Abstract

Business Intelligence (BI) technologies are trying to help people understand the data much faster, so that they can decide better and faster and eventually make a move forward towards the accomplishment of the objectives of the business. The key goals which are behind BI objectives are the growth of organizational efficiency and output. We will deal with two aspects concerning the diminution of time to obtain the reports of analysis — this thing results from an analysis done in some Romanian companies which have implemented BI solutions. - the effective accomplishment of the reports of analysis concerning the evolution in different periods of time (daily, weekly, monthly, annually, etc) of some economical indicators useful in the management of sales.

1. Introduction

In the course of history, our perception regarding time passed through significant modifications. This occurred because among other things, the duration of life modified, the period of work extended, the rhythms accelerated and a competition appeared between the employees. It is more obvious the fact that time became a resource which had to be optimized, rationalized and controlled within an organization.

The definition of time notion raises many problems generated by the different perception of the people around us regarding this subject. Yet, we will stop at a definition from dictionary which says that “time is a limited duration considered in comparison with its given use”. However, time measurement is made only on the basis of the result of each activity achieved in a previously established period of time. In other words, we don’t manage time in itself, but the activities carried on in a certain period.

* E-mail address: luminitaserb@yahoo.com
No matter the features or the qualities of a successful manager or the qualities of his staff, an essential criterion, which is at the bottom of success, consists in the way one deals with time. Time is inherent in management. It represents the essence of economical and technical progress, as the fructification of an idea, the analysis of some economical indicators, the predictions and the estimations depend on time.

The manager cannot be in profitable business for the firm which he is responsible for if he does not know to manage his resources efficiently. And time is a precious, economical, demanding and irreversible resource, time is the rarest resource because it cannot be replaced, but it has no limits at the same time, it is expensive, but it cannot be purchased, stored, multiplied, and his loss cannot be assured even by the greatest assurance company in the world, so it cannot be reimbursed, it is very perishable and rigid.

Therefore, time is no one’s property, it is impersonal, it belongs to everyone and it is not retained by any physical borders. But the managers preoccupied with the performance know that time can be measured constantly and the fact that one takes decisions in a very short time is a priority for the success of a business.

Time management presents various advantages for managers. This encourages them to:
- achieve the pursued goal,
- establish priorities,
- obtain a general view upon the tasks to accomplish,
- communicate better,
- obtain many results per unit of time,
- delegate tasks,
- maintain balance in personal and professional life,
- develop creativity,
- participate to the life quality improvement of all members of the organization.

In order to take the decisions necessary to the business management, managers need up-to-date, complete and correct data. In most cases, these exist but are relatively difficult to process in view of their conversion into useful information. A problem is constituted by the difficulty of access, due to different storage environments – electronic (in one or more systems) or on paper. Another problem is represented by their multitude and different way of organization. Many times, the value of information decreases at the same time with their antiquation and it cannot represent a reliable decision support.

The people’s need for information has been always present, but what defines the current period is the high volume of available data, as well as the necessity to have answers as quick as possible. Because of the markets agglomeration and economic environment evolution, the ability to collect data and convert them in useful information for the decision process can be the element which makes the difference.

In order to answer to this acute necessity, there have been developed a series of specialized software instruments which are generically called Business Intelligence.

Business Intelligence systems are instruments of collecting, processing and analysis of data with the help of which the results of a company can be estimated. Depending of their nature, these results can be updated periodically or in real time.

Based on last generation technology, Business Intelligence systems are absolutely necessary for the efficiency growth at decision level, for the improvement of relations with clients, suppliers and employees.

Business Intelligence systems offer the possibility to obtain the needed reports and analyses in the shortest time by employees as well as by management. The information is at the same place, can be accessed anytime and can be presented in an intuitive form, leading to the significant growth of productivity.

A BI system can process and analyze a great volume of data, from various sources, the consolidated information about articles, partners, cash-flow, profit, discounts, fixed assets, stocks etc. being at a click distance. No matter what volume of data, these can be represented and analyzed through an unlimited number of visualizations. Once visually represented, the trends or problems can be easily observed and decisions are taken much simpler when the information is presented clearly. The analysis of data in a BI system is not reduced only to some static graphs during greater time periods. These can be profoundly studied, the passage from a general image to specific details being made very easily.
2. Why a company must implement a BI system?

The analysis of data generated by the activities of a company is a laborious activity, which implies considerable human and time resources, especially if the volume of information is very great. We can exemplify taking as a model a company which has an implemented ERP system, managed by an administrator without having a BI system. This person must answer to the demands of sales, financial and marketing staff, providing the primary data for the reference necessities. How does he achieve this?

The administrator interrogates the system and the results are copied in an Excel file, saved then as a data basis (for example .dbf) which is sent to the addressee. This, in his turn, saves the local file, access it and creates the reports using a management system of data bases (for example Microsoft Access). We may say that everything goes quite well so far. Everybody seems to know what they are doing and are satisfied with this process. Still, there are a few negative aspects which affect the process and implicitly the time and performances of implied employees, namely:

1. The administrator of ERP system who provides the data - becomes practically an obstacle in this process because he is alone, has also other responsibilities and cannot answer consistently to all demands.
2. Data quality – once extracted from the system, data can lose very easily their credibility. Users or time can modify them so as the reference on their basis could lose accuracy.
3. Overcharge of system – the files attached to messages overcharge the e-mail servers, which saved then to disc overcharge the discs, occupying space and modifying their performance.
4. Losses of time due to repetitive work and efforts of information correlation – in most cases users spend many hours with data arrangement and formatting in order to be converted into reports. Also, coming to an agreement regarding the content of reports resulting from different departments of the organization requires time. The sales report may comprise incomes which the financial report doesn’t comprise as collected for example. The correlation of all this information requires again effort, experience and time.

Thus, the company loses practically a month with consolidated annual reports towards external partners. We can add to this the time spent to identify and obtain the periodically necessary information for decision processes. So, the way in which the employees carry on their activity to obtain and analyze the information, is inefficient from the perspective of necessary time to obtain the desired results.

How these drawbacks can be eliminated? Through the implementation of a BI solution in which the visual representations simplify the things, allowing to the users from any level of the company to better understand the data on the basis of which they must achieve their goals. The software of Business Intelligence includes a support system in taking of decisions, which is acted by an underlying data basis. This data basis offers to management staff access in real time to ad hoc reports, online tables, board time tables which provide a great number of information under the form of financial reports, business scorecards and key performance indicators. Further, we shall present some of the reasons for which a company needs a BI system:

1. The existence of a specialized staff which takes care of the company’s multiple data bases as well as of a great number of operators who take over the orders from field or other documents and introduce them in the system, supposes recurrent costs. These people have to process the information many times, even separately for each department: at accounting-financial department for book keeping, at production and warehouse department for processing and delivery, at sales and management department for reporting etc. The activities which imply the handling of great quantities of information are achieved with a high consumption of material and human resources. But a Business Intelligence system integrated in the computing platform of the company allows for the reduction of these operational costs.
2. The use of communication devices as mobile phone in the process of information transmission between the employees of a company supposes not only high costs but also the risk of distortion of the communicated information for different technical reasons or related to interlocutors. In a BI system, data can be accessed directly by all implied decision factors, with a minimum cost, including from mobile devices.
3. The lack of up-to-date information, necessary in the daily activity, regarding cash-flow, dimension of stocks or availability of resources can generate additional costs. The inadequate exploitation of resources can determine a low productivity and deterioration of relations with clients while the stocks over-measure implies more storage space and the risk of deterioration of goods in stock. On the other hand, the use of a BI system diminishes these risks
considerably; for example, the availability of information about stocks offers the possibility to synchronize the process of production or supply with the sales process.

4. There are frequent situations when we need complete and updated information in order to be presented in a business meeting. For this, it is necessary the mobilization of all company: each department will offer in a shorter or longer time a series of reports regarding their activity. It is necessary the study of materials, each in its given format and extraction of the most relevant information, a process which is often laborious and tiresome.

A BI integrated system available also on mobile devices can offer in few moves the wished analysis and answers to any question. The information is updated permanently and there is no need to interact with the managers of departments and interrupt the current activity in order to have a general view.

Either it comes to decision process or relations with business partners, it is necessary a general approach of the business sustained by the possibility of detailed analysis of all company information. This implies not only the implementation of a Business Intelligence system but also the creation of an organizational culture oriented to this type of “smart” business, able to adapt to any kind of situation from internal or external environment.

As a result of a study realized at some Romanian companies which implemented a BI solution, we concluded the following aspects:

- The time of access to business information and analysis reduces with 50%;
- Any BI solution consolidates multiple data sources easily;
- The speed to obtain the reports rises from 1-2 days for complex reports up to few minutes;
- It presents flexibility regarding data measurement – if it has been found an area which needs explanations (for example an unexpected diminution of sold quantities from a sales channel) we can dig deeper into data till we identify the problem in a very short time (we select the channel or group, choose the client and then the product which determined the diminution);
- It leads to the reduction of the number of employees who are taking care of reporting (from six persons to one person);
- The obtainment of quick results determines the action of sales agents only when main problems appear (when sales decrease);
- Management and performance staff have access to same data and alarm signals displayed by BI, the discussion switching to figures interpretation and corrective actions.

The success of an organization depends on the method and the speed which responds to the market conditions which are constantly changing. BI solutions offer the organizations a trump by giving them the whole perspective of the data base, allowing them to take better decisions in a more alert rhythm. If a report tells us that sales have decreased with 80% by comparison to the last month, an analysis tells us WHY and WHERE some decisions must be taken.

The increasing of the competition in some market areas forces the adoption of BI solutions to become critical in Romania as well. The companies faced with a real competition are interested in finding out, in the shortest time possible, which is the best product on the market, the most fruitful customer or what new products should appeal in order to be competitive.

3. Design of some analysis reports with the help of QlikView application

For the projection of the reports of analysis we have used QlikView application and not some other BI solutions available on the local market due to the powerful engine of analysis, with little time on big volumes of data, price and duration of implementation. QlikView represents a new generation of BI software, analysis and report which delivers in a quarter of time, at half price, twice the value of traditional systems based on OLAP technology.

QlikView is a complex and powerful BI software package and data analysis which offers a better way to work with the data of a business. The graphic interface offers an increasing interaction to the users. With a few clicks on the mouse, they have immediate access to information that goes from the general level to the level of the slightest details. The organizations, thus, succeed in discovering still unsuspected information, in understanding better what is going on in their current activity and, as such, in making the best decisions for their development.

A QlikView document is created by retrieving data from one or several sources, e.g. from a relational database or from text files containing data tables. This retrieval is done by writing and executing a script, in which the database, the tables and the fields to be retrieved are specified. The script can be generated automatically with the tools
included in QlikView. Note that QlikView in itself is not a traditional database, i.e. you cannot add or alter data in the source database.

To make selections in QlikView, you don’t need any previous knowledge of databases or search routines: you simply click on the item of which you want to know more. The clicked item turns green, and the program immediately presents all the items associated with the selected one. Graphics and tables can be created to get an even better overview of data. Any graphic or table can be printed or exported to other programs.

QlikView charts can be divided into two major categories. The first, graph charts, consists of bar, line, combo, pie, scatter, radar, grid, block and gauge charts. The second category, table charts, consists of straight tables and pivot tables. These chart types are drawn as tables with cells in columns and rows. Any object in QlikView – from lists to graphics and tables – is accessible through a “click”. QlikView enables the users to find their own way towards the analysis and understanding of things.

QlikView is the business intelligence solution that extends the concept of simplifying the analysis for everybody, further than ever. The extended facilities for personalizing and visualizing information, combined with advanced co-operative work abilities make QlikView easily adapted within organizations that use intensively electronic data stocks.

To give an example we considered a company that deals with product distribution. The company has got several warehouses situated at different addresses and furnishes products to several clients from all over the country. The used information refers to:

- Articles characterized through: Product Code, Product Name, Weight, Product Group, Group Type;
- Customers defined through: Customer Code, Customer Name, Location Code, Customer Location Name, Customer Group, Customer Group Type, Department, Town, Invoicing Code;
- Invoice heading which comprises: ID, Invoicing Code, Date, Warehouse Location, Warehouse and Bill
- Invoice lines consisting of: ID, Product Code, Quantity and Price.

The most important operation that can be done very easily with QlikView is the “Filter” spreadsheet. This allows visualizing several pieces of information at the same time. The operations that can be made on this page are:

- The simple or multiple selection: for example if we select a certain product we can visualize information about the name, the customer’s type and location to whom the product was distributed, about the group of product to which the particular product belongs, the warehouse, the delivered quantity and the price of the product, about the bills released for the sell of the product.
- The search: for example, if we want to find a bill number in order to see the information comprised in this particular bill (sold product, date of release, quantity, price), we have to select the thing corresponding to the bill and introduce the number of the bill. As the numbers are being introduced, all the bills that have the specified values comprised in their number are selected.

Using the information taken from the database described above we made the following spreadsheets:

1. Sales by region.. We build the annual or monthly evolution of sales for each warehouse. By selecting a location, we obtain the specific graph with the sales evolution from the respective warehouse. By multiple selection, we can obtain in few seconds the sales evolution over a specified period of time (one month, two months or few months depending what we select)
This graph can be modified with a single click under the form of a table, thus obtaining the next report (see figure 2).

2. Comparisons between the days of the week. In this report there can be noticed the differences between the sold quantities, the products value, the average price and the number of products for every location of deposit.

We build the evolution on a certain day of the week of the sold quantity, value, average price and number of products. For example, establishing the date of 10.08.2011 we get specific data for the three dimensions only for the day of Wednesday from the current or previous month (we take in account the last 4 weeks) and we compare these days to one another in order to establish if there was or not an evolution of the sales (see figure 3).
A very important thing for the drawing of all the spreadsheets is the dimension established as representative for them. Thus we used as dimensions: time, location of warehouses, customers, products, etc. These can be selected and altered on each sheet and we can use combinations of these dimensions in order to define groups.

This table can be modified easily by changing the dimensions, in this way, visualizing the same information grouped differently. For instance, we can find differences in the quantities, values and prices for a group of products, or for other customers or types of customers (partners or non-partners), or from a locality. Selections can also be made, for example, we can choose to draw a statistics only for a certain group of products, for a certain customer, a certain geographic area or for a certain group of customers etc. In fact, these selections can be made in all accounting papers built by means of this QlikView application.

3. Period comparisons will done using the same dimensions, but we establish a certain period for which we want to visualize sales evolution. For example, if we use a 7 days period, this does not mean that we built the evolution for that week, but for a 7 days period previous to the analysis date. This thing is very important in business, because we don’t have to wait till the end of the week to have access to information, but it is considered a week starting from current date (7 days ago).
In the next diagram, we can observe the evolution seven days in seven of the quantity sold by the company, the obtained value as well as the average price from each warehouse. There are made a few comparisons between days and it is established also the average on each period.

<table>
<thead>
<tr>
<th>Period Evolution - Quantities KG</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS</td>
</tr>
<tr>
<td>GJ</td>
</tr>
<tr>
<td>TC</td>
</tr>
<tr>
<td>AG</td>
</tr>
<tr>
<td>OB</td>
</tr>
<tr>
<td>BV</td>
</tr>
<tr>
<td>YL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period Evolution - Average Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS</td>
</tr>
</tbody>
</table>

Figure 4. Period comparisons for warehouse

These periodical comparisons can be visualized also under a graphic form, by the quick change of the information display way, for a quicker understanding of evolutions from each period (see figure 5)
Previous reports can be simply modified so that we can analyze the data by groups of products (see figure 6), by groups of clients, by region, etc. This thing is possible by choosing from a menu the desired options. Once changed the dimension in the first table, it will change automatically in the other tables.

Figure 5: Graph with period comparisons

Figure 6: Periodic evolution for group of products
Conclusion

Business Intelligence answers to all challenges related to information obtainment. It eliminates the prodigality of resources and time, excludes the errors, materialize the management vision upon the important aspects of the business, furnishes the information instantaneously to all implied, no matter what data volume or complexity.

The important areas in which a BI solution acts are:

1. **Operational efficiency.** A Business Intelligence solution helps to the improvement of order-cashing cycle, the identification of weak points in the company’s flows and the optimization of operations. Thus, flexibility arises by diminution of the time to answer to internal and external changes and delivers the key information from company’s data. Also, a new perspective is achieved by the possibility to access the information from all company’s levels and facilitate the use of resources.

2. **Profitability.** A Business Intelligence solution brings benefits in the profitability area by decisions based upon correct information, identification of non-profitable elements and cross selling opportunities of products and services, elimination of lost sales because of the lack of stocks, prices optimization by the analysis of direct and indirect costs and supervision in real time of achievements given the target.

3. **Cost reductions.** A Business Intelligence solution leads to the obtainment of exact information about the expenses per cost centers in view of identification of reduction opportunities, supervision of acquisition costs, use and maintenance of fixed assets, reduction of costs generated by the extraction and processing of information or by wrong information or delays. By cash-flow analysis, we can obtain reductions of financial costs and by stocks optimization, we can obtain reductions of goods costs.

4. **Productivity of employees.** With the help of a Business Intelligence solution, all the information is centralized so that the employees have more available time to focus on the important aspects of their activity, can take quick decisions based upon correct and actionable information and are more efficient by using multidimensional dynamic analyses instead of bi-dimensional static reports.

5. **Client satisfaction.** A Business Intelligence solution helps to offer quick and correct information to clients, to adapt offer to demand for a better client retention while the rise of service level generates higher revenue per client.

We believe that, in the future, Business Intelligence solutions will become indispensable tools in the management of any company since quick and good decisions will become critical for survival and evolution on the European market. Romania shows a great potential to assimilate IT solutions, the receptivity for Business Intelligence solutions becoming more and more obvious both as mentality and practical application within the Romanian business environment. There are still problems, as there are Romanian managers that still need to be convinced to adopt global Business Intelligence solutions.

References


