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BUSINESS INTELLIGENCE FOR SMALL AND MEDIUM SIZED BUSINESSES

The paper presents the concept of business intelligence (BI) use in small and medium sized businesses (SMBs). The importance of SMBs in the contemporary economy has been emphasized, the reasons why managers of these enterprises are interested in BI implementation have been described. Arguments are discussed on how BI can support the contemporary SMBs. Subsequently, the benefits and the barriers of BI implementation in SMBs are indicated. Finally, the key factors that influence the BI adoption in SMBs are identified.

Keywords: small and medium sized business (SMBs), business intelligence, business decision-making.

Пйотр Муріяс

БІЗНЕС-АНАЛІТИКА НА СЛУЖБІ МАЛОГО ТА СЕРЕДНЬОГО БІЗНЕСУ

У статті представлено концепцію бізнес-аналітики для малих та середніх підприємств. Показано роль малого та середнього бізнесу для економіки в цілому та причини зацікавленості менеджерів МСБ у бізнес-аналітиці. Продемонстровано, чим саме бізнес-аналітика може бути корисна для МСБ. Надано список переваг та бар'єрів на шляху впровадження інструментів бізнес-аналітики у середовищі МСБ. Виділено ключові фактори успішного впровадження бізнес-аналітики на малих та середніх підприємствах. Ключові слова: малий та середній бізнес (МСБ), бізнес-аналітика, прийняття рішень у бізнесі.

Рис. 2. Літ. 11.

Пётр Мурияс

БИЗНЕС-АНАЛИТИКА НА СЛУЖБЕ МАЛОГО И СРЕДНЕГО БИЗНЕСА

В статье представлена концепция бизнес-аналитики для малых и средних предприятий. Показана роль малого и среднего бизнеса для экономики в целом и причины заинтересованности менеджеров МСБ в бизнес-аналитике. Продемонстрировано, чем бизнес-аналитика может быть полезна для МСБ; дан список преимуществ и барьеров на пути внедрения бизнес-аналитических инструментов в среде МСБ. Выделены ключевые факторы успешного внедрения бизнес-аналитики на малых и средних предприятиях.

Ключевые слова: малый и средний бизнес (МСБ), бизнес-аналитика, принятие решений в бизнесе.

1. Introduction

Small and medium sized businesses (SMBs) play a crucial role in economy of many countries. The statistics published by the United States Census Bureau shows that (2013):

- more than 99% of the US businesses are SMBs;
- SMBs account for 99,9% of 27 mln employers and private non-farm businesses;
- SMBs employ roughly half of the 120 mln non-farm private sector workers in the United States (the data for 2006).

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Moreover, American SMBs produced 46% of the private non-farm gross domestic product in 2008 (Kobe, 2012).

The importance of SMBs in European economy confirms the Annual Report on European Union SMBs presented in Rotterdam in September, 2012 by the European Commission. It indicates that these enterprises retained their position as the backbone of the European economy despite the world economic crisis (Wymenga et al., 2012). The number of the EU SMBs is over 20.7 mln, that constitutes more than 98% of all EU enterprises. In 2012 about 67% of the total employment was located in SMBs. These business organizations created 58% of gross value added (GVA) in 2012.

Focusing on Polish economy it is worth mentioning that it survived the years of the global crisis thanks to its elasticity (PARP, 2012), which was possible due to the strong agility of SMBs that are able to better fit their activities to the unpredictable business environment. The SBA Fact Sheet (European Commission, 2012) reports the following data on Polish SMBs:

- about 99,8% of all Polish enterprises are SMBs (approximately 1,4 mln);
- about 5,6 mln people were employed by these enterprises (68,2% of all employees);
- SMBs created 51,5% of GVA.

The aforementioned data confirm that the economic situation of SMBs directly influences the national economies. Therefore, so important is to empower these enterprises in their business activities and create the conditions that allow them improve their business.

2. Business intelligence to support the SMBs

Today's business environment poses the same challenges to large as well as to small and medium sized enterprises. They need to face in particular:

- growing volumes of data flowing into enterprises and their complexity and disparity;
- increasing demand for business information within the organization;
- shrinking time window for making decisions.

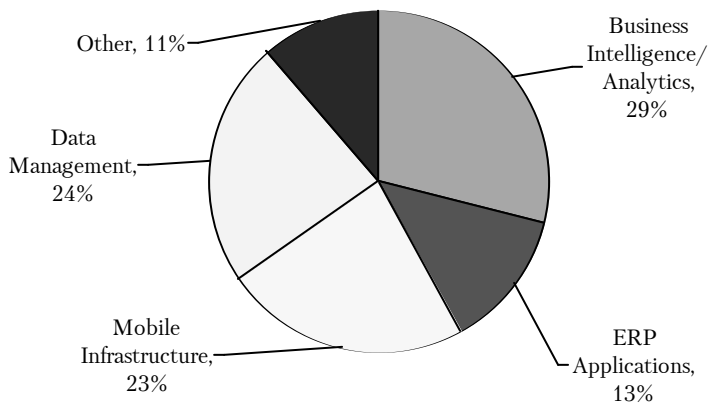
Moreover, just like large companies, SMBs have to create their own business strategies, and then determine the level of their realization. It requires defining and continuous measuring the metrics and key performance indicators (KPIs) that will be the basis for future decisions.

Under these conditions managers are looking for ways to improve significantly the decision processes and business performance. The surveys (Lock, 2013; Olszak, Ziemia, 2012; Lock, 2011; Sholz et al., 2010) show that SMBs more often leverage business intelligence (BI) as an effective and efficient solution to empower decision-makers.

According to Gartner, Inc. (2013), BI and analytics have grown to become the fourth-largest application software segment and their worldwide revenue will reach \$13,8 bln in 2013, which is a 7% increase from 2012. The market is forecasted to reach \$17,1 bln by 2016.

For many years BI was preserved for large companies. The main reasons for that were high budget for BI projects, huge amount of data gathered from organization and its environment and the need to have highly skilled staff to analyze these data.

Today this idea is more pervasive in SMBs than at large enterprises. The BI adoption rate in SMBs is equal to 47%, while at large companies – 37% (Krensky, 2013). The increasing interest in BI confirms the report by Aberdeen Group (Lock, 2013), which indicates that BI and analytics investments have the highest priority (Figure 1).



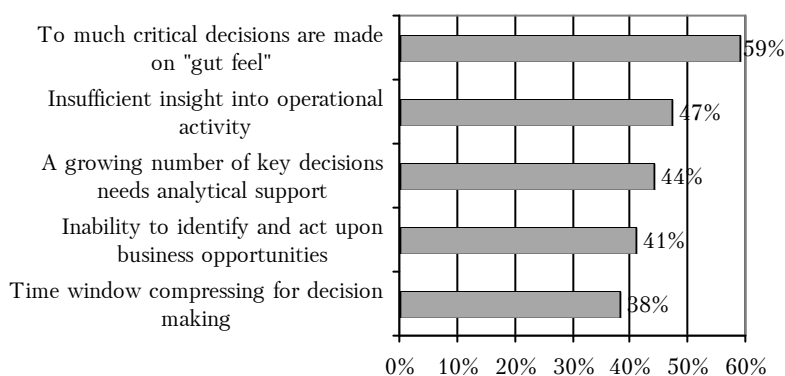
Source: (Lock, 2013).

Figure 1. 2013 top priorities – Investments in technology

At the present, BI is in the focus of most SMBs because it:

- allows creating clear and deep visibility of particular business processes;
- reduces time spending on analytics;
- allows discovering new opportunities for business.

Figure 2 demonstrates top reasons that drive business analytics for SMBs. It is distinctly visible that the SMBs managers want to shift their attention from data capturing to data utilization in decision-making.



Source: (Lock, 2013).

Figure 2. Top pressures of BI use in SMBs

In typical SMB the same employees are often engaged in many business activities. They have limited abilities to play a wide variety of business functions and do different jobs at the same time. BI can help them by providing quicker access to key information and acceleration of their decisions. In particular, it can support:

- reports preparation;

- analyses of performance management and operational processes;
- distribution of reports and information.

In the long term BI allows:

- declining operational costs and higher productivity;
- improving decision processes;
- shaping the culture of better business data application;
- higher competition.

Therefore, the use of business analytics becomes the most critical contemporary need.

3. Benefits and barriers of BI use in SMBs

Before an enterprise decides to implement a BI idea, it should know what kind of benefits it brings for organizations as a whole and its environment and when these benefits would be visible and countable.

There are the following benefits delivered by BI:

- it helps to transform raw numbers into information as a strategic asset;
- better insight into operational data;
- reduction of costs of business reports and analyses;
- self-service in analytics;
- improvement of valuable business data delivery (to the right place, at the right time, to the right person);
- better and faster decisions that help improve efficiency and growth of SMB;
- faster adoption to rapid changes in business environment;
- sharing information and knowledge.

BI renders that data gathered in IT systems gain a real business value. Managers can discover new previously unseen facts and opportunities. They are able to identify trends and patterns for markets and customers, which leads to the growth of revenues, profits and business performance. Many analysts have Excel-based skills, which help them intuitively manipulate the data providing a better insight into business and the ability to drill-down into transactional data. Sometimes they have to change the perspective for the same data. BI allows flexible reporting and self-service in analytics. This function is very useful because end users can customize reports accordingly to their unique needs and perform analytics with minimal IT assistance.

BI reduces the time between the moment of data appearance in internal IT systems and the moment of decision-making. Automated transactional data transformation into analytical form, automated reports generation and distribution, alerts in response to undesired changes of key performance indicators (KPIs) and exceptional business situation — all these ensure quick reaction from decision-makers' side.

The phenomenon of data democratization at enterprises has also been observed. Everyone, who needs business information, can get it. Everyone, who discovers new facts using analytical tools, can share this knowledge with others. In this regard BI creates a good platform for collaboration and for active use of the trusted information, thus reducing the risk of wrong decisions and taking advantage of new opportunities.

The realization of BI concept requires overcoming some barriers. It is not possible to make a general assumption that for each SMB these barriers are the same. They depend, for example, on organizational culture, business maturity of an enterprise to realize such a project, technical and software facilities etc. This issue is widely dis-

cussed by Olszak and Ziemba (2012). In this paper there have been taken into account the business and IT barriers, which sources are within enterprise.

The business barriers of BI implementation are:

- the negative attitude of owners' and managers' who do not support the BI idea;
- lack of many cases of BI use in SMBs;
- lack of awareness of benefits delivered by BI;
- wrongly defined business objectives and needs;
- high costs of BI implementation;
- looking at BI as a cost source rather than the source of competitive advantage;
- thinking about BI as an IT tool instead of new business approach to enterprise management;
- strong orientation on automating operational business processes and transactions (Data-In instead of Data-Out).

All the barriers mentioned above are related to low business maturity of enterprises, which should be understood as the organizational culture of analytical empowerment and decision-making based on facts rather than a gut feeling. The symptom of this maturity is also the readiness to improve business performance by turning the data into action.

Among the key IT barriers to BI implementation are:

- low level of IT use at an enterprise;
- lack of appropriate data or low level of their quality in inner IT systems;
- thinking about BI only as IT tools, which are complex, multilayer applications, rather expensive and time-consuming in their implementation;
- unwillingness of IT department to allow free access to databases for many users.

IT limitations are relatively easy to overcome. Much more difficult is to build this atmosphere where all employees are fully engaged in the prevalence of BI idea as well as active and effective in the use of BI.

4. Key factors of BI adoption in SMBs

The success of the BI idea implementation in SMBs depends on business as well as IT factors. The listed below business key factors should be considered:

- well defined business goals and information needs of end users;
- managers and other employees with BI competencies;
- strong orientation on data-driven activities;
- user skill sets;
- budget that allows deploying the BI idea.

The main challenge SMBs have to face is knowing what they really want to know. In many cases the enterprises owners and the line managers cannot answer this question. The effective and efficient BI use to achieve business objectives requires well-defined information on each management level. Employees, who will apply business analytics, should know the facts that have to be measured and metrics as well as KPIs, which are clearly defined and representative to describe in numbers these facts. They have to understand the need of KPIs use and be aware of the necessity of their frequent measurement and continuous improvement. Furthermore, people engaged in

analytics should have the skills to validate these metrics and KPIs to be sure that the company is on its track to success.

The significant factor in BI adoption is the attitude of top management. Apart from decision-making on current activities, they should be responsible for the creation of the culture of information use and knowledge sharing. The testimony to the existence of this culture will be the policy of data governance and compliance, which ensures the proper usage of data and their distribution to the right people and right places. The other important aspect related to above issue is the ubiquity of BI. The best-in-class SMBs figure out that only pervasive BI implementation within organization leads to better business outcomes and gives the synergy of the benefits from BI use. The engagement of both executives and front line managers is the key to successful BI adoption.

The survey conducted by M. Lock, the expert from Aberdeen Group, indicates that one of the key elements influencing the effective BI usage is the strong orientation on data-driven activities (2011, p. 9). He strongly emphasizes that corporate data have to be treated as a strategic asset of an enterprise. In contemporary company decisions made with a gut feeling have to be replaced by data-driven decisions. In today's highly competitive market conditions there is no time and place for intuitive decision-making. Metrics and KPIs, generated from the gathered data, are the tool to measure the progress towards the required objectives.

The next key factor deciding on BI success in SMBs is the level of employees' competency to use the BI software in everyday work and their ability to interpret the obtained results of analyses. The practice shows that many decision-makers in SMBs do not have technical skills to use IT tools to conduct business analytics as well as to visualize their results. Therefore, the proper BI project should include the trainings that break human resistance against new software utilization and make end BI users familiar with its functionalities and benefits which it offers.

BI is a kind of investment, meaning that its implementation requires capital expenditure. Before a SMB starts any activities related to BI, it should answer the following question: Does it have enough money to complete all the tasks leading to successful BI idea implementation? The positive answer to that question allows enterprise managers enter a higher level of management.

In addition to the above mentioned key factors of BI adoption, there are the following IT parameters that should be taken into account in BI project:

- access to appropriate business data;
- adequate BI system architecture;
- well-realized data integration;
- adequate BI tools.

The first and main factor concerns the possibility to access the corporate data stored in different databases and disparate formats. The most of SMBs utilize an ERP system, which can be the source of valuable data for the analytical database. But the real challenge is handling the big data coming from the company's external environment. SMBs managers have to decide which data have business value for them, and the IT department has to extract and clear these data for further analytical use.

The second IT issue is related to the adequate BI system architecture. At this point the most important question is about the form of the source for analytical data.

Data warehouse, data marts or a transactional database: which one to select? In practice data warehouses are used by large companies. Medium enterprises may utilize data marts as well as operational databases, small business operational databases or spreadsheets. But there is one thing that links all types of data sources – the need to ensure high quality of data, which is met by the integration process.

The well-realized data integration is a necessary condition to create a common central database of useful and consumable data for analytical tools. This repository represents one truth about the whole enterprise.

BI requires the IT tools that should be adequate to the current business conditions and information needs of decision-makers. The main features of this kind of software are:

- handling the growing amount of data and their significant disparity;
- data integration from many homogenous and heterogeneous sources;
- enabling database querying and data discovery;
- proper visualization to ensure data understanding (dashboards, portals and intuitive reporting interfaces);
- enable intuitive activities in response to the displayed alerts (actionable dashboards).

SMBs do not have to spend today much money to purchase advanced analytical tools of big world-leading vendors like Oracle, SAP, SAS or IBM. The offers by cheaper analytics software are various Tableau, Qlikview or TIBCO Spotfire products are powerful with analytics for reasonable prices. Furthermore, enterprises should seriously take into consideration the free of charge BI software like Pentaho, Jaspersoft, BIRTH family products or Palo BI Suite.

Summarizing, the adoption of BI in SMBs requires building the appropriate atmosphere that conduces the creation of trusted data sources, active information-use and developing business best practices to gain and share knowledge.

5. Conclusions

At present the increasing impact of business intelligence on SMBs activities has been observed. BI today creates a real business value of data asset and provides significant improvement in recognizing and taking advantage of business opportunities. The well-defined and well-pursued policy of BI use allows SMBs managers track the business strategy performance and improve decisions that ensure driving their enterprises to success.

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