Organizational Decision Based on Business Intelligence

Pejman Hosseinioun , Rose Shayeghi , Ghasem Ghorbani Rostam

Abstract—Nowadays, obtaining traditional statistics and reports is not adequate for the needs of organizational managers. The managers need to analyze and to transform the raw data into knowledge in the world filled with information. Therefore in this regard various processes have been developed. In the meantime the artificial intelligence-based processes are used and the new topics such as business intelligence and knowledge discovery have emerged. In the current paper it is sought to study the business intelligence and its applications in the organizations.

Keywords—Business intelligence, business intelligence infrastructures, business processes.

I. INTRODUCTION

IN large organizations, many separate and integrated software systems are providing services to the organization and so some parts of organization's processes are mechanized. These systems are constantly generating information. Each of these systems produces separate reports in different levels of management. However current managers need information for decision which is beyond what the reports of these systems produce. Due to this require, some instruments were developed with using the knowledge of artificial intelligence which produce outputs and analyses. The process of converting raw data into analytical data consists of several steps. The current paper explains various aspects of this process and also introduces architectures of existing software, business intelligence instruments, and its related software fields, studies its applications in the organizations and even shows that exploring and analyzing data can be simplified by business intelligence. It also allows decision makers in each category to have an access to the information anywhere and anytime easily in order to realize and analyze them better.

II. BUSINESS INTELLIGENCE

If you work in an organization with a high volume of data, suggest them to use the business intelligence as a tool to facilitate business decisions in order to decide correctly based on data and the situations of industry and market. [3]

Business intelligence refers to the process of converting raw data to business information (the information which leads the decisions in an organization).

As the example, the following questions can be answered in an organization:
i.   The company's top product in terms of sales.
ii. Comparison of sales in the current year with previous years.

Pejman Hosseinioun is with Sama Technical And Vocational Training College Islamic Azad University, Islamshahr Branch , Islamshahr , Iran, E-mail:P_hosseiniun@yahoo.com)
Rose Shayeghi is with Sama Technical And Vocational Training College Islamic Azad University, Islamshahr Branch , Islamshahr , Iran, E-mail:roseshayeghi@yahoo.com)
Ghasem Ghorbani Rostam is With Department of Physic, Islamshahr Branch, Islamic Azad University (E-mail:gh_gh_r@yahoo.com

iii. The rate of sale in the past three months.
iv.   The reasons of decreasing rate of sale in a particular region.
v.   Estimating the amount of sale in coming months.
vi.   Improving the field of sale.
vii. Areas of improvement and its effect on the benefit of company.
viii. The same products that are purchased by customers.

In order to answer the aforementioned questions business, intelligence needs past data, current and daily data about rate of sale, orders, returns, and etc… .

In a business intelligence solution offered to an organization, different people from different sectors are involved. The people need to use application software and various technologies in different stages including collection, storage and analysis of data and present the obtained results. Therefore different tools were provided by different companies. The tools of business intelligence are application software which was designed for the current process in business intelligence so the information can be analyzed and presented properly by them.

In different stages of business intelligence, various techniques are used according to the desired operations which will be discussed more.

It is noteworthy that designed tools are based on these techniques.

1. ELT
2. Data Warehouse
3. OLAP
4. Data Mining
5. Reporting Software
6. Direct Processing of Transactions
7. Intelligent Decision Support System
8. Intelligent Agent
9. Knowledge Management System
10. Supply Chain Management
11. Customer Relationship Management
12. Resource Planning
13. Enterprise information Management

III. BASIC CHARACTERISTICS OF A GOOD ARCHITECTURE FOR BUSINESS INTELLIGENCE SYSTEMS

A. Usability

Providing all facilities of business intelligence in the same and common way for all different users and being prepared to provide all required information for different users.

B. Using a common API for integration and extensity

An API enables the integration of business intelligence with other current or future systems. In this regard an API needs to be used in order to cover all components of business intelligence.

World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:6, No:5, 2012

C. Optimum use of available resources to simplify and ROI

A modern architecture for business intelligence needs to have the highest return on investment with implementation and rapid development of business intelligence system. The architecture should support the environment of various applications, combination and integration with infrastructure such as platforms, databases, PLAP resources, servers, Web application servers, security providers, reduction on the cost of new implementations and the cost of maintenance.

D. Widespread access to the data of organization

Every organization has a wide range of various data and storage mechanism for different users and purposes. In order to create a flexible system, to integrate data and to access data, it is necessary to use an open data strategy in the architecture of system. The users who are using the data need to be assured about integrity of data throughout the organization.

E. Displaying joint business

Business process and performed analysis based on them should be shared throughout business intelligence system and the results should be in one direction regardless of the source and the information. Thus the managers and knowledge workers use the analytical results with certainty to accuracy and integrity of data.

F. Skill

If there is a change in the organization, the business intelligence architecture should be able to apply required changes quickly and accurately in other sectors.

G. Capability of interaction in business intelligence

Business users need to have an access through an interface to all capabilities of business intelligence. The users can have an access to analysis and various tools through this common interface and can participate in preparing a report in a common form. The user prepares a report and shares it with others. Everyone can only have access to certain information. Finally the business manager observes different reports and shares the obtained results with others.

H. Ease of operation

In order to achieve maximum benefit of using business intelligence, a kind of architecture is required that can be easily implemented, integrated and applied. Trade partners and customers need the systems which are easy to install and to use.

IV. BUSINESS INTELLIGENCE INFRASTRUCTURES

A. Software infrastructures needed for business intelligence

Software extracts accurate information from additional and wasted data sources. Innovative analytical tools provided by independent software vendors (ISV) that have been implemented for various business domains specifically, lead continuous progress of business intelligence industry in market. Tool and analytical techniques developed by ISVs

help to solve lots of major business issues such as paying up based on people's missions, measuring the success of selling a certain product in the particular area shops.
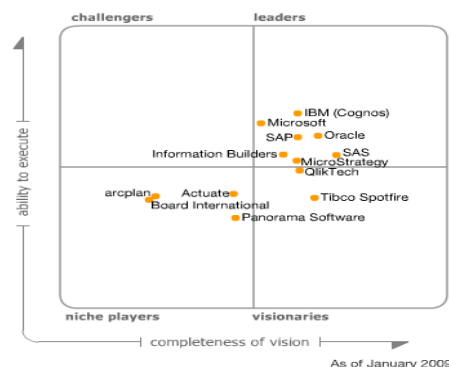

Fig. 1 condition of business intelligence software in the world [7]

B. Hardware infrastructures for business intelligence

Foundation of business intelligence system is provided with hardware layer so it leads flexibility and extensity of business intelligence system in future. Hardware will have major effect on the function of software infrastructure in business intelligence, selection from available options of tools, required skills for supporting system and the costs. Furthermore the purpose of a business intelligence system should be rising in the efficiency of the whole system not only in the hardware of the system. [4]

1. Servers

With development of technology, the speed of processors increases and their price reduces. The action leads new points of efficiency and balance between price and power for the CPU and the RAM. This development has established more options for selecting and using in business intelligence system so that defined needs can be met by them.

2. RAM

To determine the type of RAM the following features should be noted: the feature of its compatibility with servers and communication networks in addition to the ability to expand, compatibility with commercial open standards and the positive effect of efficiency on overall system. In addition to the technical characteristic of a storage device, we need to take notice of the software that manages it in order to give more functions. Costs, advantages and disadvantages of choosing this software can be essential for an organization. It should also be considered that savings in the purchase of necessary hardware can lead further costs in support and storage system.

3. Communication Network

Nowadays the speed of communication networks is much faster with high-speed fiber optic networks and Ethernet networks. Choosing the communication systems should be along with choosing types of servers and RAM. This choice can effect on the speed of data access such as taking backup and data recovery.

World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:6, No:5, 2012

Selecting hardware equipments among other options depends on various parameters as follows
• Flexibility and extensity.

• Cost of procurement, establishment, maintenance, support and management.

• High efficiency for predicted software of business intelligence.

• Compatibility with open commercial standards.

V. FUNCTION OF BUSINESS INTELLIGENCE IN VARIOUS LEVELS OF ORGANIZATIONS

The function of business intelligence can be divided into three areas: [5]

A. Strategic Level

Major decision of organization is done by senior managers. The uses can be performed in low frequency and long periods but it might be associated with high volumes of information and processes. Decisions at this level are often taken in the non-structured areas by senior managers. The obtained results of the decisions have long-term and total effects in organization.

B. Tactical level

It is an operation which is performed in the field of middle managers. The operation can be consist of the follow-up of low level operations, way of doing it, reporting and finally the sum of useful data for taking the medium-term decisions. The obtained decisions in this level are taken in the semi-structured areas by middle managers.

C. Operational Level

It is the lowest level of business operations in an organization. It has high frequency and is done repetitively in the low operational levels of organization. The operation has high frequency and deals with a small volume of data. The obtained decisions in this level are often taken in the area of structured issues by low-level managers. The obtained results of the decisions have short-term impact.

D. Business Activity Monitoring (BAM)

It is a program in the field of business intelligence which is done in the operational level of the organization. Its purpose is preparing comprehensive information from the process of business projects in real time. The system provides the short-term decisions in commercial activities. It is also considered as a system to collect required information for high category programs of business intelligence. BAM has its most focus on internal business processes.

E. Familiar

It is the most important program in the tactical level. It is used in pursuing commercial activities with BAM and in the medium-term decisions it is used to help middle managers with periodic reports of processes. This system provides the general picture of activities of the organization for managers.

The application of business intelligence in the strategic level can be considered as a help to increase overall efficiency of organization and to optimize the processes beside each others. The systems focus on some major financial features and other important parameters. Obviously the system in this level needs to apply external processes of organization as well. As we know, a business intelligence system consists of several programs in different levels which are in the portfolio of business intelligence. One of the most important communications of the systems associates with transferring data. Different features of applications at various levels of the organization lead differences in tools, techniques and infrastructures that are needed for each of them. Using more analytical and intelligent tools is done in high level which needs high processes with access amount of massive information in strategic and tactical levels than operational one. Task of operational level of business intelligence is mostly collecting information and storing them in data marts or in special databases.

VI. CONCLUSION

Current paper sought to study all aspects of implementing business intelligence in organizations. It also considered hardware and software prerequisites, architecture, infrastructure, active and distinguished companies of the areas in the world. The managers of organizations need to investigate properly in order to use the aforementioned advantages of business intelligence and also use experts of the new field in the world of information technology. With the advent of the new filed, numerous large software companies added special business intelligence tools to their products. According to what was said about advantages and disadvantages of the issue, it seems that Iranian organizations, educational centers and computer companies should take actions to growth of their own organizations with using this new field.

REFERENCES

[1] "BusinessDictionary.com". Retrieved 10 March 2012.
[2] H. P. Luhn (October 1958). "A Business Intelligence System" (PDF). IBM Journal. Retrieved 2011-07-10.
[3] D. J. Power. "A Brief History of Decision Support Systems, version 4.0". DSSResources.COM. Retrieved 2011-07-10.
[4] Ralph Kimball et al. "The Data warehouse Lifecycle Toolkit" (2nd ed.), page 29, 2010.
[5] Jeanne W. Ross, Peter Weil, David C. Robertson "Enterprise Architecture As Strategy", International Journal of Business Management, V.1, I.2, 2010, pp 117-130.
[6] Naveen K Vodapalli. "Critical Success Factors of BI Implementation". IT University of Copenhagen. Retrieved 2011-11-12.
[7] "Gartner Reveals Five Business Intelligence Predictions for 2009 and Beyond", retrieved on 1.2.2012, http://www.gartner.com/it/page.jsp?id=856714