

INTELLIGENT RISK MANAGEMENT - A NEW PRINCIPLE IN RISK MANAGEMENT BASED ON USING BI IN RM

Valentin Petru Măzăreanu¹

Abstract

The need for a system able to store information about the risks faced by the organization along its entire existence, the history of decisions on past risk management activities (along with an analysis of the implications of those decisions – “lessons learned”) and able to record and analyze business information from external environment and provide various patterns on the evolution of market phenomena is undeniable. Business intelligence does so.

The practice of implementing a business intelligence system since the earliest days of a company’ life that would assimilate information and after that to deliver these to be used in the process of reducing the risks to which the organization is exposed may be considered a new rule of good business practice.

Therefore, let us consider this practice a new principle in risk management, named the intelligent risk management.

Keywords: risk, BI, intelligence, approach, principle

Business Intelligence and Risk Management: A Brief Overview

Such phenomena as globalization and information and communication technology pushed companies to a strong competitive environment, where competitive advantage cannot be won just by better market positioning, be it on price, on location or both. Besides the importance of rapid and effective identification of market opportunities and, taking into consideration the massive digitization of all documents, the need for high processing capabilities and understanding of all these data, companies have realized that the competitive advantage is given by the ability to anticipate the opponent's moves on the chessboard of the business environment. Under this light, business intelligence is born: a concept that involves new techniques and tools capable of analyzing large volumes of data from internal or external environment of the business having as a ultimate goal the will to lead to improved operational performance and to provide more understanding of a business, competition and the current potential market.

BI is a *fashion* concept in the business of the digital economy. Despite this, BI is still a concept that most people understand it wrongly. The reason? One would be the applicability of BI in different fields, from business or lobbying and advocacy to government or educational environment and even to industrial espionage. Another reason could be the interpretative nature, caused by the abundance of acronyms in current

¹ Ph.D., Professor at The Faculty of Economics and Business Administration, “Alexandru Ioan Cuza” University of Iasi, Iasi, Romania, vali.mazareanu@feaa.uaic.ro

information systems business. There is BPM (Business Performance Management and Business Process Management), CPM (Corporate Performance Management), BAM (business activity monitoring) and others. According to some authors these systems are independent. Others say all these depend on business intelligence or in other words, derived from BI with limited capacity for data analysis.

The business intelligence concept was introduced by the Gartner Group in the mid 90s. But according to Zaman opinion¹, the concept of business intelligence existed long before, since the '70s, being used in mainframe reporting systems.

The need for BI systems can be easily explained: to survive the current competitive market, a company should try to develop a successful strategy, to develop a successful strategy you need the ability to predict future conditions, understanding the past is the best way to predict the future. Business intelligence does so.

Getting closer to risk management field, we know that the risk response plan requires choosing of a risk response strategy.

At this level the options are: measures to avoid risk or risk mitigation, risk acceptance or decision to transfer risk (insurance or outsourcing).

Decision is not simple and involves both the analysis of risk information obtained in previous stages (we refer to information about protected assets, vulnerabilities, likelihood of occurrence, size, impact and so forth.) but also the analysis of other information from internal and external environment related to organization' strategy.

Under these circumstances, the need for a system able to store information about the risks faced by the organization along its entire existence², the history of decisions on past risk management activities³ (along with an analysis of the implications of those decisions – “lessons learned”) and able to record and analyze business information from external environment and provide various patterns on the evolution of market phenomena is undeniable. Business intelligence does so.

Understanding the *intelligence* in business intelligence

Psychologically, the intelligence concept has a double sense: the process of adaptation through information assimilation and processing and also ability⁴.

Intelligence refers to that knowledge needed to fulfill a mission, that kind of strategic knowledge that reveals critical threats and opportunities that may endanger or ensure the fulfillment of a mission.

Intelligence often reveals secrets or expresses a deep understanding. While there is a wide range of definitions of intelligence, perhaps the most representative is that provided by

¹ Zaman, M., *Business Intelligence: Its Ins and Outs*, at <http://www.technologyevaluation.com>, accessed on 10.01.2005

² Could offer a Top 10 risk list

³ Could offer the organization risk appetite

⁴ Cosmovici, A. (coord.), *Psihologie*, Ed.Polirom, Iași, 199., p.131

U.S. Central Intelligence Agency (CIA)¹: "reduced to its simplest terms, intelligence is knowledge and the way we (*pre-*)sense the world around us - the prelude to decisions and actions of politicians [...]". These components of intelligence provide understanding and determine leaders to take decisions which offers security for business or states. According to Raisinghani² the intelligence involves knowledge of competitive information (information such as profitability or revenue).

The major benefit of intelligence is the knowledge of customer and potential customer. This knowledge helps to improve customer services and better business orientation towards the needs of these customers.

We have to mention that the intelligence concept can be analyzed at several levels: national intelligence (attention is focused on understanding the global environment), military intelligence (the attention is on understanding of foreign military threats), competitive intelligence (a subdivision of business intelligence, which takes into account current and future competition) and of course, business intelligence.

The process of obtaining intelligence (intelligent knowledge) has been described as the process of discovering secrets using secret means³, it starts with the need for knowledge of policy makers and ending with delivery of that knowledge⁴.

We make an observation: even if the process is presented as a cycle, the process actually operates continuous action, with more feedback and feedforward which requires collaboration among consumers, collectors and analysts.

To conclude this section we understand by the intelligence term used in BI that vital information or knowledge for a decision.

In the light of risk management, this knowledge would be the whole process of managing and responding to a particular risk. Therefore, an intelligent knowledge is more than a piece of information. It represents the way once can benefit from a piece of information.

In the future, in the case of emerging a new threat, the first step would be to consult the system on how was the response plan in the past. Business intelligence system will extract that knowledge from data warehouse and provide it to the decision-maker after analyzing of internal and external conditions.

¹ Waltz, E., *Knowledge Management in the Intelligence Enterprise*, Artech House, 2003, p.11 apud. A *Consumer's Guide to Intelligence*, "CIA (Office of Public Affairs), Washington, D.C., 1999, p. vii. For a comprehensive discussion of the range of definitions of intelligence and its central meaning, see: "Wanted: A Definition of 'Intelligence,'" in *Studies in Intelligence*, Vol. 46, No. 3, CIA, Washington D.C., 2002, Unclassified Edition, accessed on-line October 3, 2002, at <http://www.cia.gov/csi/studies/vol46no3/index.html>.

² Raisinghani, M., *Business Intelligence in the Digital Economy – Opportunities, Limitations and Risks*, Idea Group INC., 2004., p.vii

³ Waltz, E., *Knowledge Management in the Intelligence Enterprise*, Artech House, 2003, p. 11

⁴ See Măzăreanu, V., *Inteligență în Business Intelligence*, in *Analele Universității „Al.I.Cuza Iași”, Științe Economice*, 2005/2006, Tomul LII/LIII

Defining business intelligence

The business intelligence concept is relatively new and is used by authors and software vendors to characterize a wide range of technologies, software platforms, specific applications and processes designed to assist in decision making and deliver competitive advantage based on accessed, stored and analyzed data.

According to IBM¹ business intelligence means using data to optimize decision making and thus discover new opportunities. In Business Intelligence Roadmap, Moss and Atre² present business intelligence as an architecture and a collection of integrated applications and operational databases and decisions support systems that provide the business community easier access to business data. Business intelligence, as defined by Gartner³, is the process of transforming data in information and through discovery, transforming this information into knowledge. This means that it is about a process of delivering of understandings that will determine managers to make tactical decisions, and establishing, changing or adjusting business strategies and business processes in order to achieve competitive advantage and improve business processes and profitability.

As it may be seen, business intelligence is a concept with many faces which (as stated by Chaudhary⁴) deliver the right information at all levels of an organization. To be fully understood, Vitti, Luckevich and Misner suggest an examination from three different perspectives⁵:

- better decisions in less time;
- converting data into information;
- using a rational approach to management.

Business intelligence involves an iterative process: it starts from the operational environment; data are extracted from this medium and stored in data warehouses (the data warehouse is in the form of a data center, separate from operational data); decision-maker uses decision support systems to extract data from data store; having this information, a decision-maker can create action plans; this change in the operational information lead to a new iteration of the BI cycle.

The components of a BI system are:

- data warehouse
- decision support system;
- data mining (knowledge discovery);

¹ Almeida, M.S., Ishikawa, M., Reinschmidt, J., Roeber, T., *Getting Started with DataWarehouse, and Business Intelligence*, IBM Corporation, San Jose, 1999, p.1

² Moss, L., T., Atre, S., *Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications*, Addison Wesley, 2003, p.10

³ Gartz, U., Enterprise Information Management, in Raisinghani, M., *Business Intelligence in the Digital Economy – Opportunities, Limitations and Risks*, Idea Group INC., 2004, p.50

⁴ Chaudhary, S., Management Factors for Strategic BI Success, in Raisinghani, Mahesh, *Business Intelligence in the Digital Economy – Opportunities, Limitations and Risks*, Idea Group INC., 2004, p.191

⁵ Vitti, E., Luckevich, M., Misner, S., *Making better business intelligence decisions faster*, Microsoft Press, 2002, p.16

- text mining process (requires the analysis of natural language text to extract key terms, entities and relationships between those terms and entities; text mining techniques: term extraction, information retrieval and analysis of links);
- ETL process (extraction, transformation and loading);
- Reporting and query tools;
- OLAP (Online Analytical Processing) tools.

The key component of the loop BI is the decision-maker, in our case the risk manager. He takes information provided by the system to support decision making and outlines a course of action. To make a decision, the decision-maker search, analyze and process relevant information. This information is then used (consciously or unconsciously) by the decision-maker in a manner intended to result in eliminating or reducing risks that might arise from a decision

Conclusions: *Intelligent Risk Management* – a new principle of Risk Management

Literature has shown that risk management as any other field, is governed by a set of principles. For details, we suggest to analyze the opinions and models developed by the Software Engineering Institute¹, Sullivan² or PricewaterhouseCoopers³.

In our opinion, the new economy requires a complement to these views. Projects are becoming more complex, which entails an increase in the complexity of the risk management process. In these circumstances, involving information and communication technologies in the risk management process should not be ignored.

As surprised by Crouhy⁴, the technology allows information from the risk management process to be integrated into the overall process of reporting to management and the internet and intranet are the means of transport decisions of risk analysis results.

In parallel with this, we remind about the risk identification process and the importance of analysis techniques, experience of project team members (eg historical data or knowledge gained by them from other projects) or external factors (eg market information).

Based on these considerations, we want to emphasize the importance of implementing an event log. But our proposal would go beyond the current risk register, arguing the importance of establishing a data warehouse. By data we mean here any internal or external event that at one time influenced in a lesser or greater extent a project, process, activity or decision. Note that it is necessary to take account of any event and whether the

¹ ***, *The Principles of Risk Management*, at <http://www.sei.cmu.edu/risk/principles.html>, accessed on 06.09.2008

² Sullivan, J., Risk Management Policy, at www.auditnet.org/docs/Draft%20Risk%20Management%20Policy%20-%20Example.doc, accessed on 06.09.2008

³ ***, *Ten attributes of a world-class risk management culture* - PricewaterhouseCoopers Risk Management Survey, November 2002, at <http://www.pwcglobal.com>, accessed on 19.09.2003

⁴ Crouhy, M., *Risk Management*, The McGraw-Hill Companies, Blacklick, OH, 2001, p.665

outcome was positive or negative. Continuing our idea, we consider that these data will be used by an analyst in making a decision.

The main conclusion from the discussion above is the importance of implementing a Business Intelligence system designed to assist the risk management process. We believe that such systems that collect all the company's life experience is so important for risk management that a company should decide to implement business intelligence system since its earliest days, as a rule of good business practice.

Some information that would be deposited in the data warehouse are:

- Details of transactions (cash flow, exchange rate history etc.);
- Information from the external environment (monitoring share prices at stock market, the effects of its fluctuations, analysis of competition, STEEP - Social, Tehnologic, Economic, Environment, Politic factors etc.);
- Information from the internal environment (data about employees, other knowledge areas of the project - See PMBOK from PMI for details, record the organization assets etc.);
- Information from the extensive internal environment (includes information about customers, suppliers and business partners of the organization);
- Information about past projects (the risk that the company was exposed to, identified vulnerabilities, applied risk assessment models, decisions on risk management plans, etc.).

In the situation of the existence of such a system within an organization, a person responsible for risk management is in touch with the latest information about internal and external environment in which the organization operates and also has access to the organization's activity history, including history and Risk management plans drawn up at other risk analysis.

In our opinion, this practice of implementing a business intelligence system since the earliest days of a company' life that would assimilate information and after that to deliver these to be used in the process of reducing the risks to which the organization is exposed may be considered a new rule of good business practice. Therefore, let us consider this practice a new principle in risk management, named the *intelligent risk management*.

Bibliography

1. ***, *Ten attributes of a world-class risk management culture*, PricewaterhouseCoopers Risk Management Survey, November 2002, at <http://www.pwcglobal.com>, accessed on 19.09.2003
2. ***, *The Principles of Risk Management*, at <http://www.sei.cmu.edu/risk/principles.html>, accessed on 06.09.2008
3. Almeida, M.S., Ishikawa, M., Reinschmidt, J., Roeber, T., *Getting Started with DataWarehouse, and Business Intelligence*, IBM Corporation, San Jose, 1999
4. Cosmovici, A. (coord.), *Psihologie*, Ed.Polirom, Iași, 1999
5. Crouhy, M., *Risk Management*, The McGraw-Hill Companies, Blacklick, OH, 2001

6. Gartz, U., *Enterprise Information Management*, in Raisinghani, M., *Business Intelligence in the Digital Economy – Opportunities, Limitations and Risks*, Idea Group INC., 2004
7. Măzăreanu, V., *Inteligență în Business Intelligence*, în *Analele Universității „Al.I.Cuza Iași”*, Științe Economice, 2005/2006, Tomul LII/LIII
8. Moss, L., T., Atre, S., *Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications*, Addison Wesley, 2003
9. Sullivan, J., *Risk Management Policy*, at www.auditnet.org/docs/Draft%20Risk%20Management%20Policy%20-%20Example.doc, accessed on 06.09.2008
10. Vitt, E., Luckevich, M., Misner, S., *Making better business intelligence decisions faster*, Microsoft Press, 2002
11. Waltz, E., *Knowledge Management in the Intelligence Enterprise*, Artech House, 2003
12. Zaman, M., *Business Intelligence: Its Ins and Outs*, at <http://www.technologyevaluation.com>, accessed on 10.01.2005

Acknowledgements

The results presents in this paper were obtained in the framework of the postdoctoral school programme financed by the “*Dezvoltarea capacității de inovare și creșterea impactului cercetării prin programe postdoctorale POSDRU/89/1.5/S/49944*” project.