Business information systems – knowldege management

Business, Management

On the basis of the decision making stands information, as one of the main elements that determine the evolution of our-days society. As a consequence, data analysis tends to become a priority in the activity of an organization for decision making. The diversity and the dynamic evolution of tools and technologies from Business Intelligence category, represent a positive factor, wilt a decisive role, In the evolution of decision making systems and Implicit In Increasing quality of decisions.

For an organization, Business Intelligence technologies are strong and complex tools for analysis, reporting and prognosis in which the core Is data warehouse. This paper aims to highlight the essential role of Business Intelligence in order to increase the quality and timeliness of inputs to the decision process. Keywords: business Intelligence, competitive advantage, knowledge, decision making, organizational performance, sustainability Introduction In today's highly competitiveenvironment, business organizations need to act fast in order to secure their financial situations and their market positions.

Firms are continuously striving for ways to attain a sustainable competitive advantage. They deed to count more on their Internal distinguished strengths to provide more added customer value, strong differentiation and extendibility. Business decision making is a highly complicated process that most business organizations need to survive in the competitive environment which becomes progressively restraining. This type of competition shows that there is an increasing need for informational assistance to facilitate decision makers to produce fast, In time and accurate decisions.

Statement of the problem Informationtechnologyls the enabler that supports the core business of an organization (Evans, 2003: 2). However it is important to establish the best information solution that not only supports thegoalsand operations of an organization but also holds the potential to give the organization a competitive advantage. Business Intelligence Is said to offer a way to navigate through data to generate information typically by using Online Analytical Processing (OLAP) which provide a way to use querying, analyzing and reporting.

Business Intelligence uses various kinds of functions that convert data into something tangible, clear, true and realistic as possible and can be relied upon in the decision making process. The hypotheses reposed is that organizations are aware of the advantages of implementing a Bal system, but that they do not fully understand how it can benefit the organization, taking the cost factor into account, and how It can with what the current have In their organization. The mall focus of this research Is to determine the Impact of within organizations.

The research is based on qualitativecase studyresearch methodology executed on interviews with management from five different organizations, namely Sandal with be referred to as company A, Business Partners will be referred to as company B, Pick And Pay will be referred to as company C, Statelessness Municipality will be referred to as company D and Oven that will be referred to as company E in this research report. Research Methodology The research methodology is based on two methods, namely literature reviews and case study methodology.

The purpose of the literature reviews was to establish the terminology and to identify the issues that are applicable to the research. The literature reviews provides background to evaluate and compare scenarios in the various companies researched. An empirical method is used in the case study. The case study tends to provide a qualitative empirical research rather than a initiative research. Qualitative research indicates that the research is accurate in observations that can be used as general indicators, and may be applicable to other cases.

According to (Yin, 1994: 1) case study methodology is the preferred research methodology when the researcher uses questions, which include " why' or " how' to collect real-life context. " Questions being asked are related to contemporary set of events over which the investigator has little or no control" Case Study design The case study design follows the approach of a multiple-case design, which implies that certain aspects of each case may be studied.

The advantage of a multiple-case study is that the different case studies can be compared to provide a better understanding of the current scenarios to make it applicable for general use (Olivier, 2004: 99). Five different organizations was approached to participate in the research as mentioned earlier and will be referred to company A, B, C, D and E. Company A, B and E are from the financial sector, company C is from retail sector and company D is from governmental sector.

A prerequisite was that the interviewees should have a broad knowledge of information technology and be on a managerial level with a umber of years experience in the organization. It was necessary for the interviews to be able to provide information from a strategic viewpoint but also be able to provide scenarios for description purposes. Although the interviewees have different titles for their respective designations, the interviewees have vast experience in their field and could contribute extensively to the research project.

Case study protocol The purpose of the case study was protocol is to identify precisely what aspects will be studied. The protocol is used to provide an understanding of what is expected to e learnt from the case studies and to provide information for the states hypothesis. A formal questionnaire is used as the case study protocol to establish a more controlled research methodology. The questions derived from the literature study allow for a more focused approach during the execution of the case studies. It was expected that questions could encourage the interviewees to provide more information than directly requested.

Data collection The research project used a qualitative approach, when collecting data as the responses to the questions one cannot measure the answers numerically as issues such as the value of Bal systems could only be expressed in quantitative terms. As gathered. The variety of information has the inherent possibility of supporting the theory to be tested. Tape recordings have been made of all interviews. The questionnaire, which was used during the interviews, is available in annexed A of this document.

Analysis Brief Definition of Bal Companies A, B, C, D and E in a nut shell defines Bal as a collection of decision support technologies aimed at enabling knowledge workers such as executives, managers and analyst to make better and faster decisions. It is relatively easy to access the benefits deriving from information quality improvement goals of BIBS. It aims at reducing the gap between the amount of data organizations collect and the quality and the amount of quality information available to users on the tactical and strategic level of business decisions.

It is important to note that the amount of information increases slower than the number of decisions that (should) have appropriate information support. The intuition in business decisions is still important; however, its role has shifted towards a more supplementary element within the structured decision process that is based on information in all phases, I. E. Fact-based decision-making. In business practice, this information gap comes in different forms.

Among others, the common thread found among the companies researched is: * Data required for analysis is located in different sources that are hard to integrate * Data sources are inconsistent. * Management gets extensive reports that are rarely used or inappropriate. * There is quite some data within organizations they are unaware of. * Data within operational databases is not properly arranged to support management's decision. * For " non-technical" analysts, it is a complicated and time consuming activity to repaper reports and execute queries.

Traditional tools for querying and reports are, despite a graphical user interface, hard to use. * Due to an increased need for information in analytical decision processes, IS staff plays a role of data steward: integrate data from different sources, prepare reports, aggregate data, etc. * Analysts take too much time to gather the required information instead of its analysis. * There is lack of external and/or competitive information to support decision- making, data owners are too protective of information, and there are limitations of incompatible software/hardware systems

Of the five interviews conducted only company E indicated that they had a Bal system in place. The other four however indicated that there is a definite need for a Bal system to be implemented, as it would lead to effective decision making, and be an enabler for future sustainability as well as competitiveness. The responses from (Solomon Engage, Volvo, 13. 2004.) Bal assists in strategic and operational decision making. A Gardner survey ranked the strategic use of Bal in the following order [Willie, 2002]: 1 . Corporate performance management 2.

Optimizing customer relations, monitoring business activity, and traditional decision support 3. Packaged standalone Bal 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 ADS and SIS 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 leaning 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. Bal pulls information from many other systems. The diagram shown below depicts there understanding of what an integrated system looks like.

Bal converts data into useful information and, through human analysis, into knowledge. Some of the tasks performed by Bal are: * Creating forecasts based on historical data, past and current performance, and estimates of the direction in which the future will go. * " What if" analysis of the impacts of changes and alternative scenarios. * Ad hoc access to the data to answer specific, non-routine questions. * Strategic insight Company E, having a Bal system in place enlightens us with the following critical factors / characteristics surrounding Bal in there organization.

The concept of business intelligence systems Well-built business intelligence systems can provide the ability to analyses business information in order to support and improve management decisions making across a broad range of business activities. Company E invested a substantial amount ofmoneyin a Bal system. There is however no method to measure the realized business value brought about thus far. Bal systems have the potential to maximize the use of information by improving the companies capacity to structure a large volume of information and make it accessible thereby creating

competitive advantage, competing on analytics. Bal utilizes a substantial amount of collected data during the daily operational processes, and transforms the data into information and knowledge", says Company E. The main characteristics of BIBS are the capability of roving representative information to the high level management to support strategic activities such as goal setting, planning and forecasting as well as tracking performance. This is used to gather, analyses and integrate both internal and external data into dynamic profiles of key performance indicators. Bal can access both historical and real time data. In essence managers at every level cam have a into meaningful indicators.

Executives need information for strategic and tactical decision that often requires the combination of data from ERP and non-ERP application sources. The usual reports developed from daily transactions does not satisfy the business needs, an executive cannot take a real time decision based on a hundred pages per month cash-flow detailed report. Information must be aggregated and presented with a template based on a business model. In the table below represents the main differences between ERP reports (confirmed viainterview's that it is the most widely used) and BIBS reports generated by company D.

ERP systems are transaction processing and weak on analytics. Strategic and executives managers demand for technology solutions that they can extract, analyses and virtual information from ERP and standalone systems and this has provided amotivationfor new type of information such as BIBS. The components of these types of systems are based on innovative technologies

such as data warehousing, OLAP, data mining, friendly graphical user interfaces, integrating tools capable of collecting, processing, storing and retrieving data from different sources.

Business Intelligence Architecture BIBS architecture is structured on three distinct levels: Level 1 . Data Management - is represented by relational databases, data warehouses and other type of data sources. At this level is common to use a data warehousing solution that collects and organizes data from both internal and external sources and makes it available for the purpose of analysis. A data warehouse contains both historical and current data and it is optimized for fast query and analysis. Data warehouses extract, transform and process data for high-level integration and analysis.

Although a data warehouse can make it easier and more efficient to use the BIBS, it is not required for a BIBS to be deployed. Organizations can extract data directly from their host system database for their analysis and reporting purposes, but in a ore difficult way. Level 2. Model Management - is the level of data extraction, transformation and processing. This level is based on different type of models for statistic interpretation, analysis and forecasting data. At this level, we can find technologies like OLAP, data mining and analytical reporting.

The OLAP engine is a query generator that provides users with the ability to explore and analyses summary and detailed information from a multi-dimensional database. Traditional relational database systems handle this situation by using multiple queries. In many cases, the aeries become so

complex that even the developer finds them difficult to maintain. OLAP overcomes this barrier by enabling users to analyze multi-dimensional data. Managers can use an OLAP engine or typical operation like " slice and dice" data by various dimensions and then drill down into the source data or roll-up to aggregate levels.

OLAP provide tools for forecasting data and " what-if" analysis. OLAP can only mark the trends and patterns within the data that was requested. It will not discover hidden relationships or patterns, which requires more powerful tools like data mining (DIM). These tools are especially appropriate for large and complex datasets. Through statistical or modeling techniques, data mining tools make it possible to discover hidden trends or rules that are implicit in a large database. Data mining discovered by these tools must be validated and verified and then to become operational data that can be used in decision process.

LOAM(on-line analytical data mining) systems are OLAP systems used for data mining, used to discover new information from multidimensional-data. Level 3. Data Visualization Tools - provide a visual drill-down capacity that can help managers examine data graphically and identify complex interrelationships. BIBS attempts to present data in a form that is relevant for strategic decisions. At this level, one can find tools for reporting and presenting data in a friendly manner. A very efficient solution that can be used also to integrate data is to develop a business intelligence portal.

The main purpose of a Bal portal is to integrate data and information from a wide range of applications and repositories, in order to allow visualization of a multitude of systems, either internal or external to organizations, through a simple Web interface. Therefore, a Bal portal an be seen like a Webbed, secure interface, which can offer a unique integration point for the applications and services used by employees, partners, suppliers and clients of the organization. The main advantage of the information portal is that it can be easily offered as a service to the wide public.

BIBS development life Cycle BIBS lifestyle is divided in 6 stages and 16 steps as following: Stage 1: Justification Step 1: Business case assessment - business needs and opportunities are identified and then the team proposes an initial solution Justified by costs and benefits. A preliminary report is built-up. Stage 2: Planning Step 2: Enterprise infrastructure evaluation -this step estimates and values organization's capabilities to sustain and accomplish the BIBS project in terms of: infrastructure, components, devices, network and also future needs of these equipments.

In this step is built organization's infrastructure. Step 3: Project planning - BIBS involves dynamical project planning which leads to rapid changes in technology, organization and business needs, human resources and implementing team. The project plan is detailed, progressive, each stage and step has checking points and test documents and reports. Stage 3: Business analysis Step 4: Defining business needs - interviews and meetings are organized with executives and managers and business needs and requirements are identified and defined.

An initial solution is proposed, discussed and adopted. Step 5: Data analysis - this step involves identifying and designing data sources, designing detailed ERR diagrams with attributes and references between data. The logical model is designed. Step 6: Application prototyping - An initial prototype is built and tested in order to validate business needs. After testing results are estimated and reported tit positive and negative aspects. Step 7: Metadata analysis - metadata are designed and data sources are mapped on metadata structure.

CASE tools are used for designing and mapping process. Stage 4: System design Step 8: Data design - in this step the logical model is detailed and refined and physical model is designed. The data model for processing and storage are selected from the following options: relational, object oriented and multidimensional model. Difficult in the entire cycle and depends on quality of data sources. It is recommended that the process should be built in one environment which integrate al modules of the organization and not separately, on each department.

Step 10: Design metadata repository - if it is used a pre-defined solution for metadata repository then in this step it is adjusted for project requirements otherwise a metadata repository is designed in terms of metadata logical model depending on data model: relational, object oriented or multidimensional. Stage 5: Development Step 1 1: TTL development - filtering tools, procedures, operators are used for building TTL process. Data filtering and transformations depends on data sources quality. These sources are different like: files, databases, email, internet, unconventional sources.

Step 12: Application development - after prototype validation, building the final application may be a simple process. Procedures templates and interfaces are re-built; user rights and privileges are granted. Step 13: Data Mining - executive systems have to implement data mining capabilities in order to succeed and accomplish manager's requirements. This step involves testing algorithms, data mining techniques like clustering, predictive and organizing methods. Step 14: Developing metadata repository - if the metadata repository has to be built-up then metadata dictionary and data access interfaces are developed.

Stage 6: System implementation Step 1 5: Implementation - it is the delivering process in which the development team organize training sessions for managers, final documentations and technical support are prepared, data loading process and application setup is accomplished Step 16: System testing - after system implementation preliminary conclusions are made, costs are estimated and the development team build a final report in which are describe system performances and also some parts which have to be improved or re- built-up. The table below indicates the type of reports that our researched organizations can generate.

The ERP reporting system reflects that of company A, B, C, D and the BIBS report reflects that of company E. Characteristics I ERP Report I BIBS reports I Objectives I Analyze indicators that measurement and internal activities daily reports I Processes optimization, analyze key oversimplification, forecast internal internally data, internal and external focus I Level of decision I Operational/Medium I Strategic/High I User involved I Operational

level of management I Executives, strategic level of management I Data Management I Relational databases Authoresses I Data warehouse/OLAP/Data Mining I Typical operation I Report/Analyze I

Analyze I Number of records [transaction I Limited I Huge I Data Orientation I Record I Cube I Level of detail I Detailed, summarized, pre-aggregate I Aggregate I Age of data I Current I Historical. Current, prospective I Reference - Information Economical. Volvo. 13, no. 4, 2009 pig. 100. Importance of Information quality of achieving business value in making the correct decisions. IQ must be related to the investments that are needed to achieve that quality. Thus, for analyzing the attainability of information quality improvement goals of BIBS, we adopt People's IQ framework with 16 criteria covering all aspects of 'Q.

QUALITY INFORMATION CONTENT I Criterion name I Description I Comprehensiveness I Is the scope of information adequate? (not too much nor too little) I Conciseness I Is the information to the point, void of unnecessary elements? I Clarity I Is the information understandable or comprehensible to the target group? I Correctness I Is the information free of distortion, bias, or error? I Accuracy I Is the information precise enough and close enough to reality? I Consistency I Is the information free of contradictions or convention breaks? I Applicability I Can the information be directly applied?

Is it useful? Timeliness I Is the information processed and delivered rapidly without delays? I Traceability I Is the background of the information visible

(author, date etc.)? I QUALITY INFORMATION ACCESS I Maintainability I Can all of the information be organized and updated on ongoing basis I Interactivity I Can the information process be adapted by the information consumer? I Speed I Can the infrastructure match the user's working pace? I Security I Is the information protected against loss or unauthorized access? I Currency I Is the information up-to-date and not obsolete?

I Accessibility I Is here a continuous and unobstructed way to get to the information? I Convenience I Does the information provision correspond to the user's needs and habits? I Peppier 2003, p. 68Globalizationhas resulted in a shift of the traditional ways of doing business. The organizations under study have all been affected in the way they do business. From a medium sized enterprise to a multi-national and international player. Many of the strategic leaders, various stakeholders of these organizations are scattered geographically, making it difficult to strategies and getting valuable input in implementing a Bal system.

Company B suggested a technique/ tool that could be used to collaborate with them would be an agile dashboard. The Agile process: Business Intelligence Journal Volvo. 17, No. 4 When using an agile Bal approach, all those involved in the Bal initiative work together as one team with one goal and set of objectives. To accomplish this, many organizations create hybrid teams and a business intelligence competency center (BCC) composed of individuals with the necessary skills to define, architect, and deliver analytic solutions. In some cases, many of these teams are organized under business units outside of IT.

Agile employs a series of shorter development cycles to increase user collaboration. It welcomes changes during the development to deliver measurable value quickly and efficiently. As business becomes more dynamic and social in nature, Bal environments need to be prepared to move fast and deliver value in creative ways. Intertwining BI best practices with the agile software methodology is Agile Bal still follows a process and a method. There is still documentation and a plan; success metrics are still defined at the beginning of the project. Project management is still a core component in this process.

It is therefore recommended that you still use the following tools, documentation, and processes to help guide the project: * A vision and scope document is used to define initial, critical success factors and get project approval. * A requirements document outlines the core business problems and key data elements, metrics, and dimensions that are needed for the Bal solution. The difference from traditional Bal development is that this document focuses on the smaller and shorter deliverables and keeps it lean * A design document describes the database design, data mapping, reporting designs, and TTL constructs.

Again, different from a traditional Bal project, this design should focus on bringing the technical team together on the architecture and for future support without getting lost in too many details. * A project baseline plan for delivering a piece of functionality quickly, with the longer- term plan represented at a higher level. * A change control log to track which changes

are implemented and which are put on hold. * An enhancement log to track enhancements that the team is unable to fit into the first release.

Barriers to Bal in the organization Companies A, B, C, D as well as E before they implemented a Bal system agree that the incept of Bal is not understood by many business leaders, and this creates barriers to the success of implementing a Bal system. The following are some barriers identified by (Steve Williams, July 2011) that these companies experience. * Business leaders are confused and skeptical when it comes to information technology, and they need to have a much more concrete idea of what BI is and what they would be getting from it before approving six-figure to seven-figure Bal budgets.

In the absence of such enlightenment, Bal tends to be underfeed, which inhibits its success. * Any business strategy won't succeed unless a company's various units ark together. To do this, of course, each unit must have defined strategic missions and functional strategies that reflect those missions * Bal success comes down to improving the performance of the critical processes that determine business success.

A company can't earn a return on an investment in Bal unless that investment yields increased revenues, reduced costs, or both. Elementary, you may say, but many companies satisfy themselves with Bal value propositions that aren't clearly linked to their business strategies and critical business processes * There is no sense of urgency among top management

Despite obvious needs and Bal opportunities, leadershipmay not view Bal as being critical to business success.

There's no compelling internal vision and consensus or no persuasive external driver to create a sense of urgency within these companies * The absence of hard facts and solid analyses allows senior management and executives to offer a variety of plausible (but not provable) explanations for performance shortfalls * Lack of business leadership - Ultimately, the ROI on Bal comes from changing business processes, and only the business side of the house change.

Accordingly, companies need to create business led coalitions to drive the placement, deployment, and use of Bal to improve performance and profits. Nevertheless, many business executives think of business intelligence as an IT initiative, many are intimidated by the technology side of 81, and many prefer to be the Judges rather than the Judged when it comes to implementation. * The designated Bal team lacks Bal skills and experience. * IT is run as a shared service, so Bal takes a back seat. Business leaders lack IT as'. N. Y and thus avoid meaningful engagement. * The Bal team lacks business sax. N. Y and therefore struggles with Bal requirements. * IT development methods are inappropriate for rapid effective delivery of Bal Recommendations Leadership Effective BI/DO leadership is critical to sound business strategy and competitive advantage. Beyond sponsorship, the leadership factor includes organization and planning, which have proven to be significant in assessing BI/DO leadership.

Strong and consistent leadership will have an explicit influence on the competitiveness of your BI/DO initiative as well as affecting the other factors: infrastructure, skill, and value. Remember, leadership is a long-term investment that takes time to cultivate and integrate into your organization Organization Does management encourage the use of BI/DO? * Has user satisfaction with BI/DO been a management concern? * Are BI/DO objectives set by the Bal manager or derived from overall business objectives?

Planning * Is BI/DO strategy aligned with the strategic plan of the organization? * Do BI/DO objectives adapt to the changing objectives of the organization? * Has a standard process for proportioning BI/DO projects been established Skill Skill development for BI/DO teams and user communities provides a strong measure of competitiveness. An effective and robust training curriculum is a cornerstone to developing a deep pool of skill resources. As with leadership, skill development takes time.