

BUSINESS INTELLIGENCE AS AN INNOVATIVE COMPUTER TOOL FOR SUPPORTING DECISIONS IN SME

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Abstract: Knowledge management is promoted as an important and necessary factor for organizational survival and maintenance of competitive strength. To remain at the forefront organizations need to implement and use decision support system. The paper develops a theoretical and practical framework of the using Business Intelligence in the small and medium sizes enterprises based on an example a computer tool: Comarch CDN XL. This study aims to develop the model of sustainable development of SME based on using Business Intelligence as an innovative computer tool. This paper concludes with a discussion of the implications of the research.

Keywords: Knowledge Management, Business Intelligence, SME

BUSINESS INTELLIGENCE JAKO PRZYKŁAD INNOWACYJNEGO NARZĘDZIA INFORMATYCZNEGO WSPOMAGAJĄCEGO PODEJMOWANIE DECYZJI W MSP

Streszczenie: Zarządzanie wiedzą postrzegane jest obecnie jako ważny i niezbędny czynnik dla rozwoju i uzyskania przewagi konkurencyjnej organizacji. W celu dostosowania się do zmieniającego się, dynamicznego otoczenia oraz utrzymania swojej pozycji konkurencyjnej przedsiębiorstwa zauważają potrzebę korzystania z nowoczesnych systemów wspomagających podejmowanie decyzji na szczeblu strategicznym. W artykule zaprezentowano przykład narzędzia wspomagającego strategiczne decyzje w przedsiębiorstwach sektora MSP: Comarch CDN XL. Sformułowano model rozwoju MSP w oparciu o zastosowanie narzędzia Business Intelligence. W podsumowaniu pokazano kierunki dalszych prac.

Słowa kluczowe: Zarządzanie wiedzą, Business Intelligence, MSP

INTRODUCTION

The specificity of Small and Medium Sizes Enterprises (SME) makes them more competitive is highly dependent on external factors and the ability to adapt to these conditions. To a large extent is dependent on taking place in the country's socio-economic policy, including the scope of promotional activities, enabling SMEs to achieve the necessary short-and long-term competitiveness. SMEs have a decisive role in job creation and, more generally, are a factor of social stability and economic development. However, often face the difficulty of raising capital or credit, the limited warranty that they are able to offer, as well as restrictions on access to information, notably regarding new technology and potential markets.

The enterprises functioning in market economy have to implement changes in their systems of organization and the management that they use. In economic practice, making a decision in an enterprise is conditioned by competitors' action, changing environments factors, e.g. technical progress and results of research works. Added value for SME can be determine as knowledge,

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employees' skills and abilities, social relation, know-how, and particularly effective investment in a new technology.

A computer tool for supporting decisions investments play a strategic role in companies because they greatly influence the organizational structure of a company. Therefore, the projects must be properly prepared and implemented in accordance with the strategy, as well as properly managed. Support tools for strategic-level decision-making have become increasingly popular. This study investigates the role of Business Intelligence tools in today's strategic-level decision support tool market for SME.

Decision Support System (DSS) effectiveness is a positive factor for individuals who are motivated by the importance of the task. DSS use increases with user considerations of decision accuracy, suggesting that users may place more weight on accuracy and exert more effort to attain their goals when they realize the benefits of improved decisions (Chenoweth et al., 2003). DSS use can increase when the DSS decreases the effort required for implementing an effortful strategy (Todd and Benbasat, 1992), and when use of the DSS leads to increased decision quality or accuracy (Todd and Benbasat, 1996). A DSS is efficient if it assists users in their decision-making in a timely manner. Rapid advances in computing technology, especially processing speed, result in less user tolerance for any delay in Internet applications (Piramuthu, 2003). Slow speed and time delays debilitate ease of use and have a negative impact on system use (Lederer et al., 2000), (Lightner et al., 1996), (Pitkow and Kehoe, 1996).

Using of system for supporting decisions in SME became one of the fundamental issues of theory and practice. With the decline of some well-established firms, the diminishing competitive power of many companies in a burgeoning world market, and the need for organizational renewal and transformation, interest in organizational learning has grown. Managers in many organizations are convinced of the importance of improving tools for supporting decisions in their organizations. This growth in awareness has raised many unanswered questions: what are systems for supporting decisions dedicated for SME? What determines the characteristic of a good such system for SMEs? How can organizations improve this system?

So, the following research problem has been formulated:

There is a company in the SME sector with a defined functional area and business processes. There are Decision Support Systems dedicated for SME. What is needed is an innovative computer tool for supporting decisions in SME, which will allow for sustainable development of SME.

In this article the example systems for supporting decisions in SME are described and the characteristic of knowledge management in SME are presented. Consequently, Business Intelligence as an innovative computer tool for supporting decisions in SME is presented. As the result of our research the model of sustainable development of SME based on using the BI is formulated.

KNOWLEDGE MANAGEMENT AND SYSTEMS FOR SUPPORTING DECISIONS IN SME

Knowledge management in the organization relates to the formulation of strategy in this sense:

- deepening the knowledge of the orientation of the organization's mission.
- power-oriented organizational culture on knowledge.
- selection of the objectives of knowledge and knowledge selection strategies to achieve those goals.
- identification of knowledge gaps and barriers.
- assessment of the knowledge created in the enterprise.
- implementing knowledge strategies: design tasks, roles, processes, information infrastructure. computer technology (Hitt et al., 2004).

Defined set of elements of knowledge management, the combination of which allows us to build and implement a knowledge management process in the company:

- collection of knowledge.
- networks of relationships.
- methods of knowledge transfer.
- information systems.
- information networks.
- semantic systems.
- culture of the organization.

The following instruments were distinguished enterprise knowledge management (Maier et al., 2005):

- maps of knowledge sources.
- competency Management.
- individual Experience.
- achieved experience.
- good practice.
- managing semantic content.

An important part of a methodical knowledge of the organization should provide a model that integrates knowledge management to ensure the quality of management and the using of Decision Support Systems in organizations.

At present, there is some commercially available software that is able to support decision in different areas of activity in SME. The Material Requirement Planning (MRP) system or Manufacturing Resource Planning (MRPII) system is able to schedule all customer orders against the scheduled receipts of materials/components and the standard manufacturing lead-time. Recently, some Enterprise Resource Planning (ERP) system such as COMARCH have sought to help manufacturing, logistics and sales department to automate their order entry, process customer order and keep track of order status. The dynamic development of ERP systems witnessed in the recent decade together with their growing sale increase provide the best evidence for the fact that the systems are in demand as a supporting tool in management (Al-Mashari et al., 2003). Bearing in mind the needs of the market, IT developers customize ERP functionality to SME demands.

ERP systems are the major managerial tool and technology that requires the multi-disciplinary attention of operations management, information systems, finance, marketing, organizational behavior, and human resources fields (Sarkis and Sundarraj, 2003).

The access to vital information which is crucial in achieving economical objectives, for a company in a given time, affects the process of decision making as far as the application of the integrated resource management system is concerned. The development of information systems results in finding of new solutions in the area of ERP systems. The developers of such systems becoming more and more sensitive to the market demands, thus modifying the ERP system functionality areas as to meet a SME's needs. Apart from the basic ERP modules, operating on the base of the integrated and accessible database which includes: purchase, production, material management, sale, costs calculation, fix assets, financial and accounting module, there are a new modules coming to existence such as; Supply Chain Management, e-commerce techniques like ERP-B2B, B2C, mobile solutions, CRM (Client Relation Management), Work flow Management and Business Intelligence.

The SME sector should also see the need to reduce the risk of wrong decision making and gain cost savings. More and more SME are beginning to take action in order to implement and develop Support Decision Systems. The success of the enterprise will depend on the level of the development of the techniques and methods used for communicating information and transforming it into knowledge. One solution that allows you to capture, analyze and process data and information is Business Intelligence.

BUSINESS INTELLIGENCE FOR SME?

Small and medium enterprises do not only affect the harmonious development of local and regional, but also respond most flexibly to changing market conditions. For these reasons, they are seen as the main force to promote the competitiveness of the economy and improving the ability to compete in third markets. Strengths SMEs are clear and simple organizational structure, speed decision-making process, the ability to adapt to the existing demand and creativity. The basic prerequisite for improving the competitiveness of SMEs is to conduct a wide range of investment activities. Well-planned, evaluated and executed investments may significantly improve the situation of the company, bad investment decisions and reduce liquidity. Appropriate investment activities in SMEs is carried out on three basic levels: the investment budget, assessing the effectiveness of investment, financial reporting system.

So, the sector of small and medium-sized enterprises expect from their decision support tools such as support for:

- strategic decision making related to the directions of development of the company.
- carry out detailed analysis in different areas of your business.
- provide accurate information influencing pricing policy and the remuneration system.

Generally Business Intelligence is:

- information that is analyzed to the point where it is sufficient for the decision.
- a tool for informing the board.
- a means to analyze and assess the market situation.
- a continuous process, covering the entire enterprise.
- a way of thinking.
- a philosophy.

An example of a decision support tools for SME is Comarch CDN XL Business Intelligence – it's based on an analytical cube (OLAP): based on a multidimensional database. A Business Intelligence system will operate effectively if it is based on modern information technology. Thanks to it, the management of the information flow, the generation of summary reports, the making of presentations and data visualization can all be performed automatically. Information technology can be regarded as a strategic company resource. Business Intelligence combines the resulting data, and decisions about any strategic and business strategies and gives you the ability to view reports from anywhere at any time, including such things as: the ability to distribute reports to a recipient's email box – subscription, access to reports in a web browser - e-bi, the ability to view reports on your mobile device. Sample reports are shown in Figures 1-2.

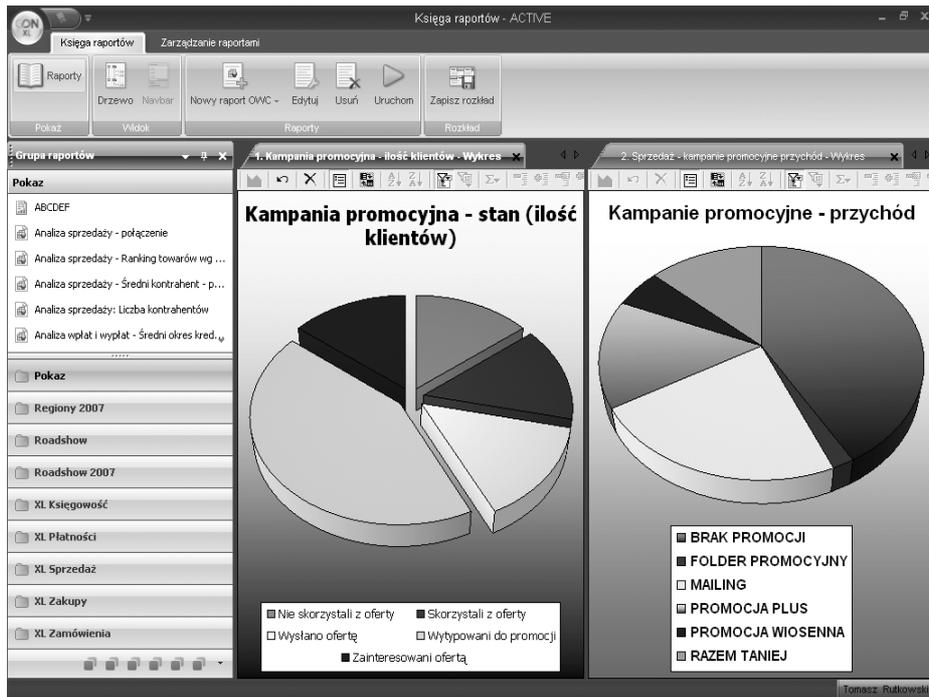


Fig. 1 Example of report in COMARCH CDN XL Business Intelligence
 Source: CDN XL Business Intelligence 8.0.



Fig. 2 Example of report in COMARCH CDN XL Business Intelligence
 Source: CDN XL Business Intelligence 8.0.

An example of methods for supporting strategic decision-making in SMEs is the Balance Scorecard. Balanced Scorecard (BS) focuses on strategy and is a method of managing the process of implementation. The concept of the card is primarily a process in which the strategy is refined, communicated, integrated business management system, and then monitored and verified.

Balanced Scorecard:

- tool for communication strategy.
- involves the objectives of workers with the objectives of the company.
- a brief message about the company's situation.
- motivated to take essential actions.
- a comprehensive look at the company.

It consists of four perspectives: customer, financial, internal processes and development. Balanced Scorecard includes:

- a comprehensive system of measuring the company's four perspectives: financial, customer, internal processes and infrastructure and development.
- coherent and systematic methodology to describe the strategy, which allows to translate vision and strategy for specific objectives.
- the management system enables organizations to monitor the strategy's progress, taking corrective action, implementing the strategic plan in accordance with the assemblies and continuous improvement and optimization strategy.

It allows you to identify the factors on which depend the future financial results and enables organizations to effectively manage the transformation of intangible assets in a measurable financial results, explaining how the intangible assets allows companies to implement the agreed strategies. There are following steps to create Balanced Scorecard:

- defining objectives.
- develop a strategic framework for the process.
- collecting ideas, fill out the framework with concrete actions and budgeting.
- linking strategy into concrete projects.
- relate the responsibilities.
- monitoring results.
- organisation the learning process.

The presented method is used also in the Comarch CDN XL Business Intelligence (see Fig. 3-4)

Biznesowa karta wyników		COMARCH BI Business Intelligence		
	Wartość bieżąca	Wartość planowana	Status	Trend
Perspektywa klienta				
Sprzedaż				
Ilość sprzedaży	102	81,6	●	↑
Liczba produktów	28	30,8	▲	↑
Liczba kontrahentów	21	24,15	▲	↑
Perspektywa procesów wewnętrznych				

Fig. 3 Balance Scorecard in Comarch CDN XL Business Intelligence
Source: CDN XL Business Intelligence 8.0.

Nazwa	Wartość...	Wartość...	Status	Trend
Perspektywa klienta			😊	➔
Sprzedaż			📊	➔
Ilość sprzedaży	12	9,6	🟢	⬆️
Liczba produktów	1	1,1	⚠️	⬇️
Liczba kontrahentów	2	2,3	⚠️	➔
Perspektywa procesów wewnętrznych			😞	✖️
Zakupy			📊	⬇️
Zakupy Wartość Netto	13 995,...	34 987,...	📈	⬆️
Zakupy Liczba Dostawców	1	12	📈	⬇️
Produkcja			📊	✖️
Procent realizacji	???	1	🟡	✖️
Średnia ilość realizacja	???	5	🟡	✖️

Fig. 4 Balance Scorecard in Comarch CDN XL Business Intelligence
Source: CDN XL Business Intelligence 8.0.

At present, the advantage of any company within the SME sector is determined by the effectiveness and extent of the knowledge that the workers hold, combined with their level of involvement within the company. The role of support strategic decision tools mainly consists of striving to increase the share of immaterial resources (at the cost of material ones) in the generated products, services, and the total market value of an organization (Król and Ludwiczynski, 2007).

MODEL OF SUSTAINABLE DEVELOPMENT OF SME BASED ON USING BUSINESS INTELLIGENCE AS AN INNOVATIVE COMPUTER TOOL

In order to solve the research problem, a model has been designed for sustainable development of SMES in the knowledge-based economy. The proposed model consists of elements (see Fig. 5):

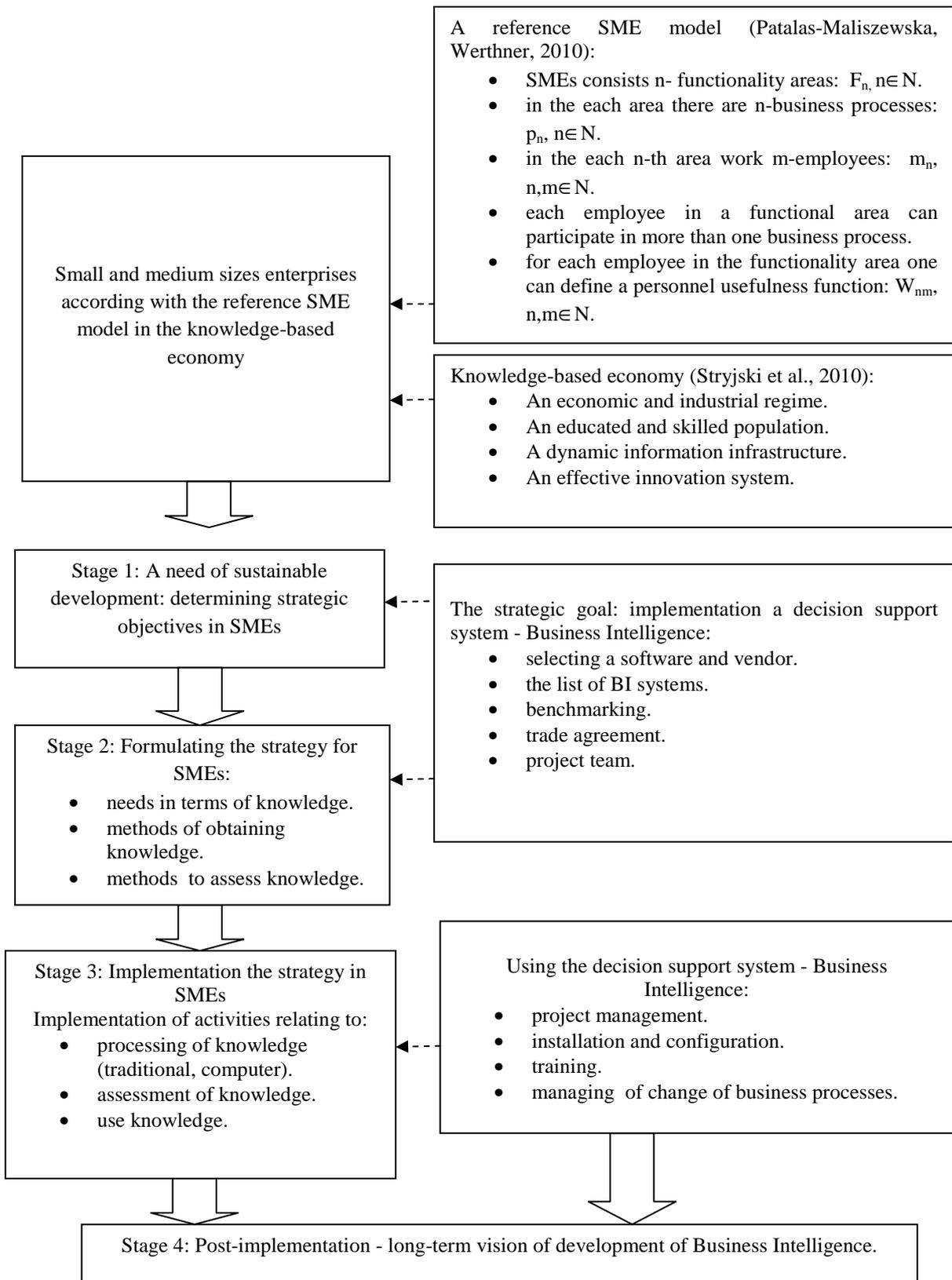


Fig.5 A model of sustainable development of SME based on using Business Intelligence as an innovative computer tool

Source: own elaboration

Original model was formulated in terms of knowledge management strategy formulation and implementation BI in the enterprise, based on (Kotarba and Kotarba, 2003). Implementation of the model of sustainable development of SME based on using Business Intelligence as an innovative computer tool (see Fig. 5) in the SME requires consistency and understanding the use of two management areas: strategic and knowledge.

CONCLUDING REMARKS

The strategic management involves rethinking how the organization creates value from knowledge-centric perspective and redesigning in the firm's strategy. To manage its more systematically, the small and medium sizes enterprises must devise an agenda for transforming from an organization simply comprising knowledge able individuals to a knowledge-focused organization the stewards the creation and sharing of knowledge within and across internal business functions and that orchestrates the flow of know-how and from external firms. So, SME must decide to manage of at the strategic level using the decision support systems. In this article is presented a framework to assists managers in determining appropriate strategies.

An enterprising SME functioning in a market economy has to implement changes in the systems of organization and management that it uses. In economic practice, making a decision in an SME is conditioned by the actions of their competitor and the changing factors of the business environment, e.g. technical progress and the results of the research. Because a competitive advantage accrues in those companies that effectively generate, maintain, and exploit 'knowledge' of their task domain and themselves, there is a need for a system to facilitate decision making at a strategic level.

The results of this study offer important implications for researchers and practitioners of firms. The results suggest that future research investigating the Business Intelligence tools will allow the company to build a sustainable competitive advantage.

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