Business Intellgence : Techniques and Benefits

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Abstract

For every company, it is very necessary to maintain information. All the informatics systems of a company has a multitude of data. when turning these data into information to make decisions, process becomes slow. The solution for this is given by Business Intelligence (BI) applications that can help companies to increase income or diminish costs by offering the executive management appropriate information on the basis of which quick and efficient decisions can be taken. Companies have understood the importance of enforcing achievements of the goals defined by their business strategies through business intelligence concepts. It describes the insights on the role and requirement of real time BI by examining the business needs.
Keywords: Business Intelligence, ETL, OLAP.

I. INTRODUCTION

Business intelligence (BI), as Zeng et al. BI has many facets. BI ideally serves as a unified presentation layer for data that originates in one or more data sources such as a transaction or ERP systems. Optimally, BI shares this data in a more intuitive manner that allows business users to easily comprehend the issues depicted by the figures - and to then take appropriate action. The Business Intelligence requires the in-depth analysis of the internal and external data related to the functioning of the business enterprise so as to enable the efficient and effective tactical, operational and strategic decisions across each organization level of the company. The Business Intelligence evolves by using the appropriate technology application to the business processes in order to streamline them and organizing and consolidating the unwieldy collections of information into knowledge to facilitate fact based assessments to the business activities swiftly and effectively. These methods assist in gathering, storing, analysing, and providing access to intelligent information on a company's data in order to identify significant trends or patterns that ultimately facilitate the decision-making process and provide the company with a competitive advantage. It is expert information, knowledge and technologies efficient in the management of organizational and individual business.

In modern businesses, increasing standards, automation, and technologies have led to vast amounts of data becoming available. Data warehouse technologies have set up repositories to store this data. Improved Extract, transform, load (ETL) and even recently Enterprise Application Integration tools have increased the speedy collecting of data. OLAP reporting technologies have allowed faster generation of new reports which analyse the data. Business intelligence has now become the art of sifting through large amounts of data, extracting pertinent information, and turning that information into knowledge upon which actions can be taken.

II. BUSINESS INTELLIGENCE:

Business intelligence as the process of taking large amounts of data, analysing 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. 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. 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.

A. 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.

B. Real time BI:

It allows for the real time distribution of metrics through email, messaging systems and/or interactive displays.

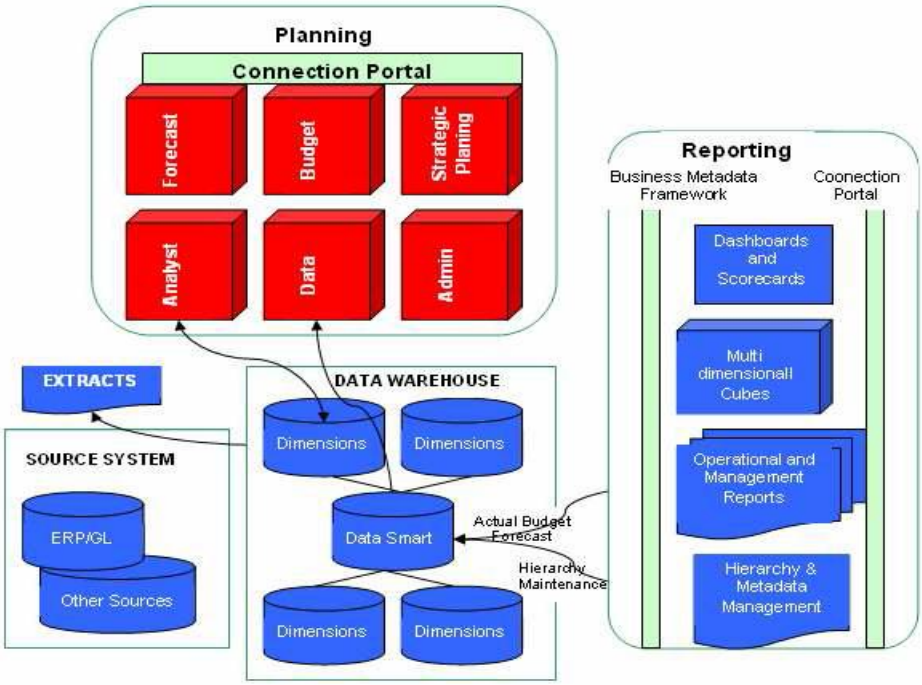
C. Data Warehouse and Data Marts:

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. 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.

III. BUSINESS INTELLIGENCE TOOLS



Business Intelligence Tools

Intelligence is the product resulting from the collection, collation, evaluation, analysis, integration, and interpretation of collected information. One of the most important functions of intelligence is the reduction of the ambiguity inherent in the observation of external activities. The process through intelligence is obtained, produced, and made available to users is named the intelligence cycle. Organisations invest in information technology in an effort to more expeditiously gather and analyse information and to create and share knowledge that can be leveraged for improving performance. An important component of this investment is in Business Intelligence (BI) systems.

Business intelligence (BI) tools enable organisations to understand their internal and external environment through the systematic acquisition, collation, analysis, interpretation and exploitation of information. Two classes of intelligence tools are defined by Carvalho R. and M. Ferreira : front-end systems and back-end systems: data warehouse, data mart and data mining. The first class of tools is used to manipulate massive operational data extract essential business information from them. Examples include decision support systems, executive information systems, online-analytical processing (OLAP), data warehouses and data mining systems. They are built on database management systems and are used to reveal trends and patterns that would otherwise be buried in their huge operational databases . The second class of tools, sometimes called competitive intelligence tools, aims at systematically collecting and analysing information from the competitive environment to assist organisational decision making.

IV. FUTURE OF BUSINESS INTELLIGENCE

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. Companies will have to rely more heavily on their

business intelligence systems to stay ahead of trends and future events. Business intelligence 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. Monthly and even weekly analysis will not suffice. 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. 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.

V. BENEFITS OF BI

BI provides many benefits to companies utilizing it. It can eliminate a lot of the guesswork within an organization, enhance communication among departments while coordinating activities, and enable companies to respond quickly to changes in financial conditions, customer preferences, and supply chain operations. BI improves the overall performance of the company using it. Information is often regarded as the second most important resource a company has (a company's most valuable assets are its people). So when a company can make decisions based on timely and accurate information, the company can improve its performance. BI also expedites decision-making, as acting quickly and correctly on information before competing businesses do can often result in competitively superior performance. It can also improve customer experience, allowing for the timely and appropriate response to customer problems and priorities. The firms have recognized the importance of business intelligence for the masses has arrived. Some of them are listed below.

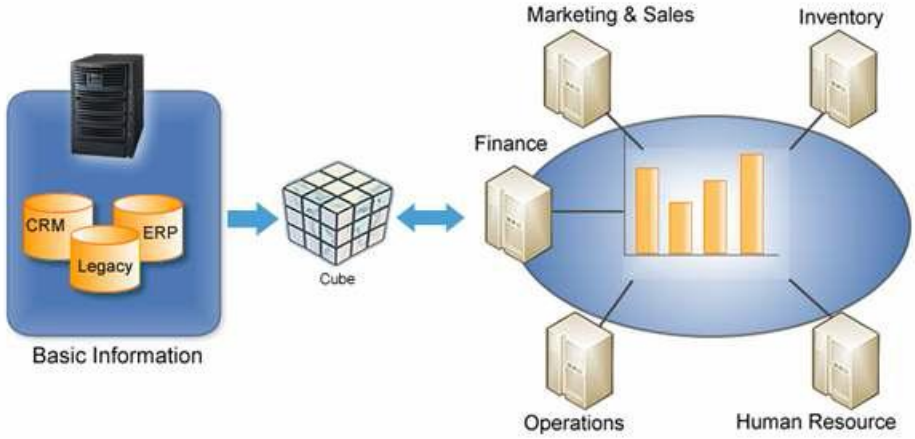
- With BI superior tools, now employees can also easily convert their business knowledge via the analytical intelligence to solve many business issues, like increase response rates from direct mail, telephone, e-mail, and Internet delivered marketing campaigns.
- With BI, firms can identify their most profitable customers and the underlying reasons for those customers' loyalty, as well as identify future customers with comparable if not greater potential.
- Analyse click-stream data to improve e-commerce strategies.
- Quickly detect warranty-reported problems to minimize the impact of product design deficiencies.
- Discover money-laundering criminal activities.
- Analyse potential growth customer profitability and reduce risk exposure through more accurate financial credit scoring of their customers.
- Determine what combinations of products and service lines customers are likely to purchase and when.
- Analyse clinical trials for experimental drugs.
- Set more profitable rates for insurance premiums.
- Reduce equipment downtime by applying predictive maintenance.
- Determine with attrition and churn analysis why customers leave for competitors and/or become the customers.
- Detect and deter fraudulent behaviour, such as from usage spikes when credit or phone cards are stolen.

A. THE BENEFITS OF BUSINESS INTELLIGENCE TO MODERN MANAGER0

Modern management usually means highly controlled organization, relying on sophisticated control measurements and tools, among them large integrated management information systems. Workflows, global business process and networked economics belong to these situations. Research and industries search for improved use of information technologies for the reintegration in human practice through various kinds of coordinating mechanisms.

The single greatest advantage in utilizing BI survey tools is the ability to rapidly acquire the customer and employee feedback critical in identifying issues, concerns and trends that contribute to dissatisfaction and attrition. Rather than the weeks or months required to distribute paper questionnaires and receive the results or to contact respondents by telephone, the Internet allows responses to be collected in a matter of hours. Bolstered with this information, organizations can take necessary actions to implement strategic and tactical solutions to increase satisfaction, reduce employee attrition and increase client retention .

Business Intelligence as tool for modern manager help him to gather, store, access and analyse corporate data to aid in decision-making. Generally these systems will illustrate business intelligence in the areas of customer profiling, customer support, market research, market segmentation, product profitability, statistical analysis and inventory, distribution analysis.



Areas of Business Intelligence

VI. BI SHARPENS BUSINESS PROCESSES

The ultimate goal of business process management is performance management: managing the performance of the organization and its business network by using all assets in ways that achieve a common set of goals and objectives. Performance management enables all individuals to work across strategic, tactical and operational levels to align actions so that the organization produces rapid, effective responses to business challenges. To connect processes with performance goals, companies need business intelligence capabilities, including metrics, key performance indicators (KPIs), executive dashboards and advanced reporting capabilities. They must go beyond just providing reports of basic operational metrics to facilitating access to aggregate data definitions and real-time information. Without BI, it is impossible to correlate process outcomes to corporate performance goals or to apply operational metrics to continuous process improvement. BI is also a critical tool for analyzing process data. Without it, it's virtually impossible to measure, evaluate and control business processes. Through process performance reports, BI gives business process managers the means to measure process execution as well as to gain insight into future workflow design improvements. BI tools map out process metrics such as throughput and flow rates in process modelling and then can be used to measure actual process execution. This data can be aggregated from the process implementation and displayed in real time in performance dashboards and reports.

VII. BUSINESS INTELLIGENCE TECHNOLOGY

Business intelligence provides organizational data in such a way that the organizational knowledge filters can easily associate with this data and turn it into information for the organization. Persons involved in business intelligence processes may use application software and other technologies to gather, store, analyse, and provide access to data, and present that data in a simple, useful manner. The software aids in Business performance management, and aims to help people make "better" business decisions by making accurate, current, and relevant information available to them when they need it. Some businesses use data warehouses because they are a logical collection of information gathered from various operational databases for the purpose of creating business intelligence. In order for BI system to work effectively there must be some technical constraints in place. BI technical requirements have to address the following issues:

- Security and specified user access to the warehouse
- Data volume (capacity)
- How long data will be stored (data retention)
- Benchmark and performance targets

People working in business intelligence have developed tools that ease the work, especially when the intelligence task involves gathering and analyzing large quantities of unstructured data. Each vendor typically defines Business Intelligence their own way, and markets tools to do BI the way that they see it.

Business intelligence includes tools in various categories, including the following:

- AQL - Associative Query Logic
- Scorecarding
- Business Performance Management and Performance Measurement
- Business Planning
- Business Process Re-engineering
- Competitive Analysis
- Customer Relationship Management (CRM) and Marketing

- Data mining (DM), Data Farming, and Data warehouses
- Decision Support Systems (DSS) and Forecasting
- Document warehouses and Document Management
- Enterprise Management systems
- Executive Information Systems (EIS)
- Finance and Budgeting
- Human Resources
- Knowledge Management
- Mapping, Information visualization, and Dash boarding
- Management Information Systems (MIS)
- Geographic Information Systems (GIS)
- Online Analytical Processing (OLAP) and multidimensional analysis; sometimes simply called "Analytics" (based on the so-called "hypercube" or "cube")
- Real time business intelligence
- Statistics and Technical Data Analysis
- Supply Chain Management/Demand Chain Management
- Systems intelligence
- Trend Analysis
- User/End-user Query and Reporting
- Web Personalization and Web Mining
- Text mining

VIII. DESIGNING AND IMPLEMENTING A BUSINESS INTELLIGENCE

When implementing a BI programme one might like to pose a number of questions and take a number of resultant decisions, such as:

- Goal Alignment queries:

The first step determines the short and medium-term purposes of the programme. What strategic goal(s) of the organization will the programme address? What organizational mission/vision does it relate to? A crafted hypothesis needs to detail how this initiative will eventually improve results / performance (i.e. a strategy map).

- Baseline queries:

Current information-gathering competency needs assessing. Does the organization have the capability of monitoring important sources of information? What data does the organization collect and how does it store that data? What are the statistical parameters of this data, e.g. how much random variation does it contain? Does the organization measure this?

- Cost and risk queries:

The financial consequences of a new BI initiative should be estimated. It is necessary to assess the cost of the present operations and the increase in costs associated with the BI initiative? What is the risk that the initiative will fail? This risk assessment should be converted into a financial metric and included in the planning.

- Customer and Stakeholder queries:

Determine who will benefit from the initiative and who will pay. Who has a stake in the current procedure? What kinds of customers/stakeholders will benefit directly from this initiative? Who will benefit indirectly? What are the quantitative / qualitative benefits? Is the specified initiative the best way to increase satisfaction for all kinds of customers, or is there a better way? How will customers' benefits be monitored? What about employees, shareholders, distribution channel members?

- Metrics-related queries:

These information requirements must be operational into clearly defined metrics. One must decide what metrics to use for each piece of information being gathered. Are these the best metrics? How do we know that? How many metrics need to be tracked? If this is a large number (it usually is), what kind of system can be used to track them? Are the metrics standardized, so they can be benchmarked against performance in other organizations? What are the industry standard metrics available?

- Measurement Methodology-related queries:

One should establish a methodology or a procedure to determine the best way of measuring the required metrics. What methods will be used, and how frequently will the organization collect data? Do industry standards exist for this? Is this the best way to do the measurements? How do we know that?

- Results-related queries:

Someone should monitor the BI programme to ensure that objectives are being met. Adjustments in the programme may be necessary. The programme should be tested for accuracy, reliability, and validity. How can one demonstrate that the BI initiative contributed to a change in results? How much of the change was probably random?

IX. CONCLUSION

The main advantages of using business intelligence for organizations will be to have interlinked integration for faster delivery of information in form of analysis, reports and actionable alerts to people with different responsibility. Managers know that through a Business Intelligence solution they can have superior possibilities to gain control over the business practices and processes. They can also get the improvement of the analysis functions of performance metrics and indicators. For this, Business Intelligence uses a set of concepts, methods and technologies meant to improve the process of conversion of data into information, information into decisions and decisions into actions. All these can help companies to increase their income and lower their costs in order to supply pertinent information towards the executive management, information also used for fast and efficient decisions.

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