes effective data warehouse and also a reactive component capable of monitoring the time critical operational processes to allow tactical and operational decision-makers to tune their actions according to the company strategy. Gangadharan and Swamy (2004) define BI as the result of in-depth analysis of detailed business data, including database and application technologies, as well as analysis practices.

They widen the definition of BI as technically much broader tools that include potentially encompassing knowledge management, enterprise resource planning, decision support systems and data mining. Berson et.al (2002); Curt Hall (1999) BI includes several software for Extraction, Transformation and Loading (ETL), data warehousing, database query and reporting, OLAP, data analysis, data mining and visualization. The BI literature lacks a universally accepted definition of BI (Pirttimaki 2007; Wixom and Watson 2010). The definitions range from one-dimensional definitions, in which BI is viewed as a set of technologies or as a

process, to multidimensional definitions, in which BI is viewed as a process, a set of technologies and a product (a detailed discussion about the BI definitions is provided in chapter two). In line with the multidimensional view, Davenport (2006) defines BI as a term which: “encompasses a wide array of processes and software to collect, analyzes, and disseminate data, all in the interest of better decision-making.” In the same way, Wixom and Watson (2010) define BI in their paper as: “a broad category of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help its users to make better decisions.” One of the main issues that are obvious in the literature is the confusion between business intelligence and competitive intelligence (CI).

In the literature, authors such as Calof and Wright (2008), Kinsinger (2007), Martinsons (1994) and Vedder et al. (1999) use the term BI to convey the concept of competitive intelligence. Competitive intelligence (CI), also known as business intelligence, is both a process and a product (Calof and Wright 2008). As a process, CI is the set of legal and ethical methods an organization uses to harness information that helps it achieve success in a global environment. As a product, CI is information about competitors’ activities from public and private sources, and its scope is the present and future behavior of competitors, suppliers, customers, technologies, acquisitions, markets, products and services, and the general business environment. CI covers the entire competitive environment (including both current and potential competitors) by collecting internal and external information to identify business opportunities and threats (Calof and Wright 2008). However, the concept of CI attained popularity only in the marketing intelligence literature together with the concept of marketing/market intelligence (Calof and Wright 2008). The most recent papers define BI as a three-dimensional concept. Shariat and Hightower (2007) characterize it as a composition of processes, technologies and products: processes for collecting and analyzing business information; technologies used in those processes; and the product as “the information (knowledge) obtained from these processes” Inspired by the BI definitions discussed, two main BI perspectives were identified and are presented in the next section.

The term “Internal” Business Intelligence covers the ability of a company to keep information from its competitors so that they may not gain a competitive advantage from their espionage activities. Theft can take the form of Industrial Espionage (IE), as defined by the Economic Espionage Act of 1996 (EEA), where trade secrets are stolen by a foreign governments or agents against domestic businesses (Fleischer, Craig, Blenkhorn, and David, 2003). Business Espionage, on the other hand, is defined by the Central Intelligence Agency (CIA) as involving the theft of trade secrets by competitors, either

foreign or domestic (Smith, 2005). This may include cases where former workers for a company take the protected trade secrets with them when they take on a new and competitive job elsewhere and use them against a previous employer. External Business Intelligence involves your company’s attempts to gain information about a competitor to gain an advantage. Based again on a CIA definition, by Smith, (2005), this is called Corporate Espionage (CE). Although the term may not seem legal, there are many perfectly ethical methods to conduct CE (Fleisher, Wright, & Tindale, 2007). Internal BI refers to the protection and utilization of internal data and external BI refers to the gathering of data and information about the competition.

According to Central Intelligence Agency CIA (Fleischer, et al. 2003) there are three types of Espionage when dealing with trade secrets, businesses intelligence and competitive advantage:

- Industrial Espionage – Foreign government vs. Domestic Business.
- Business Espionage – Foreign or Domestic Business vs. Domestic Business.
- Corporate Espionage – Legal and ethical intelligence gathering by Domestic

The Federal Bureau of Investigations (FBI), on the other hand defines the theft of trade secrets using the definitions in the Economic Espionage Act of 1996 - Economic Espionage includes industrial, business, and corporate espionage (Pooley, Lemley, & Toren, 1996). **Industrial Espionage:** Section 1831 of the Economic Espionage Act of 1996 described industrial espionage as the theft of trade secrets by a foreign instrumentality any agency, bureau, ministry, component, institution, association, or any legal, commercial, or business organization, corporation, firm, or entity that is substantially owned, controlled, sponsored, commanded, managed, or dominated by a foreign government; and/or a foreign agent any officer, employee, proxy, servant, delegate, or representative of a foreign government. An example of Industrial Espionage was the French Government, in conjunction with Air France, planting electronic listening devices in the seats in first class. The purpose of these devices was to monitor conversation between first class customers discussing business topics (Simon, 1998).

Business Espionage: Section 1832 – the theft of domestic trade secrets by a foreign or domestic business. Besides foreign governments, foreign and domestic companies are responsible for the theft of trade secrets from domestic companies. Some of the case studies that are examples of this type of espionage include (Carr, Morton, & Furniss, 2000):

- Retired Kodak employees forming a consulting business passing along Kodak internal information.
- Taiwanese Business receiving insider information on creation of labels from an employee of Avery Dennison.

- A Lockheed Martin employee hired by Boeing bringing along trade secrets

Corporate Espionage: While at first blush CE may give the appearance of something unethical, in reality there are a number of ways for companies to carry out CE that are well within the established bounds of proprietary. Many of these are actually simple methods that may prove very lucrative when properly utilized. CE is generally conducted by the employee. These are employees who gather the competitor's information as part of their normal employment process. This information can be collected in the following ways (Carr, Morton, & Furniss, 2000):

- Publications
- Conferences
- Internet
- Business Information

BI systems combine data gathering, data storage, and knowledge management with analytical tools to present complex internal and competitive information to planners and decision makers. Implicit in this definition is the idea (perhaps the ideal) that business intelligence systems provide actionable information delivered at the right time, at the right location, and in the right form to assist decision makers. The objective is to improve the timeliness and quality of inputs to the decision process, hence facilitating managerial work. Sometimes business intelligence refers to on-line decision making, that is, instant response. Most of the time, it refers to shrinking the time frame so that the intelligence is still useful to the decision maker when the decision time comes. In all cases, use of business intelligence is viewed as a proactive management system with essential components of proactive BI as shown below (Gupta, & Sharma, 2013):

3.3. Components of Business Intelligence

OLAP (On-line analytical processing): Codd, & Salley, (1993) defines OLAP as a way in which business users can slice and dice their way through data using sophisticated tools that allow for the navigation of dimensions such as time or hierarchies. Online Analytical Processing or OLAP provides multidimensional, summarized views of business data and is used for reporting, analysis, modeling and planning for optimizing the business. OLAP techniques and tools can be used to work with data warehouses or data marts designed for sophisticated enterprise intelligence systems. These systems process queries required to discover trends and analyze critical factors. Reporting software generates aggregated views of data to keep the management informed about the state of their business. Other BI tools are used to store and analyze data, such as data mining and data warehouses; decision support systems and forecasting; document warehouses and document management; knowledge management;

mapping, information visualization, and dash boarding; management information systems, geographic information systems; Trend Analysis; Software as a Service (SaaS).

Advanced Analytics: it is referred to as data mining, forecasting or predictive analytics, this takes advantage of statistical analysis techniques to predict or provide certainty measures on facts (Bose, 2009).

Corporate Performance Management (Portals, Scorecards, and Dashboards): this general category usually provides a container for several pieces to plug into so that the aggregate tells a story. For example, a balanced scorecard that displays portlets for financial metrics combined with say organizational learning and growth metrics (Andreeva, Boehm, Gaidioz, Karavakis, Kokoszkiewicz, Lanciotti, & Sidorova, 2010). Real time BI: It allows for the real time distribution of metrics through email, messaging systems and/or interactive displays (Azvine, Cui, Nauck, & Majeed, 2006). Data Warehouse and data marts: The data warehouse is the significant component of business intelligence. It is subject oriented, integrated. The data warehouse supports the physical propagation of data by handling the numerous enterprise records for integration, cleansing, aggregation and query tasks. It can also contain the operational data which can be defined as an updateable set of integrated data used for enterprise wide tactical decision-making of a particular subject area. It contains live data, not snapshots, and retains minimal history. Data sources can be operational databases, historical data, external data for example, from market research companies or from the Internet), or information from the already existing data warehouse environment. The data sources can be relational databases or any other data structure that supports the line of business applications (Andreeva et al. 2010).

They also can reside on many different platforms and can contain structured information, such as tables or spreadsheets, or unstructured information, such as plaintext files or pictures and other multimedia information. A data mart as described by (Inmon, 1999) is a collection of subject areas organized for decision support based on the needs of a given department. Finance has their data mart, marketing has theirs, and sales have theirs and so on. And the data mart for marketing only faintly resembles anyone else's data mart. Perhaps most importantly, (Inmon, 1999) the individual departments own the hardware, software, data and programs that constitute the data mart. Each department has its own interpretation of what a data mart should look like and each department's data mart is peculiar to and specific to its own needs. Similar to data warehouses, data marts contain operational data that helps business experts to strategize based on analyses of past trends and experiences. The key difference is that the creation of a data mart is predicated on a specific, predefined need for a certain

grouping and configuration of select data. There can be multiple data marts inside an enterprise. A data mart can support a particular business function, business process or business unit. A data mart as described by (Inmon, 1999) is a collection of subject areas organized for decision support based on the needs of a given department. Finance has their data mart, marketing has theirs, and sales have theirs and so on. And the data mart for marketing only faintly resembles anyone else's data mart. Beside components Business intelligence has its own systems.

3.4 Business Intelligence Systems

The role of BI systems and their influence over organizations have been subject to change. From simple, static analytical applications they have evolved into solutions that can be used in strategic planning, customer relationship management, monitoring operations, studying the profitability of products, (Negash & Gray, 2008). They are no longer regarded as a technological category only and have become the determinant of a new approach to the management of an organization (Sauter, 2010) and a new way of collecting, storing, processing, analysing, and using information (Williams & Williams, 2007). BI systems refer to decision making, information analysis and knowledge management, and human-computer interaction. Therefore, they are also often associated with systems such as MIS (management information systems), DSS (decision support systems), EIS (executive information systems), management support systems, and business / corporate performance management (O'Brien & Marakas, 2007). However, it is good to remember certain, important differences between these systems. MIS focus mainly on the automation of business processes. DSS provide techniques for analyzing information to assess potential decisions. EIS present the information in an aggregate form, and their beneficiaries are top-level management executives. Whereas, the BI goal is to provide organizations with intelligence that should be used to create competitive advantage. They combine the capabilities of different systems, which previously operated independently. BI focuses on supporting a variety of business functions, using the process approach and advanced analytical techniques (Glancy & Yadav, 2011). BI systems may be analyzed from two perspectives: technical and business (Olszak & Ziemba, 2003, 2006, 2010a). From the technical perspective they are referred to as an integrated set of tools, technologies, and software products that are used to collect heterogenic data from dispersed sources and then to integrate and analyze data to make them commonly available (Olszak, et al.2010)

They include: tools to extract, transform and load data (ETL, Extraction-Transformation-Load

tools) – are mainly responsible for data transfer from transaction systems and Internet to data warehouses;

- data warehouses – provide place for thematic storing of aggregated and already analyzed data;
- analytic tools (OLAP, On-Line Analytical Processing) – let users to access, analyze and model business problems and to share information that is stored in data warehouses;
- data mining tools – they enable to discover various patterns, generalizations, regularities and rules in data resources; tools for reporting and ad hoc inquiring – enable the creation and utilisation of different synthetic reports; and presentation layer – applications including graphic and multimedia interfaces which task is to provide users with information in a comfortable and accessible form.

From the business (organizational) perspective, BI systems mean specific philosophy and methodology that refer to working with information and knowledge, open communication, and knowledge sharing along with the holistic and analytic approach to business processes in organizations (Olszak, et al.2010). BI systems are assumed to be solutions that are responsible for transformation of data into information and knowledge, and they also create some environment for effective decision-making, strategic thinking, and acting in organizations (Negash & Grey, 2008). The value of BI for business is predominantly expressed in the fact that such systems cast some light on information that may serve as the basis for carrying out fundamental changes in a particular enterprise, that is establishing a new co-operation, acquiring new customers, creating new markets, offering products to customers (Olszak & Ziemba, 2004) and many more.

3.5 What else does Business Intelligence do?

BI assists in strategic and operational decision making. A Gartner survey ranked the strategic use of BI in the following order (Shah, 2012)

1. Corporate performance management
2. Optimizing customer relations, monitoring business activity, and traditional decision support
3. Packaged standalone BI applications for specific operations or strategies
4. Management reporting of business intelligence

One implication of this ranking is that merely reporting the performance of a firm and its competitors, which is the strength of many existing software packages, is not enough. A second implication is that too many firms still view business intelligence (like DSS and EIS before it) as an inward looking function. Business intelligence is a natural outgrowth of a series of previous systems designed to support decision making. The emergence of the data warehouse as a repository, the advances in data

cleansing that lead to a single truth, the greater capabilities of hardware and software, and the boom of Internet technologies that provided the prevalent user interface all combine to create a richer business intelligence environment than was available previously. BI pulls information from many other systems for its competitiveness.

3.6 Competitive Analysis of Business Intelligence

Competitive intelligence (CI) is a specialized branch of Business Intelligence. It is “no more sinister than keeping your eye on the other guy albeit secretly” (Imhoff, Zhang, Wolfe, & Bounoua, 2010). The Society of Competitive Intelligence Professionals (SCIP) defines CI as follows (Negash, 2004). Competitive Intelligence is a systematic and ethical program for gathering, analyzing and managing external information that can affect your company’s plans, decisions and operations (Negash, 2004). In other words, CI is the process of ensuring your competitiveness in the marketplace through a greater understanding of your competitors and the overall competitive environment. Competitive intelligence (CI) is not as difficult as it sounds. Much of what is obtained comes from sources available to everyone, including (Imhoff, 2003):

- Government websites and reports
- Online databases, interviews or surveys,
- Special interest groups (such as academics, trade associations, and consumer groups),
- Private sector sources (such as competitors, suppliers, distributors, customer) or
- Media (journals, wire services, newspapers, and financial reports).

The challenge with CI is not the lack of information, but the ability to differentiate useful CI from chatter or even disinformation

Of course, once a firm starts practicing competitive intelligence, the next stage is to introduce countermeasures to protect itself from the CI of competitor firms. The game of measure, countermeasure, and counter-countermeasure, and so on to counter to the last measure is played in industry just as it is in politics and in international competition. The question will be, “Is it really worth applying in SMEs?”

3.7 Is it really worth it? Measuring Financial Impact

3.7.1 Benefits of BI adoption in SMEs.

Given the huge amount of data that is collected by companies and the information in the public domain, conventional wisdom suggests that the company that can extract, analyze and capitalize on the information will have a strategic advantage (Love, & Irani, 2004). Love et al. (2004) suggests that as with any business

initiative, management needs to know whether the cost of the effort was worth the benefit that is, was there a tangible business advantage? Interestingly, the business community has had a difficult time determining the value of BI efforts. There are several reasons for this. The first is that, often, the executives initiate a BI effort without first calculating a projected return on investment (ROI). According to Kimball, & Ross, (2002) in a 2002 The Data Warehousing Institute (TDWI) conference survey, “only 13% of all respondents had calculated the ROI of their BI projects, and only 37% were planning to do so”. Why is this? When the 510 respondents who rated the value of BI projects as “high” or “very high” were asked what the benefits were, only two of the top 6 benefits were hard, tangible benefits (time savings, cost savings) compared to intangible benefits (single version of the “truth”, better strategy and plans, better tactics and decisions, and more efficient processes)

In another survey, the 50 top Finnish companies were polled regarding their BI practices. Here, the greatest benefits were; better quality of information, better observation of threats and opportunities, growth of the knowledge base, increased sharing of information and improved efficiency. In contrast to the previous study, cost savings and time savings were lowest on the list of benefits (Elbashir, Collier, & Davern, 2008). Therefore, it is not surprising that a ROI is difficult to determine when the perceived benefits are rather “soft”. Consistent with the above results, a Forrester research study found that “only 16 of 50 companies calculated an ROI before building a data warehouse” (Elbashir, Collier, & Davern, 2008). Note that the advantages (Elbashir, Collier, & Davern, 2008) of an integrated BI project are many. These include:

- Enterprise wide information
- Enterprise wide access
- Easy access through a single, personalized portal
- More real-time information
- Decreased costs and time associated with typical report writing
- Ability to set up more complex alerts

Studies conducted in 2003 show Return on Investment (ROI) for BI installations can be substantial. An IDC study on the financial impact of business analytics, using 43 North American and European organizations indicated a median five-year ROI of 112% from an investment of \$2 million (Negash, 2004). Return ranged from 17% to 2000% with an average ROI of 457%. However, BI budget and ROI were not found to be correlated (Negash, 2004). A wide range of the benefits for an organization emerges from the basic principles of BI. Hannula and Pirttimäki (2003) carried out a study among the large Finnish companies to find out the benefits gained from BI. The most significant benefits provided by BI activities were:

- Better quality information acquired for decision-making (95%),
- Improved ability to anticipate earlier the possible threats and opportunities (83%),
- Growth of knowledge base (76%),
- Increase of sharing information (73%),
- Improved efficiency (65%),
- easier information acquisition and analysis (57%), and
- Faster decision-making (52%).

Time-savings (30%) and cost-savings (14%) were not considered particularly important. The researchers also asked the interviewees to name one factor to describe the most significant benefit of their BI activities. The following benefits were considered to be important:

- harmonizing the way of thinking of company personnel,
- broadening understanding of business in general, strengthening strategic planning,
- increasing professionalism in acquisition and analysis of information, and
- understanding the meaning of information

The major benefits of BI, as presented by Thompson, Rust, & Rhoda (2005) are:

- Faster, more accurate reporting (81%),
- Improved decision making (78%),
- Improved customer service (56%),
- Increased revenue (49%).

Many Organizations around the world and in many different industries have been reaping the benefits of BI for years (Eckerson, 2002). A department of finance and revenue has closed its tax compliance gap by \$10 million a year while optimising customer satisfaction, thanks to a new BI solution. A major electronics retailer attributes \$1.3 million a year in fewer out-of-stock situations to a BI solution. The same solution also saves \$2.3 million a year in inventory costs due to more accurate supplier shipments. A major automobile manufacturer generated a 2,000 percent ROI on a financial BI solution that saved the firm millions of dollars by identifying repossessed vehicle loans more quickly (Wixom, & Watson, 2010). These are just a few of the many successful BI solutions at work today. Seven out of ten companies are moving to analyze their data either daily or instantly in 2006 according to Gartner, and CIO's are listing BI as their second-highest priority in 2005, (up from tenth in 2004). Gartner also forecasts that companies worldwide will spend nearly \$6 billion this year alone to gain better insight into their internal operations. SMEs can't afford to ignore the benefits of BI if they want to remain competitive. Many of the benefits of BI are intangible. Wixom, & Watson, (2010) present tangible benefits as well as those that is difficult to measure. For example, companies may eliminate software and hardware licenses and fees when they consolidate and retire data marts, or companies may reduce headcount when they replace manual reporting

processes. Other benefits, such as the enabling of new ways of doing business, are much more difficult to quantify, but may generate a competitive advantage or open up new markets for the company. The three general BI benefit factors can be described as follows (Wixom, & Watson, 2010):

3.8 BI benefit factor 1: Improvements in data support

The first factor encompasses all attributes that are connected to reporting and its improvement. For example, it includes the reduction in the overall effort concerning data analysis and reporting as well as improvements in the reports' quality and a more flexible reaction to new information needs.

3.8.1 BI benefit factor 2: Improvements in decision support

Factor 2 covers the attributes that can be associated with decision support and its improvement. It contains facts about improved business decisions through more precise as well as more current data analyses. In addition, the identification of chances and risks can be improved by using BI systems. Also the improvement in the business results loads onto factor 2.

3.8.2 BI benefit factor 3: Savings

The third factor includes statements which pertain to successes in rationalization. These include attributes regarding savings in personnel and in costs. By saving personnel and costs, competitive advantages can be achieved indirectly, either by diminishing the cost part in the income and loss statement or by having the possibility of using the saved resources in other areas.

3.9 Costs of business intelligence

Most firms today do use some form of business intelligence, although only a few operate complete BI systems. To simplify the cost discussion, consider a firm starting from scratch. According to (Wixom, & Watson, 2010) putting a BI system in place includes the following costs:

- Hardware costs. These costs depend on what is already installed. If a data warehouse is in use, then the principal hardware needed is a data mart specifically for BI and, perhaps, an upgrade for the data warehouse. However, other hardware may be required such as an intranet (and extranet) to transmit data to the user community.
- Software costs. Typical BI packages can cost \$60,000. Subscriptions to various data services also need to be taken into account. For example, firms in the retail industry buy scanner data to

ascertain how demand for their products and competing products responds to special offers, new introductions, and other day-to-day changes in the marketplace.

- Implementation costs. Once the hardware and software are acquired, a large one-time expense is implementation, including initial training. Training is also an ongoing cost as new people are brought in to use the system and as the system is upgraded. In addition, annual software maintenance contracts typically run 15% of the purchase costs.
- Personnel costs. Personnel costs for people assigned to perform BI and for IT support personnel, need to be fully considered to take into account salary and overhead, space, computing equipment, and other infrastructure for individuals. A sophisticated cost analysis also takes into account the time spent reading BI output and the time spent searching the Internet and other sources for BI.

Outside the above costs, there are already a number of studies on BI success factors (Olszak, & Ziemia, 2012). In the context of Business Intelligence systems, CSFs can be perceived as a set of tasks and procedures that should be addressed in order to ensure BI systems accomplishment. These tasks and procedures would either to be fostered, if they had already occurred, or be worked out, if they were nonexistent. Olszak, & Ziemia, (2012) cited the below Critical Success Factors as major.

3.9.1 Political

Inconsistency in policies, laws and regulations, and political instability affect BI systems accomplishment. Several associated factors that may prompt political challenge to the project are:

- Political takeover or military coup;
- War or revolution;
- Allegations of corruption causing government resignation; and
- Nationalization of assets with or without adequate compensation.

3.9.2 Legal

Legal factors include:

Unexpected changes in government policies pertinent to laws and regulations and currency conversion;

- Absence of appropriate regulatory systems;
- Rates and methods of taxation including customs, royalties, convertibility of currency;
- Role of local courts in arbitration; and
- The methods by which electricity tariffs are set and approved.

3.9.3 Cultural

Various socio-cultural background of the parties involved, various thinking processes

3.9.4 Technical

Several associated factors that may prompt technical challenge to the project are:

- Design;
- Engineering;
- Procurement; and
- Construction, equipment installation and operation of the equipment and its compatibility with accomplishment of project objectives.

3.9.5 Managerial/ organizational

Managerial or organizational factors refer to inadequate or ineffective management of the project by project sponsor or project management agency. The events in managerial factors include the following:

- Inadequate communication;
- Unclear objectives;
- Too optimistic goals in relation to project cost and schedule;
- Lack of project sponsorship;
- Unclear lines of responsibility, authority, and accountability;
- Slow and cumbersome decision-making process;
- Lack of training of the local staff for sustainability; and
- Lack of end-user participation

3.9.6 Economical

Economic factors refer to the issues influencing the economic feasibility of the project including the changes in domestic economic conditions of the recipient country or inaccurate project development plan due to unpredictable economic conditions

3.9.7 Environmental

Environmental factors refer to issues in conflict with established environmental regulations of the recipient country. This comprises pollution related issues such as noise, air pollution, water pollution, and visual disturbances and those related to natural resources such as unsustainable use of natural resources including minerals, water, land, and flora and fauna.

3.9.8 Social

Hostility due to religion, customs, and ethnicity of the project participants:

- Social uprising or riots due to ethnicity or polarization of social strata;
- Security of the stakeholders;

- Overestimation of capacity of the beneficiaries; and
- Resistance of the beneficiaries to new social values and standards or to absorb the effects of economic change or new technology.

3.9.9 Corruption

Factors which enable corruption include:

- State agencies and politicians that implement projects;
- Lenders that may favour some contractors;
- The delegation of architects, engineers, supervisors, and consultants responsible for each project;
- Panels inspecting and accepting finished projects;
- Contractors who are ready to buy projects with bribes; and
- Laws and regulations that can be misinterpreted to favour any parties.

3.9.10 Physical

Natural disaster for example fires, floods, drought, lightning, typhoon, earthquake, wars, hostilities, military coups, civil strife, and acts of terrorism dangerous to BI systems accomplishment.

4. Discussion of findings

Findings revealed that organizations which have the greatest success with BI travel an evolutionary path, starting with basic data and analytical tools and transitioning to increasingly more sophisticated capabilities until BI becomes an intrinsic part of their business culture. The article report, "Three Approaches to BI and Decision Impact", describes a three-stage process in which organizations gradually grow in analytical sophistication as their business needs and demands evolve (Baars, & Kemper, 2008):

1. Business Intelligence (IT). Organizations at this level generally approach BI as an IT-driven initiative focused on data collection and analytical tool selection. They ask "What happened?" and focus on making better business decisions through analysis of historical data.

2. Information management. At this stage organizations ask, "How are we doing against the plan, and what can we squeeze now to hit the target?" Do we have the right bullets to hit the target? Decisions become more real time as businesses bid BI tools and technology to push information to people so they can make better business decisions in the moment. This usually involves integrating data from CRM and ERP applications.

3. Extrapolative insight. In this approach, businesses add advanced analytics and predictive modeling to anticipate likely future events and capitalize on new trends or market opportunities.

These enterprises ask "What will happen next, and how can we optimize the outcome?" They not only see the future, but play a role in creating it.

Note that the advantages of an integrated BI project are many.

Watson, & Wixom, (2007) discusses some of the findings below as benefits

- Enterprise wide information
- Enterprise wide access
- Easy access through a single, personalized portal
- More real-time information
- Decreased costs and time associated with typical report writing

Business intelligence is not necessarily about tools and technologies; rather it is strategies of combining data from various sources with methodologies that make those facts solidify in a cohesive manner (Watson, & Wixom, 2007). Once the data is sourced, scrubbed, enriched, conformed, and finally housed in "access-ready" formats BI tools can make the data sing and dance.

4.1 Future of business intelligence

Liautaud, & Hammond, (2000) posited that in this rapidly changing world, consumers are now demanding quicker more efficient service from businesses. To stay competitive companies must meet or exceed the expectations of consumers (Kysar, 2003). Companies will have to rely more heavily on their business intelligence systems (Watson, & Wixom, 2007) to stay ahead of trends and future events and SMEs are not spared. Business intelligence end-users are beginning to demand Real time Business Intelligence or near real time analysis relating to their business, particularly in frontline operations. They will come to expect up to date and fresh information in the same fashion as they monitor stock quotes online (Kysar, 2003). In the not too distant future companies will become dependent on real time business information in much the same fashion as people come to expect to get information on the internet in just one or two clicks. Also in the near future business information will become more democratized where end users from throughout the organization will be able to view information on their particular segment to see how it's performing (Watson, & Wixom, 2007). So, in the future, the capability requirements of business intelligence will increase in the same way that consumer expectations increase. It is therefore imperative that companies increase at the same pace or even faster to stay competitive.

4.2 Recommendation

SMEs are perfect candidates for an incremental approach to BI. To be agile and compete with larger rivals, managers and business users at midsize

companies need targeted, timely and accurate information – information that can successfully drive strategic business decisions. But because they have limited IT staff and budgets, smaller firms need a practical solution that enables them to deploy components tactically and incrementally. These businesses should “think big” – that is, draw on the conceptual frameworks of larger companies – yet scale their approaches to fit a company with fewer resources. For a Business Intelligence project’s implementation to be successful and to bring tangible business benefits to SMEs in the future, it is worthwhile to meet some of the below basic conditions:

- BI system must be a part of the company's business strategy. It must correspond to the real needs of users and support key processes and business decisions at all levels of management (strategic, tactical and operational). To do this the knowledge about the BI system opportunities in the context of business challenges becomes indispensable for an enterprise. A good understanding of decision-making processes is also required, because only then the BI system can be used effectively;
- Managing the BI system implementation ought to be centralized, but all of its prospective users should be involved in the implementation. Only such a situation will enable users to adapt the BI system functionality to the individual needs while ensuring the proper conduct and success of implementation;
- The implementation of the BI system requires appropriate knowledge and skills for the BI implementation. A competent project team, consisting of managers, employees and IT specialists, is essential;
- BI system implementation project must have a sponsor who is positioned in the organizational hierarchy as high as possible. Commitment of managers, especially of the board, in the process of choosing and implementing BI systems is required. This will ensure adequate resources and be a clear signal to employees that management attaches due importance to the project;
- BI system requires permanent development and adaptation to new challenges and expectations of an enterprise. The consequence of BI system non-development is its depreciation and withdrawal;
It is necessary for users to be able to use the BI system. This can be provided by staff training and a very high-friendliness of the system; and
- The cost of BI implementation must cover the costs of technology, but also account for measures to establish a project team, technical support, and substantive support, and change management, employees training as well as maintaining and developing the BI system in the

future. Otherwise, the enterprise receives a powerful tool that no one will use.

5. Conclusions

Nowadays, BI becomes an essential part of any enterprise, even SMEs. This necessity is caused by the increasing data volume indispensable for decision making. Existing solutions and tools are mostly, aimed at large-scaled enterprises; thereby they are inaccessible or insufficient for SMEs because of high price, redundant functionality, complexity, and high hardware and software requirements. SMEs require solutions with light architectures that, moreover, are cheap and do not require additional hardware (Abadi, et al. 2003) and software. Business intelligence is very much worth it in SMEs. The research results indicate that the use of a BI system will result in a business success only if the BI users, on a regular basis, develop business and decision-making processes, recognize their needs, assist their modeling and oversee the completion of a project as well as actively participate in the implementation of new BI components. The knowledge and skills of a project team and BI systems users are of primary importance. It can be summarily concluded that business intelligence is a cutting edge strategic asset in SMEs and again it is really worth adoption by SMEs in Zimbabwe as return on investment (ROI) is guaranteed when all the necessary procedures are taken.

Reference

1. Abadi, D., Carney, D., Cetintemel, U., Cherniack, M., Convey, C., Erwin, C., & Zdonik, S. (2003, June). Aurora: a data stream management system. In *Proceedings of the 2003 ACM SIGMOD international conference on Management of data* (pp. 666-666). ACM.
2. Ale Ebrahim, N., Ahmed, S., & Taha, Z. (2010). Critical factors for new product developments in SMEs virtual team. *African Journal of Business Management*, 4(11), 2247-2257.
3. Andreeva, J., Boehm, M., Gaidioz, B., Karavakis, E., Kokozkiewicz, L., Lanciotti, E., & Sidorova, I. (2010). Experiment dashboard for monitoring computing activities of the LHC virtual organizations. *Journal of Grid Computing*, 8(2), 323-339.
4. Azvine, B., Cui, Z., Nauck, D. D., & Majeed, B. (2006, June). Real time business intelligence for the adaptive enterprise. In *E-Commerce Technology, 2006. The 8th IEEE International Conference on and Enterprise Computing, E-Commerce, and E-Services, The 3rd IEEE International Conference on* (pp. 29-29). IEEE.
5. Baars, H., & Kemper, H. G. (2008). Management support with structured and unstructured data—an integrated business intelligence framework. *Information Systems Management*, 25(2), 132-148.

6. Baars, H., & Kemper, H. G. (2008). Management support with structured and unstructured data—an integrated business intelligence framework. *Information Systems Management*, 25(2), 132-148.
7. Baars, H., & Kemper, H. G. (2008). Management support with structured and unstructured data—an integrated business intelligence framework. *Information Systems Management*, 25(2), 132-148.
8. Beck, T., Demirguc-Kunt, A. & Levine, R. (2004): SMEs, Growth and Poverty: Cross Country Evidence.
9. Bierly III, P. E., Kessler, E. H., & Christensen, E. W. (2000). Organizational learning, knowledge and wisdom. *Journal of organizational change management*, 13(6), 595-618.
10. Bose, R. (2009). Advanced analytics: opportunities and challenges. *Industrial Management & Data Systems*, 109(2), 155-172.
11. Calof, J. L., & Wright, S. (2008). Competitive intelligence: a practitioner, academic and interdisciplinary perspective. *European Journal of Marketing*, 42(7/8), 717-730.
12. Carr, C., Morton, J., & Furniss, J. (2000). The economic espionage act: bear trap or mousetrap?. *Texas Intellectual Property Law Journal*, 8(2), 159-209.
13. Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business Intelligence and Analytics: From Big Data to Big Impact. *MIS quarterly*, 36(4), 1165-1188.
14. Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business Intelligence and Analytics: From Big Data to Big Impact. *MIS quarterly*, 36(4), 1165-1188.
15. Codd, E. F., Codd, S. B., & Salley, C. T. (1993). Providing OLAP (on-line analytical processing) to user-analysts: An IT mandate. *Codd and Date*, 32.
16. Creswell, J. W. (2002). Educational research: Planning, conducting, and evaluating quantitative.
17. Abadi D. J. (2009) Data Management in the Cloud: Limitations and Opportunities. *IEEE Data Engineering Bulletin*, 32(1):3-12, March
18. Davenport, T. H. (2006). Competing on analytics. *harvard business review*, 84(1), 98.
19. Dresner, H. (1989). Business Intelligence. *Gartner Inc.*
20. Eckerson, W. W. (2002). Data quality and the bottom line. *TDWI Report, The Data Warehouse Institute.*
21. Eckerson, W. W. (2002). Data quality and the bottom line. *TDWI Report, The Data Warehouse Institute.*
22. Elbashir, M. Z., Collier, P. A., & Davern, M. J. (2008). Measuring the effects of business intelligence systems: The relationship between business process and organizational performance. *International Journal of Accounting Information Systems*, 9(3), 135-153.
23. Fleisher, C. S., & Blenkhorn, D. L. (Eds.). (2003). *Controversies in competitive intelligence: The enduring issues*. Greenwood Publishing Group.
24. Fleisher, C. S., Wright, S., & Tindale, R. (2007). A chronological and categorized bibliography of key competitive intelligence scholarship: Part 4 (2003-2006). *Journal of Competitive Intelligence and Management*, 4(1), 34-107.
25. Gangadharan, G. R., & Swami, S. N. (2004, June). Business intelligence systems: design and implementation strategies. In *Information Technology Interfaces, 2004. 26th International Conference on* (pp. 139-144). IEEE.
26. Gibson, M., Arnott, D., Jagielska, I., & Melbourne, A. (2004). Evaluating the intangible benefits of business intelligence: Review & research agenda. In *Proceedings of the 2004 IFIP International Conference on Decision Support Systems (DSS2004): Decision Support in an Uncertain and Complex World* (pp. 295-305). Prato, Italy.
27. Glancy, F. H., & Yadav, S. B. (2011). Business intelligence conceptual model. *International Journal of Business Intelligence Research (IJBIR)*, 2(2), 48-66.
28. Golfarelli Matteo, Rizzi Stefano and Cella Luris. (2004) 'Beyond Data Warehousing: What's next in Business Intelligence?' Proceedings of DOLAP-04, Washington, DC, USA. Retrieved May 17 2006 from www.acm.org
29. Golfarelli, M., Rizzi, S., & Cella, I. (2004, November). Beyond data warehousing: what's next in business intelligence?. In *Proceedings of the 7th ACM international workshop on Data warehousing and OLAP* (pp. 1-6). ACM.
30. Golfarelli, M., Rizzi, S., & Cella, I. (2004, November). Beyond data warehousing: what's next in business intelligence?. In Proceedings of the 7th ACM international workshop on Data warehousing and OLAP (pp. 1-6). ACM.
31. Grigori, D., Casati, F., Castellanos, M., Dayal, U., Sayal, M., & Shan, M. C. (2004). Business process intelligence. *Computers in Industry*, 53(3), 321-343.
32. Gupta, Y., & Sharma, N. (2013). When BI Meets CRM: An Emerging Concept in Retail Industry. *International Journal of Business Analytics and Intelligence*, 1(1), 41-48.
33. Hannula, M., & Pirttimäki, V. (2003). Business intelligence empirical study on the top 50 Finnish companies. *Journal of American Academy of Business*, 2(2), 593-599.
34. Hanson, W. E., Creswell, J. W., Clark, V. L. P., Petska, K. S., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of counseling psychology*, 52(2), 224.
35. Harris, L. J., Abdollahi, H., Newhook, T., Sauter, P. K., Crawford, A. G., Chojnacki, K. A., ... & Berger, A. C. (2010). Optimal technical management of stump closure following distal pancreatectomy: a retrospective review of 215 cases. *Journal of Gastrointestinal Surgery*, 14(6), 998-1005.
36. Imhoff, M. L., Zhang, P., Wolfe, R. E., & Bounoua, L. (2010). Remote sensing of the urban heat island effect across biomes in the continental USA. *Remote Sensing of Environment*, 114(3), 504-513.
37. Inmon, B. (1999). Data mart does not equal data warehouse. *DM Direct*, 1675-1.
38. Kimball, R., & Ross, M. (2002). The data warehouse toolkit: the complete guide to dimensional modelling. *US: John Wiley & Sons.*
39. Kotrlik, J. W. K. J. W., & Williams, H. A. W. H. A. (2003). The Incorporation of Effect Size in Information Technology, 40. Learning, Information Technology, Learning, and Performance Research and Performance Research. *Information Technology, Learning, and Performance Journal*, 21(1), 1.
40. Krathwohl, D. R. (1993). *Methods of educational and social science research: An integrated approach*. Longman/Addison Wesley Longman.

41. Kysar, D. A. (2003). The expectations of consumers. *Columbia Law Review*, 1700-1790.
42. Liautaud, B., & Hammond, M. (2000). *e-Business intelligence: turning information into knowledge into profit*. McGraw-Hill, Inc..
43. Lin, Y., Michel, J. B., Aiden, E. L., Orwant, J., Brockman, W., & Petrov, S. (2012, July). Syntactic annotations for the google books ngram corpus. In *Proceedings of the ACL 2012 System Demonstrations* (pp. 169-174). Association for Computational Linguistics.
44. Love, P. E., & Irani, Z. (2004). An exploratory study of information technology evaluation and benefits management practices of SMEs in the construction industry. *Information & Management*, 42(1), 227-242.
45. MacGregor, R. C., & Vrazalic, L. (2005). A basic model of electronic commerce adoption barriers: A study of regional small businesses in Sweden and Australia. *Journal of small business and enterprise development*, 12(4), 510-527.
46. Negash, S. (2004). Business intelligence. *The Communications of the Association for Information Systems*, 13(1), 54.
47. Negash, S. (2004). Business intelligence. *The Communications of the Association for Information Systems*, 13(1), 54.
48. Ngwenya, T., & Ndlovu, N. (2003). Linking SMEs to Sources of Credit: The Performance of Micro Finance Institutions in Zimbabwe. *International Labor Organization*.
49. O'Brien, J., & Marakas, G. M. (2007). *Management information systems with MISource 2007*. Granite Hill Publishers.
50. Olawale, F., & Garwe, D. (2010). Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach. *African Journal of Business Management*, 4(5), 729-738.
51. Olszak, C. M., & Ziemia, E. (2012). Critical success factors for implementing business intelligence systems in small and medium enterprises on the example of upper Silesia, Poland. *Interdisciplinary Journal of Information, Knowledge, and Management*, 7, 129-150.
52. Parry-Giles, S. J., & Parry-Giles, T. (1999). Meta-imaging, The War Room, and the hyperreality of US politics. *Journal of Communication*, 49(1), 28-45.
53. Perrini, F. (2006). SMEs and CSR theory: evidence and implications from an Italian perspective. *Journal of Business Ethics*, 67(3), 305-316.
54. Ponelis, S. R., & Britz, J. J. (2013). A descriptive framework of business intelligence derived from definitions by academics, practitioners and vendors.
55. Pooley, J. H., Lemley, M. A., & Toren, P. J. (1996). Understanding the Economic Espionage Act of 1996. *Tex. Intell. Prop. LJ*, 5, 177.
56. Ranjan, J. (2009). Business intelligence: concepts, components, techniques and benefits. *Journal of Theoretical and Applied Information Technology*, 9(1), 60-70.
57. Robertson, P., Smith, K. H., & von Tunzelmann, N. (2009). Innovation in low-and medium-technology industries. *Research Policy*, 38(3), 441-446.
58. Robson, C. (2002). *Real word research*. Oxford: Blackwell.
59. Rutkauskas, A. V. (2008). On the sustainability of regional competitiveness development considering risk. *Technological and Economic Development of Economy*, 14(1), 89-99.
60. Shah, S. S. A. (2012). A Case of BI Adoption in Pakistan: Drivers, Benefits & Challenges.
61. Shariat, M., & Hightower, J. R. (2007). Conceptualizing business intelligence architecture. *Marketing Management Journal*, 17(2), 40-46.
62. Shollo, A. (2013). *The Role of Business Intelligence in Organizational Decision-making*. Copenhagen Business School/Copenhagen Business School, Institut for Produktion og Erhvervsøkonomi/Department of Operations Management.
63. Simon, S. (1998). Economic Espionage Act of 1996, *The Berkeley Tech. LJ*, 13, 305.
64. Smith, R. H. (2005). *OSS: the secret history of America's first central intelligence agency*. Globe Pequot.
65. Thompson, D. V., Rust, R. T., & Rhoda, J. (2005). The business value of e-government for small firms. *International Journal of Service Industry Management*, 16(4), 385-407.
66. Tsang, E. W. (1997). Organizational learning and the learning organization: a dichotomy between descriptive and prescriptive research. *Human relations*, 50(1), 73-89.
67. Tvrdikova, M. (2007, June). Support of decision making by business intelligence tools. In *Proceedings of the 6th International Conference on Computer Information Systems and Industrial Management Applications* (pp. 364-368). IEEE Computer Society.
68. Unwin*, T. (2005). Towards a framework for the use of ICT in teacher training in Africa. *Open Learning: The Journal of Open, Distance and e-Learning*, 20(2), 113-129.
69. Wang, F. Y., Carley, K. M., Zeng, D., & Mao, W. (2007). Social computing: From social informatics to social intelligence. *Intelligent Systems, IEEE*, 22(2), 79-83.
70. Watson, & Wixom, (2007). The current state of business intelligence. *Computer*, 40(9), 96-99.
71. Westerski, A. (2013). *Semantic technologies in idea management systems: a model for interoperability, linking and filtering*.
72. Wixom, B., & Watson, H. (2010). The BI-based organization. *International Journal of Business Intelligence Research (IJBIR)*, 1(1), 13-28.
73. Wixom, B., & Watson, H. (2010). The BI-based organization. *International Journal of Business Intelligence Research (IJBIR)*, 1(1), 13-28.
74. Wright, Phillip (1999) "Industrial Espionage and Competitive Intelligence: One You Do, One You Do Not", *Journal of Workplace Learning*, Vol.11(2).