

CBI – Framework for Collaborative Management in Knowledge Society

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CBI – Collaborative Business Intelligence is one of the superior manifestation forms of the knowledge society in the field of modern organization management instruments. Coalescing business intelligence solutions with collaborative activity instruments, CBI is the new paradigm for substantiating economic decision making, as main instrument in collaborative management. Lately, CBI is under intense scrutiny, biggest challenges concerning achieving high performance on huge data sets, real time processing and processing of heterogeneous data, originating from increasingly complex sources. Extending the collaborative decision making models with external environment elements leads to new dimensions of business management. Social business intelligence, through interaction of its specific instruments, techniques and features with the CBI paradigm, makes it the framework for decision making in the collaborative environment specific to the knowledge society.

Keywords: Collaborative Business Intelligence, Collaborative Management, Knowledge Society, Information and Communication Technology, Social Networks, Collaborative Resources

1 Introduction

Beyond the favourable context provided, there is no doubt that state of the economy in the knowledge society is a challenge for organizations and their management, no matter the domain of activity. There is a need to decrease costs and risks, on the background of decreasing sales, hesitant suppliers and costly credits. Maintaining a long term perspective (with intermediary steps meant to adjust to economy realities) leads to focusing on flexible management methods.

Collaborative management implemented through CBI may be a solution. Beyond the concept of *profit maximization*, achieving organization's objectives in an economic cycle is possible through adoption of intelligent strategic decisions, reengineering of business processes and innovations in products, technologies and services.

In spite of apparent CBI advantages, economic organizations must consider the increasingly lower availability of resources – primary production factors. In this context, the most interesting approach belongs to the Romanian economist Virgil Madgearu, in his thesis about recognition of priority and ascendancy of work (again, the

anthropocentric approach) as a production factor: “*work is the decisive factor, which conditions the entire life of the human society, as any type of society is nothing else than the organization of work in order to satisfy human needs to the highest extent*”. Still, in the conditions of explosive development of information and communications technology, putting the non-inexhaustible primary resources principle into practice, involves a higher focus on new production factors, at least regarding amount/consumption of information and definition/development of organizational culture.

2 Business Intelligence – Concept, Process, Technology, Architecture

Terminologically, business intelligence was used for the first time by Gartner Group in the mid 90's. As a concept, it was promoted 4 decades ago, when it was used in the reporting systems specific to mainframe technology [8]. Those reporting systems were static, well defined, bi-dimensional and without analytical capabilities. Among others, the development of business intelligence was prompted by the increasing demand for multi-dimensional dynamic

systems to support intelligent decision making processes and provide predictive features. Currently, business intelligence solutions are increasingly complex, being capable or multi-criteria analysis of data and predictive outputs. For a collaborative management model, these features serve very well the informational substantiation processes and elaboration of alternative decisions.

A justification for the need of business intelligence solutions is the need of organizations to survive on the market during current competition conditions. In order to develop a successful strategy, the management level must be able to anticipate future market conditions and “understanding

the past” is the best way to “predict the future”. This is accomplished through business intelligence solutions integrated into the informational component of the organization (Figure 1).

With the help of business intelligence, the organization may exploit the resources (work, nature, technology or capital) in order to achieve current objectives and maximize the profit. Also, obtaining real time correct information and promptly transmitting them to the relevant persons may improve the decisional process. Thus, decisions are better substantiated, considerably less time is used to make a decision and short term economic efficiency grows, ensuring the premises for a long term development of the organization.

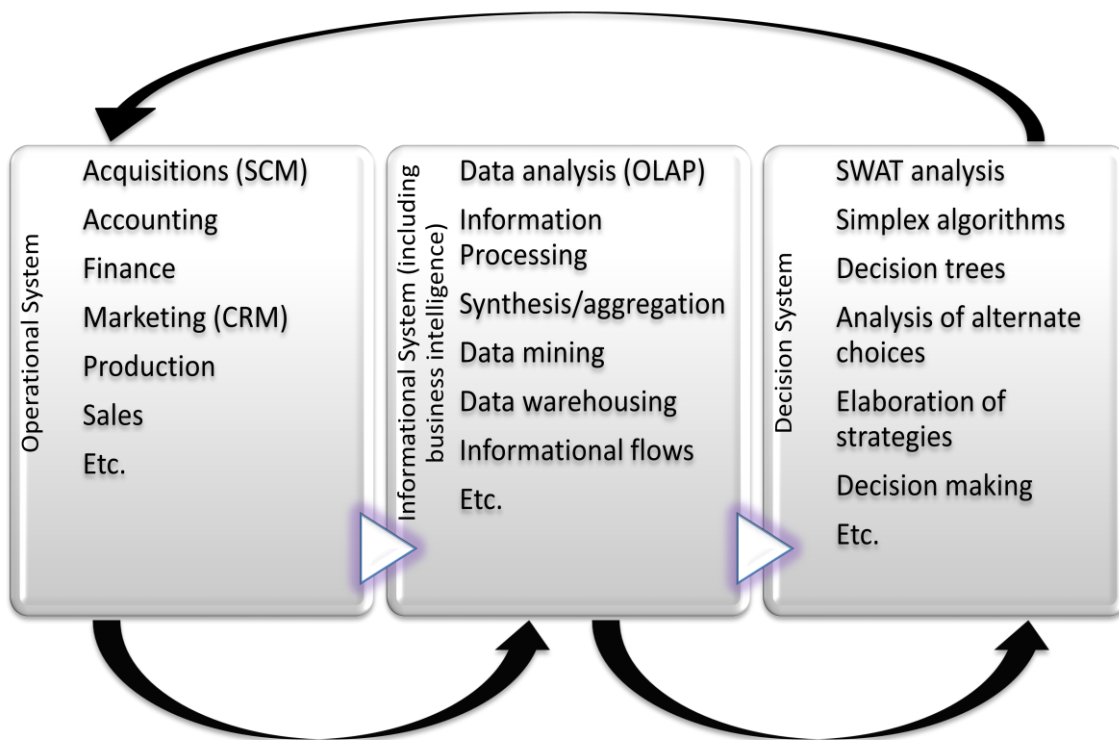


Fig. 1. Information cycle in modern organization

On the other hand, business intelligence may be defined as an abstract concept, which involves using high level software for business applications [3] Various approaches consider business intelligence as a collection of modern *technologies* which assist organizations in the process of creating and developing intelligent management systems. According to IBM [1], business intelligence

means “using data type values in order to make better decisions”. Certainly, targeted directions include market access, analysis of competition and using seizing new opportunities.

According to Romanian Business Intelligence Association (AIER), business intelligence is the ensemble of useful data research, collection, processing and

distribution activities by economic agents, with the purpose of gaining competition advantages, through exploiting them in a defensive and/or offensive manner. It is noticeable a trend to superimpose the business intelligence meaning onto the traditional informational system of an organization: the ensemble of personnel, procedures and resources (material and financial) that collects, transforms and distributes information in an organization [7] From this perspective, contemporary economic organizations may implement several types of information systems:

- Simple manual information systems (paper written information);
- Informal information systems (tacit and explicit information, shared through work relations and organizational culture);
- Automated information systems (that use hardware, software and human resources to transform data into information for the users).

Business intelligence appears in [5] as *architecture* built on a collection of applications, integrated operational data bases and decision support systems. This

architecture provides the business community with easier and faster access to economic data. Business intelligence applications for decision support facilitate management specific activities. They include multidimensional data analysis (OLAP), data mining, business analysis and forecast, interrogation, reporting and graphics, geo-spatial analysis, knowledge management etc. From a functional perspective, business intelligence is an iterative process where the input is the operational environment (operational system). Data is extracted from this environment and stored in the data storage (data warehouse, which is a central data container, separated from operational data) (Figure 2). The decision maker uses decision support systems to extract data from the data warehouse.

The extracted data is processed and transformed into economic decision substantiating information. This metamorphosis of operational information leads to a new iteration of the business intelligence cycle, thus ending the feed-back loop of the economic organization cybernetic system.

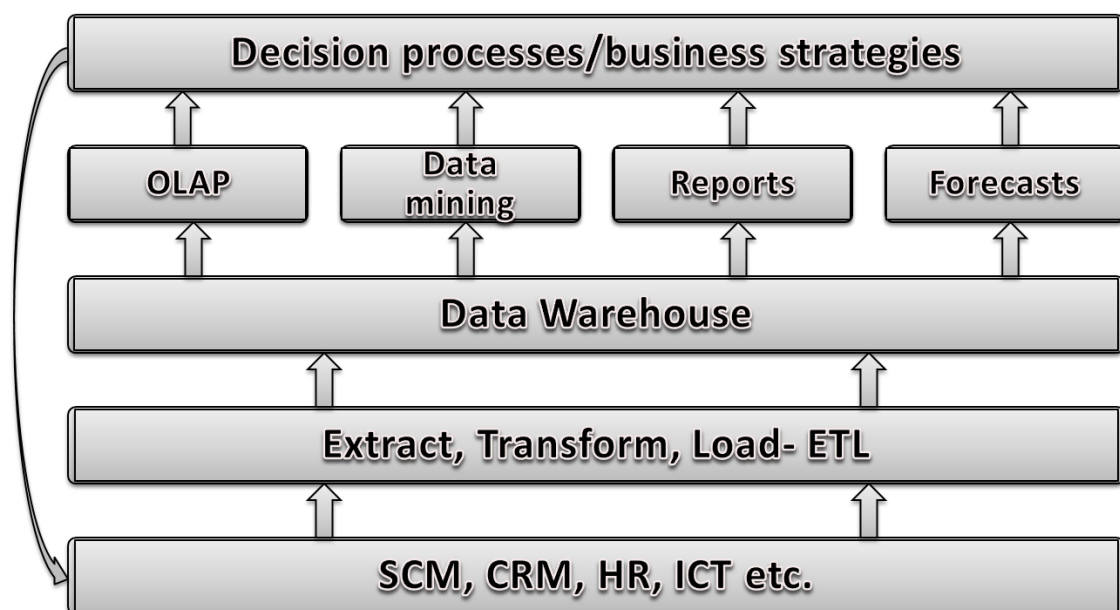


Fig. 2. Business intelligence informational cycle

The terms *data* and *information* are not always interchangeable. Still, in the context

of this paper, it is useful to imagine data as the primary material resources processed into

end products – information. The information may be defined as data converted into an intelligible and useful context for the relevant users. The defining characteristic of the information is the level of novelty to the human receptor. Of course, sometimes no processing is required to transform data into information.

Still, data does not become useful until they undergo a quality process, where the form is aggregated, processed and organized and the content is analysed and evaluated being placed in an adequate context for the user. Thus, information may be imagined as a data processing placed in a context that endows it with value for specific users [7]

3 CBI – Collaborative Business Intelligence

CBI – Collaborative Business Intelligence is one of the superior manifestation forms of the knowledge society in the field of modern organization management instruments. As a collaborative management instrument, CBI integrates sharing social resources in order to improve existing projects, products or business processes. This type of business intelligence is usually managed through analysis software that combines traditional project management features with techniques derived from social networks. One of the most important CBI characteristics is that it “invites” the client to interactively participate from the incipient stages of the business processes, not only after the products is launched on the market. [6]

Drawing its roots from social business intelligence, CBI is perceived as an ideal way to fully profit on the human capital, both inside and outside the business. Inside the business it allows employees to transparently participate to resource and project allocation, no matter if they are directly involved in those projects or not. In other words, CBI matches a principle of the anthropocentric management paradigm by recognizing/measuring the employee merits. On the other

hand, outside the business, clients have a chance to actively participate in modelling the products and services, ensuring a high level of satisfaction of their needs.

The contribution of social networks to the business intelligence field is focused on the ability to bring new clients (especially for small organizations, operating on niche markets). The collaborative character of CBI provides the possibility to analyse economy trends and high relevance statistics. In the context of knowledge society, the collaborative aspect is not restricted to organization boundaries. By extending beyond these boundaries, collaborative management process introduces external variables into the decision equations.

One increasingly important element is the final client. His preferences are transformed from unknown business variables into resources that must be allocated in the decision process in order to create targeted products. Client preferences are inserted into CBI based decision models through instruments, techniques and features social media has introduced to business intelligence (Figure 3).

As the social networks and internet applications become more complex, more and more detailed data may be gathered about users/consumers. They are transmitted to organizations that activate on small markets and will be used for commercial purposes (loyalty campaigns, promotions, questionnaires, satisfaction measurement etc.). In the same time, user interaction leads to the possibility to quickly propagate information favorable to the organization – one of the most used current methods for promoting on the market. Also, information may become a trusting source for clients looking to document on a certain product for future purchase. The speed of propagation for this information is continuously growing, actively using the user networks of friends [4].

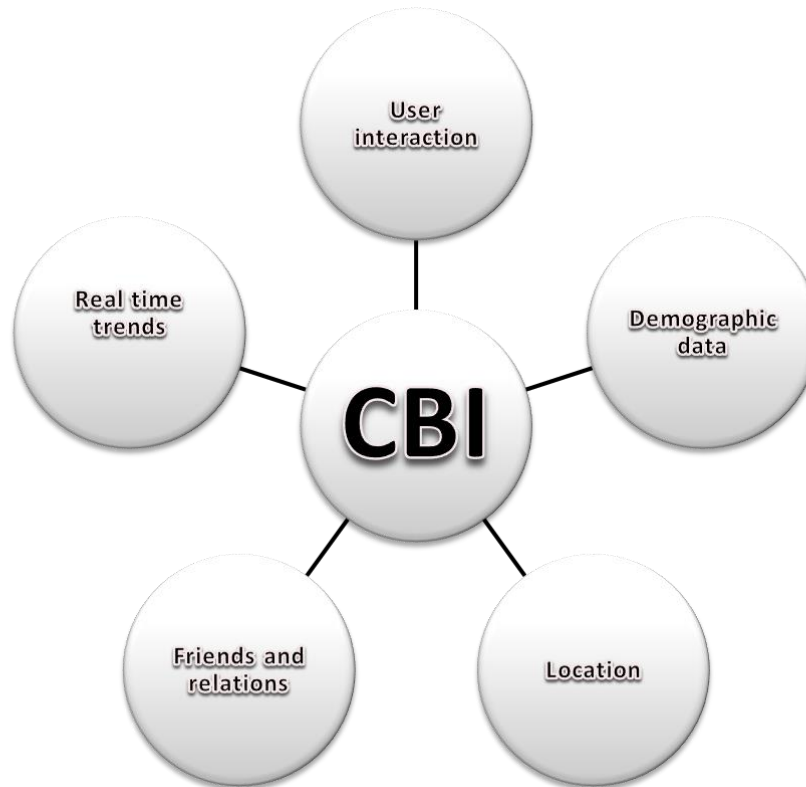


Fig. 3. Social extension of CBI

For using CBI, organizations must recognize the need for a virtual existence in the social environment. This way, the potential for creating loyalty, sales or informing the client becomes significant, with quantifiable effects and trustful measurements. [2]

The common goals of social networks and companies that desire to sell products and services is meeting the needs of the same client/user, which will lead to consolidation of these interdependence relations, which will be actively reflected by CBI techniques and processes. This creates a bridge between the client and the organizations that serve him, ensuring a competition advantage for businesses that will invest in CBI.

Since their birth, business intelligence (earlier) and social networks (most recently) have been researched and developed continuously. While business intelligence has the main objective of facilitating decision processes at organization level by providing reports with relevant data, social media aims to develop into a reliable source of opinions, relations and personal data on individual level.

Existing in parallel for a while, these concepts have inevitably combined into the concept of social business intelligence, the foundation of CBI. As a concept, on the basis of social media data and from an extended collaborative approach, CBI aims to extract relevant information in order to make efficient decisions. In the current context, where many organizations implement business intelligence systems, adding the social-collaborative component increases competition and adds an important benefit for the client.

4 Conclusions

Economic reality certifies that business intelligence solutions are a vital instrument for organization success. Key indicator analysis like time to cash the bills, stock rotation, client behavior regarding payments, turnover on business segments, generate information that may create strategic advantages. Competition advantage against the competitors provides leverage and the ability to react fast in a difficult and competitive environment.

Current orientation of business intelligence technologies, including CBI, highlight the change from traditional business intelligence to in-memory processing and storing data on column (due to huge data volume and processing needs). Another direction is processing the unstructured data (like graphics) and usage of bionic hybrids to improve the capabilities of applications by transferring some processing tasks to the hardware (hardware implemented software, for example SAP HANA system – High Performance Analytic Appliance).

The next step in CBI development as a framework for collaborative management in knowledge society is the identification and definition of the most important metrics for social media. Quantifying the results of these metrics and introducing them into decision models should to generate reaction in a short time.

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References

- [1] M. Almeida, et al., *Getting Started with DataWarehouse, and Business Intelligence*, IBM Corporation, 1999.
- [2] *Social Media and Business Intelligence*, First Edition, CIO Whitepapers & bookboon.com, Ventus Publishing ApS 2012, ISBN 978-87-403-0309-4
- [3] A. Bernstein, et al., *Business Intelligence: The Next Frontier for Information Systems Research?*, www.technologyevaluation.com, October 2010
- [4] B. Dinter, A. Lorenz, *Social Business Intelligence: a Literature Review and Research Agenda*, 33rd International Conference on Information Systems, ICIS 2012
- [5] L.T. Moss, S. Atre, *Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications*, Addison Wesley, 2003
- [6] M. Rouse, Self-service and collaborative BI, Search Business Analytics, <http://searchbusinessanalytics.techtarget.com/definition/collaborative-BI-collaborative-business-intelligence>, acc. Oct. 2014
- [7] M. Stoica, C.N. Bodea, B. Ghilic-Micu, M. Mircea, *Managementul sistemelor informaționale*, Ed. ASE București 2012, pp. 11, ISBN 978-606-505-574-2
- [8] M. Zaman, *Business Intelligence: Its Ins and Outs*, www.technologyevaluation.com, January 10, 2005



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