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Business intelligence (BI) in decision support and corporate financial management

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Abstract:

Background: The increasingly present dynamism and the high level of competitiveness in the market are factors that encourage organizations to explore tools that make it possible to transform available data into strategic information to obtain a competitive advantage in the market of business intelligence tools, that is, business intelligence, influence organizational performance.

Materials and Methods: This article, through an exploratory bibliographical research, describes the importance of business intelligence in supporting decision-making and corporate financial management, denoting its concepts, its ability to generate important information, identifying the competitive advantages of business intelligence in the decision-making and management process financial.

Results: Companies that do not use BI tools may fail to extract important information to make accurate diagnoses, which can help the decision-making process and financial management. For this reason, they end up wasting a very rich asset, capable of increasing performance and market competitiveness. As a result, they are unable to react to the changes occurring in the market in an agile and efficient manner.

Conclusion: The research found that Business Intelligence enables access to strategic information in a fast and precise manner, thus optimizing the decision-making process and corporate financial management.

Key Word: Business Intelligence; Decision-Making Process; Financial Management.

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I. Introduction

With the technological advance and increase in market competitiveness, a product of the very evolution of knowledge that is continuously progressing through several fields in the last decades, organizations started to explore tools to help the decision-making process and financial management. Therefore, the management of various procedures started to be implemented in an intelligent way, combining efficiency and agility in obtaining information.

Management information systems allow important information to be obtained through the use of data. Thus, it is possible to monitor and control performance indicators through reports that aim at the company's sustainable growth. The use of Business Intelligence[1], as a tool to support the decision-making process and corporate financial management, is at the core of this work. These systems can work at different levels of management, whether strategic, tactical and operational, becoming essential for the success and even survival of organizations. In view of this, the article aimed to answer the following question: Can the use of Business Intelligence tools contribute to corporate decision-making and financial management?

In order to respond to this problem, the general objective of this article is to describe the importance of Business Intelligence in supporting decision-making and corporate financial management. Accordingly, the following specific objectives were established: to describe the concepts of Business Intelligence (BI), to identify the competitive advantages of this resource in the decision-making process and financial management, and to demonstrate the capability of Business Intelligence systems in generating strategic information for the decision-making process and financial management.

The methodology used to prepare this article is bibliographic, descriptive and exploratory research, carried out from a study of authors and works published in books, annals of scientific events, articles and scientific journals. The initial hypothesis is that Business Intelligence systems can help optimize the decision-making process and financial management in face of the constant transformations that occur in the market.

The concept of Business Intelligence, adopted in this study, refers to the ability to transform data into strategic information for the decision-making process and financial management so that it is possible to identify the competitive advantages of using these tools to support the decision-making process and corporate financial management. Thus, it is possible to increase profitability and improve the quality of products and services provided. In view of this, it is necessary to analyze the influence of business intelligence systems in the decision-making process and in corporate financial management.

II. Material And Methods

Procedure methodology

The methodology used for this article consists of bibliographic, descriptive and exploratory research. Regarding the proposed study, it is a bibliographic review, carried out from the theoretical survey of works written in electronic channels such as websites and electronic books, as well as the physical media such as books, scientific articles and proceedings of scientific events. This research is classified at the exploratory level since the main objective of exploratory research is to develop, clarify and change concepts, seeking the identification of problems or researchable possibilities for studies, providing an overview of the subject to be studied[2].

Scientific methodology is the systematic process employed by science to formulate and solve problems for the objective acquisition of knowledge[3]. The scientific method guides the sequence of steps to be performed in the investigation of the problem or phenomenon studied. Through observations and experimentation, based on the various magnitudes of a phenomenon, the scientific method seeks to produce practical and applicable knowledge used to predict and/or control phenomena or occurrences. A systematic literature review makes it possible to generate new knowledge about the reviewed topic by reviewing and synthesizing representative literature on a topic in an integrated manner[4]. In line with this, emphasizes that descriptive research has as its main objective, the description of the characteristics of a given population, or the establishment of relationships between variables, to establish the nature of that relationship[5].

Argues that exploratory research tends to be more flexible in its planning, as it aims to observe and understand the most varied aspects concerning the phenomenon studied by the researcher[2]. The most common exploratory research is literature surveys[2]. However, at some point, most scientific research goes through an exploratory stage, since the researcher seeks to become familiar with the phenomenon he intends to study. Therefore, the study uses an exploratory method of descriptive nature for its creation. So, the research is guiding for the evaluation of the objectives of this article.

III. Result and Discussion

Business Intelligence systems are essential for business success and even organizational survival. These systems can act at several levels of management, whether strategic, tactical, or operational. However, they are not limited to the business environment and can be used in several areas, such as healthcare, retail, public management, commerce, transportation, and information technology, among others.

"Many industries have adopted BI early, including healthcare, information technology, and education. All organizations can use data to transform operations[6]." In healthcare, BI can be used to collect and analyze data on patients, treatments, and outcomes to identify trends and patterns and improve the quality of care. In education, BI can be used to collect and analyze data on students, teachers, and schools in order to identify trends and patterns, and improve the quality of education. In politics, BI can be used to collect and analyze data about buyers, candidates, and campaigns in order to identify trends and patterns and improve the quality of the electoral process.

Information systems consist of a set of elements integrated with each other[1]. Such elements relate to each other and may be human resources, data, or processes that allow the extraction and obtaining of strategic information by processing the organization's data. Explains that "a system is a group of components that interact to achieve the same goal and produce information[7]." Consonantly, states that "business intelligence, in free translation, business intelligence, means the systematic analysis of external and internal business information related to a company's business[8]."

As the name implies, these are intelligence systems that have the capacity to collect and process available data, to transform them into strategic information for the company. Because of this, they can contribute to the decision-making process and corporate financial management. Business Intelligence (BI) can be understood as a process of transforming raw data into useful information to support effective business strategies[9].

"Business intelligence or Business Intelligence mean both a set of tools and applications that help in decision making, which allow interactive access, analysis and manipulation of mission-critical corporate information[10]". It ispossibletostate, therefore, that

> An information system (IS) can be technically defined as a set of interrelated components that collect (or retrieve), process, store, and distribute information intended to support decision-making, coordination, and control in an organization. In addition, information systems also help managers and workers analyze problems, visualize complex issues, and create new products[11].

Thus, Business Intelligence systems enable the analysis and creation of fundamental scenarios for the organization's strategic planning, facing an increasingly dynamic and fast-moving market. For this reason, the use of these systems becomes inevitable and increasingly indispensable.

Financial Management

Financial management is of substantial importance for the proper functioning of an organization. This is because financial management is responsible for defining the best allocation of resources, investments, and economic feasibility analyses, among other factors essential for business decision-making and for the proper functioning of the organization. Defines finance as "the art and science of managing money. It is, therefore, the process that allows making the best decisions regarding the operation of the company[12]. Financial management is related to the attributions of the financial manager in organizations[12]. Thus, managers are responsible for planning, granting credit, evaluating proposals, and raising funds for the most distinct types of organizations.

Financial management can guarantee the success or failure of an organization because the use and application of resources in a rational way are vital for a successful company. It is through financial management, with the use of BI, that it becomes possible to obtain precise and strategic information so that the decision-making process can be more assertive. "Financial planning formalizes the way in which financial objectives can be achieved. In a more summarized view, a financial plan means a statement of what the company should accomplish in the future[13]". In this segment,

Assures that corporate financial management has four functions[14], listed below:

1) Financial Planning: identifying the most profitable assets according to the organization's profile and identifying future problems and challenges, establishing minimum indicators to reach the company's profitability targets;
2) Financial Control or Comptrollership: the process that aims to control and evaluate the company's financial performance indicators, by means of comparative analyses between the budgeted and the performed, in addition to defining corrective measures, implementing these corrective measures, and verifying their effectiveness;
3) Asset Management: control of financial inflows and outflows, through cash flow monitoring and working capital management, to establish better activities and obtain the desired return on assets, considering risk and return indicators;
4) Liability Management: strategic analysis that manages the organization's capital structure, which aims to ensure liquidity, financial risk and cost reduction.

It is thus stated that financial management is directly linked to organizational results. Because of this, it is fundamental to have knowledge about the organization's financial situation in order to make the most appropriate decisions, as well as to carry out planning consistent with the picture. Therefore, it is important to define indicators and manage them to follow the organizational performance indexes.

Defines that financial planning provides the necessary coordinates to reach organizational objectives, being this planning vital for the good functioning of a company, so that, it is performed by the cash planning that involves the company's revenue forecast and by the profit planning created based on projections and financial statements required by the creditors[15]. The financial administration aims to optimize the management of the company's resources, presenting the best alternatives for the allocation of financial resources. Thus, it raises the organization's economic indicators, contributing significantly to the achievement of the objectives and organizational goals. Because of this, tools that enable fast and dynamic access to financial indicators are essential for efficient financial planning.

Decision-Making Process

The analysis and transformation of data is increasingly present in the business world due to its strategic nature, as it enables the identification of risk factors and provides business opportunities to implement improvements by enriching organizational knowledge. As a result, it is possible to make more assertive decisions and optimize the company's performance. According to Laundon and Laundon (2014), decision-making is a continuous process and consists of four steps: the first is identifying the problem, the second is proposing a solution, the third is evaluating the proposals, and the fourth step is choosing the solution and implementing it. The aforementioned process has become dependent on information obtained, so that technology routinely elevates the quantity and quality of information[16].

Through the data available in organizations, it is possible to identify problems that can directly impact organizational performance. Thus, the information must necessarily be accurate and high quality so that it is possible to have the exact picture of the organization. Managerial tools are of a qualitative and quantitative nature, through which it is possible to generate important information for decision-making through the use of databases, enabling accurate information in face of organizational issues[17]. State that the relationship between information systems and financial services is so strong that many advise economics students to major in information systems to complement their education[11]. According to the authors, financial managers are involved in the implementation of strategies related to the use of information systems because they work directly with top management and the board of directors, with the aim of ensuring financial return, a good application of resources, and the achievement of organizational objectives.

Therefore, Business Intelligence systems can be important allies for financial managers, since they generate strategic information for the most distinctive organizational environments. Thus, it is possible to identify where resources are being allocated to then visualize fundamental scenarios for the company's strategic planning. Also state that information systems contribute significantly to decision making, since they enable employees at lower levels to access fundamental information about the organizations[11]. The democratization of information, in the company, is an important ally for organizational performance, because it allows stakeholders to verify, in a faster way, indicators that are not under the responsibility of senior management, but that directly affect the performance of the organization.

The use of Business Intelligence in generating strategic information for the decision-making process and financial management

The practicality to gather information in an integrated manner with management systems provides an opportunity for the use of BI in organizations, aiming to establish strategies, analyze data, and monitor performance indicators. BI systems require four elements for their implementation[18]:

1. Data Warehouse: stores the data taken from the company's systems and aims to query and manipulate the data, allowing the creation of filters and graphics through the relationship of data from all departments, to obtain strategic information that provides a competitive advantage;
2. Business analysis: represents the processing and use of tools to manipulate and analyze data;
3. Information management: monitoring and creating indicators and established goals, which enable a comparative analysis regarding organizational performance.

Enable the user interface

When using a BI system it is necessary to consider the operational management models, the needs and functions of personnel, the internal processes, and the systems that are already used in the organization[8]. Thus, BI systems use the data that is extracted from the systems used by the company so that this data is manipulated to obtain important information for analysis and business management. Therefore, it is necessary that strategic users have access to this information, so that the management and monitoring of these indicators can be performed.

BI enables the extraction of correlated information from the most diverse sources, so that this data can be grouped and organized to provide support in decision-making[19]. In this sense, states that knowledge is power and, therefore, access to correct and updated information makes it possible to allocate resources to the areas that will bring more benefits, besides allowing the identification of processes or part of processes that need urgent actions[8]. Having the right information in the shortest amount of time possible is a valuable tool for the growth and even the survival of the organization. The market is increasingly dynamic and competitive. With this, thorough control of the company's indicators and its main market competitors becomes necessary.

Data is the fundamental input for information production, and information can be taken as the result of processing, quantifying, and structuring this data[18]. According to the scholar, information is a great source of competitive advantage, because through it organizations identify, in an anticipated manner, the possibilities and actions of market competitors. This process ends up enabling more agile actions and even the anticipation of solutions, the development of new services or products so that the organization focuses on using more energy on strategic opportunities. Therefore, it is important to use the best tools available to transform data in organizations, since these tools can be important assets to obtain a competitive advantage in the market.

Convergingly, say that decision-making can be automated through algorithms, which identify the problem and precisely define the steps to be followed[11]. In such cases, decisions are made more quickly, so that they become faster, compared to monitoring by managers. Therefore, it is critical that these systems are well-aligned and closely monitored to avoid losses. The Business Intelligence system has three main objectives: the first is to enable access to data in an interactive way, the second is to allow the manipulation of this data, and the third is to provide managers with information that enables proper analysis, with the purpose of the decision-making process being more agile and efficient, resorting information already available in the organization[18].

As a result, these systems can be considered great allies for strategic management and decision-making, since they allow an interactive and dynamic analysis, speeding up and shortening organizational processes. Knowledge can be understood as the assimilation of experiences acquired with the references used for evaluation and incorporation of new knowledge[18]. So, knowledge has a high degree of reliability and relevance, becoming a fruit of access to information, through the construction and aggregation of value to it. In this way, BI systems allow a comparative analysis, enabling a more precise and usual performance control, making evaluations more agile and dynamic, and thus enriching the organizational knowledge.

Power BI

Currently, there are several BI tools on the market. But, for research purposes, this paper will address the Power BI tool, which is a Microsoft BI system. Briefly, it is "[...] a collection of software services, applications, and connectors that work together to transform your unrelated data sources into coherent, visually engaging, and interactive information[20]". Defines Power BI as a tool focused on information visualization, through interactive and virtual dashboards, making this tool fundamental for the strategic administration of organizations, because it offers these resources in an integrated and dynamic way[21]. Similarly, "Power BI brought simplification and agility to elaborate administrative practices[22]". Power BI is a Microsoft tool that enables the transformation of data into dynamic and interactive dashboards, through which the main indicators are presented so that managers can view, in real-time, updates on the organization's behavior. An example of this is the financial and performance indicators, fundamental factors in the decision-making process.

Competitiveadvantagesof Business Intelligence in thedecision-makingprocessand financial management

The systematic analysis provided by BI tools aims to identify the most appropriate paths, according to the problem, making a difference in the creation of solutions, aiming to provide better services to customers, increase profits, and operate more efficiently. Thus, organizational financial management is optimized, changing the work organization, its evaluation and improvement methods, to enable the teams to work in interconnected data networks. For this reason, it is important to analyze the influence of the use of these tools for the decision-making process and financial management.

States that BI provides intelligent and updated information to the most distinct areas, allowing the integration of data from various sources, and providing the analysis of cause and effect that optimizes the monitoring of processes and decision-making[23]. BI thus allows relating data from the most diverse sources, making the quality of information higher and more detailed, since it relates the most distinct variables, becoming the knowledge base of the business organization. The operating result is the result of all income and expenses. The result is, therefore, the fruit of the set of operations[8]. That said, the improvement of a process improves organizational performance, impacting the entire production framework of the company. A vision of the beginning and end of the process, in this sense, becomes essential.

The tools that allow broad access to the main organizational performance indicators are a great ally in this process because they signal the areas that are running away from the desired indexes. Not using such a resource can, therefore, negatively impact organizational performance.

Companies are always in search of the best results in order to increase profitability. Because of this, tools, technologies, and information systems are important allies to achieve high levels of efficiency and productivity and ensure the survival of the organization in an increasingly competitive market[11]. One of the great benefits of using BI in organizations is the ability to provide accurate information in an agile manner and in real-time[18]. This, this information is of great importance for the decision-making process and for the organization's strategic planning. These are in constant search to achieve performance; therefore, it is essential to use the best tools to monitor and control the organizational performance indicators.

To obtain the best results, agility and precision are required. For this reason, BI systems are important allies for the elaboration of the organization's strategic planning, since they allow the supply of strategic information in real-time. In this segment, state that many managers work blindly, relying on luck, without being able to count on accurate information at the right time[11]. Such a factorcan lead to over orunder-production, misallocationofresources, andexcessive response time, which causes financial lossesandcustomerlosses.

The tools that allow broad access to the main organizational performance indicators are a great ally in this process because they signal the areas that are running away from the desired indexes. Not using such a resource can, therefore, negatively impact organizational performance. "You do not manage what you do not measure, you do not measure what you do not define, you do not define what you do not understand, there is no success in what you do not manage[24]." Also assures that it is not possible to manage without having the right information so the decision-making process is affected by the available information[25]. Becauseofthis, ifthere are inconsistencies in theinformation, the business performance willbeaffected.

Maintains that companies benefit from these systems with guaranteed risk reduction, better use of resources, process improvement, and decision-making through the use of concrete information, which provides the elaboration of strategies for both the present and the future[18]. The strategic planning of the organization benefits from these systems, as it allows for the creation of specific scenarios and, based on this, define the best strategies for resource allocation and use. Administrators need systems to help them in the decision-making process because attributions such as planning, organization, leadership and control are of fundamental importance for organizational success[25]. Such attributions, when well performed, can mean an important competitive advantage. Still, the main advantages of implementing information systems to support decisions[25] are:

- Improved productivity;
- Reduced costs and expenses;
- More assertive decisions;
- More effective planning;
- Business growth;
- Better results;
- Vision of the future;
- Creating more effective strategies;
- Decreased business risk.

BI systems can measure information of fundamental importance for organizations. However, to be able to use these tools fully, it is necessary to translate the data into the main organizational indicators and, based on these indicators, develop scenarios and carry out the organization's strategic planning, whose actions provide optimization of the decision-making process and corporate financial management.

Disadvantages of not using Business Intelligence

Business Intelligence systems are strategic tools to control and monitor organizational performance indicators, providing the identification of operational failures, which can harm the company's performance. In view of this, companies that do not use such tools can face a series of setbacks. Successful companies, are those that learn to use new technologies, manage to achieve operational excellence, creation of new products, design of new services and business models, improved relationships with customers and suppliers, improved decision-making, competitive advantage, and survival[11], as can be seen below:

1. operational excellence: organizations are in constant search to raise operational efficiency in order to increase profitability;
2. New products, services, and business models: technologies and Business Intelligence systems are important allies to create products, services, and business model
3. Relationship with clients and suppliers: companies are able to map, in a more efficient way, the clients' profile, enabling the creation of more effective strategies to increase revenues, besides improving the response time for suppliers;
4. Better decision making: the supply of more precise information and with more agility optimizes the decision-making process;
5. Competitive advantage: the organization gets better results than its competitors, spending fewer resources to get superior products, making the response time to customers and suppliers more agile and fast, increasing profits and competitiveness;
6. Survival: enables the organization to identify market changes more quickly, increasing its ability to respond and formulate market strategies.

Many organizations fail to conduct in-depth analysis of organizational performance. Thus, the lack of strategic information causes a drop in business performance. BI tools enable the enrichment of the company's knowledge so that they can identify market opportunities, making these tools fundamental to obtain a competitive advantage. Companies that do not invest in data analysis face three main problems[26], as follows:

1. Disorganization: when the company does not perform data analysis, much of the information becomes disconnected or lost, so that, it is not possible to perform an accurate diagnosis of the company's situation.

2. Little value added to the activities: the decision-making process is compromised by the lack of analysis, thus unnecessary expenses may go unnoticed. Another important issue is rework, which can cause a loss of productivity, operational delays, and a drop in performance.
3. Lack of standardization and motivation in processes: due to the absence of BI systems, the indicators are not collected, so it is not possible to identify the main operational bottlenecks, leading to low productivity and poor distribution of tasks.

Companies that do not use BI tools may fail to extract important information to make accurate diagnoses, which can help the decision-making process and financial management. For this reason, they end up wasting a very rich asset, capable of increasing performance and market competitiveness. As a result, they are unable to react to the changes occurring in the market in an agile and efficient manner.

IV. Conclusion

This article studied the use of Business Intelligence to support decision-making and corporate financial management, since, with the increase in market competitiveness, organizations need to have mechanisms that enable access to information. This information must help the decision-making process and financial management in a fast and precise way, in order to guarantee increased competitiveness and organizational performance. With the purpose of describing the importance of Business Intelligence in supporting decision-making and corporate financial management, three specific objectives were defined for this article. The first objective was to describe the concepts of Business Intelligence, the second was to identify the this information system's competitive advantages in the decision-making process and financial management, and the third was to demonstrate the capacity of Business Intelligence systems to generate strategic information for decision-making and financial management.

Having said that, by means of bibliographic, descriptive and exploratory research, it was verified that Business Intelligence systems influence organizational performance, by providing strategic information for decision-making and corporate financial management from different organizational levels, thus raising the company's performance and market competitiveness. In this sense, through the authors who supported this study, it was identified that the Business Intelligence systems can be a great ally to optimize the financial management and corporate decision-making process because they provide managers and other interested parties access to strategic information with greater speed, agility and precision, which makes companies adapt more quickly to the changes occurring in the market.

Such adequacy contributes to the provision of privileged information to assist the decision-making process. Therefore, these systems can transform the processes and operations related to organizations' financial management in a way that makes it possible to increase profitability, improve the quality of products and services provided. In terms of the authors mentioned in this research, it was found that technology and information systems can be used to create new products, services, and process optimization, among other functionalities. Thus, when they are well aligned with the organizational objectives, they make it possible to add value to the business by developing strategies and enriching business knowledge, fundamental factors for increasing market competitiveness and organizational performance.

The main bottleneck for this article was the search for up-to-date bibliographical research. In this way, the preparation of this article was enriching and sought to contribute to new research on the subject, aiming to contribute to the analysis of tools that can help improve organizational performance. Therefore, it is suggested that further research be conducted to compare the tools that can be used to optimize the decision-making process and corporate financial management. As from the authors that support this research,it was verified that Business Intelligence is a tool with high potential to obtain a competitive advantage, which enables the optimization of the decision-making process and financial management. Consequently, it makes it possible to achieve operational excellence, optimizing the use and application of resources in an increasingly dynamic and fast market, besides making it possible to respond to customers and suppliers in a more agile, dynamic and assertive way, a fundamental factor to maintain competitiveness and survival in an increasingly technological and dynamic market.

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