The Requirements for Building a Model to Calculate Business Intelligence Tasks

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Abstract: Business Intelligence (BI) systems have consistently been rated as one of the highest priorities of Information Systems (IS) and business leaders. BI allows firms to apply information for supporting their processes and decisions by combining its capabilities in both of organizational and technical issues. Many of companies are being spent a significant portion of its IT budgets on business intelligence and related technology. Evaluation of BI readiness is vital because it serves two important goals. First, it shows gaps areas where company is not ready to proceed with its BI efforts. By identifying BI readiness gaps, we can avoid wasting time and resources. Second, the evaluation guides us what we need to close the gaps and implement BI with a high probability of success. This paperproposes to present an overview of BI and necessities for evaluation of readiness.

Key words: Business intelligence, Evaluation, Success, Readiness

I.   INTRODUCTION

Many firms have realized that the only way to continually compete and profit in the globalMarketplace of today is to utilize the power of information. In today's highly competitiveworld, the quality and timeliness of business information for an organization is not just a choice between profit and loss; it may be a question of survival or bankruptcy. The business needs to know what is happening right now, faster, in order to determine and influence what should happen next time. Companies spend billions of dollars annually on implementation andmaintenance of IS. Estimates are that IS expenses constitute the largest portion of organizational expenditures. Given the size of these expenditures, companies expect to gain benefits commensurate with the money being spent. Unfortunately recent figures estimated that nearly half of IS project did not result in the anticipated benefits. So it is important to know how companies can get a benefit and suitable return on their investments.

Previous information systems like maintaining accounting ledgers or processing financial transactions were applied to automate manual processes. The benefits from these types of systems resulted from increases in efficiency or effectiveness of the underlying processes resulting in measurable cost saving or revenue increases. Traditional enterprises may normally face issues such as the overflow of data, the lack of information, the lack of knowledge and insufficiency of reports. Top managers used to make and take decisions based on their experiences which these lead to more risk of decision failure and reducing the value of the decision. As worldwide competition is maturing, past decision-making modes can no longer satisfy the requirements of enterprises for decision efficiency and benefits; enterprises mustmake good use of electronic tools to quickly extract useful information from huge volume of data by providing the skills of fast decision-making. Socio-economic reality of contemporary organizations has made organizations face some necessity to look for instruments that would facilitate effective acquiring, processing and analyzing vast amounts of data thatcome from different and dispersed sources and that would serve as some basis for discoveringnew knowledge. Recent years, there are many software packages which can provide a set of complete solutions for the operation and management processes of organizations. Nowadays, the individual-system approach applied to decision-support such as Decision Support Systems (DSS) has been substituted by a new environmental approach. With the potential to gain competitive advantage when making important decisions, it is vital to integrate decision supportinto the environment of their enterprise and work systems. Business Intelligence can beembedded in these enterprise systems to obtain this competitive advantage. BI systems provide benefits by supporting analytical processes that provide recommendations for changing products or processes in ways that improve their competitiveness or operational efficiency. And practitioners design and implement Business Intelligence as umbrella concept create a decision-support environment for management in enterprise systems.

However, the effects of the implementation of electronization tools vary that the probability of failure is higher than that of the success. Therefore, the ability to implement BI project and support it, depends on readiness of companies.

Business intelligence technology gives this ability to the managers and experts of these companies. But nowa days BI systems include one of the largest and fastest growing areas of IT expenditure in companies and if the BI project fail, they will lose a lot of money. For reducing costs through BI implementation and preventing from fail of BI project, we need to evaluate readiness of thesecompanies from two aspects: Organizational and Technical.

This paper presents an overview of BI and necessities for building a model which enables us to assay and evaluate readiness of companies from technical and organizational aspects when they want to implement BI project. The outline of the paper is as follows: Section 2 shows an overview of BI and its definitions. Section 3 presents the necessities for building an evaluation model of readiness. Finally, section 4 presents the conclusions and prospective.

II.   BUSINESS INTELLIGENCE

Business Intelligence or BI is a grand, umbrella term, introduced by Howard Drenser of the Gartner Group, in 1989, to describe a set of concepts and methods to improve business decision making by using fact-based, computerized support systems. The first scientific definition by Ghoshal and kimreferred to BI as a management philosophy and tool that helps organizations to manage and refine business information for the purpose of making effective decisions. The goal of BI systems is to capture (data, information, knowledge) and respond to business events and needs better more informed, and faster, as decisions. BI was considered to be an instrument of analysis, providing automated decision making about business conditions, sales, customer demand, product preference and so on. The Data Warehousing Institute, a provider of education and training in data warehouse and BI industry defines business intelligence as: The processes, technologies, and tools needed to turn data into information,information into knowledge, and knowledge into plans that drive profitable business action.

Business intelligence encompasses data warehousing, business analytic tools, andcontent/knowledge management.1 Business intelligence has been defined as "business information and business analyses within the context of key business processes that lead to decisions and actions and that result in improved business performance". Another definitions is "a set of processes and technologies that transform raw, meaningless data into useful and actionable information". It utilizes a substantial amount of collected data during the daily operational processes, and transforms the data into information and knowledge to avoid the supposition and ignorance of the enterprises. Golfarelli at al. argue that BI is the process that transforms data into information and then into knowledge. It is the process of gathering high-quality and meaningful information about the subject matter being researched that will help the individual(s) to analyze the information, draw conclusions or make assumptions. l. lecture that BI is 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. Zeng et al. have put forth that BI is "The process of collection, treatment and diffusion of information that has an objective, the reduction of uncertainty in the making of all strategic decisions. Ranjanconsiders BI as the conscious methodical transformation of data from any and all data sources into new forms to provide information that is business-driven and results-oriented. Eckerson understood that BI must be able to provide the following tools:production reporting, end-user query and reporting, OnLineAnalytical Processing (OLAP), dashboard/screen tools, data mining tools, and planning and modeling tools. It uses huge-database (data-warehouse) analysis, and mathematical, statistical and artificial intelligence, as well as data mining and OLAP. BI includes a set of concepts, methods and processes to improve business decisions, using information from multiple sources and applying past experience to develop an exact understanding of business dynamics. It has emerged as aconcept for analyzing collected data with the purpose to help decision making units get a better comprehensive knowledge of an organization's operations, and thereby make better business decisions. A BI system is a data-driven DSS that primarily supports the querying of a historical database and the production of periodic summary reports. It can be presented as an architecture, tool, technology or system that gathers and stores data, analyzes it using analytical tools, facilities reporting, querying and delivers information and/or knowledge that ultimately allows organizations to improve decision making.

Lönnqvist and Pirttimäki [43] stated that term, BI, can be used when referring to the following concepts:
1. Related information and knowledge of an organization, which describe the business environment, the organization itself, the conditions of the market, customers and competitors and economic issues;
2. Systemic and systematic processes by which organizations obtain,analyze and distributethe information for making decisions about business operations.

BI allows firms to apply information for supporting their processes and decisions by combining its capabilities in both of organizational and technical issues. Put another way, business intelligence allows people at all levels of an organization to access, interact with, and analyze data to manage the business, improve performance, discover opportunities, and operate efficiently". Problems and a huge amount of data of enterprises are input into data mining systems for data analysis so that decision makers can obtain useful information promptly for making correct judgment; that is, in regard to enterprise operating contents, abilities of fast understanding and deducing are provided, and thus enhancing the quality of decision-making and improving performance and expediting processing speed. From a technical perspective, BI systems offer an integrated set of tools, technologies and software products that are used to collect heterogenic data from dispersed sources in order to integrate and analyses data to make it commonly available.

In some research, BI is concerned with the integration and consolidation of raw data into key performance indicators (KPIs). KPIs represent an essential basis for business decisions in the context of process execution. Therefore, operational processes provide the context for data analysis, information interpretation, and the appropriate action to be taken. Figure 1 depicts this concept.
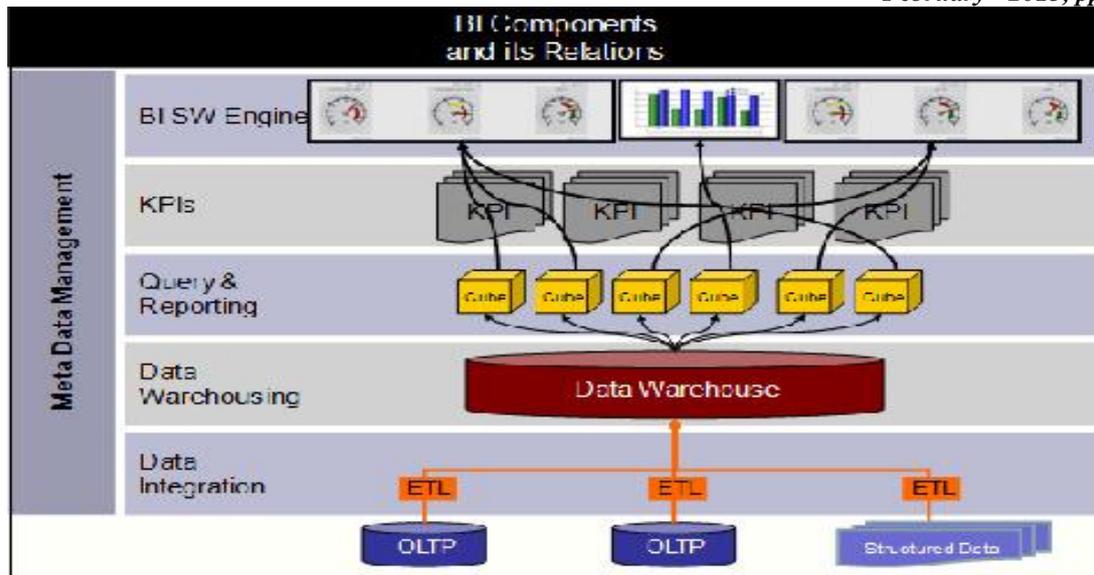
Figure 1: KPIs and BI Components (Source: [47])

Therefore, BI covers a wide range of tools and broad scope, and among the commonly mentioned important applications are data warehouse, data mining, OLAP, DSS, Balance Scorecard (BSC), etc. However, in the overall view, there are two important issues. First, the core of BI is the gathering, analysis and distribution of information. Second, the objective of BI is to support the strategic decision-making process. By strategic decisions, we mean decisions related to implementation and valuation of organizational vision, mission, goals and objectives with medium to long-term impact on the organization, as opposed to operational decisions, which are day-to-day in nature and more related to execution.

III. NECESSITIES FOR EVALUATION OF READINESS

In recent years Business Intelligence systems have consistently been rated as one of the highest priorities of IS and business leaders. Winning companies, such as Continental Airlines, have seen investments in BI generate increases in revenue and produce cost savings equivalent to a 1,000% return on investment (ROI). Many of companies are being spent a significant portion of its IT budgets on business intelligence and related technology. Estimates of the amount spent on BI in 2006 range from $14 to $20 Billion, with growth estimates of from 10% to 11% per year for the foreseeable future. A Gartner Executive Program survey, as shown in figure 2, conducted in 2008 across 1,500 organizations in Western Europe found that BI is the top technology priority for CIOs.
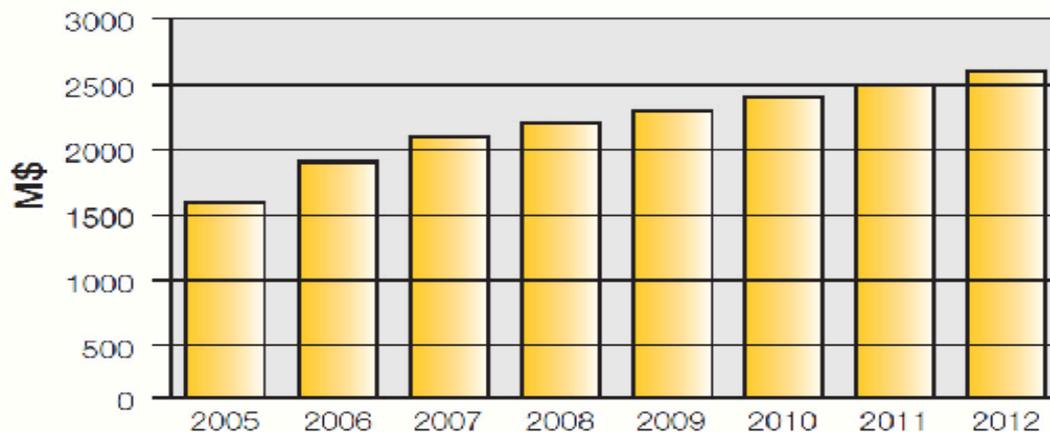

Figure 2: BI Spend Pre diction (Source: [53])

In spite of these investments only 24% of BI implementations were identified as being very successful in a recent survey of companies using BI systems. Losing companies have spentmore resources than their competitors with a smaller ROI, all while watching their market share and customer base continuously shrink. The complexity of business intelligence – data warehouse systems is very high so it is better to consider from the beginning various foreseen aspects that could impact the overall cost and increase the initial investment of the project buteven with a good analysis there are still remaining a large numbers of variables to be considered. The companies which are investing heavily in BI must expect to achieve benefits from their investments. How can some organizations achieve to these benefits while others don't? What are differences between those companies which gain benefits from BI

implementation with the companies lost their money? Unfortunately, while much has been written about how to effectively implement and use business intelligence technology, research on BI and specifically detailing how an organization can achieve benefits from BI is sparse.

3.1. BI Success

The stakes are high for organizations to develop successful BI implementations. When we want to research how BI can be considered successful we have to be able to define what we mean by success. As we know, BI is a class of information system and it is better that we begin to clarify how success is measured for IS in general. Many IS researchers have tried to evaluate success. Early work focused on multiple criteria including "profitability, application to major problems of the organization, quality of decisions or performance, user satisfaction and wide-spread use". The appropriate success measure depended upon the perspective of those evaluating success or the nature of the problem being addressed.

While multiple criteria measures are useful in IS success but many of those criteria aredifficult to measure. As a result, much of the work on IS success has focused on system use as a proxy for success. In other words, the authors advised that capability of system usage is an important clue for its success. Usage of an information system means that the system can be accepted by users,.

3.2. BI Readiness

BI readiness means that the essential prerequisites for BI success are in place. BI readinessassessments are used at the front end of BI projects to determine the degree to which a givencompany is prepared to make the changes that are necessary to capture the full business value ofBI. The BI Readiness Assessment is a series of tasks that analyzes several key areas acrossan organization to evaluate how prepared an organization is to begin short term tacticaldeployment of Business Intelligence solutions and mature it practice over the long term.

Evaluation of BI readiness is vital because it serves two important goals. First, it shows gapsareas where company is not ready to proceed with its BI efforts. By identifying BI readinessgaps, we can avoid wasting time and resources. Second, the evaluation guides us what we needto close the gaps and implement BI with a high probability of success.

3.3. Necessities for building a model

The bottom line in any evaluation program is the finding of problems and the demonstrationthat the system under evaluation satisfies its requirements. It is unfortunate that, in many cases,the evaluating program is actually aimed at showing that the BI system, as implemented, runs asit is requested by the users. That is, the evaluations are aimed at showing that the BI project doesnot fail, rather than that it fulfills its requirements.

There are a few books that discuss exactly on BI readiness. Williams and Williamsidentified seven factors defining "business intelligence readiness" as being:

i. Strategic Alignment;
ii. Continuous Process Improvement Culture;
iii Culture Around Use of Information and Analytics;
iv.BI Portfolio Management;
v. Decision Process Engineering Culture;
vi.BI& DW Technical Readiness;
vii Business/IT Partnership [23].

The authors (S. Williams, and Williams, N.) suggested that only when an organization cangain the benefits of BI, if it has this readiness. Davenport and Harris in their book "Competingon Analytics," focused on the impact of BI systems on organizations. They identifiedsomething that called an analytical capability, which was their conception of the ability of anorganization to use BI and as consisting of organizational acumen and technology factors. They suggest that an organization need to have capability in both organizational andtechnology factors. But they provide a high level view of these factors without discuss in detail.

Based on their research, there are only 35 articles in BI implementation categorywhich covers issues in a variety of BI contexts including data warehousing, data mining,Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), KnowledgeManagement Systems (KMS), and eBusiness projects.

Research in information systems is generally focused on either developing theories thatexplain related phenomena or on verifying existing theories. Analysis of the researchstrategies (in BI Research) over the ten year period from 1997 to 2006 illustrates that FormalTheory/Literature Review, Field Study-Primary Data, Field Study-Secondary Data, and SampleSurvey are represented in almost every year of the time frame. These four strategies areexploratory in nature and indicate the beginnings of a body of research. BI research coversdiverse subjects ranging from practical applications of neural networks, to end-usersatisfaction, to the use of clustering as a business strategy to gain a competitive advantage.Based on the journals and the books mentioned above and previous sections, there is not anyresearch of evaluation of BI readiness in companies.

So we need to:

i. investigate and determine BI readiness factors and their associated contextual elementsthat influence implementation of BI systems in companies

ii. developing a model for evaluation of BI readiness in companies

IV. CONCLUSIONS AND PROSPECTIVE

In this paper an attempt has been made to depict an overview of BI and the necessities forbuilding a model to evaluate readiness of companies in implementing BI project. It was shownthat in today's highly competitive world, using BI is vital and no business organization can denythe benefit of BI. BI technologies are applied by profit and non-profit firms and business usersbecame increasingly proactive. Successful BI project is an important issue for both researchersand practitioners; however, not many studies have done on BI readiness. Although someguidelines for implementation exist, few have been subjected to model building. Duringprospective scientific research related to this study, the authors will work out models to evaluatereadiness of companies in implementing BI projects.

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