Economy Transdisciplinarity Cognition www.ugb.ro/etc	Vol. XV, Issue 1/2012	273-278

The Economic Recovery of the SME's by Implementing BI Technologies

Marian Viorel FOTACHE, Gabriela FOTACHE
George Bacovia University in Bacau, ROMANIA
marian.fotache@ugb.ro
gabriela.fotache@ugb.ro

Abstract: *Small and midsize businesses (SMBs) have long been the backbone of nearly every regional economy in terms of gross domestic product (GDP) and employment. According to Eurostat data, SMBs employ 95 percent of the EU's work force and account for more than 50 percent of GDP.*
Despite this challenging environment, the EU´s SMEs started to bounce back after the sector had been hit by the recession in 2009. The number of SMEs in the EU remained at the 2009 level with a total of 20.8 million. This stabilization followed by a considerable decline in numbers (-2.1 percent) in 2009. The combined gross value added (GVA) of SMEs grew strongly by 3.4 percent after a decline of 6.4 percent in 2009.
Due to their small size and lean structures, SME are potentially more dynamic than big enterprises, which makes them particularly important for job creation. But they are also more vulnerable, lacking often access to capital and to funding sources.
Keywords: SME; BI; business performance, dashboards, BI tools.

Introduction

World, in general and especially the business environment have changed radically in recent years and continue to change with an unpredictable dizzying pace. The events began to succeed after 2008, when the first largest bankruptcy happened, and this is Lehman Brothers, having a major impact on all businesses, regardless of industry or size. Dynamics and increased volatility in markets having a cross-sectorial impact on a global scale require deep/radical changes as concerns management practices, even a rethinking of economic paradigms.

At the macro world level, with the two US and EU conservative representatives, the unipolarity is increasingly put into doubt due to growing influences of the three emerging powers in full accession China, Russia and India and that have a growing role on market dynamics. Are actually the buds of a multipolar world characterized by growing regionalization and internationalization of production through the balance of economic power has shifted significantly towards areas tectonic re-configured by the global economic pragmatism itself. Of all the foundation and the dispersion elements, the knowledge economy, invariably emerges. And as you know the economy and / or knowledge society develops ultra-global and most developed nations from a socio-economic point of view, national wealth depending on education now more than on natural resources.

The micro level organizations today, face a greater degree of uncertainty, forcing them to review management practices, and develop superior capabilities to manage the current performance and long-term viability of their business. Parties that have an interest in that business, and regulators want greater transparency in the activities and responsibilities of these organizations. These new requirements are added to traditional risks facing organizations today namely: globalization, deregulation, technological advances. Data have become increasingly complex and voluminous, in performing storage processes and their analysis. Therefore managers face greater pressure generated by the lack of certainty that the information on their operations is fair and consistent. To be proficient they must have confidence in their interpretations and ultimately not in the reported results.

BI, by the tools available to support managers may be rethinking the organization and implementing new management models (such as performance management, excellent management, etc.)

Since the first BI implementations were meant to be a kind of "energizing" for decision makers, enabling them to make better decisions in less time. The first implementation of a BI solution recorded in the literature, dates from 1985 and was developed by Metaphor Computer Systems Procter & Gamble. In the same year, Pilot Command Center Software sales the first commercial client-server solution for executive information system. All these events took place 15 years after commercial launch Express solution, the first tool to analyze processes in real time. At that time, in Romania, management is still made with pen and paper.

BI has entered since the early 2000s on the Romanian market and yet the penetration rate is very low. A first study conducted by Microsoft in 2007, assessed that more than 10% of medium and large companies are using BI and the largest share was represented by multinational companies that had investment capacity and a culture that effectively use solutions business.

In our opinion we think that is very important to make a distinct approach of the size of the enterprises. If large organizations, where data volume is very high, go without saying that they are implemented and operated at a level of greater efficacy or less complex reporting and analysis solutions and is the cornerstone of the implementation of BI solutions. In addition, these organizations have a high degree of feasibility of operation of such instruments and especially afford the investment efforts of such projects.

Many small and medium organizations (SMEs) hardly afford even purchase a solution of the category information processing systems transactions because they do not have resources to implement BI projects.

If in large enterprises it is almost obvious the need for BI tools, in SMEs the obvious question is whether they really need such sophisticated solutions or just extend the reporting capabilities of existing solutions by including advanced tools for enterprise-wide reporting , the multidimensional analysis tools, analysis and ad-hoc queries etc. Analysis in terms of justifying the benefits of BI tools need such instruments at any level and find enough arguments to justify that SMEs are more vulnerable to the adversities of the current business environment but must also be realistic and analyze the degree of recovery of investment in such projects, the risk of under-spending [1] while the technical expertise of these companies are limited to issues of infrastructure that may be incompatible and therefore will generate additional costs and other Several factors can tilt the balance of success of such complex projects.

Based on these data, this paper proposes a study to assess the use of BI solutions in decision making for a sample of business organizations, representative of the Romanian business environment. This study may provide a starting point in a guide for policy makers especially in the SME sector, the implementation / development and operation of BI tools with significant impact in improving decision making and implementation of metrics to assess their impact quantitative and qualitative methods.

1. Main BI Tools for SME

15-20 years ago there were less dynamic markets, competition was much lower and the limited number of suppliers and customers allowed a close, direct connection with them. Profit margins were high, which allowed an oversized personal schedule. Makers relied more on intuition and common sense in decision making and less on information supported by analysis of large data volumes. In time, flair and good intentions were not enough in business administration that requiring quick decisions, cases were more critical in terms of increasing competition and reducing resources.
The current crisis has further amplified these trends by effectively requiring managers to adapt to an ever faster pace of reaction.

BI appearance is nothing but an evolution of information and communication technologies by adapting them to new needs of today's managers by adopting new discoveries at hardware, software, user perceptions, consumer behavior, management theory etc. [2].

A wide range of techniques and technologies that support more or less reminiscent of the decision making can be classified as BI tools here:

- Spreadsheet applications, query software and obtaining reports - allows retrieval, sorting, calculations, data presentation and interpretation,
- OLAP tools,
- Digital dashboards,
- Technology for datamining,
- The engineers' decision - the work that unites key best practices used in decisions of the organization,
- Process mining, process management technique using event logs, the basic idea is to extract knowledge from experience,
- Business performance management - a set of processes that help organizations to maximize business performance. It is a specific tool for advanced forms of BI concentrating on business processes like planning and budgeting, in order to give a better utilization of production facilities, financial resources, human or material.

Note that this is a very general approach and many of these tools are not unique to BI technologies.

If we consider the diversity of interpretations and definitions given by various authors and researchers to BI term, we can imagine how hard it is to determine which the only specific BI tools are, even if we see BI as "any information which becomes a strategic business value..." [3] or the term of business management which refers to applications and technologies used together to gain access to testing to allow transformation into information and then of their knowledge.

According to The Business Intelligence Guide can include as main instruments predominantly assimilated BI field:
- Advanced reporting tools at the enterprise level (Advanced Enterprise Reporting) - generate statistical reports strong highly formatted and distribution.
- Multidimensional analysis (analysis cube or cube based BI) - are instruments that give managers the opportunity to conduct multiple tests on multiple dimensions specific type slice and dice OLAP technologies
- Ad-hoc query and analysis - tools used ROLAP (relational OLAP) query the database for answers to questions concerning cases, isolated.
By using techniques such slice-and-dice, you can make database queries to the lowest level of transactions. In his attempt to find answers to questions, the user can "dig" to the data that formed the basis for obtaining certain specific reports.
- Data mining (data mining) - sometimes called knowledge discovery in databases ("Knowledge Discovery in Data Bases" - KDD) is one of the latest technologies to analyze data associated with OLAP, the concept of deposit Data.

Various articles using other names and meanings contained in the concept of data mining, such as: "data archeology", "data processing patterns", "gathering information" or "data dredging". In the development of these tools were in the main mathematical and statistical software packages used in social sciences and artificial intelligence. Including advanced analysis, hypothesis testing and predictive analytics [4].

BI functionality - at this concept there are developed text mining level, as there are assessments that only 20% of existing information in the data organization is structured so that the remaining 80% would be ignored by traditional data mining tools. Text mining processes in support of decision makers, in order to focus on something specific that requires further analysis, support them in efforts to identify sources of documentary field containing additional information. We can use the assessment as to achieve a classification document of importance for a particular area.

- Advanced methods of logical analysis - based on correlation analysis, trend analysis, financial analysis and projections, this toolkit, called Analysis Services, allows business managers solve

problems that were previously impossible or extremely difficult to be solved, such as customer demand forecasting, customer response to the media etc.

These tools are evolving to quality standard type datamining tools, as follows:
- traditional reporting solutions help us understand what happened.
- datamining identify patterns and trends in expression data to help predict what may happen next.
- advanced methods of logical analysis provides a broader context and interpretation that guide decision makers to direct specific actions.

- Advanced visualization techniques - some years ago in the course of information systems we were explained how important is the logical design phase, design phase forms and reports as elements of impact upon users. Major difference at the time of the forms and reports was that the first was active (requiring intervention by the user) and other documents were considered passive. Perhaps the biggest jump at BI is that these reports become "alive". The user is provided with various tools that can effectively control the display mode of the system outputs from hyperlinks in dynamic graphics have become interactive reporting solutions providing immediate access to many forms of visualization not only improve the appearance and intelligibility data implicitly but also provide sufficient information and to understand the method that led to the obtaining of those outputs.

Naturally, to gain relevance analysis system outputs, regardless of how good presentation, requires reporting to a reference, so BI Scorecards include in this category (score sheets), Dashboards (dashboards) and BI Portal.

Corporate strategic objectives and the means for achieving these objectives, define the business philosophy of any organization. Everything that happens in the organization must be aligned to one of the objectives in this category. Also each such objective must be defined between one and three key performance indicators (KPI) by measuring which to assess progress in achieving their organization. Activities and assessments relating to this objective involve three elements:
- - People - who performed the activity
- - Processes - how the activity will be
- - Technology - tools used to complete the task and collect data generated by this activity.

Alignment with strategic objectives of the organization and maintenance of this state must be a constant process involving continuous access to data "deep" performance evaluation. A powerful tool to support managers in this direction is the scorecard.

2. Advanced Reporting and Analysis Based on Visual Spreadsheet – Cheap Solution for SME

Due to the fact that the managers have less and less time in order to inform and support decisions, the classic static reporting solution that provides business transactional systems like ERP, CRM, SCM etc. are no longer able to meet the current needs of business today.

Not infrequently, IT or Finance department employees of an organization have to resort to an intermediate stage, transient, use a spreadsheet application (most often Microsoft Excel) as a tool for post-processing and data exploration statements reporting systems to get other synthetic reports in May, more suggestive, more interactive and practical applications of organization management line.

This approach is possible due to relatively low costs involved. Most organizations use the Office suite, so Excel was so handy, but the important advantage is the experience of exploitation by users of such applications spreadsheet. It became possible to develop (not infrequently distorted cognitive limitations of such users) gradual, incremental, apparently without much effort of reporting options and solutions for complex visual analysis.

Starting with 2007 version Excel has reporting and analysis capabilities greatly improved, the most representative being *pivot tables* and particularly *slice,* the 2010 version. Along with the improvement of filtering tool (multidimensional, color coded filtering etc.) conditional formatting, expanding graph types portfolio can be obtained are also elements that can fit Excel into powerful BI tools category.

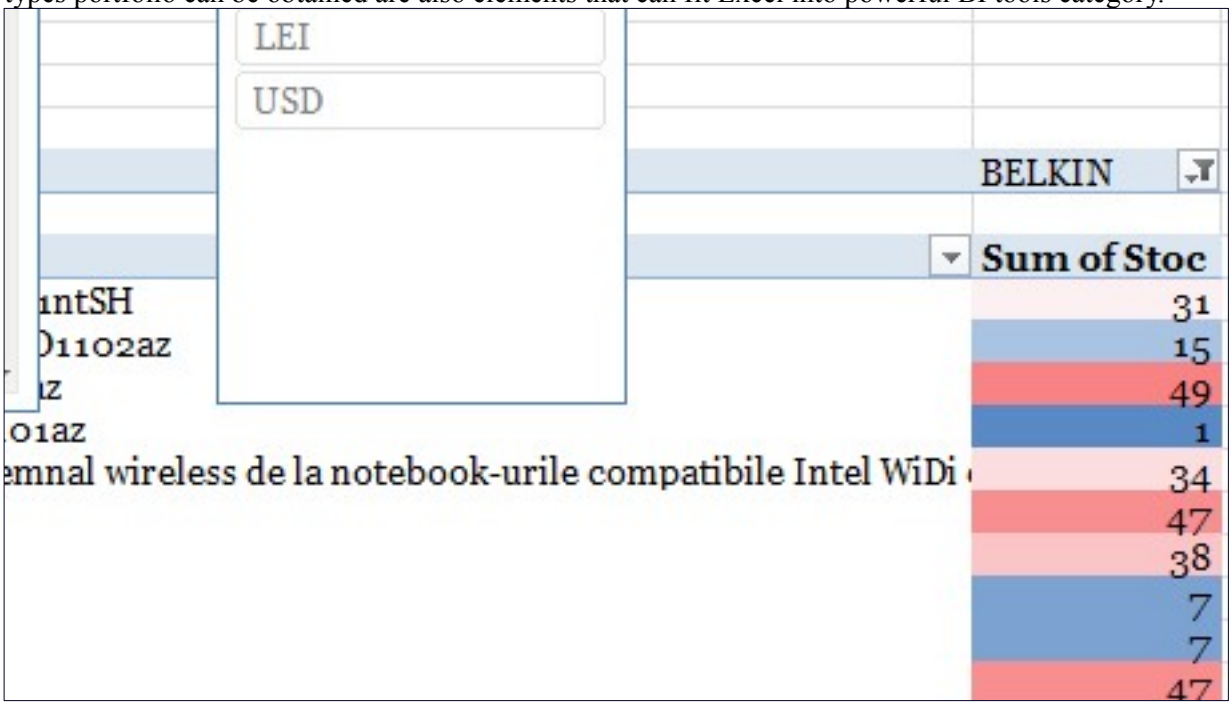

Figure 1. Using Pivot Table and Slice in Excel 2010

Using Excel as a BI tool presents some limitations such as:
• reprocessing requires high consumption of time;
• require the allocation of dedicated human resources (or time dedicated to the book manager) to run the transactions underlying the various reports in Excel imports, (possibly in a more advanced state organizations, information comes to pass, in an intermediate form, through processing, in a database more "light", such as Microsoft Access) and then reverse it reprocessed to provide some more information value, in very few cases, reaching even the transformation of information into a graphic format, enabling an easier "digestion" for the manager`s (human) brain.
• quite often such imports require cleaning operations, also time consuming and quite often, identifying input errors that require correction and regeneration source reports.

All these activities, in the first instance, are difficult to quantify end up costing a lot and as observed in studies, conducted at several local companies that resort to this method even if the organizations concerned had implemented even by one or more platforms Business Intelligence, a situation that seems paradoxical at first glance but fully justified by the fact that BI tools are not providing information requested by managers or users of those tools were unable to exploit the solution in order to achieve it in the format accepted by the manager.

Using the Excel in this way represented the first stage of implementation of BI functionality being an effective alternative to static reporting systems and it has been generically called reporting and analysis systems based on spreadsheets (spreadsheets) and it already appeared more than 20 years ago.

Current trends have led to the development of BI solutions by adapting the general trends of the ICT domain, i.e. there is a "migration" in the Internet space, most products being offered by developers of Web-based BI which allowed the development of new types of BI instruments provided as services.

Another line of development is the development of BI based on related queries (BI NGO) which, although operating at the same time logical relational and multidimensional, has a main core of each column of data preprocessing, similar to an indexing. This preprocessing takes place during and after running the entire ETL process. Thus, the system knows *a priori* which are distinct values in each column and on witch row of the table is teach distinct value.

The advantage is that this mechanism provides the ability to identify and access pre-indexed and all possible values associated with data in other columns.

3. Dashboards

Dashboards Have Been Used Since The Late 1980s When They Began to be applied for Management Information Systems Strategic organizations (Executive Information Systems). The difference between these early models and business intelligence solutions used today is significant in terms of how data are presented using of the level of the current tools, advanced visualization tools and also superior detailing capacities scrutinizing even the inferior levels.

Dashboards provide an insight into large volumes of performance data organization. Their use is quite popular, not only for ease of use and superior productivity observation of indicators of developments in a more concentrated form. Many times there is a tendency to build dashboards for each Key Performance Indicator (KPI), the disadvantage is hiding critical data relevant behind many values that are not necessary at that time.
Intelligent design of a dashboard is essential for understanding the value it generates. Early attempts to achieve dashboard is characterized by a specific graphics board copying machine (speedometer, fuel indicator etc.) somehow limited and similar to the now traditional type pie charts. As things have evolved if the board of a machine tools today have digital dashboards that use various forms as suggestive and their impact on the view, becoming increasingly significant.

Conclusions

In every SME's, employees make hundreds of different decisions each day. That poses a problem because experience, knowledge, and rule of thumb can take years to develop. Some employees never acquire them. Those who do may still fall prey to decision traps or biases in judgment. Improving the quality of business decisions has a direct impact on costs and revenue. For instance, giving a customer a discount may or may not help the bottom line, depending on the profitability of the client over the duration of the relationship. One of the solutions that can improve the result of the act of decision is the use of BI solutions. BI may play the role of an integrating level of the methodologies with the day to day tasks, with the business processes and with information coming from diverse sources, leading to reduce delays between action and the measurement of the decision effects that, maybe, can act as a motional force for individuals, teams, business units and for the overall society.

References

[1] Fotache M., Fotache G., *BI. - Theory, Reality or Marketing Concept*, ETC 2009, issue no 2, George Bacovia University Publishing House.
[2] Fotache M., *Business Intelligence Solutions in Current Business Environment*, The 9th ISINI Conference, Bacău, 22 – 26 August, 2007
[3] Rud, Olivia (2009). *Business Intelligence Success Factors: Tools for Aligning Your Business in the Global Economy*, Hoboken, John Wiley & Sons, New Jersey
[4] Ralph Kimball et al. (2008), *The Data warehouse Lifecycle Toolkit*, (2nd edition), John Wiley & Sons, New Jersey