

The Contribution of Business Intelligence to The Agility and Organizational Performance of Small and Medium-Sized Enterprises

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ABSTRACT

In a business context where the digital transformation of processes and activities is accelerating, the role and importance of information technologies (IT) for the operation and performance of companies is an undeniable reality. However, despite the advantages that IT brings to companies, they face particular challenges in terms of the strategic and technological choices available to them. More specifically, due to a lack of resources and skills, both strategic and technological, many companies are struggling to make the right decisions and have a competitive advantage as well as to reach the level of sustainable business

performance. This difficulty in making good decisions in business is frequently observed with small and medium-sized enterprises (SMEs) which, despite the existence of these different technological tools and the many benefits that they can bring in their management, still have problems of making good decisions which is crucial to ensure the commercial, economic and financial development of their companies, but above all to face competition and to have a sustainable competitive advantage. The conceptual models developed in this work reveal that the general performance of SMEs can be achieved by combining the right strategies and effectively using the decisions made in the channel of technological tools. This study has certain limitations because the conceptual models developed come from the previous studies identified. However, it will pave the way for other researchers who will be interested in further thinking.

Keywords: Business intelligence, SME Performance, Decisions making, Small Firms, Organizational Performance, Agility, Organizational Agility.

INTRODUCTION

Due to increasing globalization and rapid technological changes in the digital age, small and medium-sized enterprises (SMEs), like large enterprises, face new challenges and strategic issues. However, to respond adequately, they must adopt business strategies that will enable them to cope with the markets' vagaries and survive in the dynamic and changing conditions of ecosystems unique to the digital age.

The scientific literature suggests that information technologies can increase business performance provided they are adapted to

the characteristics of each organization, including its strategy, structure, and environment (Henderson and Venkatraman, 1993). It is in this perspective that we support technologies such as BI, which are not only capable of managing a company's data but also its decision-making management. Indeed, BI technologies allow organizations to take charge of the information management processes for decision making, and then to have data on a raw material that has no meaning in itself, but which is then stored, processed, and transformed to obtain meaningful information, allowing companies to make the right decisions. Its creation and use in companies are intended to support the decision-making process at the management level. Nevertheless, until now, there is no clear approach for its adoption (Becerra-Godinez et al., 2019).

Hence the uncertainty as to the best approaches to adopting these tools in the context of SMEs. However, the latter are facing enormous changes due on the one hand to factors such as market competition, trade policy, and global partnership (Ong et al., 2011), but also an admittedly strategic situation of digital transformation. While, on the other hand, it is about change in customer interests, market demands, prices, and supply chain management (Ali et al., 2017). These changes offer both opportunities (such as flexibility, low-cost networking, cost reduction, and rapid communication) and threats (eg, information security threat, order disruption).

Nowadays, companies collect thousands of data from their customers and stock it in their ledger and database. What do they do with their data? Does this collected data allow them to make good decisions to achieve their strategic business objectives? According to a study by NewVantage Partners (2020), 98.6% of leaders believe that their organization aspires to a data-driven culture, this initiative was only successful for 32.4% of them. Similarly, an IDC survey located in Bastien's (2019) article suggests that one in four companies see 50% of their BI projects

fail (Bastien, 2019). Yet, SMEs, as well as large enterprises, are investing heavily in various IT tools including BI tools, in order to be more profitable, reduce data processing time, increase revenue and have relevant information to make good decisions, as well as have a competitive advantage.

On the other hand, companies have been struggling to make the right decisions until now, due to a lack of relevant information, among other reasons. Nevertheless, data is considered the critical element that helps to improve decision-making in an organization, which allows a company to be a player in the digital age (Becerra-Godinez et al., 2019). It should be noted that the abundance of IT in the digital age has certainly brought many benefits and opportunities to businesses, including SMEs. In particular, having the ability to operate more efficiently and utilize IT is essential for business survival and prosperity (Li et al., 2016).

At the same time, however, this generates a marked increase in volatility, as well as greater uncertainty in the markets and products that are quickly replaced or become obsolete (Tallon and Pinsonneault, 2011). Not to mention that failures to implement BI tools in the context of SMEs are often due to the fact that they encounter more difficulties at the technological and strategic levels. Then, due to a lack of resources and skills to properly evaluate the contribution of the technologies they implement to their strategic objectives, there is a form of weakening of these organizations (Pelletier and Raymond, 2016). In addition, recent scientific writings suggest that there is very often a lack of quality information, standardized processes, information flows, and due to their limited resources, SMEs are often stuck in carrying out projects, large-scale IT projects (Becerra-Godinez et al., 2019; Cloutier and Pelletier, 2020).

Consequently, SME managers keep asking themselves questions about the return on the investment that these IT tools are

supposed to bring to their companies while considering more their capacity to react quickly to the unpredictable changes and the dynamic conditions of the market. the business ecosystem and therefore to be more agile at all levels of the organization (Li et al., 2016), as well as to have organizational performance.

Given the situation faced by SMEs, *we want to determine whether investing in BI still brings agility and performance to SMEs.*

The globalization of markets and electronic business is bringing about profound changes in the functioning of organizations, and in particular in the use of information technology (IT). These changes are pushing companies to make good strategic decisions to stay competitive and survive in the markets in which they interact. However, strategic decision-making is a major problem for SMEs (Raj et al., 2019). Therefore, managers decide to turn to BI for better business analysis and especially to have relevant information that can facilitate good business decision-making. It is in this context that we raise a fundamental question, namely: How does BI contribute to the agility and performance of SMEs?

The objective is to demonstrate that BI would contribute to the performance of SMEs in order to strengthen the capacities of SME managers and help them better understand these BI technologies in their respective SMEs. Indeed, the objective in carrying out this work is to be inspired by BI adoption models, which can strengthen the strategic capacities of SMEs when choosing the solution, adopting, and implementing BI in their management. This study includes introduction, a literature review, a discussion and a conclusion.

LITERATURE REVIEW

This section aims first to better understand the different concepts of this study namely, SMEs, business performance, and the schematic representation of all the variables helping to better elucidate the process of adoption of BI in the business context. It is then presented the different theoretical perspectives that the literature has adopted to date to describe the process of adoption and implementation of BI in companies as shown in Table 1.

Table 1. Definition of key research concepts

<i>Concept</i>	<i>Definition</i>	<i>Authors</i>
Business Intelligence	The concepts of business intelligence and analysis include tools and technologies that support a set of user communities in an organization, as a result of the collection and 'organization of multiple data sources to support decision making at operational, tactical, and strategic levels.	(Loshin, 2012)
Small and medium-sized enterprises (SMEs)	A small and medium-sized enterprise (SME) is a business whose income, assets, or number of employees are below a certain level. The criteria for determining an SME vary between countries and sometimes between industries (Ward, 2020). In the European context, SMEs are defined as having less than 250 employees, an annual turnover of fewer than 50 million euros, or a balance sheet total not exceeding 43 million euros. On the contrary, in North American contexts it is defined as having 500 employees or less, whereas in wholesale trade it is generally 100 employees or less.	(Ward, 2020, Matt et al, 2020).

Information Technology and SMEs	<p>Information technology (IT) is widely regarded as capable of delivering considerable strategic and operational value to organizations. SMBs use IT for many purposes, including improving efficiency, reducing costs, and providing better service to their customers. This IT should provide SMEs with a competitive advantage as well as better integration between business partners in the supply chain. However, there are barriers to the use and adoption of IT in SMEs which can broadly be classified as internal and external.</p>	(Afolayan et al, 2015)
Cloud and Small Business	<p>Cloud computing is a model for convenient, on-demand network access to a shared group of configurable computing resources (e.g., network, servers, storage, applications, and services) that can be quickly provisioned and released with minimal management effort. or interaction with the service provider. Cloud computing extends today's use of IT as a service over the network (Internet). Its main objective is to reduce the cost of IT services while increasing efficiency, reliability, availability, and processing. Cloud computing is more acceptable to SMBs eCloud is a model for convenient, on-demand network access to a shared group of configurable computing resources (eg, network, servers, storage, applications, and services) that can be quickly provisioned and released with minimal management effort or interaction with the service provider. Cloud computing extends today's use of IT as a service over the network (Internet). Its main objective is to reduce the cost of IT services while increasing efficiency, reliability, availability, and processing. Cloud computing is more acceptable to SMBs because</p>	(Chang, 2015, Rao-Graham et al., 2019)

	of its relative advantages, flexibility, and scalability features.	
Organizational Agility	Agility is the ability of the organization to detect changes in the business ecosystem, to respond effectively, promptly, and efficiently, to improve organizational skills.	(Kawtar et al., 2017, Arokodare et al., 2019).
Sustainable performance of SMEs	The performance of SMEs can be understood from a quantitative and qualitative point of view. In general, various factors of the internal environment, which potentially influence the performance of SMEs. To survive, succeed and achieve sustainable performance, SMEs must effectively deploy and combine their physical, human, and organizational assets.	(Cicea et al, 2019)
Good Decision Making	Decision-making is an essential activity for the management of any business. It can be defined as a plan of action chosen purposely from a set of alternatives to achieve organizational or managerial objectives or goals. Successful business performance depends on many of these decisions. The performance of SMEs and, ultimately, the competitive advantage are based on these decision-making processes.	(Rocio, 2016)

The term business intelligence was first used by Luhn Hans (1958), who referred to an automatic system needed to accept information in its original form, disseminate data quickly to the appropriate places, and provide requested information. “We call it a Business Intelligence system” (Luhn, 1958). The ability to understand the interrelationships between available facts to guide action towards a desired goal (Gagné, 2018) was reintroduced by Howard Dresner in 1989, seen in the article by Raj et al. (2019), who suggests that BI systems are specialized computer systems

that combine collected data, data storage, and knowledge management with analytical tools to present complex and competitive information to planners and decision-makers (Raj et al., 2019).

According to Blais (2017), “the purpose of business intelligence, through a computerized architecture, is to collect data from an entire information system to transform them into a series of indicators and lines of analysis aimed at providing reliable information to facilitate decision-making and thus improve the performance of the organization”. Its objective, according to Gagné (2018), is to transform data into a lever for growth by offering a synthetic view of current (or even forecast) activities after having collected and modeled company data from sources as varied as spreadsheets, databases, text files, or web services. In its current functioning, BI encompasses the various tools, applications, and methodologies to provide decision-makers with the right information at the right time through reports, dashboards, and statistics (Gagné, 2018). The benefits of BI on the bottom line of companies are time-saving, cost reduction, return on investment (ROI), better strategic plans, decisions, and satisfaction (Tatic et al., 2018). BI is now emerging as a separate stream in the strategic management literature related, to SMEs, to competitive advantage and organizational agility (English and Hofmann, 2018).

Organizational agility

Agility is the capacity of the organization to detect changes in the business ecosystem, to react in a timely and efficient manner, to improve organizational skills (Kawtar et al., 2017; Arokodare et al., 2019). Agility is not only reactive, but it also supports the proactive identification of emerging business opportunities in the context of change. (Harsch and Festing, 2020). In addition, Tallon and Pinsonneault (2011) suggest that agility is the ability to detect

and respond to opportunities and threats with ease, speed, and dexterity. Thus, put in parallel with the notion of alignment, this concept can be considered as a key element and undoubtedly an important component for the survival of the company in the digital age (Kawtar et al., 2017; Cheng et al., 2017; Cheng et al. Siau, 2020). Even though the digital age transforms businesses with the help of IT, each business unit remains integrated with the others. This is why the scientific literature also evokes the idea of support capacities for the company, that is to say, those which allow taking dynamic, rapid measures, as well as appropriate actions (Widjajani and Nurjaman, 2019). Specifically, strategic agility creates the organizational capacity to continuously adjust and adapt with strategic direction to achieve overall business performance (Arokodare et al., 2019). On the other hand, following the conditions of the business ecosystem in the digital age, the adoption of organizational agility will improve the continuous and adequate adjustment of the organization towards a dynamic business ecosystem and adapt in time, while maintaining the strategic direction of the organization in the heart of the business, and taking into account changing circumstances as well as the volatility of the business world (Arokodare et al., 2019). It is from this same perspective that Widjajani and Nurjaman (2019), indicate that strategic agility means that organizations can take quick, decisive, and effective actions to anticipate and achieve change. They add that strategic agility can improve the efficiency of a company's operations to turn investments into a product, at the right price and available everywhere. This is a major asset for the success of SMEs (Widjajani and Nurjaman, 2019).

The impact of BI on the organizational agility of SMEs.

As we mentioned in our introductory part, BI makes it possible to support decision-making processes in most organizations (Chen

and Xiao, 2020), so that they can make adequate and timely decisions, gain a competitive advantage, and maintain a distinct long-term strategy in a turbulent business ecosystem (Knabke and Olbrich, 2016). Both SMEs and large enterprises are facing the turbulent situation of the business ecosystem especially with the flood of IT in the digital age. Hence, it is, therefore, crucial to know that the key success factor for a successful company in a dynamic business environment is good decision-making accompanied by an efficient and flexible digital strategy capable of coherently supporting other organizational strategies, as well as business processes (Henderson & Venkatraman, 1993). We will then speak of organizational agility in the sense that it expresses all the capacities of a company to develop, prosper, and adapt quickly to changes in an unpredictable and constantly moving ecosystem (Walter, 2020; Harsch and Festing, 2020). BI is increasingly challenged by the turbulent and dynamic business ecosystem (Chen and Xiao, 2020; Knabke and Olbrich, 2016), which generates changing requirements thus requiring SMEs to develop dynamic capacities and have more flexibility in the use of their business strategies and data, as well as having a good adaptation of information delivery that can support an increasing amount of data that must be integrated into their decision-making processes (Knabke and Olbrich, 2016). Chen and Xiao (2020), argue that the purpose of BI is to collect, store, access, and analyze data, including data on customers, partners, operations, and other information about changes in the environment. This gives it the ability to detect changes in the business ecosystem and therefore, its use in the organization will help increase organizational agility by improving organizational capacities, performance management capacity, management capacity. customers, and process management capability (Knabke and Olbrich, 2016).

Small and medium-sized enterprises (SMEs)

SMEs are defined as relatively small industries that are actively managed by their owners, highly personalized, largely local in their area of operations, and largely dependent on internal sources of capital to finance their growth (Ali et al., 2017). According to Tremblay (2021), small and medium-sized enterprises (SMEs) are businesses whose size, defined based on the number of employees, the balance sheet, or turnover, does not exceed certain limits; the definitions of these limits differ according to the country or countries. In the Canadian context, the SME is a business that must not employ more than 500 people, must not have assets exceeding \$ 25 million, and must not be owned more than 25% of its capital by a company of greater importance (Tremblay, 2021). A study by Innovation, Science and Economic Development Canada (2020), argues that “in December 2017, the Canadian economy had a total of 1.18 million businesses with employees. Of these, 1.15 million (97.9%) were small businesses, 21,926 (1.9%) were medium-sized businesses. In the same year, small businesses employed nearly 8.29 million people in Canada, or 69.7% of the total private-sector workforce. These represent a real heavyweight for Canada's economic growth”. Very often, SMEs are the main drivers of innovation, despite their limited resources (Mois and Borza, 2019). In addition, SMEs are recognized as key players in the economy and large business ecosystems in many countries around the world (Matt et al, 2020).

They have also overwhelmingly been recognized for their increasing contribution to the economic development of a country and their constant and increasing contribution can be seen by providing income-generating activities, thus increasing the growth rate of real income per capita, balancing the distribution of income, and improving economic stability (Ali et al., 2017). However, the development of SMEs strongly depends on their manager or leader.

Binkkour (2016) argues that the leader of the SMEs remains the keystone of any organizational system in the operation and organization of the SMEs. Thus, all fundamental decisions go through the manager, from where he must have a good perception, a good decision-making style, a good vision, and a good profile to consider the innovation and the performance of his company. It plays a crucial role in the entire decision-making process (Binkkour, 2016). In addition, Gagné (2018) argues that business leaders and by extension all those who need to make important decisions are faced with a major challenge, namely having reliable information to act quickly and in full knowledge of the facts. Although IT and tools that can enable data collection, such as applications, databases, social media, and more, are present in many SMEs these days; do they manage to extract a unified view among the thousands of data collected and produce relevant and usable information for better decision-making? This is where the importance of BI in SMEs comes from (Gagné, 2018).

Small and medium-sized enterprises and business intelligence

According to Torres (2008), BI in the context of SMEs is the set of processes and technologies that enable the management and executives (leaders) of a company to make more informed decisions. The author also maintains that the process of obtaining reliable information with the use of BI is very complex, especially since it begins with the processing of millions of data already collected by the company and then proceed to assemble these data, structuring them, and implementing them in interpretation processes to produce reliable information from which we can act (Torres, 2008). This process facilitates the structuring of company data and allows easy and efficient decision-making. Companies spend a lot of their time collecting data.

A study by Torres (2008) confirms that companies have always had armies of analysts who spend 80% of their time gathering information and 20% analyzing it. Business intelligence aims to turn the tide and get them to spend 20% of their time gathering information and 80% analyzing it. Therefore, we say that BI simplifies the information management process, intending to inform and accelerate decision-making (Torres, 2008). It is important to know that BI is used more by large companies than SMEs. However, large companies, as well as SMEs, have the same challenges in terms of innovation. They are looking for competitive advantage or organizational performance and all seek to answer the following questions: Who are my best customers? What products or services sell more and under what circumstances? What factors stimulate or hinder profitability? And any other question of the same order (Bélanger, 2014). But, we must remember that between the two types of businesses, SMEs run a higher risk when difficulty arises. Since they are smaller in scope and generally market fewer products compared to larger companies. Consequently, it is undoubtedly more important for the SME to constantly watch over the evolution of these assets, the profitability of these products or services, and to put in place effective strategies allowing them to obtain precise and relevant answers to the questions linked to its competitive nature and profitability (Bélanger, 2014) using, in particular, the technologies presented in Table2.

Table 2. Some examples of BI technologies

<i>Technologies</i>	<i>Definitions</i>	<i>Authors</i>
Enterprise Ressource Planning	The concepts of business intelligence and analysis include tools and technologies that support a set of user communities in an organization, as a result of collection and	(Loshin, 2012)

(ERP) and BPM	analysis. 'organization of multiple data sources to support decision making at operational, tactical, and strategic levels.
<i>Online Analytical Processing</i> (OLAP)	“OLAP, or Online Analytical Processing, is a computer processing technology that allows a user to easily view and extract data for comparison in different ways. The time to launch queries against relational databases and produce results faster in the form of dashboards for companies. (Bastien, 2018).
Cloud computing	Means “Common online utility, independent of location, available on-demand”. It has been defined as the practice, or model, of using a network of remote servers hosted on the Internet for the storage, management, access, and processing of data. There are three types of cloud service namely: Infrastructure as a Services (IaaS), Platform as a Service (PaaS), and Software as a service (SaaS). Enterprise cloud also has three deployment models, which are public cloud, private cloud, and hybrid cloud. (Belyh, 2019; Rostek et al., 2012; Sang et al., 2016).

BI Applications

When it comes to BI applications or software, there are several ranges to support business decision-making. These allow companies to do comprehensive and personalized data analysis. They also make it possible to establish dashboards and to carry out strategic studies based on real-time information as shown in Table 3. As mentioned above, there are several applications of BI, however, it is not retained only five applications, following their "open source" characteristics and their adaptability to SMEs.

Table 3. Some BI applications

<i>Applications</i>	<i>Definition</i>	<i>Authors</i>
BIRT (Business intelligence reporting tools)	BIRT was first launched in 2004 as an open-source analysis platform helping to produce visually appealing reports. Birt can extract data from many different sources including databases, web services, and Java objects to create a report.	(McKenzie, 2015)
Jasper Report	JasperReport was first launched in 2020, it is one of the largest and most widely used “open-source reporting” tools and is capable of using data from any type. data source.	(Hoffman, 2020)
KNIME	KNIME is an open-source BI tool that integrates various components for data mining and machine learning. The data can be enriched using several commercial extensions that can be used.	(Hoffman, 2020; Fedouaki et al., 2013)
Inside Software	Created on the following premise: 80% of companies use Microsoft Excel. On the other hand, few of them can create effective management reports or tools due to a lack of knowledge and/or training on this tool. Infine0 has therefore developed Inside. Inside's goal is to: - Facilitate data collection with a multitude of APIs and direct database access. Automate report creation with simple and efficient authoring tools. And automate the distribution of reports both by email and on mobile media (tablet and mobile phone).	(Bastien, 2018)
Power BI	Power BI from Microsoft provides comprehensive data management. Power BI is the most comprehensive business intelligence tool in its class and allows you to quickly and easily generate dashboards so that you have strategic information at all times. Power BI combines power analysis with a friendly user interface (UI)	(Baker, 2019)

	and remarkable data visualization capabilities. Customers have a choice of a limited free version or the professional version (which starts at \$ 9.99 per user per month). The free service is designed for individual users and offers only 1 gigabyte (GB) of storage with daily refresh cycles and the professional version offers (10 GB) of data storage. It is one of the best BI tools on the market.
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Architecture

BI architecture refers to the infrastructure that organizations use to define their data collection flows, information administration, and all the technology that supports their BI (Sisense, 2020). Both SMEs and large companies sometimes face the same problem in terms of data abundance. The latter two collect data passively, however, the big difference between the two lies in the use of this collected data and the quality of the information produced for good decision-making (Gagné, 2018). Creating a sustainable architecture depends on understanding the different components involved in the development of powerful BI tools. The process is broadly divided into three areas: data collection, information management, and business intelligence (Sisense, 2020).

The first area refers to the different channels and methods of collecting data from the activities carried out within your organization. This includes understanding the data that different users need to meet their needs, as well as a clear idea of the quality, type, and timeliness of the data. This step is vital for adding value because the right data produces the best information. The second major element is data management. This covers various aspects of data integration, cleaning of datasets, and building the overall structures that will host and administer the data. Finally, BI is the

part of an organization's architecture that analyzes properly organized data sets to produce information. This area involves the use of real-time analytics, data visualizations, and other BI tools (Sisense, 2020). Through the analysis of scientific literature, we see that there are several existing BI architectures, these architectures are different in their structures such as layers, components, processes, and relationships to guide the BI to its implementation work (Ong et al. 2011). BI architecture typically includes components, such as data sources, data integration, data warehouse, data mining, and applications (visualization; see Figure 1) (Sang et al, 2016).

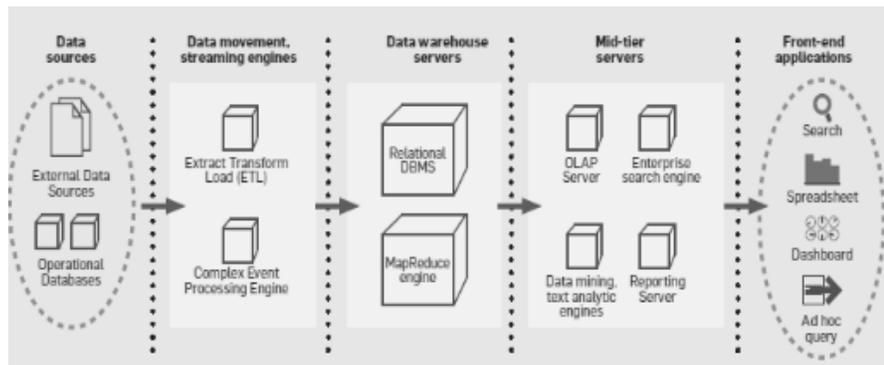


Figure 1. Adapted from Sang et al. (2016).

The movement of data is an essential function for a BI system. In the extraction, transformation, and load (ETL) process, the transformation and the load processes are usually implemented. Load problems related to entering transformed data into a data warehouse or target database (Sang et al., 2016). The Datawarehouse is essential to the operation of any BI system because it stores and delivers the historical and most up-to-date

data required. In this case, the selection of important data and how to store it most efficiently is a critical decision (Kalelkar, et al. 2014). The SME that wishes to adopt BI solutions to innovate, be more agile, have a competitive advantage, or improve its organizational performance should make the right choice of BI technologies, applications, and architecture, which can take charge of all the data and produce quality information for decision-making.

Business performance

Indeed, the term “performance” is widely used in all areas of management. Performance can be defined for a company as the level of achievement of results concerning the efforts committed and the resources consumed. It is largely based on the concepts of effectiveness and efficiency. It can also be approached from a measurement perspective, with an emphasis on selecting the appropriate indicators and levels to quantify an organizational outcome (Anwar et al., 2016). According to Santos and Brito (2012), company performance is a relevant concept in strategic management research and it is frequently used as a dependent variable to assess the level at which companies are achieving set strategic objectives. It often measures profitability, growth, customer satisfaction, employee satisfaction, social performance, and environmental performance. Thus, a company cannot achieve its objectives and meet the needs of consumers and market competition if it has not put in place a good business strategy, and this is by taking into account the indicators of the moment: environment, consumer, product, advertising, information technology, etc. Additionally, the business performance includes metrics such as return on sales, return on capital, profit per share, and non-financial metrics such as market share or rate and time to develop new products (Venkatraman and Ramanujam, 1986). For the sake of consistency, performance is seen as the strength

and long-term prosperity of the company against its competitors (Ward, 2012). However, the design of performance measures should follow certain principles to ensure their effectiveness. In particular, the objectives and strategies of the company should be taken into account at the time of design.

What is performance in the context of SMEs?

It is difficult to determine the concept of performance whether in the context of large companies or SMEs. Indeed, the literature review takes into account the contextual difficulty that lies in the exercise of defining performance. Thus, Ajzen et al. (2016) maintain that “performance can only be defined through its indicators and the occurrence of these”. Consequently, the definition exercise is transformed into an attempt to characterize these performances, using specific indicators, and the desire to translate the state of health - in the broad sense - of a company employing quantification.

The performance of SMEs can be understood from a quantitative point of view: efficiency, financial results, level of production, number of customers, market share, profitability, productivity, revenue dynamics, costs, liquidity, etc. Also from a qualitative point of view: achievement of objectives, management style, employee behavior, customer satisfaction, product and process innovation, organizational innovation, and in their work. A series of 14 indicators were considered to describe the performance of SMEs: reputation, productivity, employee satisfaction, profits, sales, rapid delivery of orders, sufficient working capital, the efficiency of production, product quality, achievement of objectives, number of customers, ease of supervision, reduction in product cost, and product diversification (Cicea et al., 2019).

Although we have identified different performance indicators specific to SMEs, however, Ajzen et al. (2016) emphasize the

preponderance of financial or economic indicators in defining performance in SMEs, suggesting that talking about a firm's performance is tantamount to dealing with its capabilities and financial results. Although this is also true for large companies, there is however a greater diversity of indicators of different natures. The difference seems to be marked above all in the indicators relating to the organization of work and working conditions and, by extension, the presence and use of human resources management practices (Ajzen et al., 2016).

The degree of SME development and performance is influenced by three categories of factors: (1) the general economic climate which directly or indirectly influences the GDP and gross national product, as well as the capacity to invest; (2) the structural characteristics of the economy, reflected in the level of technologies used, public and private expenditure on R&D and innovation, and the innovative activities deployed; and (3) microeconomic factors, such as the number and structure of firms by size class or the survival rate (Cicea et al., 2019). In addition, Combe (2012, as cited in Billal, 2019) argues that the development of SMEs also depends on how they formulate their business strategy, which not only defines the main long-term goals but also determines the critical activities and important resources to achieve these goals.

METHODOLOGY

Since the different mechanisms at work, as well as the perspectives that are best suited to assess the business process, the conceptual approach is used here. That is, this work is a conceptual study based on the existing literature on business intelligence and its impact on organizations in general and SMEs in particular. To do this, a comprehensive review covers the relevant literature on the subject as well as these concepts (Ali et al., 2017). Key impact

journals e.g., Science Direct, Journal of Knowledge Management, MIS Quarterly, Journal of Information and Knowledge Management, Cairn info, the Business ultimate source, etc. were read. As BI and SMEs are the main areas of this study, this study begins with a documentary search in the different databases using keywords: BI, SMEs, sustainable performance of SMEs, etc.

Business intelligence and the performance of SMEs

According to the article by Ali et al., (2017), BI has proliferated due to its increasing contribution to determining business performance, integrating data from disparate sources, warehousing data, planning, forecasting, budgeting, and decision making that guide business operations to desired performance. Below is Figure 2 illustrating the role of BI in information management and business decision-making.

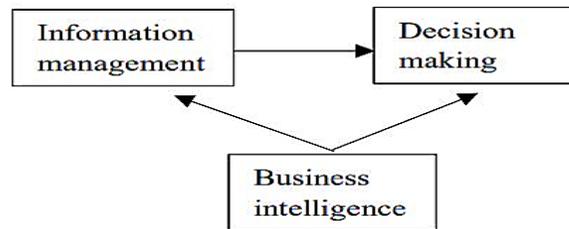


Figure 2. Adapted from Ali et al. (2017).

The implementation of BI in SMEs

As mentioned in the previous point, SMEs encounter several difficulties when implementing BI. Whether from a planning or technological point of view or when choosing the solution to adopt. Tatic et al. (2018) state that approximately 60% to 70% of BI applications fail due to technological, organizational, cultural, and infrastructure issues. From a technological and infrastructural point of view, the barriers to adoption are mostly related to the lack

of information, lack of financial resources to invest in these technologies, lack of databases, lack of expertise in the management of data and information. In addition, SMEs very often encounter problems distinguishing between quality information and unnecessary information (Bisson et al., 2013). While from an organizational perspective, one of the major issues facing SMEs is the lack of knowledge about the capabilities of BI systems and what they could bring to their businesses (Gudfinnsson and Strand, 2017). Also, there is a lack of managerial support, skills, and experience issues among the biggest organizational challenges SMEs face (Olszak and Zemia, 2012). In addition, Gudfinnsson and Strand (2017) agree that the biggest organizational obstacle that SMEs encounter during the process of adopting BI systems is the lack of strategic alignment between the company and the BI system. But also, the lack of support from managers and the lack of knowledge about the capabilities of the BI system (Gudfinnsson and Strand, 2017).

DISCUSSION

As we mentioned in our literature review, managers/owners are key elements in the development of a BI project (Olszak and Ziemba, 2012). SMEs tend to have highly centralized management over managers/owner-leaders who make the majority of critical decisions (Gibson and Arnott, 2003). This suggests that any decision to adopt BI systems within the organization depends largely on the individual characteristics and opinions of the leader (Gibson and Arnott, 2003). Also, Olszak and Ziemba (2012) found that the innovativeness of owner-managers is an important determinant of the adoption of SME enterprise resource planning. This is to say that the innovative nature of owner-managers has a significant impact on the levels of BI adoption in SMEs. In addition,

Gibson and Arnott (2003) agree that managers with a high level of technical knowledge and being innovative are more likely to adopt new technologies. Not to mention that effective leadership has a positive impact on organizational performance and plays a key role in achieving organizational goals (Gross, 2020). Thus, external forces, financial capability, and BI skills are not the only determinants of BI adoption; the attitudes and opinions of key decision-makers in the organization are crucial (Titac et al., 2018). Also, the fundamental and prerequisites for effective implementation of a BI system is the existence of an adequate database that is possible to generate precise, coherent reports and to correctly represent the factual situation in SMEs (Tatic et al., 2018). For this reason, one of the essential prerequisites for the implementation of BI systems is additional business management systems such as ERP, CRM, WMS, and others. Thus, being able to provide internal and external data likely to produce quality information for better decision-making in SMEs (Tatic et al., 2018). Hence, the authors argue that BI allows the reduction of information dispersion, facilitates user interaction, allows easy access to information, real-time dissemination of information, and enriches the process of taking information decisions (Ali et al., 2017). Therefore, BI is major support for enriching companies' information management systems. As for substantive decision making, BI as an application driven by information systems provides the appropriate level of data accuracy and information confidentiality. But it also produces knowledge relevant to SMEs (Ali et al., 2017).

The knowledge the authors are basing reference here is just what happened; what is happening and what could happen in the organization. This forms the basis for making decisions about what to do and how (Ali et al, 2017). Thus, BI is seen as an umbrella that is commonly used to describe the processes of collecting, storing,

accessing, and analyzing data to help users make better decisions (Olszak and Ziemba, 2012). In addition, BI has become evident as a logical facilitator of information management which is a key necessity in decision making (Ali et al, 2017). According to Bisson and Duffy (2013), knowledge creation and its application to strategic business decision-making are considered a key source of competitive advantage for companies. However, it is important to know that the implementation of BI systems is not systematic for SMEs, so they can also be failed (Guarda et al, 2013). Among the causes of failure to implement BI in SMEs, we cite limited resources, lack of expertise to develop the data culture in the company, lack of implementation skills and absorption capacity to effectively deploy the BI project, limited technological skills, or the chosen solution does not align with the strategic objectives of the company (Rao-Graham et al, 2019).

The implementation of BI in a company does not always guarantee a return on the investment (Guarda et al, 2013). Many authors point out that limiting the development of SMEs results in difficulties in the implementation and implementation of BI (Olszak and Ziemba, 2012). The perceived and real obstacles to implementation are numerous, and not all of them fall within the organization's control sphere (Afolayan et al, 2015). Thus, SMEs managers must first take a goal modeling approach to address the challenges of their businesses and identify key areas where the action is needed to support better adoption of BI systems (Gudfinnsson, 2019). The important elements of a modeling approach are to determine the processes, the CSF of the SME, and to define the expectations of the users of the company in terms of information requirements, to adapt the BI solution to the expectations of commercial users (Olszak and Ziemba, 2012). In addition, managers of SMEs play a crucial role in organizational culture (Guarda et al, 2013). One of the factors for successful

implementation in an organization is the end-users and organizational culture (Gudfinnsson and Strand, 2018).

The author suggests developing a data culture at all levels of the organization to facilitate the implementation of BI in SMEs (Gudfinnsson and Strand, 2018). Thus, SME leaders need to promote a data culture in their company to change employees' views on BI usage (Cheng and Rehman, 2018). Not to mention that one of the most important aspects of BI implementation is also related to the training of employees and the change of end-users in terms of new approaches to the decision-making process to be adopted (Rouhani et al, 2016).

The main objective of end-users is to solve data-related business problems while preserving a certain degree of self-sufficiency during the decision-making process (Rouhani et al., 2016). Therefore, it will be important for SME managers to define the level of engagement that end users are willing to devote to learning new tools and completing tasks (Rouhani et al., 2016).

Finally, SMEs face many challenges when it comes to the IT implementation process in general; this is due to the lack of resources, skills, or experience (Tatic et al., 2019). Hence, managers need to think about capacity building both for themselves, but also for employees, when adopting IT. These capacity building can be done through training, project study groups, or external expertise, to have a better adoption of IT in their companies. In addition, it will be crucial to adopt BI solutions that align with the business and strategic objectives of the organization in order hoping to have a good result from these solutions (Gudfinnsson, 2019). All of the above, in this section, requires special attention from managers/owners of SMEs for better adoption of BI systems and to achieve established organizational goals.

CONCLUSION

The implementation and application of BI in SMEs is a critical factor for successful business operations, mainly due to the role and importance of BI in the business process, the resource management process, and the strategic decision-making of companies, thus improving the general performance of the company, organizational agility, and the efficiency of SMEs (Tatic et al., 2018). It is within this framework that we have discussed the two conceptual models in this work to provide SMEs the most plausible way to implement BI systems, thus being able to improve their decision-making processes and enable the achievement of strategic objectives as well as general performance in their companies. It is known that the successful implementation of BI in SMEs is a process that demands a lot of resources (material, financial, technological, and human) from companies, but it also depends on several internal and external factors of the company which will have to enter the challenges for this success (Rouhani et al., 2016). Making decisions based on accurate and reliable data and key indicators is recognized as particularly important for SMEs (Guarda et al., 2018). Hence the importance of properly carrying out the processes of implementing BI systems. However, it is crucial to take into account organizational aspects, processes, and technologies (Guarda et al., 2013): - From an organizational point of view, the aspects to be taken into account are: the adequacy of the budget, the competence of the BI project manager (his/her leadership) and the staff/team/manager's qualification; - From a process point of view: well-defined user expectations (information requirements) and adapting the BI solution to user expectations (requirements); - From a technological point of view: integration between the BI system and other systems ERP, for instance, a good source of data such as databases inside and

outside the company thus making it possible to collect, provide, and obtain data, to produce quality information. Although we know that with BI systems, SMEs can integrate powerful analysis tools into their management system, have standardized information, produce dashboards, the monitoring system with various metrics, data integration, and quality information allowing SMEs to make good strategic decisions, thus facilitating the achievement of objectives (Olszak and Ziemba, 2012). However, it is essential that the strategic objectives of BI are aligned with the business strategy and vision of SMEs, to obtain an ultimate result from BI systems and to observe performance (Gibson and Arnott, 2003). In light of all of the above, we conclude that BI can contribute to the performance of SMEs. However, SMEs must properly align their business goals with BI's strategic goals, while respecting the critical success factors and other aspects cited in this paper that enable successful adoption of these systems within enterprises.

The theoretical contribution of this study should therefore serve as the first step of a basis for further research on the implementation of business intelligence in the context of SMEs and on the design of a model. BI maturity in particular, and secondly, for practitioners, needs analysis guide, diagnostic tool, and strategic planning for organizations. And on a practical level, this study should serve as a strategic tool for the implementation of business intelligence in the context of SMEs. In addition, this research will help to better document the question of the implementation of business intelligence in SMEs, especially from the point of view of managers or owner-managers of these structures. In addition, it aims to propose means of action that are better suited to the realities of implementing business intelligence in SMEs.

Finally, it should provide avenues to better support the implementation of business intelligence in SMEs, in order to have

a good result from these technological tools in these types of companies. Moreover, as all human work is hardly free from imperfections, the research and the results of this brief are subject to limits. Recommendations for further research related to a comprehensive analysis and in-depth research into the possibilities of properly integrating BI systems into existing SME information systems, carefully analyzing the quality of data and specific information in databases of SMEs, as well as the degree of practical use of the BI system on a day-to-day basis for SMEs that have already implemented BI systems.

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