THE USE OF BUSINESS INTELLIGENCE (BI) IN SMALL AND MEDIUM-SIZED ENTERPRISES (SMEs) IN BOSNIA AND HERZEGOVINA

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ABSTRACT

Small and medium-sized enterprises (SME) represent an extremely important aspect for an economy of a country, especially for the economies of developing countries such as Bosnia and Herzegovina (BiH). Increasingly demanding market, process of globalization, advancement of information and telecommunication technology, and an increase in the negotiating power of certain stakeholders such as customers/clients, have caused the need for a better, faster and more efficient system of making day-to-day decisions, both on operational and strategic level. SMEs are not an exception, as confirmed by the research results, which imply that SMEs in BiH, in most cases, do not have the Business Intelligence (BI) system. The research results also suggest that a significant number of SMEs have one or more information systems, such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Data Management Systems (DMS), Warehouse Management System (WMS), which generate the required data into one or more databases, which are the main source of data for BI. The research also confirms that SME companies in BiH recognize the role and importance of BI, but there is a significant number of barriers and obstacles that hinder the implementation of BI system. These key obstacles and barriers relate to the lack of financial resources, insufficient knowledge and management experience, lack of vision and clearly defined strategic goals, insufficiently defined Key Performance Indicators (KPIs) and their requirements.

Keywords: SME - Small and medium-sized enterprises, BI - Business Intelligence, KPI - Key Performance Indicator, improvement of decisionmaking in SME in Bosnia and Herzegovina

1. INTRODUCTION

Small and medium sized enterprises (SMEs) in developing countries such as Bosnia and Herzegovina (BiH) have a very important and significant role for the overall economy. Creating an effective strategy for strengthening SMEs has multiple positive effects both on economic, social, and other segments, thus tremendously increasing the competitiveness and economic prosperity of a country (Džafić, 2015). Under the conditions of modern economy, extremely high competition, lower entry barriers, the process of globalization and market liberalization, and the increase in the negotiating power of certain stakeholders, SMEs genuinely need to be more innovative and efficient in their business. Carefully making the right decisions based on real time data/ information generated on the basis of accurate and reliable databases can help SMEs to operate efficiently and effectively. SMEs with accurate and precise databases based on carefully defined Key Performance Indicators (KPIs) that are changed and customized over time, have the ability to proactively affect internal and external changes. An efficient reporting system primarily relates to Business Intelligence (BI) systems which include establishing business performance measurement, discerning business problems, integrating information, predicting the business future, and making the proper decisions for conducting the changes (Shaheb, Shah, Shahadat 2017, p. 155).

The goals of the research are given as follows:

- Analysing and using business data/ information for making business decisions in SMEs
- Analysing and using BI in SMEs
- Analysing the impact of BI implementation within SMEs on the efficiency and effectiveness of operations

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- Analysing key causes and barriers for BI implementation in SMEs

The hypotheses are postulated as follows:

- SMEs do not have advanced reporting systems (BI tools), posing a risk and danger for SMEs' business.
- Implementation of BI systems in SMEs leads to increased efficiency and effectiveness of operations.

2. LITERATURE REVIEW

SMEs can be defined as relatively small sized industries with the following characteristics: actively managed by their owners, highly personalized, largely local in their area of operations dependent on internal sources of capital to finance their growth (Shahe, Shah, Shahadat 2017, pp. 151-152). There is no unique division of SMEs due to a varying degree of development and size of a country's economy, meaning that SMEs in large economies and developed countries can represent large companies in small economies and underdeveloped countries. However, what is common to many countries and economies (historically observed) is the role of SMEs as the hidden engines of country's development. SMEs have a critically important role in the economy of each country, especially in underdeveloped countries and developing countries such as BiH. The key roles are the economic and social role, fundamental for economic development. SMEs face significant constraints and struggles with resources issues in relation to large companies and corporations. That is why SMEs have the need for constant monitoring of business and the use of resources in everyday business, especially in the information management and decision-making segment (Raj, Wong, Beaumont 2016, Ngah, Abd Wahab, Salleh 2015, pp. 1325-1328).

Systemic approach and application of information technology are crucial in the process of collecting, managing and using data/information. Having accurate information at the right time leads to making better business decisions that directly affect the business of SMEs, both in the segment of revenue increase and/or in the reduction of costs (Agostino, Søilen, Gerritsen 2013, p. 7). The progress of information and telecommunication technology contributes to rapid lowering the cost of data storage and access. This allows companies to create the most effective interaction between applications, databases, technologies, and analytical methodologies to increase business performance (Horakova, Skalska 2013, p. 50). BI system can be defined as "The processes, technologies to turn data into information, information into knowledge, and knowledge into plans that drive cost-effective business action. Business intelligence (BI) encompasses data warehousing, business analytic tools and content management." (Al-ma'aitah 2013, p. 25). BI represents the knowledge gained through the access and analysis of business information (Dresner Advisory Services 2017, p. 3). It is important to point out and emphasize that BI is not a product, technology or methodology. It is a combination of products, technologies and methodologies that leverage information assets to key business processes to achieve improved business performance (Benjamin 2013).

BI fulfils a highly significant and important role in the business of all companies, including SMEs. However, the implementation of BI in SMEs is slow and gradual, primarily due to a significant number of constraints that SMEs face, because of which BI solutions are less frequent in SMEs compared to large companies and organizations. It is also important to point out that BI is not equally implemented in all SME departments, but it is most commonly used in: sales, marketing, purchasing, accrual, finance, accounting, human resources, and IT (Horakova, Skalska 2013, p. 52). Therefore, it can be concluded that the application of BI is not an exclusive top-level management (Raj, Wong, Beaumont 2016, p. 42, Davenport, Harris, Morison 2010, Negash, Gray 2008). Moreover, the justification for investing in BI solutions is questionable if the same will be used exclusively by a limited and small number of SME managers/employees. BI system should be implemented and included for decision-making processes, whether day-to-day operational or strategic decisions. Of course, BI needs to be adjusted to diverse functions, needs and levels of decision-making, to improve the efficiency of decision-making.

Essentially, BI tools provide analytical data and KPI that allow organizations of all sizes to

have better management (Raj, Wong, Beaumont 2016, p. 48) and therefore to be more efficient and effective. For SMEs, it is also an interesting fact that in most cases top management decides on IT issues. Due to this, top management support in SMEs is not a question of "success" but of general interest in BI systems (Scholz, Schieder, Kurze, Gluchowski, Böhringer 2010, p. 5). Top management awareness of the opportunities and risks of implementing BI solutions is crucial as well as their awareness of potential implementation risks (financial, process, hierarchical, etc.) or the risks that SMEs encounter in case they do not implement BI system (e.g. inefficient system of making business decisions and KPI monitoring).

Some of the most significant benefits of BI system are faster and more accurate reporting, improved decision making, improved customer service, and revenue increase. BI is considered as a technique to collect the internal and external data available to a company, backing decision making and improving corporate performance (Olexová 2014, p. 95, Vugt, Jacobsen 2017, p. 3). Tangible benefits of BI relate to time saving, cost saving, return on investment (ROI), while intangible benefits relate to revealing the true state of business, better strategic plans and decisions, and customer and supplier satisfaction (Ipomai 2016, pp. 10-12).

Most companies are interested in BI primarily because of the value generated by converting data into information or information into knowledge used to make business decisions (Srichai, Thammakoranonta 2011, p. 32, Haračić 2012, p. 162). BI does not only improve the process of decision making, it also improves business processes within the company (Al-Ma'aitah 2013, p. 24). It therefore increases the efficiency and effectiveness of operations. Adequate implementation of BI includes its application in various business segments of a company, one of which is Business Process Management (BPM). A survey carried out among domestic companies clearly shows that domestic companies have plenty of room for improving the efficiency and effectiveness of their operations but also that BPM is no longer a luxury for companies, but rather a means of survival in the market (Tatić, Haračić, Haračić 2018, pp. 11-12).

BI empowers better understanding of internal business processes (micro view) but it also enables more thorough understanding of all the participants in the market (as a macro view) through systematic acquisition, collation, analysis, interpretation, and exploitation of information. A crucial segment of BI is identifying opportunities and market-related threats, relationships with customers, suppliers, and competitors (Olszak 2014, p. 1103). Implementation of BI systems in SMEs is a strategic decision that affects performance, efficiency, cost, resource use, and so on (Vugt, Jacobsen 2017, p. 2).

When it comes to BI, it is essential to point out the existence of various BI versions. Thus, for instance, BI 1.0 relates to data warehousing, data mining and Online analytical processing OLAP. Implementation of web mining, opinion mining techniques, mobile mining techniques, and semantic processing are applied in establishing BI systems. BI designed for acquiring and processing data from web resources relates to version BI 2.0 (Horakova, Skalska 2013, p. 54). BI 3.0 is responsible for gathering and analyzing data from various mobile devices (Olszak 2014, p 1103). A typical BI system includes the following components (Kfouri, Skyrius 2016, p. 99):

- On-line analytical processing referring to the way end users navigate through data along various dimensions.
- Advance analytics for analyzing data using statistics and other quantitative techniques to predict and indicate patterns.
- Data warehouse handling integration of numerous organization records for aggregation and query tasks.
- Real-time (BI) functions for real-time analysis and distribution of information.

There are certain signals that may indicate the company has problems in analyzing the data. Some of the signals include the following (McCabe, Aggarwal, Davis 2011, page 3):

- Employees spend too much time re-entering data from one system to another, and reconciling data from these inconsistent systems.
- Managers invest too much time creating Excel spreadsheets to make business decisions.

- Different managers make decisions based on different sets of data that report various versions of stories.
- Managers do not utilize the company's business data because they do not trust it.
- Managers have no way to measure key performance indicators such as productivity, return on investment, time to report, days sales outstanding, etc.
- Managers are incapable to track real performance against the strategic plan.
- Only a handful of specialists are able to analyze data and generate reports; most users have to request analytic reports that are labor intensive and slow to arrive.
- Reports are routinely created for historical reasons ("that's what we've always done") rather than for business-driven reasons.
- The budgeting and forecasting process is complex and takes weeks instead of days.
- There is a lack of real-time visibility and collaboration capabilities.

BI system processes information and data from numerous sources (internal and external) supporting superior business decision-making through past, present, and predictive compositions/trends of organizations' operations (Benjamin 2013, p. 2, Ipomai 2016, p. 1). The conditions of modern economy create an environment in which a final customer/user is more important and significant for the company. BI is an excellent tool that can help SMEs to maintain an adequate level of customer satisfaction and loyalty (Al-ma'aitah 2013, p. 24).

BI has a number of characteristics and goals, while the following are considered as the most important (Al-ma'aitah 2013, p. 25, Horakova, Skalska 2013, p. 51): data access from various different sources, continuous improvement, threats and opportunities anticipation, response to internal and external environmental decisions, speed-low cost, problem identification and problem solving, easy way to display knowledge and easy data retrieval. Additionally, BI empowers the achievement of the following business goals: meeting business strategy and mission, improving business performance, maximizing profit, minimizing cost, improving customer satisfaction, taking right decision and actions, reducing risks and uncertainty, providing constant monitoring and control, etc.

Successful BI implementation requires making a strategic decision and clearly defining the implementation steps as the basics. Implementation of BI solution has a number of basic preconditions that relate, inter alia, to the existing information systems of SMEs (ERP, WMS, DMS) or the construction of adequate databases Data or DW Data Warehouse (DW). This means SMEs should have adequate information systems, regulated business systems, and satisfying databases on the basis of which it is possible to generate proper KPIs, data and information.

Complex BI implementation steps incur huge costs, due to considerable investments in infrastructure, software, licenses, training, and wages. Unfortunately, due to this valuable investment many organizations fail to recognize the expected benefits of BI (Gaardboea, Nyvanga 2017, p. 484). The most important characteristics which differ SMEs from larger companies include resource and knowledge limitations, lack of money, reliance on a small number of customers, and need for multi-skilled employees (Dyczkowski, Korczak, Dudycz 2014). These characteristics constitute the prime reasons why SMEs need BI for analyzing and satisfying their customer's needs (Vugt, Jacobsen 2017, p. 1). SMEs are socially and economically important and need tools and solutions to maintain their competitiveness in challenging environments, particularly because they operate in extremely competitive, turbulent and uncertain markets (Fedouaki, Okar, El Alami 2013, p. 2). Implementation of BI requires SMEs to possess an organizational structure and hierarchy built on the organizational culture and business processes that rely on information technology in everyday work. Unfortunately, there are many examples of unsuccessful implementation of BI within SMEs and other companies, directly affecting financial and all other operations. For instance, about 60% to 70% of BI applications fail due to the technology, organizational, cultural

and infrastructure issues (Clavier, Lotriet, Loggerenberger 2012, Karim 2011, pp. 196-203, Olszak, Ziemba 2012). Progress in information technology as well as the modern software and hardware solutions have helped in overcoming some of the key barriers and implementation issues. The usage of modern technology enables final customers to use BI applications, unlike in the near past, with the optimal utilization of resources and the necessary financial resources for the successful implementation of BI system. The growing application of cloud computing, Software as a Service, as well as open source BI expand the opportunities for SMEs to implement BI (Fedouaki, Okar, El Alami 2013, p. 2).

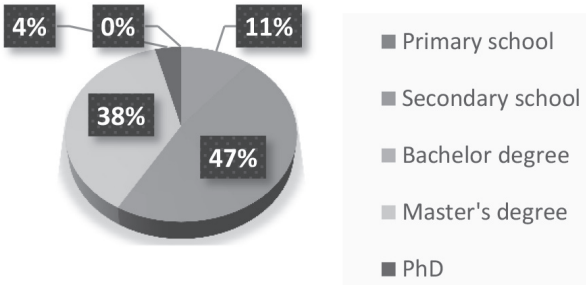
3. RESEARCH RESULTS

The research was conducted in the period from July 2018 to October 2018. A total of 2500 questionnaires was distributed by e-mail to the respondents who were employees of SME companies in BiH. Only 101 questionnaires were filled in full, with all required answers. Considering the number of completed questionnaires, it can be concluded that SME employees were not interested in participating in the survey and they were unwilling to provide information about the SME in which they work, even though the research was completely anonymous. The questionnaire consisted of the following five segments: general data about respondents, analysis of the current situation, business practice in SMEs, decision making, causes and barriers of BI implementation in SMEs.The research questions were intentionally created on the basis of an analysis of available literature and research covering the subject area (Srichai, Thammakoranonta 2011, Horakova, Skalska 2013, Dresner Advisory Services 2017, Agostino, Søilen, Gerritsen 2013, Olexová 2014, Scholz, Schieder, Kurze, Gluchowski, Böhringer 2010, Olszak, Ziemba 2012, McCabe, Aggarwal, Davis 2011), the authors' experiences and defined goals of the research.

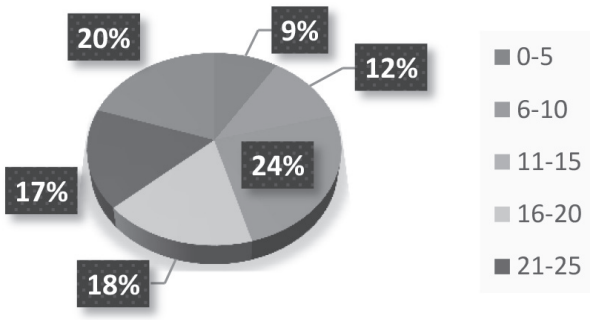
The classification of SMEs is based on the number of persons employed defined by the EU regulation (European Commission 2018). A smaller number of respondents belong to a group of large companies whose results will be presented. However, the specific focus of research, comments and conclusions relate to the companies belonging to the SME segment.

3.1. General data about the respondents and SMEs

On the basis of the research results, 66% of the respondents were male while about 33% of them were female. Additionally, 47% of the respondents had a university degree and 38% of them completed master's degree. Over two-thirds of the respondents work in SMEs that have been in business for over 11 years or more.



Graph 3.1. Respondents' level of education



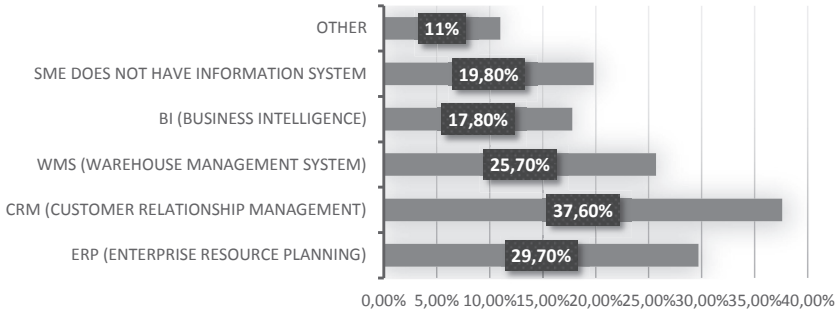
Graph 3.2. The duration of SMEs business operations

Source: Authors' analysis.

The majority of the respondents were from SMEs with up to 50 employees (46%), 33% of them were from SMEs with 51 to 150 employees, 10% of them were from SMEs with 151 to 300 employees (10%), while 12% of them were from SMEs with over 300 employees. The majority of the respondents were from SMEs whose primary activity is trade (36%), following by production (27%), services (30%), education (3%), and others (4%). Based on the results of the survey, it can be concluded that SMEs generate significant annual revenues exceeding several hundred thousand to several million BAM, which points to the fact that SMEs involved in the research maintain a stable business.

3.2. Analysis of the current situation in SMEs

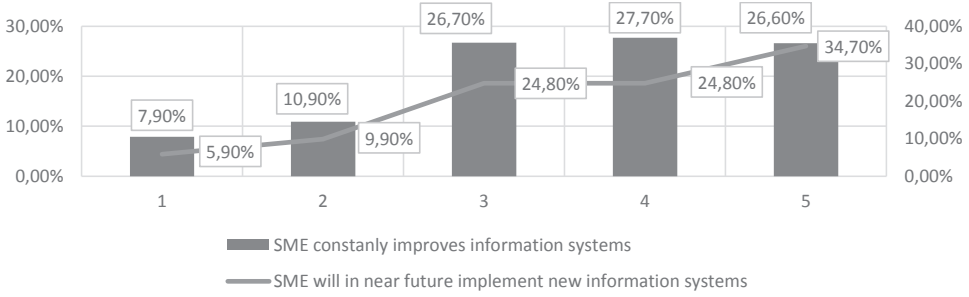
According to the results of the research, a considerable number of respondents specified that SMEs used one or more information systems. The most frequently used information systems are ERP and CRM, as presented in the graph below. The survey did not include a segment related to the development stage of information systems, modules implemented and everyday usage among employees.



Graph 3.3. Information systems used in SMEs

Source: Authors' analysis.

On the basis of the results presented in the previous graph, it can be concluded that the majority of SMEs have the basic prerequisites for implementing BI system, meaning that they could use databases of one or more information systems they have at present. Additionally, 11% of SMEs with "Other" information systems relate to a certain type of simple ERP solution primarily intended for accounting. About 50% of the respondents believe their company is constantly improving the information systems, which is one of the basic prerequisites for efficient business operations under the conditions of modern economy. These details as well as others that will be presented further, clearly justify the fact that the vast majority of SMEs have operated for over 10 years.



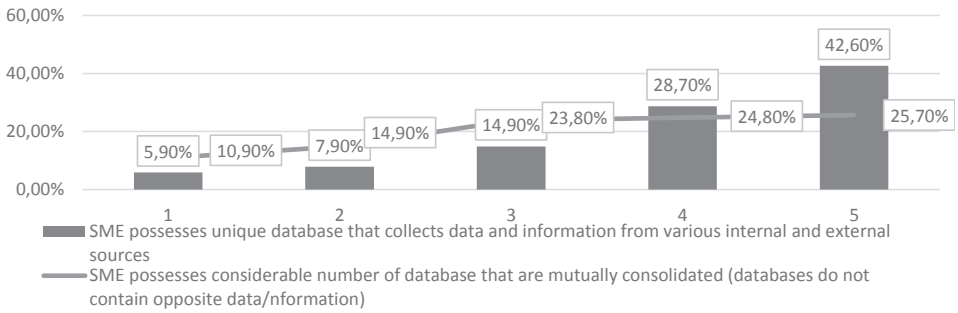
Graph 3.4. Research results related to the improvement and implementation of new information systems

(1 – I do not agree, Very little; 5 – I fully agree, Very much)

Source: Authors' analysis.

Optimistic research results relate to the fact that a significant number of the respondents sincerely believe their company will implement new information systems in the future. This sufficiently proves the fact that SMEs undoubtedly recognize the role and importance of advanced information systems in order to ensure efficient and effective long-term business.

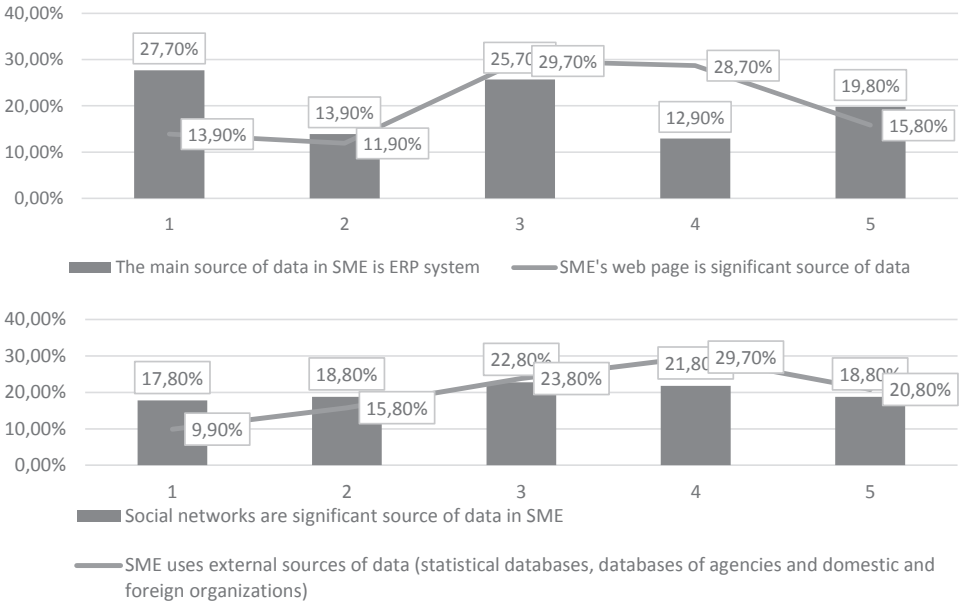
Unique databases are essential for successful BI implementation, on the basis of which it is possible to generate the required reports. The results of the research suggest most respondents consider their company has a unique database, collecting data from a broad number of internal and external sources. The research did not include a segment of quality and size of the database, or hardware configuration of the servers.



Graph 3.5. Databases in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

The respondents specified that the databases in their companies are consolidated. One of the possible reasons for this may be the specific types of information systems used in SMEs, meaning that ERP, CRM and WMS are precisely information systems that complement each other according to their architecture and use shared data stored in a single database or separately in compatible and consolidated databases.

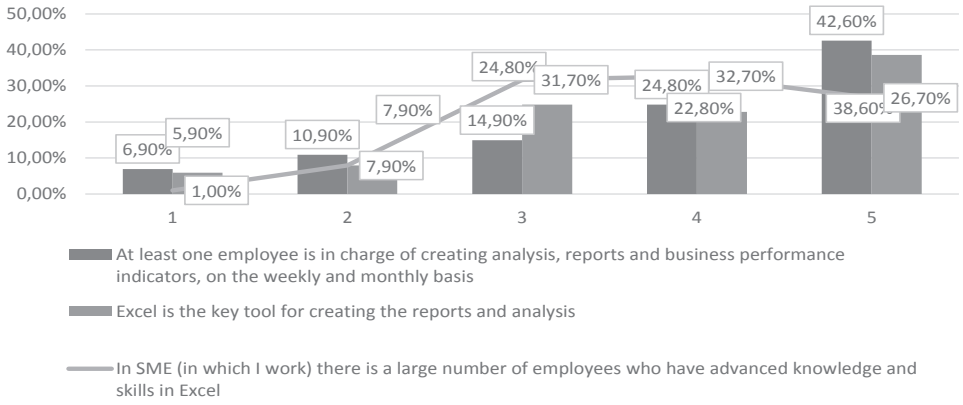
Significant research results refer to data sources typically used in SMEs, powerfully suggesting the primary source of data is not ERP system, as presented in the following graphs. Additionally, the research results reveal that SMEs use different sources of data. ERP system should be regarded as the foundation of business, with a broad number of specific modules intended to generate significant data/information on a daily basis, which should not only represent the excellent base for business reporting but should also provide input parameters for business processes and purposes that are not in the narrow focus of ERP (e.g., CRM, WMS, DMS, etc.)



Graph 3.6. Data sources in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

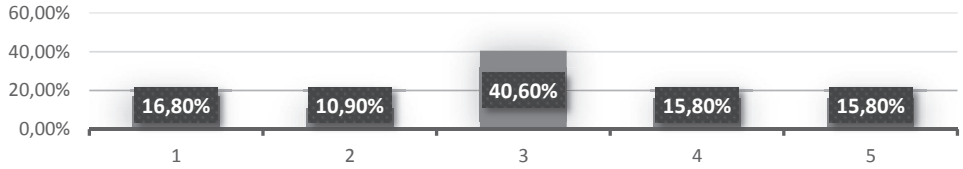
According to the results of the research, over half of the respondents stated there is at least one employee in charge of the analysis and reporting. Furthermore, in a significant number of SMEs, Excel is a very important tool used for reporting and analysis and they typically have one or more employees with the sophisticated knowledge in Excel. In the case of good quality data (e.g. relevant, consistent, up-to-date) and practical possibility to export data from databases, Excel can be a reporting solution, especially for small companies. However, when

it comes to companies with a higher number of employees or with significant turnover and increasing number of business processes, it is necessary to have a more advanced reporting system.



Graph 3.7. The use of Excel in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

On the basis of the research results presented so far, it is possible to derive a number of conclusions which will be properly presented in detail in the discussion part, which are highly supported by the results of the research presented in the graph below.

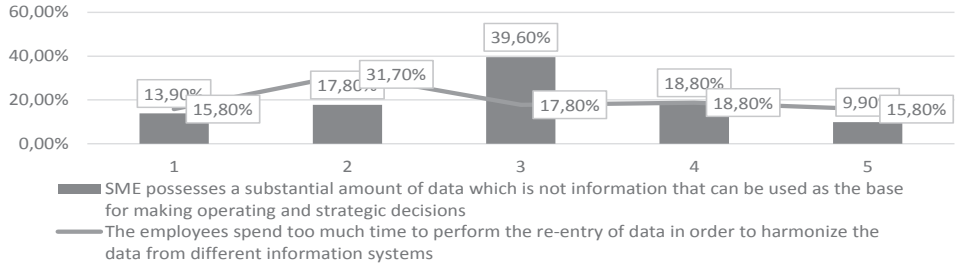


Graph 3.8. SME managers are aware they do not have an adequate system of data analysis and reporting
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

Distribution of the research results on the previous graph may indicate that the respondents do not have the exact data/information and that they are not quite sure if they possess an adequate system of reporting and analysis. The results of the research that will be presented further also point to similar conclusions, related to the fact that SMEs do not have an adequate reporting system and that the same should be improved tremendously, which would lead to better decision making, both on operational and strategic level.

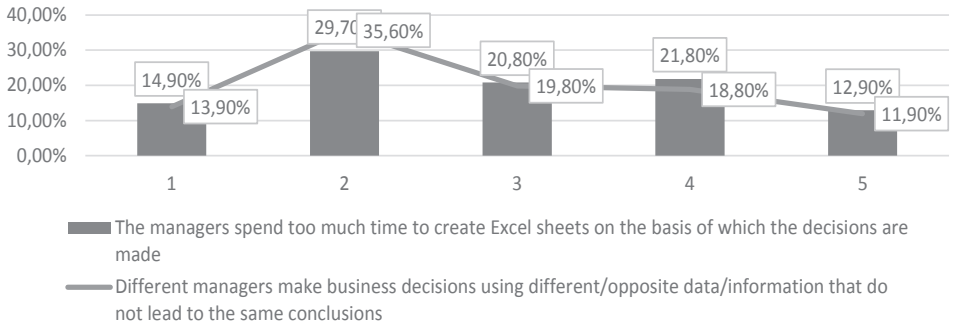
3.3. Business practice in SMEs

The research results in this segment lead to a logical conclusion that the respondents are unsure if their companies have the correct information or whether they have sufficient amount of data, on the basis of which the decisions are typically made. We can also conclude that a significant number of the respondents believe that in the course of their business processes, employees do not carry out the re-entry of data, suggesting that most SMEs have information systems that use one or more consolidated databases, which was presented in the previous graphs.



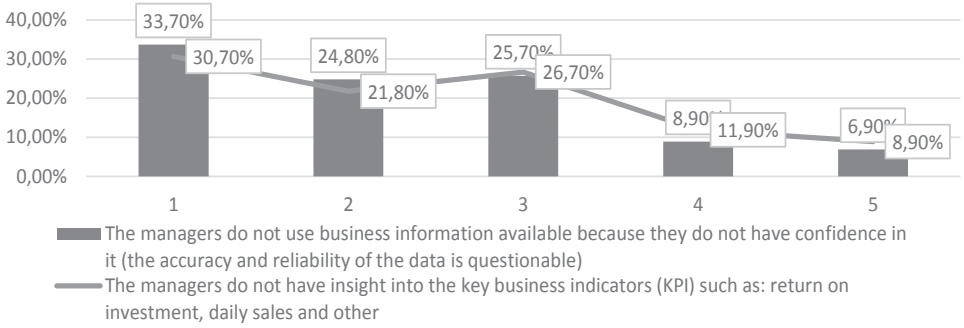
Graph 3.9. Availability and data processing in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

The results of the research presented sufficiently indicate that a considerable number of the respondents spend a substantial amount of time creating Excel analysis, on the basis of which they make business decisions. Without going into the complexity of the analysis, we can conclude there is a need for a reporting system where the key focus of managers will be to make decisions, progressively eliminate barriers and potential obstacles in daily business based on accurate and reliable information. An additional argument supporting this relates to the research results which show that different reports do not necessarily lead to the same conclusions.



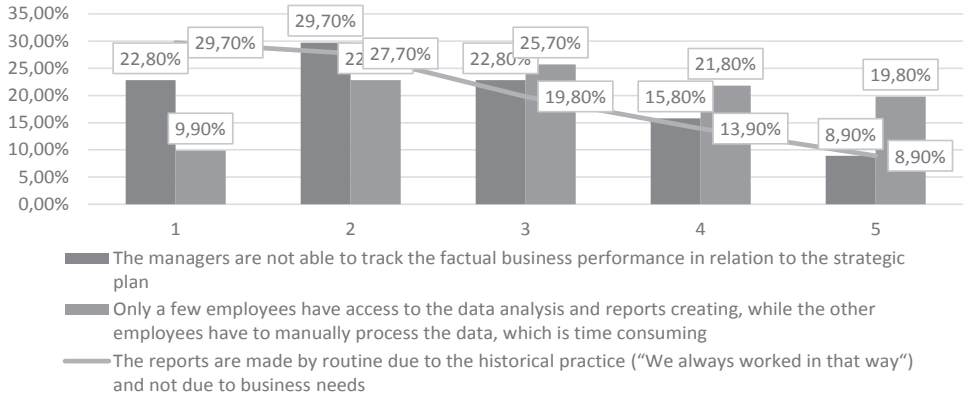
Graph 3.10. Interpretation of data/information in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

Despite the lack of advanced information systems, most respondents believe managers have confidence in data and information on the basis of which they make business decisions or that they have KPIs on the basis of which they can monitor the efficiency of operations. However, it is critically important to signal the fact that the research results at the same time point to the conclusion that there is room for significant improvement, not only in the segment of reliability and accuracy of data, but also in the required metrics.



Graph 3.11. Reliability and use of KPI in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

The respondents believe a great number of reports are intentionally used to monitor business performance and make business decisions but a considerable number of the respondents at the same time genuinely believe that a few employees have a direct access to generating the required reports while the rest of the employees "manually" generate time-consuming reports. These results may point to the conclusion that the reporting system is not available/distributed to all employees equally and that they do not have an authority to instantly access it, which can ultimately affect the efficiency not only of business processes/functions but also the general efficiency of the company.



Graph 3.12. Access to reports and their utilization

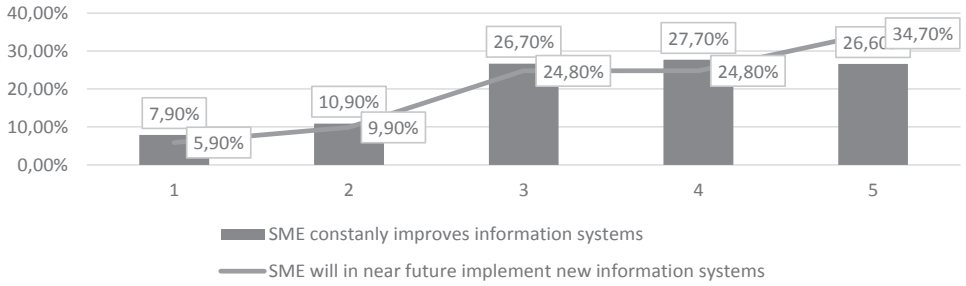
(1 – I do not agree, Very little; 5 – I fully agree, Very much)

Source: Authors' analysis.

The final conclusion that can be drawn for this segment of the research is that SMEs possess reliable data and valuable information but they require a systemic approach to generate the necessary data and information, such as BI system. It is also possible to conclude that the respondents actively use Excel as an essential tool for generating reports and analyzing business performance, which can undoubtedly be a bottleneck for SMEs with a more considerable number of employees, business processes, etc.

3.4. Making business decisions

According to the research results, it is evident SMEs genuinely need BI as a reporting system for analyzing business performance. Furthermore, the research results clearly indicate there is a certain discrepancy between the indicators available to managers and employees, creating confusion about the factual situation in the company. Only an adequate BI system that employs accurate, reliable, and timely data has the ability to generate reports and KPIs indicating the real state of business in SME.

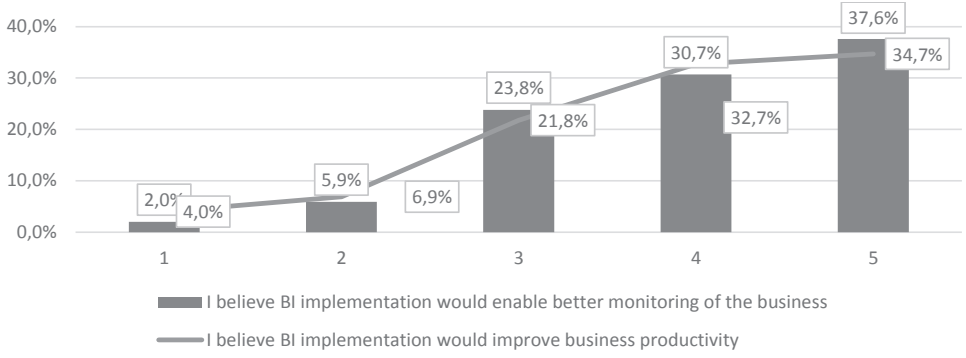


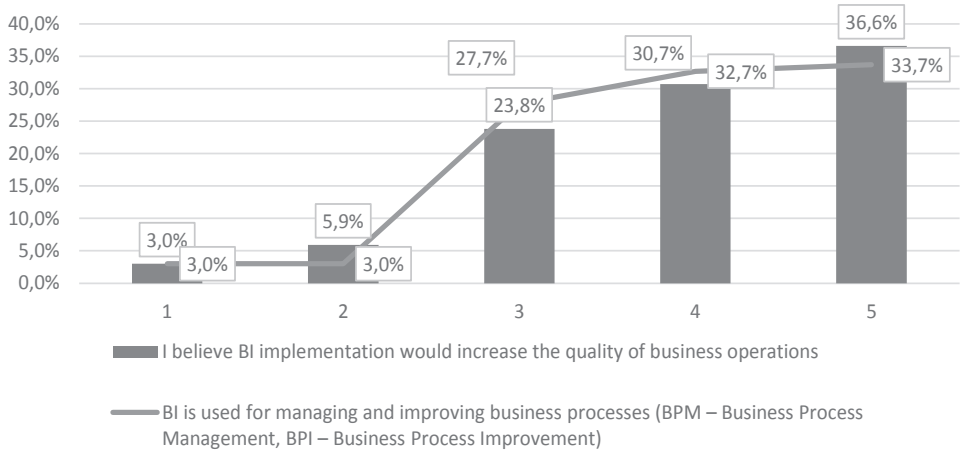
Graph 3.13. The need for BI in SMEs

(1 – I do not agree, Very little; 5 – I fully agree, Very much)

Source: Authors' analysis.

The vast majority of the respondents consider BI has a number of advantages and practical applications in SMEs. Thus, for instance, the respondents believe BI provides better control over SME business and increases productivity and quality. In addition, the respondents consider BI to be extremely useful when managing and improving business processes (BI in the BPM service).



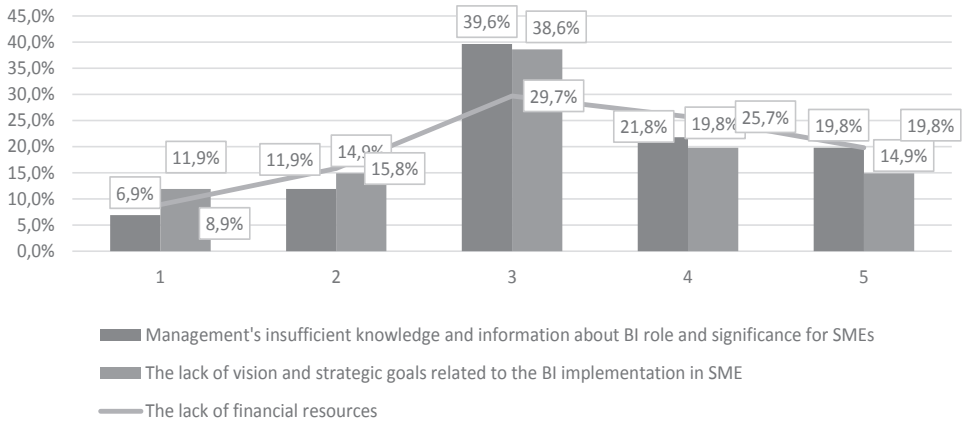


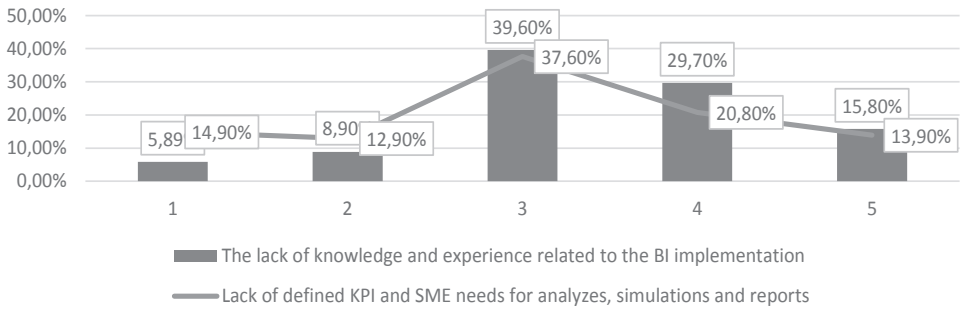
Graph 3.14. The impact of BI on the business performance of SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

At the end of this research segment, we can conclude the respondents consider there is a real need for BI effective tools in SMEs. The majority of the respondents believe the implementation of BI would have multiple advantages and positive effects on the business of SMEs. This segment of the research, compared to other segments of the research, clearly indicates that respondents in most cases have a clear attitude and the distribution of respondents' answers confirms that their attitudes agree with the stated claims.

3.5. Causes and barriers of BI implementation in SMEs

The last part of the research was devoted to the analysis of the key barriers and obstacles that directly affect the possibility of implementing BI in SMEs. According to the research results, the key barrier relates to managements lack of knowledge and information about BI role and significance for SMEs. An additional obstacle for managers who are aware of the role and importance of BI for SMEs is precisely the lack of information and experience in the field of solving the identified problems/opportunities. Namely, a significant number of managers are not sufficiently familiar with the techniques and types of BI solutions existing on the market, and which of these solutions would be the most appropriate for SMEs in which they operate, which ultimately affects the vision and strategy related to the implementation of BI in SMEs. An additional and very important segment in SMEs is the amount of financial resource available for investment. The research results suggest one of the significant barriers of BI implementation is the lack of financial resources.





Graph 3.15. Barriers of BI implementation in SMEs
(1 – I do not agree, Very little; 5 – I fully agree, Very much)
Source: Authors' analysis.

The lack of experience and knowledge in BI implementation segment is also a significant barrier. When it comes to BI implementation, we do not suggest SME employees should perform the implementation but they should be capable to adequately implement BI system with the help of external companies/consultants according to the needs and specific requirements of SMEs. An additional problem and barrier are unclearly defined KPIs, which are very important and crucial in the implementation of BI system. Implementation of BI system, as outlined, is an exceptionally sensitive process affected by many factors. Adequate preparation of the implementation and explicit definition of the project tasks and the ways to eliminate/reduce the obstacles directly affects the success of the implementation and practical use of BI system.

4. DISCUSSION

Successful implementation of BI in SMEs is a process that depends on a number of internal and external factors. Making decisions based on accurate and reliable data and key indicators is recognized as distinctly important by the respondents working in SMEs. The fundamental prerequisite for efficiently implementing an advanced reporting and analytic system is the existence of an adequate database, based on which it is possible to generate the necessary reports that are accurate, consistent, and properly represent the factual situation in SMEs. Because of this, one of the essential prerequisites for the implementation of BI system is a successfully implemented additional information system, such as ERP, CRM WMS and others. According to the research, SMEs with ERP in most cases have both CRM and BI. From the aspect of the number of employees, these are the companies with 51 or more employees, who have operated efficiently for over 11 years, achieved significant revenues and they primarily belong to the branch of the trade and production industry.

Some of the additional prerequisites for successful BI implementation typically include constant improvement of existing information systems or investment in the new ones, as well as the existence of one or more consolidated databases. According to the research results, the vast majority of SMEs without ERP, CRM systems, or ultimately BI systems expressed their desire to gradually introduce and implement them.

The foundation of BI is a database on the basis of which it is possible to efficiently generate the necessary reports and reliable indicators. Considering the research results, it is evident there is a lot of room for improvement in this segment, meaning that it is necessary for SMEs to carefully analyze the architecture and the data they possess and to extract the data/information they will need to improve the preparation and implementation of the new information systems.

The research results uniquely point to the fact that SMEs recognize the role and importance of an adequate reporting system for improving the business decision making system. The existing systems for monitoring and analyzing data help in properly supervising the defined goals. However, based on the results of the research, there is a significant place for improvement. Based on the fourth segment of the research, we can reasonably conclude that

SMEs have an urgent need for an advanced reporting system such as BI system and that its successful implementation would lead not only to the improvement of the decision-making system but also to a tremendous increase in efficiency, productivity and effectiveness of SME operations.

Successful SME business comprises an extremely important factor for the economy of a country, especially for developing countries such as BiH. Implementing BI system and fulfilling the prerequisites for such a process leads to increased competitiveness and productivity of domestic SMEs. However, the implementation of BI system is a process that typically requires a more considerable number of resources, both material and immaterial. According to the results of the research, the key barriers and obstacles to the implementation of BI system are the lack of financial resources, lack of vision and strategic goals in terms of BI implementation, insufficient information and knowledge, and other barriers presented insofar. However, the implementation and application of BI system are not an exclusive right and opportunity only for large companies and corporations. They possess more resources but the implementation and application process can be more complex than implementing and applying it in SMEs. Therefore, it is critical to emphasize that the implementation of BI system should be one of the strategic goals for SMEs and that the process of fulfilling the prerequisites and reducing/eliminating the barriers should remain the goal and plan for the near future. It is equally necessary to emphasize that BI system should be seen as a long-term investment that will instantly make returns right after the moment of successful implementation and practical application.

Based on the survey results, we present specific recommendations for SME companies in BiH:

- The successful implementation of information system (e.g. ERP, CRM, WMS, etc.), typically requires a strategic approach that will correctly anticipate SME needs and requirements for analytical tools such as BI.
- The implementation of information systems involves carefully designing a database that should anticipate the current and future requirements of SMEs in terms of improving existing or implementing new information systems as well as BI solutions.
- Improvement of the existing or implementation of new information systems should anticipate current and future KPI requirements in order to collect the necessary data and group them according to the present and future needs of SMEs, with the aim of faster and simpler implementation of BI system.
- Implementation of information systems typically requires significant financial resources necessary for the procurement, implementation, and hardware maintenance. The authors' practical recommendation relates to the cloud solution, one of the possible solutions available to SMEs, which provide a significant number of distinct advantages over traditional hardware solutions (some companies were proud of their own data centers but they are now proud they do not possess them at all, because they instantly switched to the cloud).

5. CONCLUSION

BI implementation and application in SMEs are a critical factor for successful business operations, primarily due to BI role and importance in the process of making operational and strategic business decisions, consequently improving the general business performance and efficiency of SMEs. The conditions of a modern economy such as an extremely demanding and competitive market require SMEs to deliver an adequate product, at the right time, with low costs. The key segment of BI system is the rapid identification of bottlenecks and processes with black box syndrome, meaning that BI performs an active role in Business Process Management - BPM, Business Process Improvement- BPI and Business Process Reengineering -BPR (Tatić, Haračić, Haračić 2018, p. 37). It also improves the productivity and stimulates new ideas and innovations in business (Olszak 2014, p. 1107). Based on the considerable amount of research properly presented in the "Literature Review", and based on the research results, we can

draw a conclusion that the implementation of BI system in SMEs undoubtedly has several beneficial effects on the business, especially in the segment of improving strategic and business decision making, continuous optimization of resources, improvement of business processes, and efficiency of SME operations.

Based on the presented research results, it can be concluded that domestic SMEs have a lot of room for improving the business decision making process, both in the segment of existing systems of reporting as well as in the process of implementing advanced reporting systems, such as BI system. The key question is whether domestic SMEs will recognize the importance of well-timed BI implementation and start with the process of surpassing the barriers and obstacles with the help of modern trends and technologies, such as cloud computing (Bange, Eckerson 2017, page 5). Furthermore, an additional question is whether domestic SMEs recognize BI advantages and opportunities which can considerably reduce or completely eliminate certain key barriers for the successful BI implementation, which can be a subject of further research as well.

Recommendations for further research relate to a comprehensive analysis and extensive research of the possibilities of properly integrating BI system into the existing information systems of SMEs, carefully analyzing the quality of data and specific information in SME databases as well as the degree of practical use of BI system in everyday business for SMEs that already have implemented BI.

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