BUSINESS INTELLIGENCE
EFFECTIVE SOLUTIONS OF MANAGEMENT

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Abstract: Business Intelligence (BI) is the most popular concept in today’s Decision Support Technologies. BI offer sophisticated information analysis and information discovery technologies (Data Warehouse, OLAP, Data Mining) that are designed to handle and process the complex business information associated with today’s business environment. Only a revolutionary Business Intelligence solution, like the proposed portal-based, can solve the complex issues faced when evaluating decision support applications and ensure the availability of any business-critical information. In this paper we recommend some BI solutions in order to create a collaborative business environment. In the last years more and more firms from Romania are facing with a new challenge: the use of Business Intelligence technologies. This challenge comes somehow later than in other countries since a lot of Romanian firms do not have implemented yet an ERP system that could offer a better data repository for the new technology. It is important to mention that Business Intelligence (BI) is not a single application. It consists of a series of components that interact behind the scenes to extract electronic data, assemble it, analyze it and display it in a form that is easy to work with and understand. These components include: a database; an ETL (Extract, Transform and Load data); analytic tools; reporting/querying tools; training.

Key words: Business Intelligence, Decision Support Systems, OLAP, Data Warehouse, artificial intelligence.

1 Introduction
Using as brick and mortar the knowledge is the success formula against the limits of low-developed society as it was till few years ago. The function for the informational companies requires an enhanced activity in direction of innovation, learning and partnership interactions. So there is done the way for the new intelligent technologies[1].

2 What is Business Intelligence
There the Business Intelligence technologies is most appropriate to transform data into information needed in decision-making. Since 1958 when the term of Business Intelligence was introduced, it has encountered over the years different approaches regarding its definition[3]. Business intelligence is a set of methods, concepts and algorithms intended to help us in achieving the aim of gathering the data from all over the organization in order to turn those data into new and relevant business information and eventually into knowledge. We consider the studied matter important since more and more Romanian firms are replacing their legacy information systems with truly Enterprise Resource Planning systems creating proper conditions for further use of Business Intelligence technologies. We consider the existence of an ERP system as a minimal prerequisite for implementing a BI solution.

Business Intelligence (BI) is a process for increasing the competitive advantage of a business by intelligent use of available data in decision-making[4]. The five key stages of BI are:
Data Sourcing, Data Analysis, Situation Awareness, Risk Assessment, Decision Support.
Another trigger-element sustaining the investment in BI is the capacity of the package of software applications to generate an aggregate picture upon the company performance and in the same time to offer a better transparency toward shareholders. The platform of BI allow the transformation of data into action decisions. The dynamics of economy and the contemporaneous IT jump business make the BI application the indispensable instruments for every business. There are worldwide opinions sustaining a continuous development of IT applications in order to cover the information volume being into an increasing process estimated to 20 times more in 2012 than in 2007. The threat in this area comes not only from the upward jump in the size of data bases, but also from the increasing complexity of such applications offering the possibility to the users to compete in the market.

For giving the solution to different situation, BI models are integrated by mathematical functions that are able to identify trends in companies performance ratio. In the same the number of users without a background in IT has imposed a trend toward simplifying such IT solutions.

3 The integration of BI applications into IT existing system

Having an activity history, the companies collect more and more data bases regarding the business flows and commercial transactions. The former clasic IT data base administration solutions did not offer support for an in-deep analysis and structural evolution high-degree performance reports. Such old applications were especially focused on administration of receivables, inventories – having only the first level difficulty functions. The new applications come with enhance operative functions looking to cover all relations involved in the activity of a subject company, being in fact a package of services of Enterprise Relationship Planning topic.

Business intelligent applications can be considered as an intermediary operator between the data base and manager, offering both the possibility of analysis and also the chance of profitable decision issue.

4 Integration of business intelligence within data bases

The producers of data base administration software include high performance BI functions that efficiently communicate with traditional IT solutions. By this way, beside the support for the classical relational data bases and analysis there are offered advanced and performance techniques of information collect and administration.

Many of the concepts of business intelligence are not new, but have evolved and been refined based on experience gained from early host-based corporate information systems, and more recently, from data warehousing applications. The dramatic expansion of data warehousing combined with the wide-spread adoption of ERP and CRM, and the overall increase in computer literacy, fueled this exponential demand for BI reporting and analysis applications.

The BI technologies have evolved in direct link with the Business Information Systems. IBM outlines three generations in the evolution of Business Information Systems: First-Generation: Host-Based Query and Reporting, Second-Generation: Data Warehousing, Third-Generation: Business Intelligence. Some of the tasks performed by BI are: Creating forecasts based on historical data, “What if” analysis, Ad-hoc access to the data, Strategic insight.

These technologies allow a multi-dimensions analysis and a use of mathematical models for forecasting the economy trend based on the information existing in data bases. Additionally, there are added instruments (like Extract Transform Load) that allow a data consolidation inside the already created data base.

So, all successful software applications include also functions of business intelligence. The share market of this kind of IT suppliers is more and more dynamic, existing more and more different IT programs.

The main companies very actively inside this domain, using such performance-oriented instruments, are: IBM (DB2 Universal
Database), Microsoft (SQL Server), Oracle (Data Base Oracle)

Additional to this international operators, on the Romanian market there are active several players offering pretty good solutions: Cognos products offer a complete set of BI functions, among them it can be noticed: OLAP, data base re-viewings, reports, so on; SPSS and Business Object are two complete business applications allowing operations in area of statistics and data mining, reports and data analysis; ProClarity comes with a easier way for management analysis, and he WEB based application leads to an enhanced access of information; CorVu package is a business intelligence solution for management looking to cover needs in area of better performance for financial and operational divisions. This package is integrated with ERP solution produced by QAD.

A current report in Romania with CEO’s of the enterprise that already use BI solutions shared us:

- the database engine of currently OLTP used system
  Fig.1

- when they intend to implement a BI system
  Fig.2

- what tool they use for analyzing data extracted from the warehouse
  Fig.3

- what is the most used feature of there BI system
  Fig.4

So, we can conclude that a lot of them still don’t have implemented an ERP system because they have surrogates applications that call themselves ERP but most of this system are pretty far from what truly an ERP system means. Among the most preferred analysis tools remains Microsoft Excel wits its abilities to extract and present data in a fashionable manner.

The regular image of a champion is nothing else but a sportsman whose efforts allow him to go further or faster, or to sustain victorious campaigns. Such principles of competition should stay at the base of economic relationships among the developed countries and less developed countries [5].

5 The way to choose a Business Intelligence tools

Over the previous years we have been faced with a lot of issues concerning how should we choose the right tool for achieving ours goal. We do not recommend one technology or another but we’d like to emphasize those characteristics that the chosen technology should meet in order to increase our chances to succeed. A lot of our customers asked for a facility that should allow them to run ad-hoc queries against the data repository that could be saved for later use. Our users did not always have a deep knowledge in computing so they always wanted an easy and stable solution that could allow them to get the right situations in the shortest time. In case that they could not accomplish their missions due to a misunderstanding related to the use of the system, they made use of our tutorials and help files for understanding the necessary steps that should be followed. The technology used must allow our users to run the queries over the Internet in a secure manner, eliminating the risk of intercepting the data that traveled over the Internet. For achieving such a goal, we need to use powerful encryption algorithms or even better secured VPN tunnels. At the same time, the chosen technology should allow us to define
a very precise access policy both for the reports and queries interfaces. The technology should allow you dimensional drill-down thus allowing to your users to directly identify the data that caused a certain evolution of a business phenomenon. In order to answer to the requirements of our users we often found necessary that the underlying technology should allow us to use stored procedures and views. The chosen technology should offer us enough information resources and sustained support from their vendors so in case when we are faced with a problem, we could ask the opinion of a “more trained eye”. Retrieving the data stored in data warehouses means searching into terabytes of data repositories so we consider the possibility for introducing a query time limit as a must for such technology. When we are experiencing poor performance problems then the only way we know for identifying and solving the bottlenecks is the existence of a performance monitor that should allow us to find the causes of the problem and eliminate them. Regarding data modeling the chosen solution must allow us to define data tables using SQL syntax. A very important feature that must exist in a flexible way in such technologies is the data import facility. Importing data from other information systems makes the exception in the case of OLTP systems and the daily activity in Business Intelligence systems so this facility is an extremely important one. The system should be able to connect to a variety of data sources from flat files to object oriented database systems or web services. The import should offer the opportunity to filter and clean up the data in order to ensure highest possible quality of data. Pumping data into a data warehouse from the data source systems is an activity that must be run sometimes in real-time. This is why we consider a must the existence of an agent technology able to continuously feed the data warehouse based on some schedules or business rules. Backup and recovery tools must be present. Since the size of the data warehouse could be very large it is important to have an incremental backup facility. The figure 5 briefly introduces the process of choosing BI technology.

Fig.5

6 Conclusions
From the above mentioned issues concerning the development and implementation of Business Intelligence within Romanian SME’s arose next conclusions:
1. Even if the Business Intelligence technologies have reached their maturity they are still far away from being used within Romanian SME’s. This situation it is not related to the technology itself but rather to the fact that the spread of ERP systems among those enterprises is still at beginning. Without having a reliable data source the implementation of a Business Intelligence solution is rather a beautiful dream than an immediate reality. If we take into account the number of implementations on the SME’s of the FoxPro and Access solutions, we will realize that they still lead on the market, and the situation doesn’t seem to change within the next two or three years.
2. Those SME’s that have implemented truly ERP solutions are at the very first stage of using Business Intelligence technologies as an additional information data-source and as a competitive advantage. Their data warehouses are not so huge but in the next few years the dimensions of those data repositories could strongly vary according to the volume of daily business activities raising the old problem of
poor performance for those of them whose data
warehouses were not well designed.
3. For getting most of the new technology
without compromising the OLTP systems the
enterprises must use different servers: one or
more servers specialized in providing BI
services and one or more servers providing
support for the OLTP functionalities.
4. The risks that arose from the use of new
technologies are mainly induced by the poor
data quality in the data-source information
systems, by the underestimation or
misunderstanding of project complexities and of
the user needs and requests. The import from
external data sources claims to be an important
risk factor too because of the level of trust in the
source system, or even errors within the data
filters that should be supposed to eliminate errors and irrelevant
data. More achievements in this direction are
expected to come from the artificial intelligence
field namely intelligent agents. Other risk factors
are induced by the poor planning of the
implementation.
5. We do not claim that our proposed strategy
for implementing and developing a business
intelligence solution is the best approach to the
subject but we can tell that using a strategy is far
better than having no one. We do not claim that
our strategy is 100% bullet proof in the case of
Romanian SME’s but taking into account what
others faced with, could be the slight edge
between the success and failure of a Business
Intelligence project.
Business Intelligence is the art of gaining
business advantage from data - therefore BI
systems and infrastructures must integrate
disparate data sources into a single coherent
framework for real-time reporting and detailed
analysis by anyone in the extended enterprise –
customers, partners, employees, managers, and
executives. Without any doubts, business
decisions are only as good as the information on
which they are based[2].
New information technologies like enterprise
portals and federated portals help reduce the cost
of deploying business intelligence systems to a
wider user audience, especially information
consumers like executives and business
managers. Selecting, developing, and
implementing the right BI systems and
infrastructure are complex and challenging
tasks. The presented portal-based BI solutions
like Collaborative Business Infrastructure and
Data Warehouse Environment ensure the
availability of business-critical information.
Competitive organizations accumulate business
intelligence in order to gain sustainable
competitive advantage, and may regard such
intelligence as a valuable core competence in
some instances.

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