BUSINESS INTELLIGENCE IN INDUSTRY

Mario Lešina¹

¹Midal Ltd, Varaždin, Republic of Croatia, mario.lesina@gmail.com

ABSTRACT

Business intelligence is making decisions based on the data collected and processed in the selected information. Though the term business intelligence has been used for a number of years, it was not established in practice until the mid-1990s. The reason for this was the development of the Internet and easier access to exponentially increasing amounts of available data. This paper deals with the method of collecting data, transforming it into information, and making decisions based on it in purchasing, sales, and financial operations, the most important segments of the industry.

JEL Classification: C6, D81

Keywords: information, data, decision-making, and intelligent.

1. INTRODUCTION

Business Intelligence (BI) is a set of methods, processes, and reports designed to understand the competitive environment of each business segment. It entails the systematic collection of information and its transformation into knowledge in order to promptly recognize changes in the environment, and decision-making based on information rather than intuition. For the system to be effective, the following conditions are required:¹

- BI must have clear guidelines and an established goal. BI is valuable only if it is incorporated into a company's business strategy, which requires a strategy as such and prepared medium-term and operational plans.

¹ Business Intelligence Competency Centers, Miller; Brautigam, Gerlach.

- BI should have the unreserved support of the senior management structures, executive or ownership, to obtain all required information from the company itself and occasionally to use employees for what they need without fear that the information will be inaccurate or that their requests will be refused.

- a BI team must be a combination of IT staff and people from the operational business who select and evaluate data, while IT shapes the required data into a form that is understandable and accessible to everyone.

2. THE SEQUENCE OF BUSINESS INTELLIGENCE

An interactive BI system is divided into the following phases;

- Data mining
- Transforming the collected data into information
- Analysis of information
- Decision-making based on information

This is the chronological sequence of BI, having previously defined what type of information is desired.

2.1. Data mining

Research in 2006 conducted by IBM, then the leading IT company in the world, established the amount of information in the world to be one exabyte, and that there is 20 times that amount of information on various media (CD, DVD and digital tapes)², and social networks, which publish a multitude of information, only began their intense development after this research. Such an amount of available data implies a risk of becoming overburdened by it and raises questions about its reliability. Reliable sources of information include official state institutions that control payment transactions (in Croatia FINA), judicial institutions, national institutes of statistics, audit reports for legal entities by statutory auditors required by law to review the annual reports of public corporations; non-governmental organizations whose polling and research are made with a thoroughly described and known scientific methodology and empirical data; and specialized home and business networks. Using reliable sources also reduces the amount of data.

² Laitaud, Bernard; Hammond, Mark, e-poslovna inteligencija – kako informacije pretvoriti u znanje, a znanje u profit – Prudens consilium d.o.o. 2006, p. 39.

2.2. Transforming collected data into information - Data warehousing

The collected data, diverse in both content and in form, must be filtered and irrelevant content must be rejected, and shaped into a form that will be useful in the decision-making process, and included in the database. This process is mostly done by computer, and the best tools and applications for this have been developed by PeopleSoft, Oracle, and Siebel Systems, the global vanguard in this field. The essence of these applications, and the databases that store all of the collected data so that subsequent users have the ability to review it, is to select those data that are directly related to their field of work.

2.3. Analysis of information and methodology of decision-making

Once collected and processed, the information and data should be available to anyone involved in the decision-making process. The information that will be used depends primarily on what the decision is being made. In chronological order, decision-making based on an information set is the third step, but it largely determines the first step, data mining.

The decisions in intelligent companies will always be based on information and its analysis. Consequently, the decision process is:

Diagram 1: Structure of BI



Source: Author.

Given the diversity of their business processes and functions, each of them will use different data and procedures. A somewhat unified process of information analysis and its common purpose can be detected in;

- Procurement
- Sales
- Financial operations

These phases of the business process are the most important in industry since, along with labour, they represent the largest expense and in these stages it is especially important to decide intelligently on the basis of information to increase competitiveness and market share, to reduce costs, and generally to improve the business.

3. INFORMATION ANALYSIS AND DECISION-MAKING METHODOLOGY IN PROCUREMENT

Supply is the acquisition of materials or services of adequate quality from appropriate sources and their timely delivery to the appropriate place at an appropriate price. (Knezević, 2012)³, and with regard to the subject, it is divided into:

- Operational procurement: acquisition of materials or services necessary for the business cycle,

- Capital procurement: acquisition of fixed assets, the construction of new buildings, and the purchase of machinery or tools.

According to this classification, the information to be analyzed and decided upon is different.

3.1. Information analysis and decision-making methodology in operational procurement

In operational procurement intelligent companies determine the optimal supplier correlating four crucial elements: price, quality, quantity, and delivery time. Price is definitely the most important element, but not the only one. If the quality does not match what was requested, the goods or services are pointless. Likewise, if

242

³ Available at web.efzg.hr/dok//trg/.../mnab2012sem01kc.pdf access on 13.11.2013.

the provider is unable to supply the required amount, consistency and continuity is certainly not optimal.

The equation for calculating optimal suppliers is as follows:

Equation 1. Calculation for an optimal supplier

$$O_{I} = (C_{min}/C_{P})*10 *p + Q *p + N * p + T * p$$

Source: Author. Where

0,	value of offer 1	C ₁	price of offer
C _{min}	lowest price offered	Q	Quality
N	Quantity	Т	delivery time

Weights range from 1 to 10, similar to the Lickerts method. For each set a variable is determined as follows:

- Price - on the basis of an offer with the same parity as Incoterms 2012.

- Quality - the basic criterion is the International Standard on Quality Control (ISQC)⁴. If this does not exist, then the national quality standard applies, and if that does not exist then testing by a certified laboratory or empirical testing of quality.

- Quantity - it is necessary to determine the capacity of suppliers and properly evaluate or weight them. If all other variables in the supply company have the highest value, one can also anticipate the ability of other suppliers to supplement the amount required if they do not have sufficient capacity.

- Delivery time - vendors accept the requested delivery times or provide their dates, but how they will meet them can only be determined empirically. Since there are two elements, they must be expressed by the following equation:

Equation 2. Calculation of the factor for delivery time

 $T = (T_t * p + T_r * p)/2$ Source: Author.

Where

Available on; http://www.ifac.org/publications-resources/2012-handbook-international-qualit ycontrol-auditing-review-other-assurance-a; accessed on 20.12.2012.

 T_{r} is the offered delivery date, and T_{r} is the actual delivery date in practice

The optimal supplier is the one whose result in the equation is closest to 40. The primary purpose of evaluating suppliers in this way is to create a catalogue of suppliers that very precisely define all their advantages and disadvantages. This view enables the goals to be achieved during negotiations with suppliers to be clearly defined.

3.2. Information analysis and decision-making methodology in capital procurement

During capital procurement, the above equation is also used, but since the financial resources needed to carry out capital purchases are substantially greater than they are for operational procurement, prior to the selection of suppliers it is necessary to conduct a thorough analysis of the viability of the capital investment project, and to conduct an economic and market appraisal of the project, including the following indicators and analysis:

Static project efficiency evaluation - this analysis shows whether the company will maintain stability if the investment fails to produce any positive effects.

Dynamic evaluation of the project - shows how business operations should be if the investments achieve the expected results.

The period of return on investment method – this method is used to establish the time required for net receipts, increased by revenues and reduced for increased costs, balance with the amount of financial resources.

Net current value method (NPV) - this method, discount factors, all future receipts that investment should yield down to the present time. If the resulting value is more than zero, the project is profitable.

Relative current value method (APV) - net current value of the difference between the benefits and costs of the project, i.e. the current value of the excess proceeds over the current value of the expenditure.

The internal rate of return method - the internal rate of return is the highest interest rate that the project can bear and remain profitable. This rate must be higher than the interest rate charged by a bank.

Sensitivity analysis - this method predicts business if there is a disruption in the market, i.e. a decline in the sales.

4. THE ANALISYS OF INFORMATION AND DECISION–MAKING METHODOLOGY IN THE SALES PHASE

Every product or service that the company offers is intended for a homogeneous group, called the target group. The target group is a dynamic category and is constantly changing. Each change means a change in the situation on the market. Intelligent companies constantly monitor what is happening with their target group and modify their actions and tasks accordingly to maintain or increase market share. If the entry on a new market is planned, during the definition of the sales strategy it will be necessary for operational management to quantify the target group and their spending and to define a realistic market share. In regard to the population, this will mean analysis of the demographic structure, broken down by household income, detecting the propensity to consume, determining the overall cost of a product or service, and on the basis of that data defining a market share.

Since no one in the market has an exclusive monopoly, a company should also obtain information about its competitors, their products, their market shares, and the terms that they offer. Most importantly, it must determine with what the people who purchase from these companies are dissatisfied. Based on this information a company can define its comparative advantage over its competitors. If the company is already present in the market, it must constantly monitor the actions of competitors because nothing guarantees that a comparative advantage of the moment will remain so in the future. It must also collect data on distribution channels, which respond to the subject goods and services, who makes that response, and how the goods and services are distributed. It is particularly important, especially in transition countries, and more recently countries hit hardest by the current economic crisis, to analyze data about a distributor's financial strength, its liquidity and capitalization. The result of the analysis of this information in the sales process must be a clearly defined goal on the market, but it must also be defined as an instrument to achieve this goal.

5. THE ANALYSIS OF INFORMATION AND DECISION–MAKING METHODOLOGY IN FINACIAL OPERATIONS

The cost of financial operations can be divided into the cost for payment transactions and interest and fees for collateral. Their share in overall business operations is highly divergent. The level of these fees is different for each bank, therefore an intelligent company does not neglect the other costs of financial operations only for the sake of a favourable one. Instead, it will calculate the above items with the following equation:

Equation 3. Calculating the optimal bank

 $OB_{1} = (K_{min}/K_{1} * 10) / \Pi + (\Phi_{min}/F_{n} * 10) / \Pi + (R_{min}/R_{n} * 10)$ Source: Author.

Where

B _n	bank service provider	K	lowest interest rate offered
K	bank rate to be compared	F _{min}	lowest payment transactions fee
F _n	transaction fee to be compared	R _{min}	lowest collateral cost
R _n	costs to be compared	П	percentage of bank operations in
			total costs

The bank with lowest equation result is the optimal one.

The purpose of this equation is to correlate the level of individual costs and their share of total costs.

6. CONCLUSION

Steady growth, increasing the number of employees, increasing capitalization of the company and increased profit is the goal of every company. BI as the foundation of making good, intelligent decisions is used every day, but the basic advantage of intelligent companies is in strategic planning based on real data and realistic assessments of their own abilities. Achieving these goals is influenced by internal factors that management can influence by direct measures that will increase productivity, reduce costs, and streamline staff. But there are also external factors that management cannot control but can amortize or whose negative effects on business operations it can even completely eliminate if promptly and analytically identifies expected problems. To make this possible, management must have information that is based on accurate and reliable data, analyses, and assessments. At the same time, management must have the information about the competition and their actions since a comparative advantage on which a company holds a certain market share is not constant. Competition works effortlessly in order to get to that comparative advantage, and consumer preferences are constantly changing. Intelligent management will always work to improve products or services to achieve a new competitive advantage that will be a guarantee of preserving or increasing market

share at a time when the current comparative advantage ceases to exist because of improvements by the competition or because consumer preferences change. It will also always monitor competitors, especially their weak points to achieve a comparative advantage in a particular segment.

Under the current conditions of the global crisis, only those companies that have adopted strategic plans based on realistic parameters and have well-designed plans for all, or almost all, scenarios will survive and strengthen. BI will also improve the operations of the suppliers of these companies since it applies pressure on them to be more competitive. As addressed in this paper, business intelligence, BI, has been shown to be a basis for a win - win relationship in business, and precisely this relationship is the foundation of a modern economy that is slowly developing as a result of the global economic crisis.

BIBLIOGRAPHY

Beller, Michael J.; Barnett, Alan, Next Generation Business Analytics, Lightship Partners, New York, 2009.

Bilandžić, Mirko, Poslovno obavještajno djelovanje, AGM, Zagreb, 2008.

Laitaud, Bernard; Hammond, Mark, E-poslovna inteligencija – kako informacije pretvoriti u znanje, a znanje u profit, Prudens consilium, Zagreb, 2006.

Miller, J. Gloria; Braaeutigam; Gerlach, V. Stefanie, Business Intelligence Competency Centers: A Team Approach to Maximizing Competitive Advantage, John Wiley & Sons, 2006.

Mikić, Mia; Orsag, Silvije; Pološki Vokić, Nina; Švaljek, Sandra, Ekonomski leksikon;

Leksikografski zavod Miroslav Krleža, Masmedia, Zagreb, 2011.

Turek, Franjo, Globalizacija i globalna sigurnost, Interland, Varaždin, 1999.

Panian, Željko, et al., Poslovna inteligencija; studije slučajeva iz Hrvatske prakse; Narodne Novine, Zagreb,2007.

Žibret, Boris, Strateška nabava, Mate, Zagreb,2007.