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An examination of the impact of business intelligence systems on organizational decision making and performance: The case of France

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An examination of the impact of business intelligence systems on organizational decision making and performance: The case of France

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ABSTRACT Turbulent times are a part of modern-day business, and the way a company handles disruptive events determines its success. Various technological tools have been developed to help businesses overcome unforeseen and anticipated events that may impact the business. One such technological tool is business intelligent systems, which help to gather data regarding business operations and environment turning it into information that can be clearly understood. Large companies have adopted the use of these big data analytic systems, but most small and medium sized enterprises (SMEs) lag behind. There is little information on how business intelligence systems impact SME businesses. This study examined the impact of business intelligence systems on organizational decision-making and performance. The study consists of an empirical qualitative research that was carried out with interviews of 200 members of 10 selected SMEs. The study found out that when BI systems are deployed in SMEs, they facilitate timely decision making, improves organizational efficiency, enable a company to meet client's needs appropriately and lead to more satisfied employees.

KEYWORDS Business intelligence systems, competitive advantage, customer satisfaction, employee satisfaction, organization, SMEs

1. INTRODUCTION

Today, businesses face various unforeseen events that normally have a detrimental impact on their progress and performance. Business intelligence systems are currently perceived as a solution to such disruptive events that hit the businesses unexpectedly, irrespective of whether it is a large or small business enterprises (Fourati-Jamoussi & Niamba, 2016: Jenster & Søilen, 2013). Business intelligence systems refer to those computerized methods and processes that turn data into information, which is then converted into business knowledge (Popovič et al., 2012). These systems offer technological solutions that provide analytical capabilities as well as data integration services that can provide valuable information for business stakeholders. However, assessing the success of business intelligence systems is a problem as they cover entire organizations and their benefits can only be long-term (Popovič et al., 2012). Additionally, small and medium enterprises (SMEs) are perceived as laggards when it comes to implementation of technological systems. This is because they lack the financial capacity as well as the required expertise to implement and manage big data systems. On the topic of business intelligence, most researchers have focused on large companies and therefore neglect SMEs despite BI tools being essential for all businesses. Therefore, there is a lack of sufficient information on the impact that BI systems have on SMEs. This empirical research provides the results of a study that

examined the impact of the business intelligence systems in SMEs by collecting and analyzing data on how organizational members perceive these big data analytical systems. The purpose of the study was to determine whether and how business intelligence systems facilitates timely organizational decision making and other impacts in SMEs and also to examine how organizational members perceive business intelligence systems.

2. BUSINESS INTELLIGENCE AND BUSINESS INTELLIGENCE SYSTEMS

The term business intelligence (BI) has become increasing popular in the last few decades. According to Sabanovic, & Søilen, (2012), business intelligence is a multifaceted term that encompasses techniques, processes, and tools that facilitates faster and more effective decision making in business enterprises. This definition agrees well with the definition of Popovič et al., (2012) of business intelligence, which is a composition of computerized processes and methods that help to turn data into information then into knowledge that aid in business decision making. Business intelligence systems provide essential tools that help in effective reporting and analyzing business information so as to understand the organizational internal and external environments (Fourati-Jamoussi and Niamba, 2016: Søilen, 2015). This gives the managers essential data that is used in decision-making processes.

A business enterprise can use one or more types of business intelligence systems so as to boost its decision-making processes. There are four major business intelligence systems that are used in a business, namely: reporting, analysis, monitoring, and prediction tools (Sabanovic, 2008). The reporting intelligence business systems focus on the development of business documents that contain valuable information on what has happened. These provide the businesses with information about the company activities within a given time span. The intelligence business analysis systems provide information on why an event happened (Vesset & McDonough 2007). This is a crucial part of the business because the provision of data without analysis is useless. The intelligence business analysis systems collect and analyze data before presenting it which makes it easy for business leaders to understand and interpret it. The tools that are commonly used under these types of systems include the following: spread sheet analysis, ad-hoc query, and visualization tools (Sabanovic, 2008: Sabanovic, & Søilen, 2012). The spreadsheet analysis tools analyze data that are contained in spreadsheets and help to evaluate the entire organization or a specific unit of performance. For instance, spreadsheet analysis tools can be used in tracking the number of hours that the employees have worked. The ad-hoc query tool is software that allows companies to develop specific data queries such as the creation of query of the number of items that have been sold within a specific period (Vesset & McDonough, 2007). The visualization tools, on the other hand, are software that accepts raw data and creates visualizations that business leaders can read and understand (Negash & Gray, 2008). An example is a tool that can create a graph comparing methods by which customers have been contracted within a specific and given time. The third type of business intelligence systems is monitoring tools. This allows businesses to monitor information and data in real time. Snapshots can be taken at any time to get reports thatcan assist in timely decision making. Tools under this form of business intelligence systems include the following: dashboards, key performance indicators and business performance management (Sabanovic, & Søilen, 2012). According to Eckerson (2010), the dashboard tools provide a central location whereby actionable and useful metrics are contained and represented graphically, making it easy for users. The key performance indicators (KPIs), on the other hand, measure the performance of a given specific project within a company, for example, return on investment. The business performance management tools refer to the system that ensures that the organization meets the set performance goals. It is therefore designed to deliver results on whether the performance goals are met or not. Lastly, the prediction business tool helps those businesses that are keen on predicting what may happen to their business based on the data that they have on business trends. Vesset & McDonough (2007) note that the prediction business intelligence systems are more complex and therefore most businesses contact third parties to provide the services while others use software that automates the entire processes. These systems are comprised of data mining and predictive modeling tools. The data mining tools work by finding patterns and relations that exist between large data sets and

transform them into understandable information for the companies. The predictive modeling tools, on the other hand, uses modeling techniques to predict an outcome of a given event or its probability (Vesset & McDonough 2007).

3. THE ROLE OF BUSINESS INTELLIGENCE SYSTEMS IN ORGANIZATIONS

Business intelligence systems are an important part of organizations as they can be used to determine their performances. From the definition of business intelligence, it is clear they enhance decision-making (Sabanovic & Søilen, 2012: Popovič et al., 2012). According to Popovič et al., (2012) business intelligence provides quality information to organizations which are essential in the process of decision making. This is because it equips the knowledge workers with an opportunity to timely access of information, analyze it effectively and intuitively present the right information. Such an opportunity enables an organization to make the right decision and take the right action. Therefore, business intelligence should be understood as the ability of an entity to think, plan, predict and solve the problem in an innovative manner (Popovič et al., 2012). Business intelligence emphasizes abstract thinking and innovative ways of solving problems in a timely manner because appropriate actions are taken so as to advance business goals and overcome any looming business disruption event. This is only possible when the right business systems are implemented.

Apart from helping a business organization in making proper decisions regarding their functions, business intelligence has other benefits. Sabanovic, & Søilen (2012) argue that business intelligence systems (BIS) do not only help in making better and more efficient decisions but also impact the entire organization to improve its return on investment, gain new customers and suppliers and also recruit the best employees and enhance their satisfaction. Business intelligence systems bring greater visibility into business by allowing the leaders to have an entire understanding of the company and the environment that it operates in (Sabanovic, & Søilen, 2012). This is possible because BIS lead to the gathering of the information that is used in strategic planning. The strategic plans of an organization touch on different areas that give an organization a competitive advantage. These plans allow a company to target consumers in a better manner, attract top employees, have the best suppliers and as such a return on investment will be realized.

These systems are also important in determining the strategic decision of a business. When BIS are implemented, misunderstanding the goals of an organization can be avoided. This is vital in ensuring that all organizational members and their actions are going to the same direction (Sabanovic, & Søilen, 2012). Business intelligence can be used to gain competitive intelligence which is vital in shaping the strategy of a company. According to Jenster & Søilen (2013), competitive intelligence encompasses the following processes: defining, gathering, analysis and distributing information that is used in decision making. The competitive intelligence gathered, therefore, facilitates strategic planning in an organization. Thus, a BIS leads to the accumulation of competitive intelligence, which is used in making strategic decisions for a given firm.

BIS also have a role in providing businesses with information for marketing functions. One of the platforms for marketing of a company is through trade shows. Søilen (2010) argues that, for the longest time trade shows have been neglected in the arenas of marketing research. They have not been considered to be important parts of market information because marketing strongly focused on customers rather than competitors and other market influencers. However, currently trade shows are becoming important in not only selling company products but also marketing the company and confirming the company presence in the market (Søilen, 2010). At trade shows a company meets different customers who provide important marketing information. Nevertheless, the knowledge transfers in trade shows occur through face to face communication despite being extensive. The marketing information can be obtained by using BIS during these trade shows. This is what can be termed an intelligent gathering of information that can be used in integrated marketing functions. Therefore, Søilen (2010) affirms that BIS can be used in gathering information for use during marketing and related function.

Lastly, BIS have an impact on the performance of a company. The major objective of adopting business intelligence is to enhance the overall performance of a company. However, there are some complications in

determining the actual outcome of these business systems. Although it is difficult to measure the outcome of any intelligent system that is implemented by a company, the overall outcome can be used to determine its effectiveness (Amara, Søilen, & Vriens, 2012). According to Jenster & Søilen (2013) BIS lead to the collection of competitive intelligence that is used in strategic decision making. This helps to shape the operations of an organization. Jenster & Søilen (2013) further argue that strategic planning has an impact on company performance. Therefore, BIS are vital in shaping the overall performance of an organization.

4. BUSINESS INTELLIGENCE SYSTEMS AND SMALL AND MEDIUM ENTERPRISES

SMEs have been lagging behind in the adoption of intelligent business systems. They only consider these systems to be effective for large companies which invest highly in technologies. The large organizations have the required resources to install, maintain and hire highly skilled personnel to work on the BIS. This is like SMEs which operate on meager resources. The expensiveness of these technologies renders them economically unfeasible for small-scale businesses (Lueg & Lu 2013). However, SMEs can utilize those BIS which are not complex and do not require high levels of expertise to manage. One of the economically feasible BIS for SMEs is the spreadsheets for simple data. According to Lueg & Lu (2013), SMEs can use spreadsheets to store data and for financial analysis. The spreadsheets offer applications such as cell modeling and holistic spreadsheet modeling that help to gain important information.

BIS are important tools in the management of the clients in SMEs. Søilen (2012) who carried out research on small business enterprises in Sweden found that SMEs use BIS to manage clients and also consolidate information in an easy and quick way. Therefore, BIS are important tools for SMEs because they help them manage their customers. Clients form one of the important pillars of SMEs, and therefore the BIS can help businesses to maintain a positive relationship with its customers. Further, Søilen (2012) notes that these organization's views on BIS depend on how they solve the information needs. Additionally, the decision on the intelligence systems to be adopted depends on the experience that a person has had in another company. There is a research gap here in looking at SMEs outside of Sweden and comparing the results.

Small business can use BIS to increase their efficiency in budgeting. The budget is an important document in a small business enterprise because it provides a print on how to balance different goals by maximizing the limited resources that are available. Budgeting problems among SMEs are due to the lack of understanding of the budgeting process, simplicity and also user-friendly IT systems. The lack of systems to validate the data used in budgeting also leads to errors in the final budget. The outcome of this is wastage of company resources. According to (Lueg & Lu, 2013), business intelligence can be used to drive budgeting efficiency. This is because business intelligence increases transparency, user friendliness, and simplicity, which are essential in enhancing data validation and thus driving budgeting efficiency.

Further, business intelligence can help small businesses in dealing with competition. Today, businesses operate in a dynamic environment whereby competition seems to drive all the strategic plans of the business. It is a challenge that SMEs grapple with on a daily basis. An SME should, therefore, learn to deal and cope with these competition challenges. This can be achieved by turning a small business to be proactive and agile in its decision-making processes. Ponis & Christou (2013) argue that competitive intelligence adoption is one of the ways in which small business enterprises can deal with competition successfully. This is because competitive intelligence involves a process through which organizations gather information about competitors and use it in decision making and planning process so as to improve its performance. Competitive intelligence is part of business intelligence, and therefore it can be of help for a small-scale business enterprise (Ponis & Christou, 2013). Therefore, business intelligence can help SMEs to achieve a competitive advantage. Guarda et al. (2013) affirm this by stating that those small business enterprises which embraced business intelligence have an upper hand in the market as they compete more effectively. This is because they have additional information about their competitors as well as customers. The information that an SME obtains from business intelligence can be used for future strategic planning which can help to avert any looming competition (Guarda et al., 2013).

Lastly, those who claim that BIS cannot be applied for SMEs should reconsider their stance. This is because small businesses are dealing with increased volumes of data and use of business intelligence can help them derive a logical meaning from it. The only factor the SMEs should consider is making the appropriate choice for the best business intelligence that is in line with their strategy. This will allow the SMEs to have a competitive advantage.

5. METHOD

This study was based on a qualitative descriptive approach. Semi-structured interviews were conducted on organizational members of SMEs to collect data on issues regarding BIS (Shields & Rangarjan, 2013). Emerging themes from these interviews are then discussed. The study started by recruiting 200 research participants who were categorized into SME managers and SME junior employees. The participants were drawn from 10 SMEs located in France. From each SME, 5 managers and 15 junior employees were randomly selected. Therefore, the study ended up with 50 SME managers and 150 junior employees. A semi-structured interview (see Appendix I and II) that consisted of questions regarding various aspects of business intelligence was given to each participant. All participants completed the study. The results from the interview were then coded and analyzed, and the emerging themes are discussed as portrayed in the following sections.

Table 1 A summary of SME managers' responses on various aspects of BIS.

BIS Aspects Tested Through Mangers Interviews	**% Yes**	**% No**
Deployment of BIS	45	55
Usage of BIS at all organizational levels	19	81
Complexity of the BIS deployed	39	61
Availability of skilled employees for manage BIS	25	75
BIS assistance in decision making	89	11
Other impacts of BIS other than helping in decision making	95	5
Perception on continuation of the use of BIS	96	4

6. RESEARCH RESULTS

This research shows the results of interviews regarding the top management in small business enterprises. Tables 1 and 2 and Figures 1 and 2 show a summary of SME manager's responses on several aspects of BI systems and also how junior employees perceived BI systems within SMEs.

Table 2 Table showing a summary of SME junior employees' responses to various aspects of business intelligence systems.

Business intelligence systems aspects tested through junior employee interviews	% Yes	% No
Usage of BIS in the company	15	85
Knowledge of BIS	20	80
BIS impact on employee productivity and performance	70	30
BIS impact on business performance	69	31
Views on continuation of BIS use	85	15

7. ANALYSIS

7.1 BIS Deployment and Usage

One of the themes that emerged from the results is concerned with BIS deployment and usage in SMEs. From the results that were obtained by interviewing both the junior employees and managers of SMEs, it is clear that the majority of SMEs have not deployed BIS. Among the 50 top management employees who were interviewed, only 45% accepted that their SMEs had implemented BIS. The junior employees, on the other hand, seemed not to be sure on whether the SMEs they work for have implemented BIS or not, as only 15% agreed that they use these systems. Further, 19% of the top managers confirmed that they use BI throughout the organizational levels. This shows that SMEs are yet to fully embraced the deployment and usage of BIS. These results agree with Lueg & Lu (2013) who found that small businesses lag behind when it comes to adoption of BIS. According to Lueg & Lu (2013), the intelligence systems are so expensive for businesses and therefore they are economically unfeasible for SMEs. The high cost of BIS is, therefore, one of the barriers that keeps SMEs at bay when they try to adopt these tools. This is because SMEs operate on a tight budget and therefore they believe that investing in BIS is tantamount to straining their meager resources. Secondly, the lack of

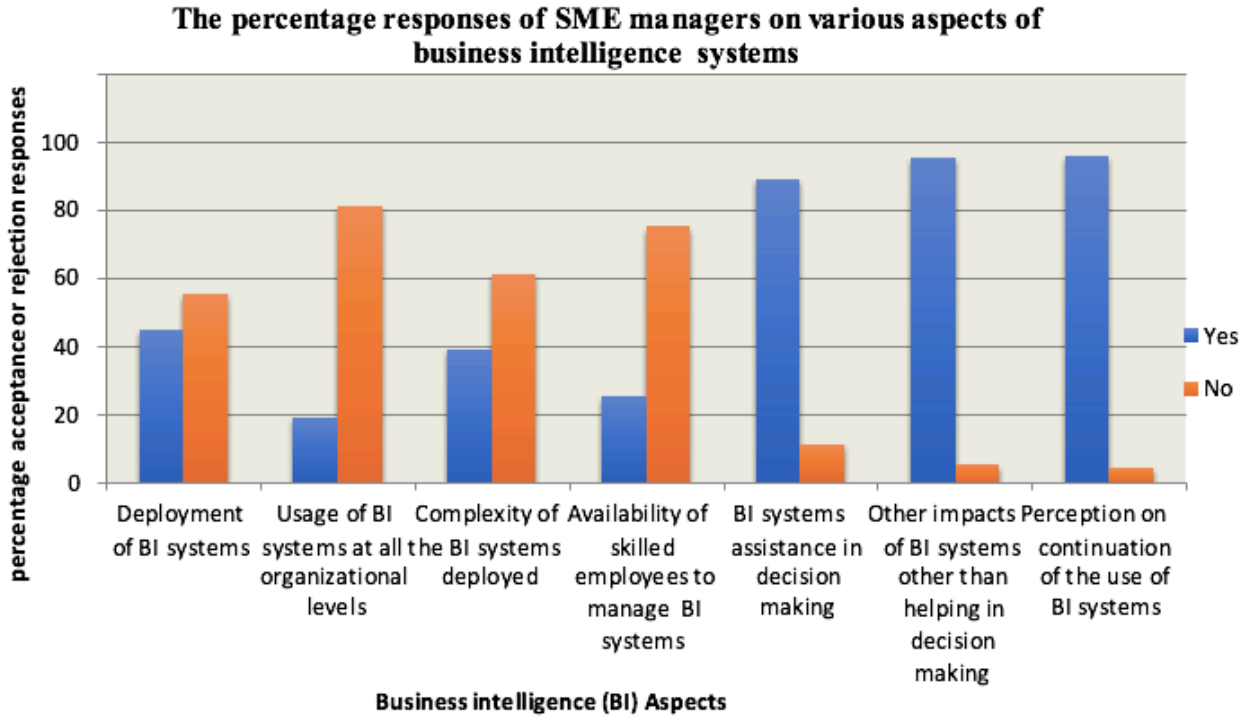

Figure 1 Graph showing the responses of SME managers to the various aspects of business intelligence systems.

proper information technology systems in SMEs is also a barrier towards the adoption of BIS (Puklavec, Oliveira, & Popovic, 2014). Olszak, & Ziemba (2012), found out that small business enterprises do not have sufficient computer equipment to host BIS. This computer equipment is capital intensive, and this is why most of the SMEs opt not to invest in them as a cost saving strategy. These decisions, therefore, limit the small firms in the opportunities that come with having computer systems. Yeboah-Boateng and Essandoh, (2014) affirm that SMEs lack appropriate computer system installations and also do not have trust in any business function hosted online for security reasons. Some of the business intelligence functions are hosted online through cloud-based services, and therefore the lack of trust and security associated with online services is a major factor that keeps SMEs from adopting BIS.

7.2 BIS Complexity and Availability of Skilled BI Maintenance Personnel

The second theme that emerged in this study is the complexity of BIS and availability of skilled BIS maintenance personnel. Among the interviewed managers, a 61% majority agreed that the BIS implemented in their small companies are complex and only 39% claimed that they have simple BI tools in their companies. Despite the majority confirming that their SMEs have deployed complex BIS, the results show that most of the companies lack the required personnel to manage these systems. According to the results, only 25% of the managers agreed that their companies have skilled employees who can handle BIS. The results of the interview conducted on the managers are consistent with those which were carried out by employees. The interview conducted on the employees demonstrates that only 20% of the employees have knowledge of BIS. From these results, it is apparent that those SMEs that have embraced BIS use the complex one. According to Boonsiritomachai, McGrath & Burgess, (2014) complexity alludes to the extent in which a given innovation is perceived or seen to pose usage or understanding difficulties. Complexity remains one of the barriers to the adoption of any innovation or technology. This is because those technologies which are less complex are highly likely to be adopted unlike those that are highly complex: they indeed result in a higherrate of adoption (Boonsiritomachai, 2014). The complexity of BIS is about the fact that they include mathematical functions that are vital in predicting a particular phenomenon in a firm so as to bring a given solution. IT skills are also vital when dealing with BIS (Boonsiritomachai, McGrath & Burgess, 2014). As portrayed in the interviews, most employees lack knowledge on BIS, and this could be affected by the deficit in IT skills.

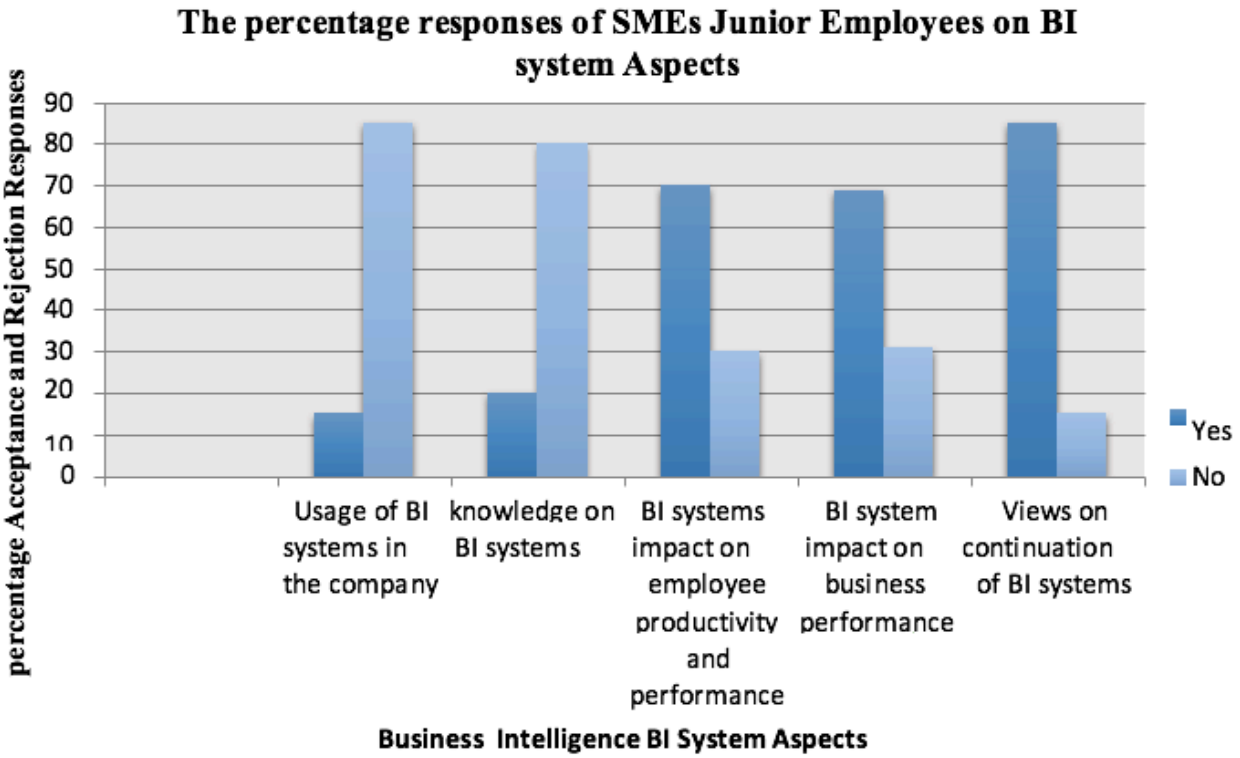

Figure 2 Graph showing the responses of SMEs junior employees on the various aspects of business intelligence (BI) systems.

Additionally, employees may have poor mathematical skills, which may make them view BIS as complex. Further, the lack of resources in SMEs may be a contributing factor towards the lack of quality personnel to manage BIS that are implemented. Lueg & Lu (2013) argues that SMEs have limited resources that may even curtail their adoption of BIS. Therefore, SMEs fail to attract highly qualified personnel to manage their BIS because they lack resources that can be used to pay experts.

7.3 The Impact of BIS on SMEs

The third theme that emerged in this study was the impact of BIS on SMEs. According to the interview, 89% of the managers accepted that BIS facilitate decision making in their companies. One of the business managers said that:

> "Our company, though categorized as a SME has deployed business intelligence systems which provide real-time data. This information is essential because it allows us to make a timely decision. For instance, I remember, there was a time we were registering a low number of sales, but the business intelligence system we use was able to show that our product was pretty expensive and that could perhaps be the reason for the low number of sales. This was real-time information from market intelligence that allowed the company to resolve to adjust the price of the product, which led to improved sales afterward". *Translated from French.*

This form of confession response shows that BIS provide important technological tools that enable firms to make decisions based on a reliable knowledge. The market trends remain highly uncertain and competitive and as such provisions of valuable information in a timely manner is of the essence. BIS bring efficiency to the businesses because they provide vital information that is used in timely decision-making processes. According to Wieder & Ossimitz, (2015), apart from providing information in a timely manner, BIS leads to the generation of quality data. The information generated is of high quality as it is free of errors and highly analyzed: the only job that is left for the business leaders is to interpret the results. Therefore, BIS are important because they give a business the capability to scan the market and forecast events.

The market analysis function of a BIS is also important because it allows an organization to identify changing trends and emerging threats in good time so that the appropriate steps can be taken. One of the respondents attested that "In our company, we rely on business intelligent solely for market scanning so as to

get the most recent changes." This is in line with Davenport, (2010) who argues a company needs to constantly be provided with information on consumer behavior and how their preferences are changing. BIS, therefore, provide a business with timely and complete information that is vital for decision making (Vizgaitytė & Rimvydas, 2012). Thus, it is apparent that BIS are important in helping business leaders to make timely decisions. BIS, thus, help front-line employees and company executives make informed decisions. They combine both historical data and real-time data that are available to the business leaders whenever needed. Therefore, they empower the business managers to make decisions quickly and with a high level of confidence because the information that is provided is highly reliable. These business analytics do not only generate information based on what happened in the past as they also consider the current situation, and also they incorporate the anticipated changes (Davenport, 2010). BIS extract data that is full of facts from a large pool of unstructured data and then transform it into meaningful information, which is also actionable. This is vital for making informed decisions in organizations whether large or small. Therefore, businesses depend on BIS as a rich source of reliable data to make informed and strategic decisions.

Apart from providing reliable information that is used for timely decision making, BIS have other benefits. According to the results of the interview, 95% of the managers agreed that BIS brings many benefits other than just timely decision making. One of the manager participants attested that:

> "Business intelligence is not just about timely decision making as it helps the businesses in other ways. For example, in our company, which is an SME, the business intelligence software has been able to provide vital information that has been used to reduce errors in production and therefore allowing the company to realize operational efficiency." *Translated from French.*

Therefore, one of the benefits of BIS that came out in this study was the increased organizational efficiency and productivity. This is in line with the argument of Poleto, Carvalho & Costa (2015) that informed strategic decisions that are made courtesy of BIS are vital in driving operational efficiency as well as business productivity. For instance, BIS can analyze customers' emails and chats with the company and be able to determine the characteristics of such customers as well as their demands. This makes a company strategize as to address customer needs and improve its operations so as to retain its competitive edge and achieve the set goals. Therefore, the result shows that BIS provides vital and accurate information that is used to inform the company on how to improve its efficiency and productivity as well.

Further, the results demonstrated that BIS had an impact on the return on investments. According to Wieder, Chamoni, & Ossimitz (2012), business intelligence gives companies opportunities to reduce cost, increase their revenues and increase their profit margins. Business intelligence has an impact on return on investment because it offers a cost effective method of gathering information regarding the business. Traditionally businesses have channelled huge amounts of cash to carry out market research that can gain important information on how to increase a company's efficiency. The business intelligence provides a cost and time-saving strategy of gathering business information. Therefore, money that would have otherwise been used to carry out market research will be directed to other important functions of a firm. Additionally, the return on investment is impacted by business intelligence because employee productivity is enhanced (Wieder, Chamoni, & Ossimitz, 2012). The interview shows that 70% of the employees agreed that business intelligence helps to foster their performance and productivity at work which in return leads to improved performance in a company. This is affirmed by one of the junior employee participants who said that:

> "Our company has made the use of business intelligence systems a norm in all its operations. At first, when they were implemented we thought the company wanted to tame us, but it was not the case. Instead, the managers use it to determine the productivity of each employee. This is vital because the low performing employees are empowered further through training and offered other supportive services to increase their efficiency. The report is also used to guide the managers and supervisors on how to motivate them and increase their performance. I thus find business intelligence systems crucial to my

performance and productivity." *Translated from French.*

Therefore, from the junior employees' responses, it is apparent that business intelligence helps to foster employees' productivity as well as performance. This comes because the reports that are provided by BIS are vital in giving company leaders information on how to motivate the employees (Wieder, Chamoni, & Ossimitz, 2012). Employee motivation is vital as it leads to the satisfaction that is essential in maintaining the loyalty of the workers.

8. PERCEPTION OF ORGANIZATIONAL MEMBERS ON THE USE OF BI SYSTEMS BY SMEs

The result of the study indicates that both the managers and junior employees of the SMEs interviewed are positive about the use of BIS in their companies. According to the results of the interviews conducted on the managers, 96% of them accepted that their companies should continue using BIS. On the other hand, the interviews that were conducted with junior employees indicate that a majority of 85% accepted that BIS use should be continued in the companies they work for. These positive responses could be attributed to the benefits that come with BIS. The BI tools have the following advantages to a company whether large or small: improved timely and strategic decision making, increased customer satisfaction and highly motivated and satisfied work force (Elbashir, Collier & Davern, 2008). All these benefits are compounded by the enhanced overall organizational performance.

9. CONCLUSION

The result of this study affirms that BIS have a far-reaching impact on the operations of SMEs. First, BIS facilitate the process of decision-making at the managerial level by providing quality, timely and accurate data. The data generated also consider the past, present and future events and therefore allow business leaders to make informed decisions for the SMEs. Additionally, the impact of deploying BIS in SMEs extends beyond facilitation of decision making, to have an effect on employees, customers and other functions of the firms. This is because they make the operation efficient, allow an organization to meet customer needs appropriately and provide information on how to improve employees' individual performances through the needed support and motivation. The overall results of all these impacts of BIS are improved company performance, as portrayed by the study. These findings are similar to those found about Swedish SMEs, so we can argue for certain universal observations of behavior when it comes to SMEs.

Lastly, the improved performance of SMEs courtesy of BI tools as underscored by this study can be used as a measurement indicator of the outcomes of BIS. Measurement of the outcomes of BIS is one of the challenges that businesses struggle with. However, it is vital in monitoring the performance of an organization (Elbashir, Collier & Davern, 2008). The performance is determined by comparing goals and the outcomes. When determining the performance of BIS in SMEs, it is important to consider the following dimensions: financial, operational and overall effectiveness. According to Ramsey & Bahia (2013), these dimensions should be determined both subjectively and objectively. This shows that the determinant of the impact of BIS should be carried out holistically by determining the overall outcome of the organization, which ranges from financial performance, to the satisfaction of employees as well as the customers (Henri, 2004).

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Appendix I: The interview questions for SME managers

a) Has your company deployed business intelligent systems? Yes/No.
b) Are the business intelligent systems used at all levels of organizational department? If not which departments use business intelligent systems? Yes/No
c) Are they complex or simple business intelligence systems? Yes/No
d) Do you have skilled employees to run these systems? Yes/No
e) Does the information that is generated by the business intelligence system help in making timely decision making? If yes, how? Yes/No/Space to explain
f) Other than helping in prompt decision making are there other impacts of business intelligence systems in your company? If yes, how? Yes/No/Space to explain
g) Do you feel the company should continue using business intelligent systems, why? Yes/No/Space to explain

Appendix II: The interview questions for junior organizational members in SMEs

a) Does your company use business intelligent systems? Yes/No
b) Are you conversant with the uses of business intelligent tools? Yes/No
c) Do you feel that the business intelligent tools intelligent tools help you to improve your productivity and business performance? If yes, how? Yes/No/Space to explain
d) Do you think that the business intelligent systems help to improve overall organizational performance? If yes, how? Yes/No/Space to explain
e) Should the company continue using business intelligent systems? if yes, how? Yes/No/Space to explain