

Business Intelligence, the New Managerial Tool: Opportunities and Limits

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Abstract

Business intelligence is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes.

An operational BI system helps non-technical users with very fast and intuitive ways of processing and viewing data. The main goal of a BI initiative is to turn a company's information into a structured and analyzable perspective - in other words, real business intelligence, which can inform the decision-making process within the company.

Through this study, we want to identify the advantages and limitations of business intelligence solutions perceived by the Romanian companies, as well as its use as a managerial tool for observing the evolution of business, its impact on managerial decisions, and the ease with which managers can use it.

By using Business Intelligence, you can eliminate inefficient bottlenecks, refine existing business processes, automate routine tasks, and introduce new levels of work organization and prioritization.

Key words: business intelligence, managerial decisions, tools, Romania

J.E.L. classification: O330, M200, M15

1. Introduction

Business Intelligence (BI) systems are complex computer systems for analyzing data and presenting information, allowing company executives, managers, and other end-users to make much better-informed business decisions. BI comprises a wide variety of tools, applications, and methodologies that allow organizations to collect data from internal systems and external sources, prepare them for analysis, develop and execute data queries, and create reports, data views, and dashboards. to make the results available to corporate decision-makers as well as operational employees. (Dedic *et al*, 2016, pp. 225-236).

Exploring and analyzing big data turns information into a perspective. The growth and variety of data are available in a large volume to manage traditional databases. For this reason, companies are considering technologies such as Hadoop databases (a collection of open-source software utilities that facilitate using a network of many computers to solve problems involving massive amounts of data and computation), Spark (open-source distributed general-purpose cluster-computing framework) and NoSQL (provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases) to fulfill their rapidly evolving information needs (Grigorescu *et al*, 2016).

One of the major reasons behind the growing demand for tools that provide Business Intelligence is the importance of knowing customers and how they interact with various businesses. Through the Business Intelligence service, the analysis of the data necessary for a company becomes easier due to the interactive graphical interface. Thus, interactive visual analysis allows for solving certain business problems and leads to improved sales, marketing, and business development strategies. The beneficiaries of such services are from various fields, from factories to marketing companies, finance, or airlines.

The main goal of a BI initiative is to turn a company's information into a structured and analyzable perspective - in other words, real business intelligence, which can inform the strategic decision-making process within the company (Golden, 2013, p. 234).

Following the new GDPR (General Data Protection Regulation) legislation, issued in 2019 at the European level, the BI market was affected; although in 2012 revenues of \$ 13.1 billion were recorded (Coronel *et al*, 2014, p 453). In 2019, the BI market was shaken in Europe by the new GDPR (General Data Protection Regulation) legislation, which places the responsibility for collecting and storing user data on data with strict laws to ensure that the data is compliant.

According to a study by research and consulting firm Gartner, whose contributor is Panetta Kasey by 2020, 80% of organizations will initiate deliberate competency development in the field of data literacy to overcome extreme deficiencies and 50% of organizations will lack sufficient AI and data literacy skills to achieve business value (Panetta, 2019). The year 2020 is considered the year of data quality management and data discovery, and the main trends could be Data Quality Management (consists of acquiring the data, implementing advanced data processes, distributing the data effectively and managing oversight data), Data Discovery/ Visualization, Artificial Intelligence, Predictive and Prescriptive Analytics Tools, Collaborative Business Intelligence, Data-driven Culture, Augmented Analytics, Mobile BI, Data Automation and Embedded Analytics (Durcevic, 2019).

2. Theoretical background

The term Business Intelligence is relatively new but it is synonymous with a range of applications that have been around for years: Decision support systems, Executive Information Systems, On-line Analytical Processing or multi-dimensional modelling (Rouse, 2019). It is the conversion of data into information in such a way that the business can analyze the information to gain insight and take action. Thus, Business Intelligence compresses the strategies and technologies used by companies to analyze data from business information.

Among the first definitions found was that used by Hans Peter Luhn, a researcher at IBM, in an article published in 1958 in which he stated that it is "the ability to understand the interrelationships of facts presented in such a way as to direct the action to the desired goal" (Luhn, 1958, pp.314-319).

The main **objectives** of a BI system are: collecting and analyzing a very large volume of data and information extracted either from operational databases or from the organization's data warehouses; obtaining forecasts regarding the strategic indicators of the organization; combining knowledge management processes with decision-making processes; exploitation of support technologies for the decision-making process to obtain complex, competitive and up-to-date information for managers (Waltz, 2003, p. 100).

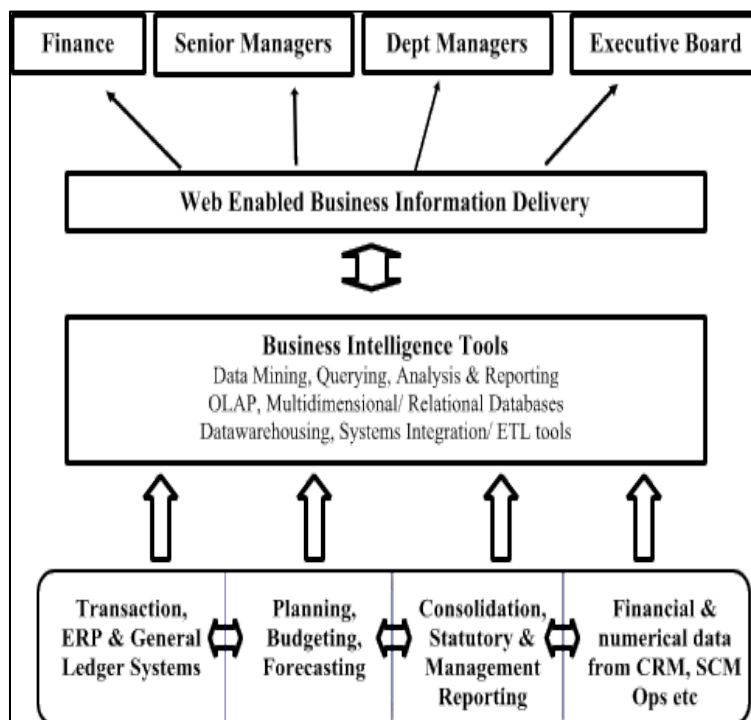
A BI program offers to a company **benefits** such as: accelerating and improving the decision-making process; monitoring one's own company (economic data, employee performance, etc.); optimization of internal business processes; increasing operational efficiency; attracting new income; obtaining competitive advantages over competitors; better knowledge of customers and improvement of services for them; identifying market trends and anticipating changes and their impact.

As a discipline, Business Intelligence consists of activities such as analysis of large volumes of data, online analytical processing, queries, and reporting. Analyzing the data generated by a company's activities is a demanding activity, which involves considerable time and human resources, especially if the volume of information is very large (Coker, 2014, pp. 41-42). But visual representations simplify things, allowing users at any level of the company to better

understand the data on which they need to meet their goals. An operational BI system helps non-technical users with very fast and intuitive ways of processing and viewing data, allowing people from any level of the company to ask questions and receive answers in just a few seconds (Grigorescu *et al*, 2018, pp. 824-838).

To fulfill the company's goals and to monitor its performance, the necessary data are collected, analyzed and the necessary measures are chosen. From a technical point of view, unprocessed data is collected from the company's activity. After the data is processed and stored in data warehouses, users can access the information, which involves starting to analyze the process of resolving business questions (fig. 1).

Figure no. 1. How Business Intelligence works



Source: authors' processing

Limitations and Ethical issues

In some companies the limitations concerning BI systems would have as reasons: the initial price of the system is costly; data mining tools use sophisticated tools and they require the company to give additional training or even hire an external consultant which increase the costs of implementation; the implementation takes a long time; uncertainty in the success of implementation; poor quality of source data is responsible for the majority of the time and cost overruns during the implementations (Kascelan, 2011, pp. 19-30).

It should also be mentioned that ethical issues may arise in the field of BI, such as the potential of automation technology to give rise to job losses; the need to redeploy or retrain employees to keep them in jobs; fair distribution of wealth created by machines; the effect of machine interaction on human behavior and attention; the need to address algorithmic bias originating from human bias in the data; the security of AI systems (eg autonomous weapons) that can potentially cause damage; the need to mitigate against unintended consequences, as smart machines are thought to learn and develop independently (Schultz *et al*, 1994, p.305-314).

Romania and Business Intelligence

In Romania, only a third of companies use Business Intelligence type specialized solution, according to the consulting company Softlead. This field is developing and the first measures were taken to introduce in the labor code the occupations of business intelligence expert and business intelligence manager, outlining occupational standards, accreditation of courses in the field, and the

establishment of the Romanian Business Intelligence Professionals Association (Condureanu, 2015).

Among the companies that offer BI services in Romania are Relevance, Plaut Consulting Romania, Phoenix IT, Inteldiligence, KPMG, DYNTELL.BI, Play Solution.

Among the companies that use the Business Intelligence solutions in Romania, 76% are big or multinational companies, such as BCR (uses IBM Cognos Upgrade; George digital banking solution onboarding), Dacia - Renault Group - (Dacia Renault corporate cards monitoring solution), BNR (implementing the statistical reporting to NBR), Volskbank (Statutory Reporting Banking Solution Implementation), IKEA (IKEA cobrand shopping card implementation), Honeywell (Migrate dashboards from Tableau to Power Business Intelligence), Albalact, l'Oreal, SNAM (National Company of Mineral Waters).

Through this study, we want to identify the advantages and limitations of business intelligence solutions perceived by Romanian companies.

To do that we must identify the BI solutions offered by the companies that activate on the Romanian market and the companies on the Romanian markets that use BI solutions and how they transform the businesses.

3. Research methodology

The study was conducted between November 2019 and February 2020 based on questionnaires, on a sample of 260 respondents from urban areas, in positions of management, coordination or development of projects, internet users, aged between 27 and 59 years. 50.8% of the respondents are men and 49.2% women, respectively.

Among Business Intelligence solution users 29.3% stated that they target the testing of some Business Intelligence in their companies, 22% of them think about a higher number of reports and analysis in the existing solutions and 18% analyze the possibility of accessing, by more users, the Business Intelligence solutions already existing in the company.

From the category of respondents who do not use BI services 18% are planning to insert such a solution (undetermined period) and 10% intend to replace totally or partially the solution currently used.

4. Findings

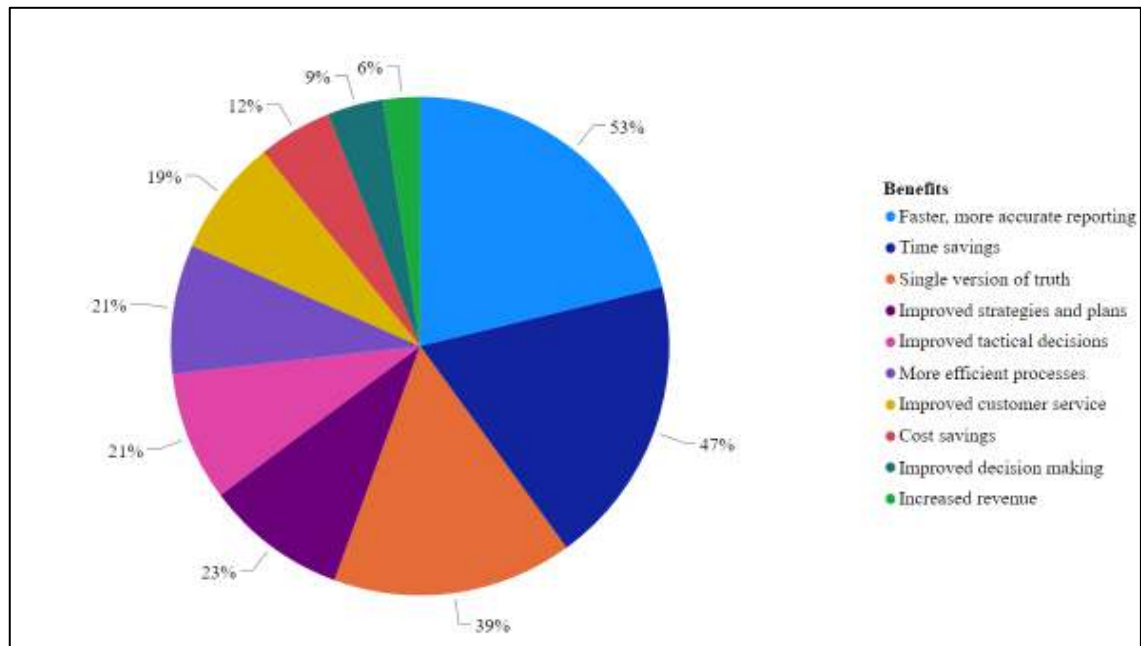
Among the benefits of using Business Intelligence, although many benefits are intangible, 53% of respondents opted for faster, more accurate reporting, 47% for time savings, 39% for a single version of the truth, 23% - improved strategies and plans, 21% - improved tactical decisions, 21% - more efficient processes, 19% - improved customer service, 12% - cost savings, 9% - improved decision making, 6% - increased revenue (fig. 2).

As any system has disadvantages, we wanted to find out the main limitations identified by users in Romania. 37% of respondents discussed the costs. Businesses that lack in-house skills or are unfamiliar with BI often have to outsource, which is where challenges of cost and maintenance come in. Due to their complex nature, smart technologies can be expensive and you can incur further costs for repair and ongoing maintenance. The computational cost for training data models can also be an additional expense. Software programs need regular upgrading to adapt to the changing business environment and, in case of breakdown, present a risk of losing code or important data. Restoring this is often time-consuming and costly.

29% mentioned as limiting skills shortage, the availability of technical staff with the experience and training necessary to effectively deploy and operate BI solutions.

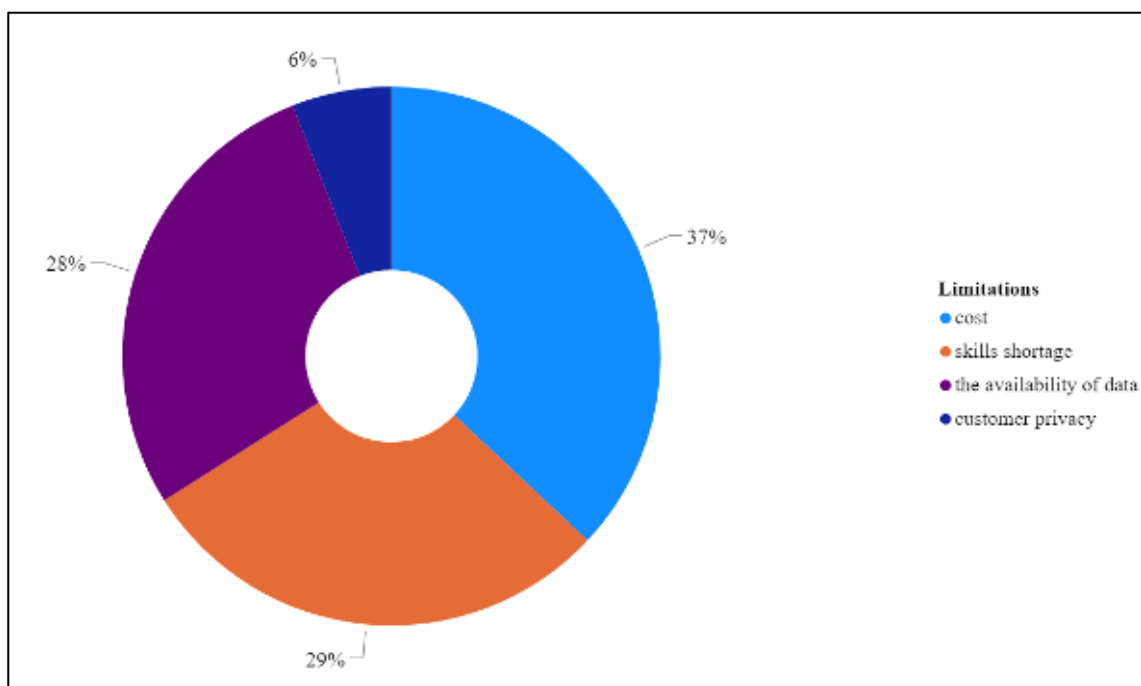
28% considered that the availability of data is a limitation because data is often soloed or inconsistent and of poor quality, all of which presents challenges for businesses looking to create value from Business Intelligence at scale. Only 6% considered customer privacy as a limitation (fig. 3).

Figure no. 2. The main benefits of Business Intelligence



Source: authors representation

Figure no. 3. The main limitation identification in Romania



Source: authors representation

Following the study, we found that 63% of senior executives report that analytics will be important for competitive advantage and only 2% feel that they've achieved a competitive advantage.

Similarly, 58% of Business Intelligence projects fail because of poor communication and not understanding what to ask and 55% of Business Intelligence projects fail because of technology, culture, and lack of infrastructure.

5. Conclusions

There is real business value for an organization to deploy packaged BI solutions. The question of whether to build or buy this application depends on several criteria. Given the cost, time-to-market, complexity, and other factors involved to implement robust and scalable BI solutions that will meet current and future needs.

By identifying new opportunities, as well as implementing beneficial strategies, companies can be offered a set of advantages in competitive markets, as well as stability.

Business Intelligence is a powerful technology invented to solve overwhelming data problems. This can eliminate inefficient bottlenecks, refine existing business processes, automate routine tasks, and introduce new levels of work organization and prioritization. It takes effort, but the results are worth it.

BI has many uses. Complementary to specialized analysis, it offers managers the opportunity to master or even dominate new markets, assess the demand and impact of marketing efforts and it can help payroll professionals give real management decision support within their organizations. To be successful, BI must be aligned with the company's business strategy. BI changes the way a company conducts business by improving business processes and transforming decision making to a more data/ fact/ information-driven activity (Sharda *et al*, 2019).

The Business Intelligence instruments market will, surely, continue growing, both as volume and as innovation level. There will be investments in analysis solutions that will assure the users' easy access, through one instrument, to a wide variety of data generated and collected from multiple sources.

We believe business intelligence plays a very strong role in the future of our industry!

6. Acknowledgement

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