The Modeling of Business Intelligence and Space Structures: Factors Associated with Implementation of Business Intelligence among Lebanese SMEs

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ABSTRACT---- *Business Intelligence (BI) provides leverage to businesses by improving decision-making concerning the future in an industry or aspects of resources planning. Because of its valuable benefits, many organizations attempt to implement BI reap the gains. However, many factors determine the success of its implementation in business. Most of these factors relate to the organizational culture and the readiness of the employees to use it appropriately to serve its purposes. This study used descriptive observational design of a quantitative nature to explore the level of adoption of BI among 56 Lebanese SMEs as well as the perspectives of both the employees and the senior management on the adoption of BI in the business. The data was collected using self-administered structured questionnaire and analyzed using the SPSS software specifically measuring the nature and types of correlation among the business variables and the level of success of BI implementation in the SMEs. The tests were done using Spearman's rho correlation coefficients. The results show that quality BI infrastructure, positive attitude among senior employees and junior workers alike toward adoption of BI, and the setting of suitable environment to implement BI are essential for success. Also, junior workers show more support for BI than the senior management. Therefore, a change of organizational culture among the senior employees is recommended to facilitate BI adoption success in the SMEs.*

Keywords--- Business intelligence, correlation, descriptive observational design, Lebanese SMEs, quantitative method, self-administered structured questionnaire
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1. INTRODUCTION

Background Information

Business Intelligence (BI) plays an integral role in supporting success of a business venture. Duan and Xu (2012) define BI as "the process of transforming raw data into useful information for more effective strategic, operational insights, and decision-making purposes so that it yields real business benefits" (p.679). In this context, the role of BI in the business enterprises comes down to the value addition in the form of information insights that help the decision-making be effective by process and affects. However, BI comes with systems that support it namely the hardware components and the software ones. These are part of the structures that must be in place for the intelligence about markets, sources of raw materials, projection of future trends, and possibility of defining the implications of the future trends on the business.

BI is not only used as a form of information research in the business built also as a means of processing the information for better use. However, this comes with both opportunities and challenges (Adamala & Cidrin, 2011). For instance, one of the benefits would be that the use of proper BI leads to successful gains in the business by creating competitive advantage for the investors in the business ventures. Also, part of the challenges is the identification of the best BI for a business by capabilities and rewards (Herschel, 2012). It is an ongoing research that includes continuous data sourcing, processing and analysis using capable tools and structures. Investigating how BI brings in value to a business is possibly done based on a particular setting. The types of business and the nature of operations also determine the aspects of BI that suit the enterprises.

Problem Statement

Determination of the suitability of the BI for a business is a source of challenge that has left many organizations with irrelevant or inadequate BI structures and tools unsuitable for their nature of work. Still, the inappropriate user of the support services and structures lead to inefficiency in the installation and use of BI systems thereby leading to lower

gains than expected (Gurjar & Rathore, 2013). The realization that BI needs proper modeling and space structures come from the identification of the required business environment, support services and structures that must being in place prior to the use of the BI tools. As a result many businesses either have a ineffective versions of the BI or maintain the traditional information sourcing and processing methods that are obsolete. Consequently, many of these businesses perform worse than their counterparts that have adopted the new BI system.

Study Rationale

There are numerous activities that occur in a business that require information recording, storage, processing and reporting. According to Herzberg, Meyer and Weske (2015), these aspects need to be properly managed for the outputs namely the processed information to benefit the firm involved. The authors view the process as integrating the value addition that helps improve competitiveness of the business among its peers. However, the ability to determine the suitability of the BI system for a firm remains a critical but unknown phenomenon among the business owners and managers. As a result, there are multiple trial and errors that lead to waste of resources on system that and little or no value to the business venture as they are either irrelevant or out-of-date (Herzberg, Meyer & Weske, 2015). Therefore, investigating the requirements that are suitable for the specific type of business, in this case SMEs, and provide a means of addressing the problem of gambling with the BI system to only find the right one but chance that come with wastes of time and resources.

The view that BI use involves the use of unending processes and procedures means that the ability to carry out each of them precisely require not only determination and commitments but also abilities to maintain the standards of information management. Use of improved BI system is linked to better organizational performance gained through the increased competitiveness and efficiencies in the development of strategies (Farrokhi & Pokoradi, 2012). The investigation into the manner BI is adopted and incorporated into the day-to-day running of the business is essential in enabling current and future success. Evaluation of how the BI is adopted among the Lebanese enterprises is essential to help the ventures improve their performances. Therefore, the issues to e addressed by this paper can be put into perspective by use of swell defined purpose, objectives and study questions as in the following sub-section.

2. STUDIES PURPOSE, OBJECTIVES AND QUESTIONS

Study Purpose

The study purpose is to investigate the status of BI in the Lebanese SMEs by indentifying the factors affecting its implementation. These factors include the attitude of the SME managers towards the adoption and use of the BI in their organizations, the perceptions of the employees about the capabilities of the BI in their work, and the suggested means of attaining success in the use of the BI components in the enterprises. It is believes that assessment of these factors will help evaluate the topic effectively for use by the current Lebanese business sand others similar ventures all over the world.

Study Objectives

Research objective enable proper investigation of study topic so that all the aspects of the issue are adequately addressed. BI includes aspects of organizational behavior and employee –specific aspects need to support its adopting and maintenance. The objectives of the study, therefore, tend to address all theses aspects and are;

1. To establish the level of adoption of BI among the Lebanese SMEs as measured by the extent of involvement of BI in the businesses.

2. To assess the attitudes of the managers of the SMEs towards BI use in terms of its capabilities and suitability for their business.

3. To determine the perceptions of the employees of the Lebanese SMEs on the capabilities of the BI in the work roles.

4. To ascertain the association between among the perceptions of the managers and the employees of the Lebanese SMEs and the level of success in the use of BI in their businesses.

Study Questions

Research questions put the objectives into answerable perspectives that enable addressing of the topic even effective. The questions tend to break down the BI aspects better in ways that can be investigated. For this paper they tend to corresponds to each of the objectives as follows;

1. What is the level of adoption of BI among the Lebanese SMEs as measured by the extent of involvement of BI in the business?

2. What are the attitudes of the managers of the SMEs towards BI use in terms of its capabilities and suitability for their business?

3. What are the perceptions of the employees of the Lebanese SMEs on the capabilities of the BI in the work roles?

4. How do the perceptions among the managers and the employees of the Lebanese SMEs associate with the level of success in the use of BI in their businesses?

3. LITERATURE REVIEW

BI Use and Business Success

Organizational management of information is directly related to the level of performance at the end of any accounting period. Many scholars agree that when the information sourcing, processing and overall oversight is done properly the ability of a firm to be above its competitors is gained than even when the opposite is the case. The influence of organizations BI levels and the performance comes from the realization that market intelligence is crucial to effective planning and execution of strategies meant to steer the business to higher levels. According to Elbashir, Collier and Sutton (2011), BI offers a means of analyzing information in ways that affects the business in terms of the forging in the way forward and overcoming barriers to the effectiveness. Strategic integration of BI system in the operations of a business is the starting point to this success. The result is the ability to project into the future which carries and acts in time to counter the challenges of the market and other aspects of the business.

Features such as a system database management and uses are central to the success of a business venture. For instance, the availability of multiple alternatives to any aspects of struggle facing the business is a way of making the running of the venture smooth for the desired outcomes to be realized. The level of organizational acceptance and uses of BI system, therefore, returns to reflect on its ability to take advantage on the market opportunity and many other aspects of business operations like sourcing for raw materials, hiring and allocation of capital for growth and development (Chaudhuri, Dayal & Narasayya, 2011). Proper implementation of BI system in the organization creates a foundation onto which success would depend on for now and the future (Chaudhuri, Dayal & Narasayya, 2011). Organizations that are aware of the benefits of having appropriate BI system in place always strive to not only update them but also create enabling environment for the excellent thriving of the BI system support.

The role of the management in the facilitation of BI system is central to the use of such initiatives. While these would be evaluate later in the coming sub-section, it is valuable to highlight that the organizational culture that lies with the behaviors of the individual employees affect the BI adoption and effectiveness. For instance, the ability to have the right plans for the BI implementation is crucial in determining the subsequent effectiveness of the other stages. The roles of the systems, the human inputs and the suitable environment all affect the manner that BI can facilitate the achievement of organizational goals in various ways. Elbashir, Collier and Sutton (2011) state that "BI systems use analytics and performance management concepts to leverage enterprise system databases and provide core management control system (MCS) capability" (p.155). The capability of the MCS relates to improve operational effectiveness that translates into value addition for the consumers with the ultimate benefits going to the business owners who realize increased returns.

BI would be likened to empowerment of the business systems like what is done for the employees improved effectiveness. Since BI devolves the power of decision making among the employees and the top management, it gives the opportunity to fasten the decision making on critical issues that may hold back the achievement of success (Chen, Chiang & Storey, 2012). Besides, the decision made is always accurate due to the uses of systematic analytical measures embedded in the BI frameworks in the organizations. Consequently, when the right decision is made at the right time in the business then performance improves taking the gains to increased levels (Chen, Chiang & Storey, 2012). Therefore, it is appropriate to state that BI facilitates organizational performance improvement.

Managers' and Employees' Perspectives and BI Success in Businesses

BI implementation provides atop-bottom system of intelligent leadership in any venture that allows for the effectiveness of the lower workers to be enhanced for a faster growth than in the traditional information systems. While the top management may have a direct role in determination of how successful the BI system operates in a business, they are less inference as compared to the lower rank workers (Elbashir, Collier and Sutton, 2011). BI system is viewed as a more than any other MCS that require the top-down management system. The employees, therefore, have more impact on influencing the ability of the BI to work properly in a business as opposed to the top management like the directors and the managers. Other scholars view that the BI must have a suitable human and systems environment to achieve

intended goals in any enterprises. Isik, Jones and Sidorova (2013), for instance, evaluated how the BI is affected by the decision environment and how its abilities are enhanced to success. This environment is a combination of the human factors like the level of skills into use of modern BI technology as well as the availability and proper implementation of the BI components like the application software. Also, the use of the possible human attitudes toward the adoption of the BI system comes to leverage the manner in which the in-use BI systems function to meet the demands of the businesses.

The bottom line is that most of the businesses using the BI system must have the support of the top management and the positive attitude of the lower workers together with the existence and proper use of its components to achieve given information goals. According to Isik, Jones and Sidorova (2013), the decisions making from the intelligence gathering and processing by the BI system in an organization depends on the human factors such as the level of competency at the BI skills and the demands of the situations at hand. This implies that even at the presence of the best BI system, the work of the intelligence may not be fruitful if the resultant information is not used effectively by the personnel concerned with the interpretation of the outputs. Therefore, the success of a BI system in an organization requires the additional input of competent and skillful employees and top management. Besides, the top management needs to have a political will to engage in the BI systems in the first place. Then, the lower level manager must also have the right attitude towards the use of their BI components to solve their job problems.

Apart from the positive attitude towards the according of the BI system among the lower workers of employees, the top management or the employees must welcome the idea of having the improved or modern BI system and use it effectively to further business goals. The combined leverages of the human skills to uses the BI system and the valuable input of the Information System (IS) built within the BI enable the firms in very competitive environments to thrive faster than their counterparts that have low level of synergy among the variables. The inputs of the business management and the employee have a vital influence in the realization of the success of BI implementation. Popovic, Hackney, Coelh and Jaklic (2012) state that, "evaluating the effectiveness of BIS is vital to our understanding of the value and efficacy of management actions and investments" (p. 729). This means that the competitive advantage derived buses of the BI comes about as a result of not only the effectiveness of the BI but also the additional value added by the human aspect of the information processing and interpretation in an organization. The statement by Popovic, Hackney, Coelho and Jaklic (2012) also is the continuous monitoring of the performance of the BI in the business that use it at the center of human factor in the deriving of benefits from its implementation.

Eminently, there would be no need of having a BI system in place that is not properly monitored against the standards and benchmarks that are the true indicators of its success. Still, the study by Popovic, Hackney, Coelho and Jaklic (2012) arrives at the conclusion that, "empirical results link BIS maturity to two segments of information quality, namely content and access quality" (p.729). This adds other two important elements of human factor influencing the use of BI system in business which is access quality and the content of the information. However, they both belong to the human factors of the levels of competency and the skills on the BI that determines the accuracy and validity of the process information for decision making. Decision making, in this case, is just another parts that relies on the human skills and competency as the end stage of BI system use in businesses. Popovic, Hackney, Coelho and Jaklic (2012) go on to propose a conceptual framework that helps understand the correlation between every BI determinant and its successful implementation and use. However, overuses of the two components of access quality and analytical tasks in BI undermine the final stage of decision making and the opposite may also apply depending on the scenario at hand (Popovic, Hackney, Coelho, & Jaklic, 2012). This shows that the human factors must be regulated within optimal levels in order to crate the synergy required for the success in the utilization of BI system in a firm.

The findings of the study by Popovic, Hackney, Coelho and Jaklic (2012) coincides with that of Isik, Jones and Sidorova (2013) who also find out that capabilities brought about by the BI of quality data access and other support structures are essential in meeting the end stage of decision making based on the intelligent information gathered by the business. The interaction among the variable involved in the BI implementation and successful use brings in the points home regarding the way forward in investigating how the pieces fit together to suits the specific businesses. As it stands now, there is a gap in the overall and comprehensive understanding of how the human variables and the BI systems and structures interrelate to bring about success in its application among businesses.

Conceptual Framework of the Interaction between BI and Human Variables

From the onset of the analyses it was worth noting that the use of BI in business brings significant gains that push firms to implement it. However, this comes with its unique challenges. Adamala and Cidrin (2011) affirm this indication that the benefits of BI require the overcoming of the challenges that come with it if the outcomes are to be the desired ones. The authors categorized the challenges into non-technological and technological elements (Adamala & Cidrin, 2011). The former are human factors while the latter are the BI support structures. Another important pre-revelation to the conceptualization of the BI success factor is that what it requires to succeed is quite deviant from those of the general IS (Adamala & Cidrin, 2011). Indeed, the majority of the differences are rooted in the human or non-

technological aspects. They relate to political will among the leaders supporting proper implementation and use of the BI and positive attitude among the employees to engage in the appropriate utilization and translation of the results derived from it. The model in figure 1 provides the conceptual framework of interrelation among factors affecting effective implementation and use of BI by businesses.
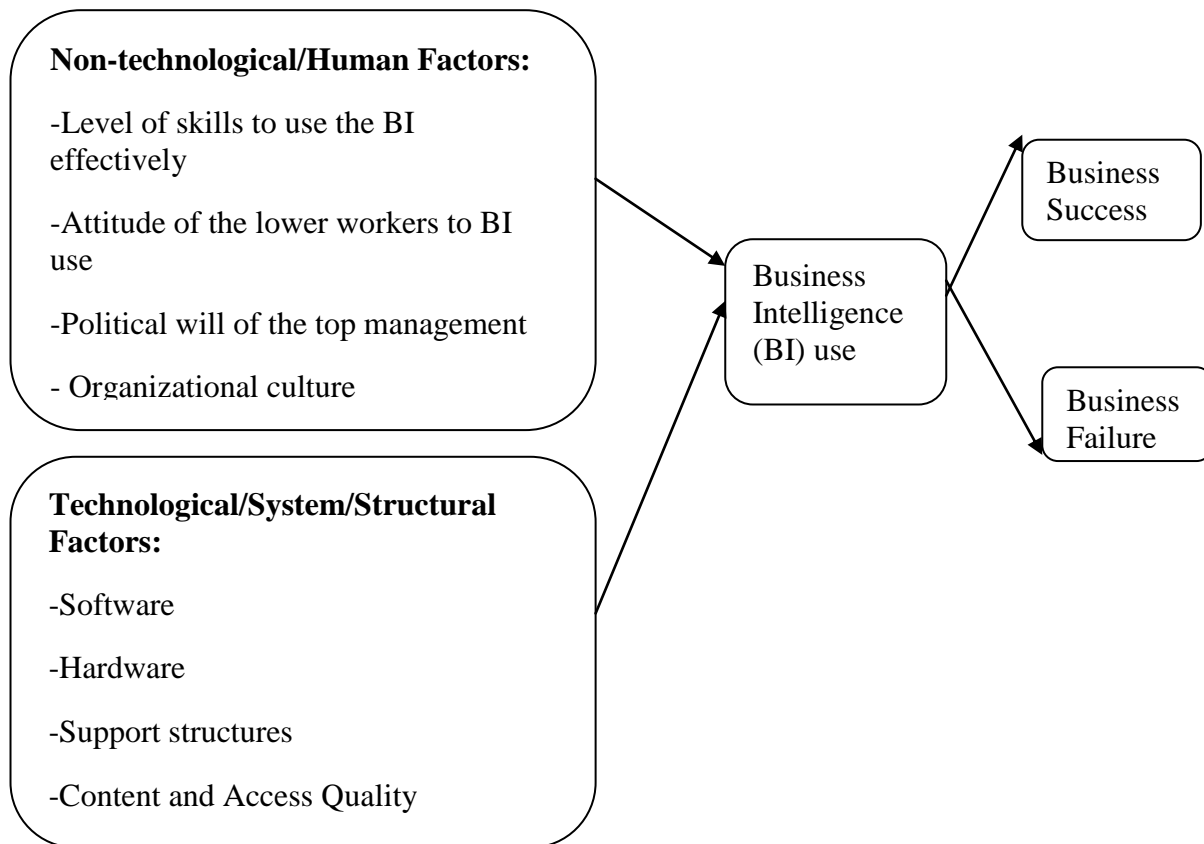

Figure 1: Conceptual framework of BI success as dependent on human and non-human factors.

4. METHODOLOGY

Study Design

Descriptive observational study design was use to complete the inquiry with the quantitative skills used in the data collection and analyses. The design included the inquiry that sought to find correlations among the independent variables and the dependent one (Frankfort-Nachmias & Leon-Guerrero, 2014). The variables were ranked allowing for ease of making the quantitative data collection and analyses (Garth, 2008). The independent variables included the input factors in BI implementation in the organizations while the dependent factors were the outputs and outcome ones that come as a result of its source. The inputs sources include the human and system factors while the outputs include the effective of BI implementation. The association of the two groups of variables wee able to show how they relate to one another thereby allowing for the correlation to be drawn and prediction of patterns possible (Garth, 2008). The scaled variables were categorized according to a simple scale from one to five in power ranking.

Sample and Sampling

A sample size of 56 permanent employees in the SMEs in Lebanon was used. Each of the employees included as a respondent was contacted through phone calls and gave their electronic mail address through which the self-administered questionnaire was sent to be filled by the participants and returned. Convenient sampling was used alongside purposive sampling to indentify only employees who worked in organization with the capability to use the BI systems (Frey, Botan & Kreps, 1999). The use of convenient and purposive sampling was prompted by the view that it is unlikely to find many SMEs in Lebanon imlemeeaing the BI in their businesses (Frankfort-Nachmias & Leon-Guerrero,

2014). The inclusion criteria was that the employee must have worked with the SME in Lebanon for at least six months, be an dealt, and be able to answer the study questionnaire without assistance by another person as the question were sent via e-mail and return the same way after filling. Most of the SMEs worked with to derive respondents, therefore, are likely to be implementing BI currently or had tried in the past. However, it was equally likely that they had never tried to implement BI as an organization.

Ethical Considerations

The Institutional research board (IRB) recommendations on the ethical concerns to observe were all considered. The SMEs from which the respondents belonged were contacted with a request to allow the study be done among the employees and granted their before the participants were recruited into the study (Frankfort-Nachmias & Leon-Guerrero, 2014). Each of the respondents was also offered free will to participate in the study with the nature and content of the research explained before any of them singed a consent form showing that they understand the study and agree to take part as a respondent. Also, the respondent was allowed to pull out of the study at will at any time or stage of the study (Frankfort-Nachmias & Leon-Guerrero, 2014). Above all, the aspects of confidentiality and privacy of the respondents and their information were observed and the copies of the final results promised to any of the respondents who wished to have own copy.

Data Collection

Data was collected using the self-administered questionnaires. The questionnaire was structured to guide the responses for the qualitative data analyses to go as appropriate (Frankfort-Nachmias & Leon-Guerrero, 2014). The respondent submitted their electronic mail address through which the questionnaires were sent in soft copies for them to fill. They filled the questionnaires within one week and returned them filled and scanned copies via electronic mail back to the researcher. Each of the questionnaires was relatively short requiring only about 10 minutes or less to fill. Therefore, the normal working routines of the respondents were not interfered with as they could take off only 10 minutes to fill the questionnaire at their convenience. Each of the respondents then scanned and returned the copy of the filled questionnaire that the researcher used to derive results.

Each of the respondents were contacted by phone in following up on the status of the sent questionnaire and this provided the mode of coordination of the data collection throughout the process. Also, some respondents gave back their feedback via handing over of hard copies of the filled questionnaires where this provided more convenience than the electronic method. The researcher picked the completed questionnaires at the places of work creating even strong bond between the study and the sample population. However, only less than half of the sample population used this method to return the filled questionnaires. Also, each of the respondents provided their preferred method of acquiring the copy of the final study results as wished. For instance, some wanted to have it through electronic mail while other preferred the postal mail system as other still need that they are given hand-to-hand at their places of work. The increased convenience of the respondents was believed to improve the quality of the contents in terms of accurate and validly as errors due to hastiness or uncomfortable environments were eliminated (Frey, Botan & Kreps, 1999).

Analyses and Presentation of Results

The quantitative data were quantitatively analyzed. The preliminary step was data entry immediately after the reception back of the completed questionnaires. Then, the cleaning took place after which the data set was ready for analyses. The initial analyses were done on the demographics of the respondents. These were done using the measures of central tendencies and those of dispersion (Garth, 2008). All the data was analyzed using the IBM's Statistical Packages for Social Sciences (SPSS) and outputs used in the results and discussion of the findings (Garth, 2008). Mean, median, standard deviation, mode, sum, maximum and minimums were used for the measures of central tendency as the range was use as the measure of dispersion. Also, frequencies proportions were used for most of the demographic characteristics analyses. The inferential statistical test was done to tests the correlation among the various variables involved (Frey, Botan & Kreps, 1999). This was done using the Spearman's rho correlation coefficient to measure the nature and strength of association among the independent and the depend variables (Garth, 2008). Spearman's' rho correlation suited as a non-parametric test proper of ranked data that have not been measured for normality in distribution pattern. The results of the correlation coefficient were measured in the scale of between 0.0 and 1.0 accordingly with the positive and negative sign significant in determining the nature of association between any two involved variables (Frey, Botan & Kreps, 1999).

The results of the findings are presented in the form of continuous prose literature, graphs and tables. While the continuous prose literature provide the means of explaining the results contained in the graphs and tables with detailed elaborations, the visual table and figures summarized the result and made it easier to understand at a glance (Frey, Botan & Kreps, 1999). All of the graphs and figure in the result section are outputs of the data analyses software.

Study Limitations

The study used a relatively small sample size of only 56 respondents that may have affected the validity of the results (Frankfort-Nachmias & Leon-Guerrero, 2014). However, other measures such as appropriate data analyses method was used to increase the validity of the results. The other remarkable limitation of the study is the use of both convenient and purposive sampling (Frankfort-Nachmias & Leon-Guerrero, 2014). This was elicited by the inability to find many SMEs in Lebanon likely to be using BI and no earlier study on the setting and this topic available to ensure accurate numbers on the possibility of finding any fitting respondents. Again, just taking one employee as a representative from one SME was able to meet the information need of the research as opposed to having any respondents from the same organization. Though these limitations are acknowledged herein, there effects are significantly reduced to negligible levels by use of other counter measures like the data analyses and reporting methods (Frey, Botan & Kreps, 1999).

5. RESULTS

Descriptive Statistics and Data Distribution Patterns

Descriptive statistics enables the researchers to show how the characteristic of the sample population was and how it can relate to the results (Yin, 1994). In the quantitative research aspects such as the demographic s of the participants such as age and occupation and marital status are just a few of the variables that are considered important (Baker, 1994). However, for this survey, the most important demographics were the department in which the respondent worked and the role played as per the job position (Jha, 2008). However, the role position was standardized at management level for the sample population as it was believed that this is the right respondent who can give adequate and unbiased information about the status and prospects of the Business Intelligence Systems (BIS) at the firm. The demographic on the department in which a respondent worked was able to disclose the closeness of the respondent to the use and vitality of the BIS thereby enabling the researcher to draw conclusion that can help in decision-making regarding the company besides assisting in the accurate and proper evaluation of the objectives.

While there are numerous descriptive statistics that could be analyzed such as the mean, median, standard deviation, range, mode, skewness, maximum, minimum and many others, the proportions of percentages stands out to be most helpful in understanding the amount of participants from each category of the data (Welman, Kruger, Mitchell & Huysamen, 2005). The percentage proportions always fall under the frequency measures that show the number of appearances of an occurrence in relation to the total occurrences. As seen in table 1 below, the respondents came from seven categories of departments namely, accounting, administrative, operations, sales, IT, manufacturing, and other. The responses were coded according to the likely outcomes.

There were initially 18 occupation variables to be chosen for the department by the respondent. These included accounting, administrative, customer service, marketing, operations, human resources, sales, finance, legal, IT, engineering, product, research and development, international, business intelligence, manufacturing, public relation, and other. These were coded in data analysis form 1 to 18 in there order of listing on the questionnaire. However, because many of them were having zero frequencies, only those that had occurrences were tabled in table 1 below. According to the result, 10.7% of respondents came from the accounting department (n=6), 32.1% came from administrative (n= 18), operations had 1.8 participants (n=1) just like the sales department that showed one respondent (n=1). The other department that also had respondents was the IT that had 14.3% (n=8), manufacturing at 3.6% (n=2), and other that had 35.5% (n=20) out of the total sample size of 56 participants. Therefore, other had the most respondents at 35.5% followed by the administrative at 32.5%. Business Intelligence department lacked a respondent but IT had a meager 1.8% appearance that was only a single respondent.

Table 1: Departments in which the respondents belonged by frequencies

What department do you work in?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	accounting	6	10.7	10.7	10.7
	administrative	18	32.1	32.1	42.9
	operations	1	1.8	1.8	44.6
	sales	1	1.8	1.8	46.4
	IT	8	14.3	14.3	60.7
	manufacturing	2	3.6	3.6	64.3
	other	20	35.7	35.7	100.0
	Total	56	100.0	100.0	

The principal research question was asking "What tools and technologies do the employees of SMEs use to be better informed about their activities and environment?" There were a total of seven options under this as shown in table 3 below. This question explored the extent of integration of BIS in the companies that took part in the survey. The answers would give the status of BIS use that also indicates the level of appreciation of the system in the work environment. The responses are described using the descriptive statistics as shown below in table 3. What was significant is that a single business would have multiple answers as long as the types of BIS exist in the workplace. Majority of the businesses use local information system (n=36) followed by reporting and querying software: tools that extract, sort, summarize, and present selected data (n=34). The least used BIS elements that which combine all of the listed ones found to be only one business followed equally by data related ones namely data mining and data warehousing with each having only 11 businesses integrating them into their use. The Online Analytical Processing (OLAP) is used by 20 businesses. Other descriptive statistics such as the mean, median, mode and standard deviation are shown in table 2.

Table 2: Descriptive statistics for tools and technologies used by the businesses

		Reporting and querying software: tools that extract, sort, summarize, and present selected data	OLAP	Digital dashboards	Data mining	Data warehousing	Local information systems	All of the Above
N	Valid	56	56	56	56	56	56	56
	Missing	0	0	0	0	0	0	0
Mean		.61	.36	.00	.20	.20	.64	.02
Median		1.00	.00	.00	.00	.00	1.00	.00
Mode		1	0	0	0	0	1	0
Std. Deviation		.493	.483	.000	.401	.401	.483	.134
Range		1	1	0	1	1	1	1
Minimum		0	0	0	0	0	0	0
Maximum		1	1	0	1	1	1	1
Sum		34	20	0	11	11	36	1

As can be seen on the pie chart of figure 1, those who agreed by saying "yes' to have the BI system in their businesses were the majority at 78. 6% (n=44) as compared to those who said "no" (21.4%, n=12). Therefore, many businesses require the BIS to be in place. For those who said they do not require the BIS, their specific reasons are listed in Appendix 1.

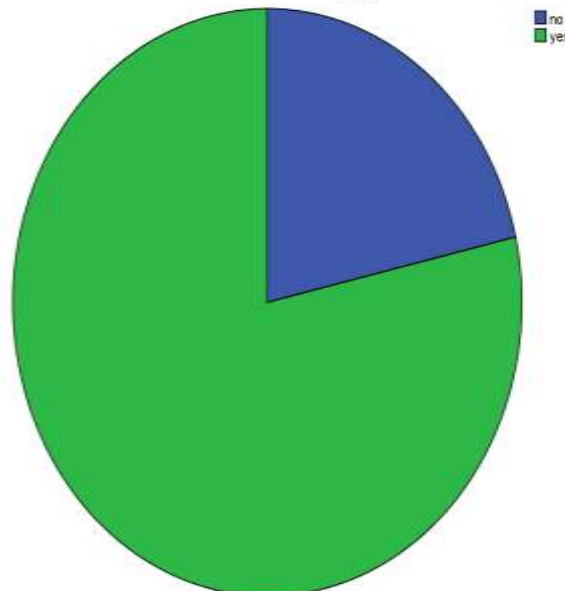In general, is it necessary to have the business intelligence information in your firm?

■ no
■ yes

Figure 1: A pie chart of perceived necessity to have the BI information in the SMEs

Reaction to BI Service

The following series of questions were meant to explore how the businesses and their employees react to the BI services. This is important in gauging the reasons for not adapting to the new technologies in BI that would benefit their firms as well as showing why they acquire them. The first question was asking the respondents to give the reaction they expect their businesses to have if there is BI information needs. The responses were ranked as "very negative" first, "somewhat negative" second, "neutral" third, "somewhat positive" fourth and "very positive" fifth.

There were options for the respondents to choose the level of requirement that they felt their business had for the BIS. The options were three and ranked from first to third in the order of "need", "want" and "both equally" from first to

third. The respondents were as shown in table 33. Majority of the respondents said they need the BIS (41.1%, n=23) followed by "want" at 33.9% (n=19) and lastly "both equally" at 25.0% (n=14) as in figure 1.
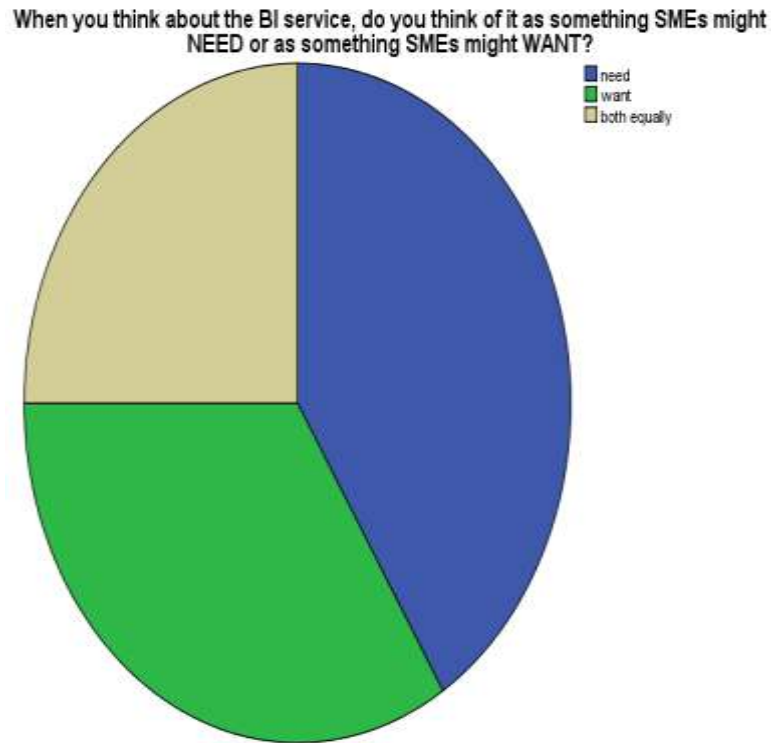

Figure 2: A pie chart of how respondents think about BI for the businesses

The last question the respondents were asked under this category of the reaction to BI was the evaluation of the level of need that the respondents felt organizations would provide. While the answers would be varied, they were mainly categorized as either positive or negative represented by "yes' or "no" respectively. In data coding, "no" was assigned 1 while "yes" was assigned 2. The frequency results are summarized in figure 3.
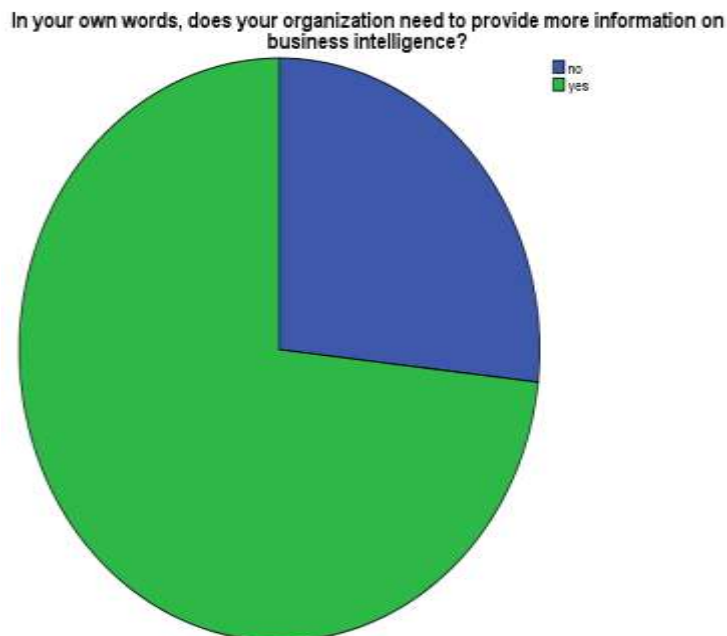

Figure 3: Histogram of the perceived necessity for the SMEs to provide BI information

Correlation Testing Using Spearman's rho Correlation Coefficient Technique

To satisfy the objectives of the study, the correlation between the various parts of the inquiry on the BIS and the SMEs for a better understanding than just the mere description of the result as in the previous parts (Creswell, 2003). Pearson's correlation would help in this analysis (Garth, 2008). However, because some of the data have been

seen to be abnormally distributed but skewed either to the right or to the left Pearson's correlation would not work properly. The best tests are those of the Spearman's rho correlation for the ranked data (Frey, Botan & Kreps, 1999). Using this technique, pairs of variables are tested for correlation that may help in understanding the relationship between one variables and the other. Therefore, variables with ability to relate are chosen for these Spearman's' rho correlation coefficient test. This non-parametric correlation test was done for the pairs of variables as found from the subsequent results (Frankfort-Nachmias & Leon-Guerrero, 2014). Spearman's correlation coefficient ranges from -1.0 to +1.0. The negative values are for the strong negative correlation while the positive ones are for the strong positive correlation. Within these are the levels for very weak, weak, moderate, strong, very strong according to the values of the coefficient from 0.0 to 0.19, 0.20 to 0.39, 0.40 to 0.59, 0.60 to 0.79, and 0.80 to 1.0 respectively (Frey, Botan & Kreps, 1999).

The first correlation was run for the pair of variables shown in table 13 and the correlation coefficient significance (2-tailed) is 0.75 (as shown in table 13). This indicates a strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a strong positive monotonic correlation between "My company is using technologies that are recognized as BI technologies" and "I am content with the BI system skills acquisition that my organization offers."

Table 13: Pearson's rho correlation coefficient for use of BI technology and tools and level of content of acquisition in the SMEs

Correlations

			My company is using technologies that are recognized as BI technologies	I am content with the BI system skills acquisition that my organization offers.
Spearman's rho	My company is using technologies that are recognized as BI technologies	Correlation Coefficient	1.000	.750**
		Sig. (2-tailed)	.	.000
		N	56	56
	I am content with the BI system skills acquisition that my organization offers.	Correlation Coefficient	.750**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 14 and the correlation coefficient significance (2-tailed) is 0.500 (as shown in table 14). This indicates a moderate positive correlation (Frey, Botan & Kreps, 1999). It means that there is a moderate positive monotonic correlation between "My organization does not have the business intelligence system" and "My firm retains the traditional IT system of information reporting and data storage."

Table 14: Pearson's rho correlation coefficient for lack of BIS in the SMEs and level of retention of the traditional IT systems of reporting and data storage

Correlations

			My organization does not have the business intelligence system	My firm retains the traditional IT system of information reporting and data storage
Spearman's rho	My organization does not have the business intelligence system	Correlation Coefficient	1.000	.500**
		Sig. (2-tailed)	.	.000
		N	56	56
	My firm retains the traditional IT system of information reporting and data storage	Correlation Coefficient	.500**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 15 and the correlation coefficient significance (2-tailed) is 0.146 (as shown in table 15). This indicates a very weak positive correlation (Frey, Botan & Kreps, 1999). It means that there is a very weak positive monotonic correlation between "The BI system requires special analytical skills" and "Very few staffs mainly from the IT department have knowledge on business intelligence."

Table 15: Pearson's rho correlation coefficient for the perception that BI requires special analytical skills and level of knowledge on BIS

Correlations

			The BI system requires special analytical skills	Very few staffs mainly from the IT department have knowledge on business intelligence
Spearman's rho	The BI system requires special analytical skills	Correlation Coefficient	1.000	.146
		Sig. (2-tailed)	.	.282
		N	56	56
	Very few staffs mainly from the IT department have knowledge on business intelligence	Correlation Coefficient	.146	1.000
		Sig. (2-tailed)	.282	.
		N	56	56

The other correlation was run for the pair of variables shown in table 16 and the correlation coefficient significance (2-tailed) is -0.075 (as shown in table 16). This indicates a very weak negative correlation (Frey, Botan & Kreps, 1999). It means that there is a very weak negative monotonic correlation between "Very few staffs mainly from the IT department have knowledge on business intelligence" and "Presence of business intelligence information in my firm will help me to remain competitive."

Table 16: Pearson's rho correlation coefficient for the level of knowledge on BI and the perception that BI will help business remain competitive

Correlations

			Very few staffs mainly from the IT department have knowledge on business intelligence	Presence of business intelligence information in my firm will help me to remain competitive
Spearman's rho	Very few staffs mainly from the IT department have knowledge on business intelligence	Correlation Coefficient	1.000	-.075
		Sig. (2-tailed)	.	.582
		N	56	56
	Presence of business intelligence information in my firm will help me to remain competitive	Correlation Coefficient	-.075	1.000
		Sig. (2-tailed)	.582	.
		N	56	56

The other correlation was run for the pair of variables shown in table 17 and the correlation coefficient significance (2-tailed) is 0.679 (as shown in table 17). This indicates a strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a strong positive monotonic correlation between "With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms" and "The BI tools have made my work easier that the day go by without me noticing."

Table 17: Pearson's rho correlation coefficient for the level of confidence in BI and work outcome for its use

Correlations

			With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms.	The BI tools have made my work easier that the day go by without me noticing
Spearman's rho	With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms.	Correlation Coefficient	1.000	.679**
		Sig. (2-tailed)	.	.000
		N	56	56
	The BI tools have made my work easier that the day go by without me noticing	Correlation Coefficient	.679**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 18 and the correlation coefficient significance (2-tailed) is 0.674 (as shown in table 18). This indicates a strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a strong positive monotonic correlation between "With the new strategy of business

intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms" and "The business intelligence system has enabled me to learn about the business environment."

Table 18: Pearson's rho correlation coefficient for the level of confidence in BI and work outcome for its use

Correlations

			With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms.	The business intelligence system has enabled me to learn about the business environment
Spearman's rho	With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms.	Correlation Coefficient	1.000	.674**
		Sig. (2-tailed)	.	.000
		N	56	56
	The business intelligence system has enabled me to learn about the business environment	Correlation Coefficient	.674**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 19 and the correlation coefficient significance (2-tailed) is 0.701 (as shown in table 19). This indicates a strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a strong positive monotonic correlation between "With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms" and "In my organization, there is a quick adaptation to the use of BI."

Table 19: Pearson's rho correlation coefficient for the level of confidence in BI and level of adaptation to it

Correlations

			With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms.	In my organization, there is a quick adaptation to the use of BI
Spearman's rho	With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms.	Correlation Coefficient	1.000	.701**
		Sig. (2-tailed)	.	.000
		N	56	56
	In my organization, there is a quick adaptation to the use of BI	Correlation Coefficient	.701**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 20 and the correlation coefficient significance (2-tailed) is 0.854 (as shown in table 20). This indicates a very strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a very strong positive monotonic correlation between "What is your employee level of being informed?" and "How well has BI helped you achieve your employee work with other employees and create the intelligence culture in the company?"

Table 20: Pearson's rho correlation coefficient for the level of being informed and how well BI has helped achieve the work with colleagues and creation of intelligence culture

Correlations

			What is your employee level of being informed?	How well has BI helped you achieve your employee work with other employees and create the intelligence culture in the company?
Spearman's rho	What is your employee level of being informed?	Correlation Coefficient	1.000	.854**
		Sig. (2-tailed)	.	.000
		N	56	56
	How well has BI helped you achieve your employee work with other employees and create the intelligence culture in the company?	Correlation Coefficient	.854**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 21 and the correlation coefficient significance (2-tailed) is 0.793 (as shown in table 21). This indicates a strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a strong positive monotonic correlation between "How well has BI helped you achieve your employee work with other employees and create the intelligence culture in the company?" and "How quickly have the employees responded to the need of business intelligence information in the firm?"

Table 21: Pearson's rho correlation coefficient for how quickly employees respond to BI colleagues and creation of intelligence culture

Correlations

			How well has BI helped you achieve your employee work with other employees and create the intelligence culture in the company?	How quickly have the employees responded to the need of business intelligence information in the firm?
Spearman's rho	How well has BI helped you achieve your employee work with other employees and create the intelligence culture in the company?	Correlation Coefficient	1.000	.793**
		Sig. (2-tailed)	.	.000
		N	56	56
	How quickly have the employees responded to the need of business intelligence information in the firm?	Correlation Coefficient	.793**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 22 and the correlation coefficient significance (2-tailed) is 0.831 (as shown in table 22). This indicates a very strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a very strong positive monotonic correlation between "How much attention do your employees pay to business intelligence information?" and "How quickly have the employees responded to the need of business intelligence information in the firm?"

Table 22: Pearson's rho correlation coefficient for how quickly employees respond to BI colleagues and how much attention employees pay to it

Correlations

			How quickly have the employees responded to the need of business intelligence information in the firm?	How much attention do your employees pay to business intelligence information?
Spearman's rho	How quickly have the employees responded to the need of business intelligence information in the firm?	Correlation Coefficient	1.000	.831**
		Sig. (2-tailed)	.	.000
		N	56	56
	How much attention do your employees pay to business intelligence information?	Correlation Coefficient	.831**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 23 and the correlation coefficient significance (2-tailed) is 0.853 (as shown in table 23). This indicates a very strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a very strong positive monotonic correlation between "How well is the business intelligence applied in your firm?" and "How is the speed of your employee's adjustment to the use of business intelligence information?"

Table 23: Pearson's rho correlation coefficient for how well BI is applied in the SMEs and the speed of employee adjustment to it

Correlations

			How well is the business intelligence applied in your firm?	How is the speed of your employee's adjustment to the use of business intelligence information?
Spearman's rho	How well is the business intelligence applied in your firm?	Correlation Coefficient	1.000	.853**
		Sig. (2-tailed)	.	.000
		N	56	56
	How is the speed of your employee's adjustment to the use of business intelligence information?	Correlation Coefficient	.853**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 24 and the correlation coefficient significance (2-tailed) is 0.822 (as shown in table 24). This indicates a very strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a very strong positive monotonic correlation between "How well do BI tools assist the works in meeting their goals?" and "How much do you trust the BI tools?"

Table 24: Pearson's rho correlation coefficient for how well BI tools assist in meeting work goals and how much trust is given to it

Correlations

			How well do BI tools assist the works in meeting their goals?	How much do you trust the BI tools?
Spearman's rho	How well do BI tools assist the works in meeting their goals?	Correlation Coefficient	1.000	.822**
		Sig. (2-tailed)	.	.000
		N	56	56
	How much do you trust the BI tools?	Correlation Coefficient	.822**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

The other correlation was run for the pair of variables shown in table 25 and the correlation coefficient significance (2-tailed) is 0.727 (as shown in table 25). This indicates a strong positive correlation (Frey, Botan & Kreps, 1999). It means that there is a strong positive monotonic correlation between "What reaction do you expect your company to have if there is presence of business information needs?" and "How well does the phrase "INNOVATIVE" describe the planned implementation of business intelligence information in your firm?"

Table 25: Pearson's rho correlation coefficient for expected reaction to BI and how "innovative" describe planned and implementation of it in the SMEs

Correlations

			What reaction do you expect your company to have if there is presence of business information needs?	How well does the phrase "INNOVATIVE" describe the planned implementation of business intelligence information in your firm?
Spearman's rho	What reaction do you expect your company to have if there is presence of business information needs?	Correlation Coefficient	1.000	.727**
		Sig. (2-tailed)	.	.000
		N	56	56
	How well does the phrase "INNOVATIVE" describe the planned implementation of business intelligence information in your firm?	Correlation Coefficient	.727**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

Preferred Main Competencies Supported by BIS in Establishing Business Competitiveness

The main competencies that BIS can support to help businesses remain competitive are listed in figure 4. The respondents gave how they felt the presence of BI fitted to support one of them with the space. Most respondents chose "other" (41.1%, n=23) followed by "better understand the core competency of my company" (25.0%, n=14). The least score is that of "analyzing collected data" (16.1%, n=9). The other possible answer of "better understand the needs and wants of the customer" scored 17.9% (n=10).
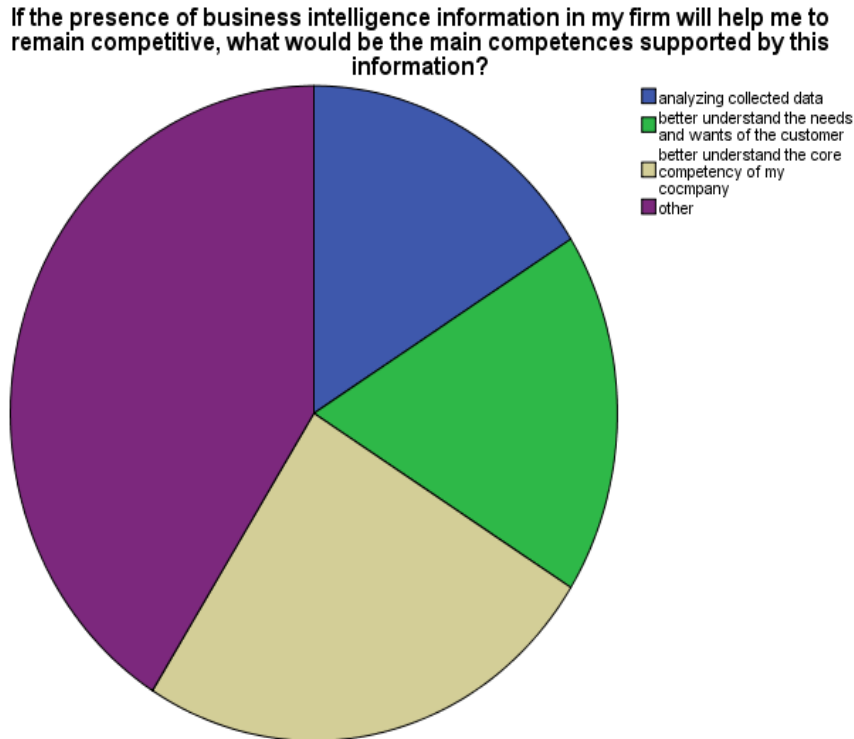

Figure 4: A pie chart of the preferred main competencies supported by BIS in establishing business competitiveness

6.   DISCUSSIONS

Demographic Characteristics

Most of the respondents came from the departments of administration followed by information technology and accounting respectively. This helped give accurate account of the application of BI in the SMEs because while BI is applicable in many aspects and departments of a business, the studies show that most of its use in these departments is higher than in others (Dorantes, Peters & Richardson, 2013; Sharma, 2014). Consequently, the principal question of "What tools and technologies do the employees of SMEs use to be better informed about their activities and environment?" was answered with majority of the respondents giving "Local information systems" to show that most of the businesses have not integrated modern BI systems into their organizations. However, most of the SMEs also use a system that uses software as a component of BI with the second majority of respondents indicating that "Reporting and querying software: tools that extract, sort, summarize, and present selected data." Also, OLAP is popular among the business studied. Apparently, heavy data use in BI is only minimal with only 11 respondents indicating its application among the 56 SMEs studied.

Most organizations in the study setting had some elements of BI already in place. This meant that the response for the level of effectiveness of such systems as perceive by the management and the employees was possible. However, some respondents showed that they do not think the BI is important for their businesses. This can be attributed the perceived lack of value that BI brings to the organization that uses it. Indeed, many studies show the value addition in terms of organizational coordination, communication and general improved efficiency in all aspects of operations (Prescott & Miree, 1998; Ramakrishnan, Jones & Sidorova, 2012). More importantly is the fact that BI increases the ability to project and determine the future enabling proper planning (Sharma, 2014).

Reaction to BI System Service

Majority of SMEs in Lebanon need the BI in place. This stems from the understating that BI comes with increased competitive advantage among competing firms ad he improved operational efficiency is another point for this indicated demand of the system of intelligence in the businesses (Dorantes, Peters & Richardson, 2013). Also, the other sudden majority of the Lebanese SMEs want the BI systems implemented. This raises the demand for BI among the Lebanese SMEs in the current and near future (Sharma, 2014). When combined with those who want and need the BI, the result is that all the SMEs in Lebanon demand BI system. Indeed, most of the SMEs showed that there level of demand for the BI systems are significant to elicit further action that could be the adoption in the business.

Correlation Outcomes

The perceptions that the BI system used by the SMEs is associated with the level of skills acquisition to handle the technology that come with it have strong positive correlation. It comes to show that the implementation of BI in organizations needs the support services such as the technology that offer its platforms as well as the personnel qualified and competent to handle them. It can be further indicated that the increased adoption of BI among the study population would come with increased skilled personnel to handle them for increased effectiveness. This result coincides with the findings of Baxter, Bedard, Hoitash and Yezege (2013) that also associate increased risk implementing BI to the lack of concurrent application of technology alongside the availability of competent personnel to use them for the benefit of the organization. Quality in BI system and its application includes the use of right components and the use of qualified personnel to run them. This is the only way that the risk involved in the uses of BI can be reduced to the minimum possible in organizations (Baxter, Bedard, Hoitash & Yezege, 2013). The use of BI among the Lebanese SMEs, therefore, conforms to the scenario founding other parts of the world and the result can be generalized into other populations.

Despite the high demand of the BI among the study SMEs, there are some of them that retain the traditional methods of business intelligence sourcing and processing. However, this correlation was only moderate positive association meaning that it is median strength. The median strength is attributable to the minority number of SMEs that use the traditional, methods of BI particularly due to the lack of awareness of the benefits of improving BI technologies and the inability to have the qualified technicians to run them properly. Also, the revelation by Li, Hsieh and Rai (2010) that the level of employee motivation to uses the BI system also influences the manner its adoption in an organization becomes successful. The authors indicate that even in the presence of quality BI systems and qualified personnel, the lack of adequate motivation to use it properly may ruin the chances of gaining from its implementation (Li, Hsieh & Rai, 2010). The implementation of BI systems in any setting or region of the world depends on the three factors of quality BI components, qualified personnel to run them and adequate level of motivation to utilize it appropriately. Likewise, Lebanese businesses need to factor in all the three variables of effective implementation of BI in order to succeed in reaping its benefits. By extension, the Lebanese businesses need to identify all the barriers to effective implementation of BI is that they can be remove prior to the putting in place of the structural system that support it or increased chances of success.

In the contrary to the above analyses, there was only weak positive association between the perception that BI systems require special analytical skills and that on the view that only a few staff members are trained enough to use it. The fact is that while many BI systems require specialized software components, their actual uses may only require the medium skills level among personnel (Popovic, Coelho & Jaklic, 2009). However, the weak positive correlation may be as a result of the awareness among the respondents on the fact that the eve of skills required to analyze information on BI platforms are above the normal as already indicated above. The lack of adequate number of skilled personnel to handle the BI may also be as a result of the low trust in the BI as a capable tool towards reaching organizational competitiveness. According to other scholars, the information technology department is vested on the most responsibility in using the BI in an organization (Ramakrishnan, Jones & Sidorova, 2012). This goes back to the three factors of quality BI structures, personnel and the will to use them properly as the pillars to success in its implementation in business of Lebanon and the rests of the world.

Many of the SMEs in Lebanon, however, appreciate the role of BI in securing organizational competitiveness. The realization that use of the traditional and obsolete methods of BI is the main reason many business lag behind in growth and development is acknowledged leading to the willingness to have the modern BI system in place. For this reason, the correlation between the realization that there are only a new staff members in the department of information that are capable of handling the BI system and the ability of the business to secure competitive advantage using it is a weak negative association. Ultimately, there is the indication that the use of BI requires sonly medium skills that can be given by merely upgrading on the skills of the incumbent employees such as use of computer packages (Zeng & Duan, 2012). The authors suggest that the computer skills that are needed for use of the computerized BI systems can easily be imparted to employees via training programs that are affordable and easily available (Zeng & Duan, 2012). Indeed, the strong positive correlation between the ability of a business to gain competitive advantage with employee effectiveness and the confessions that its use has improved the work of employees confirm the claim by Zeng and Duan (2012). BI,

therefore, has both internal gains in the form of improved employee productivity and the external benefit of increased organizational competitiveness.

The capability of BI to enhance organizational competitiveness is also shown by the strong positive correlation between the variable "With the new strategy of business intelligence in place, I get excited about working as I am convinced that my firm is enjoying competition over the rival firms" and "The business intelligence system has enabled me to learn about the business environment." It confirms the result immediately preceding this and coincides with the observation of Zeng and Duan (2012) that BI is valuable for organizations requires only minimal analytical skills based on computer knowledge. Again, the former variable is also strongly passively correlated with the speed of adoption of the Lebanese SMEs' to the BI confirming that its implementation and use depends on the level of readiness of the employees to adapt to it. Shen (2015) also indicate the same by adding the level of readiness to use the b to the infrastructure needs that should support the BI system in an organization.

The level of being informed seems to be directly related to the perceived improvement due to the adoption of BI in SMEs of Lebanon. The correlation between the level of being informed, that is similar to the amount of power commanded in an organization, and the perceived assistance gained from the BI is also very strongly positive. This leads the conclusion that the senior employees are able to benefits from the BI system more than the junior workers. Also, the sharing of processed information among the senior employees is much higher than the ability to have the same information among the juniors. Therefore, the organizations that have BI need to bridge this gap by having empowerment implement alongside the BI as suggested by Shen (2015). When this is one, the information sharing through communication in the organization is made effective to allow all the levels of being informed in the business to one leveled aspect for improved decision-making and consequently success in terms of entrepreneurial performance. Indeed, the very strong positive correlation that BI has helped the MSEs have improved work performance and the speed of response to the its adopting confirm that bridging the gap between the power relations in an organization is able to fuel its proper utilization to further benefit the organization (Baxter, Bedard, Hoitash & Yezege, 2013). The Lebanese business need to consider the employee empowerment that reduced the power relations among the employees, to facilitate the BI implementation for success as they work in synergy.

A related correlation of how fast the employees adapt to the BI and the level of attention given to it is also very strongly positively related to mean that they g concurrently. In the presence of positive attribute among the employees to use the BI and the availability of quality structural systems to support it, the success of the organization in furthering both increased employee productivity and improved business performance are ascertained (Shen, 2015). In fact, the correlation between the inquiry into how fast the employees adapt to the BI system in lace and the effectiveness of its implementation is also very strongly positively associated. Therefore, it is possible to state that the ability of the employees to adapt to BI is associated with the effectiveness of its adoption into a organization (Olszak & Ziemba, 2012).

Summarized further, employee readiness for BI is a prerequisite to success of its implementation. Consequently, the amount of trust among the employees on the BI tools and the level of effectiveness of its implementation is also very strongly positively correlated. This means that the use of BI needs to come after the trust in its tools is achieved for better adoption to benefit fully from it. Dorantes, Peters and Richardson (2013) indicate that the use of BI is similar to introduction of organizational change that requires trust in it and the readiness to adopt to new way of doing work. Indeed, the Lebanese SMEs that still do not have the BI in place would wish to introduce it as part of the innovations. To tem, the implementation of BI equals to innovativeness in an organization.

7. CONCLUSIONS

Determinants of effective implementation of BI come to quality structures, technology, qualified personnel and the suitable organizational culture that summarizes employee attribute and readiness to use its components. SMEs in Lebanon have considerably used the aspects in attempting to implemented BI tools bring the level of adoption of BI to significantly more than half. However, there is a power gap that introduces a barrier to effective implementation of BI among the SMEs that can be solved using decentralization effects like employee empowerment (Ramakrishnan, Jones & Sidorova, 2012). On the contrary the junior employees are willing and ready to have the BI implement in their firms mainly because they believe in the capabilities of BI more than the senior employees and the business owners. Consequently, the BI implementation among the Lebanese SMEs has only succeeded because of the readiness among both junior employees and the senior managers and employees are relatively compared to others (Popovic, Coelho & Jaklic, 2009). Therefore the SMEs hat have BI use are the ones that have confidence that they are competitive among peers in their various industries.

Future research is suggest to quantitatively test the manner that the BI tools have benefit the Lebanese SMEs so that the rest of the business can learn from it and introduce them in their own settings. This will also bridge the knowledge gap left unfilled by this study that has concentrated on the perception of the employees and mangers on the capabilities of BI as well as the level of adoption among the study population. BI is inevitable in any business that tends to remain competitive in the every evolving business environment as a result of rapid adoption of new information technologies (Olszak & Ziemba, 2012).

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