Strategic Management Using Business Intelligence Tools in Mettalurgical Plants

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Mettalurgical industry is one of the key industries worldwide, feeling the globalization both as a traditional industry that, by definition doesn’t change in processes, and as a global industry that reacts to knowledge society through developing new managerial systems. Business intelligence refers to in-depth analysis of company data for better decision-making. With an effective BI tool, companies can easily track their own operations, their customers’ activity patterns, and industry trends. The article focuses on the importance of implementing business intelligence techniques in the metallurgical enterprises. The first part of the research is focusing on the main characteristics of the management based on business intelligence technologies. The second part of the article refers to the business intelligence market in Romania and the third analyzes the main ways that the metallurgical plans may introduce these techniques into their daily activities. The conclusions outline the advantages and opportunities that would derive for the metallurgical plants in Romania when implementing business intelligence techniques.

1 Business Intelligence in perspective – specific technological tools and their evolution

Executive managers have made strategic business decisions based on information provided by multiple reports offered by ERP (Enterprise resource planning) systems or other applications. These were usually sets of frequently conflicting data. Business Intelligence (BI) systems, with the help of Web 2.0 technologies promise to change that reality by pulling data from all internal systems plus external sources and present integrated information that the management team could easily use.

To understand the evolution in information technology processes supporting the strategic management, we have compared the ERP systems with BI systems that are most used, considering the current developments of the internet world.

Enterprise resource planning (ERP) defines an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes within a company. It is usually based on a common database and a modular software design. The common database allows every department of the firm to store and retrieve information in real-time. The modular software design refers to the fact that a company can select the modules they need, mix and match modules from different software vendors, and add new modules of their own to improve performance. To be considered an ERP system¹, a software package has to provide the function of at least two basic systems. For example, a software package that provides both accounting and payroll functions could technically be considered an ERP software package. As all data is typically kept in one database, the introduction of an ERP system to replace independent applications eliminated the need for external interfaces that were required between systems, providing additional

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¹ White C., Imhoff C., Full Circle: Decision Intelligence (DSS 2.0), August 27, 2008
benefits like standardization, lower maintenance costs, and greater reporting capabilities. ERPs are cross-functional and may serve several enterprise departments in the same time.

Before the concept of ERP systems appeared, each department within an organization used to have its own customized computer system. The typical technical difficulties involved integration of data from potentially different computer manufacturers and systems. The ERP software, among other things, combined the data of formerly separate applications, simplifying the computer infrastructure within the large organization, and standardizing and reducing the number of software specialties required within larger organizations.

The disadvantages of the ERP systems are related to high investment in training the company’s personnel as the customization of the ERP software is limited\(^2\). In the same time, ERP system may require re-engineering of business processes to fit the "industry standard" prescribed by the system and that may lead to a loss of competitive advantage. Many of the integrated links need high accuracy in other applications to work effectively. Even if a company can easily achieve minimum standards, in time "dirty data" may reduce the reliability of some applications. In the same time, resistance in sharing sensitive internal information between departments can reduce the effectiveness.

Probably the most important disadvantage of the ERP systems is the fact that it is internally focused, while the current globalization trends ask for information interfaces that link the company with the market place.

The apparition and use of **Web 2.0 techniques** and technologies in enterprise systems has changed the way organizations create, integrate, explore, analyze, and deliver information. Therefore, we will further look at the use of Web 2.0 technologies in **business intelligence** (BI). Business intelligence applications focus on creating reports and analytics that aid executives and analysts in developing and optimizing strategic and tactical business plans and initiatives. The seven distinct components of the Web 2.0 in Business intelligence refer to: information collaboration, information exploration and analysis, information integration, information syndication and delivery, user interface, Web-oriented architecture (WOA), and open source solutions.

These components show in practice the evolution of the business intelligence system – new web technologies have lead to three major changes of traditional BI applications. The first one is represented by the move toward bringing unstructured business content into the data warehousing environment. The unstructured content can be either textual information that may be part of a structured data file, or may exist in a separate unstructured content file (reports, blogs or web pages, etc). Through the integration process into the warehouse, the unstructured content is usually converted into structured data. The second change occurs when the volume of unstructured content being analyzed exceeds the amount of structured data. The analysis of such data is done by search and content analytics applications. This is also the preferred interface for less experienced users. The third change adds collaboration techniques to the business intelligence environment. Collaboration enables users to create, document, organize, share, and discuss the business information provided. It practically allows the knowledge of the business users to be involved in the business intelligence process. The final result may be considered to be collective intelligence\(^3\), which at its turn can transform itself into a valuable business content source for further competitive intelligence analysis.

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\(^3\) White C., Imhoff C., *Full Circle: Decision Intelligence (DSS 2.0)*, August 27, 2008
To better understand the concept of collective intelligence environment, we will first refer to the components that build it, as it is represented by the convergence of three key technologies: business data intelligence, business content intelligence and business collaboration. Business data intelligence is delivered to users through desktop and web interfaces that employ technologies such as a business portal and/or business dashboards. The newest approach to delivery is web syndication using protocols such as RSS and Atom. The XML data in the syndicated web feed can keep the portal – and end-user – updated with the latest business information and it can also be consumed by data integration and web-based reporting tools. The web syndication provides a very simple and flexible way of delivering the latest business intelligence to business users.

Business content intelligence, which extends traditional business intelligence (called business data intelligence in this article) with analytics created from unstructured business content. This content represents about 80% of the information that exists within organizations. This information isn’t in a readily accessible form. Improvements in content management technologies are leading to the increased storage of more of this business content in order to be managed in shared databases, which not only makes it more accessible, but also increases its content quality and business value.

Business collaboration is referring to the accessibility of the information created by BI technologies. Managers and business users in general are demanding Google-like search capabilities within the enterprise as they think this would allow them to search and explore business content and business data as easily as they can access information on the Internet. However, experience shows that web search and enterprise search are different. The focus of web search is on speed, rather than accuracy, and search results are based primarily on content popularity as the search involves simple two or three word search-queries. The focus of Enterprise search is more on accuracy than speed and it involves a broader range of data sources. This is why enterprise search tools require richer interfaces and involve more advanced techniques. Enterprise search engines must be able to filter source information and better match business terms.

Another simple collaborative technology is provided by analyze-type applications. These refer to capturing, transforming and loading information into a target data store such as a data warehouse where it will be integrated as structured data. Integrating business content along with the business data is practically one of the most important activities, creating value-added to the collective intelligence environment. The main challenge during the whole process is the transformation of unstructured content into a semi-structured or structured format. However, taking into account that about 80% of information is found in an unstructured form, it is obvious that the companies that begin to exploit it have a competitive advantage over those that don’t yet recognize the unstructured business content value.

Taking into account the above, we have focused on the web syndication techniques that are used to deliver both business data and content to business users, as main facilitators of the intelligence community. Web syndication has been invented with the purpose to make the internet users aware of recently added or updated website content. Using web syndication, a summary of the new content is published in a web feed file that contains information such as the title and description of the new content, and details about where it is located on the internet. Even if the format of the file can be anything that can be transported using the HTTP protocol, it is generally in an XML format. The most common XML feed formats are RSS

and Atom and business users employ a web feed reader (that is also called aggregator) to locate and access the feeds.

The web syndication is most often used to deliver website content to web users but it can be used to deliver content within an organization, or even between companies\(^5\). It may filter external industry information taking into account its relevancy and then make it available to the appropriate teams within the organization. Web syndication can also help with the republishing of purchased content to authorized business users. It may provide direct mass communication among teams and team members.

Considering the fact that a web feed is simply an XML file, it means that any application that can consume an XML file can process a web feed. This is how integration servers took life. The server can examine web feeds, filter out uninteresting content and then send the remaining content to other applications, or to a data warehouse. The capability of web syndication to deliver business data and content to applications and users has led to a new generation of integration software solutions that may consume, produce, merge and transform the web feeds for any type of business content or data. These new applications are commonly known as mashups\(^6\). They employ a lightweight web-oriented architecture (WOA). They basically make the user better understand and use the information provided. Web-oriented architecture is representing the last generation of user interfaces.

**Tab. 1: The Business Intelligence generations**

<table>
<thead>
<tr>
<th>Technological generation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dumb terminals</strong></td>
<td>Basic, secured and easy to maintain user interface</td>
</tr>
<tr>
<td><strong>Client/server computing</strong></td>
<td>Richer and more interactive interface, but with increased hardware costs and high complexity (security and maintenance) – processing: desktop client computers</td>
</tr>
<tr>
<td><strong>Web 1.0 technologies</strong></td>
<td>Static user interfaces with new web-related security issues; hardware and maintenance costs were reduced – processing: host servers</td>
</tr>
<tr>
<td><strong>Web 2.0 technologies</strong></td>
<td>Rich and interactive user interface; high complexity and security – processing: split between the user’s computer and the host server</td>
</tr>
</tbody>
</table>

Source: Author synthesis

Rich Internet Application (RIA) technologies are some of the best approaches developers have ever had for building and deploying highly usable, rich and dynamic user interfaces in the context of Web 2.0 development. The key aspect of the RIA approach is that the user’s interface doesn’t have to be completely refreshed after each interaction. The cost common of technologies for developing RIAs, from a user interface perspective, are AJAX (synchronous JavaScript and XML) and Adobe Flash.

Web 2.0 has also brought forward the services-oriented architecture (SOA). When the applications and products are built using Web 2.0 technologies and designed as components

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that can easily be implemented and called as services, a web-oriented architecture (WOA) is being built\textsuperscript{7}. The WOA may support data-centric services in addition to application services. That allows that information from a data warehouse be accessed and data quality be validated. Data transformation and data analysis is also possible.

There are a wide range of Web 2.0 technologies that are available on the market. All these improve the richness and interactivity of the Web user interface and support a services-based architecture\textsuperscript{8}. All of these technologies improve the usability of data integration, business intelligence and information delivery.

2 Strategic management and Business Intelligence

Globalization has changed the way business is done worldwide, creating a network of interdependencies that are supported by technology. The last decades of the twentieth century have brought the internet technology and with that the dynamic and diverse business environment, obliging companies worldwide to adopt a strategic management that is always alert to change. Information society has changed not only the business environment, but also the managerial practices within organizations. The Information Technologies (IT) department has taken many forms and served many goals in a historically short period of time. Change is constant and therefore IT has to both adapt and create change through its unique innovative features. As the information technology umbrella is large and covers many fields, business intelligence (BI) comes to the fore as a specific tool used in management processes.

Business intelligence (BI) transforms data into information that is later on required by the company’s decision-making apparatus. It is defined as a broad category of technologies and applications for gathering, storing, analyzing, and providing access to data to help managers make better business decisions. BI applications include the activities of decision support systems (DSS), query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining. Since the early 1990’s, Business Intelligence applications and technologies have dynamically evolved as companies access to information grew exponentially. A brief “history” of business intelligence shows that its evolution is correlated with the evolution of Business Information Systems. IBM has outlined three generations of systems, outlining the BI history\textsuperscript{9}. \textit{Host-Based Query and Reporting} is the first generation of business information systems, its main feature being that it could have only be used by information providers, such as business analysts, who had an broad data and computer knowledge. The second generation of business information systems is represented by data warehousing that is a collection of integrated, subject-oriented databases designed to support DSS function, where each unit of data is non-volatile and relevant to some moment in time\textsuperscript{10}. The third generation is represented Business Intelligence systems that focus on improving the access and delivery of business information to both information providers and consumers. This is achieved by providing advanced graphical and Web-based online analytical processing (OLAP), information mining tools and prepackaged applications that exploit those tools.

\textbf{Tab. 2: The main applications developed by Business Intelligence}

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\begin{thebibliography}{9}
\bibitem{8} Leibowitz J. \textit{Strategic Intelligence: Business Intelligence, Competitive Intelligence and Knowledge Management}, CRC Press, 2006, p. 132
\bibitem{9} Sueli Almeida, M., s.a., \textit{Getting Started with Datawarehouse and Business Intelligence}, IBM – International Technical Support Organization, San Jose, 1999
\end{thebibliography}
<table>
<thead>
<tr>
<th>BI application</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Support Systems (DSS)</td>
<td>access to and manipulation of a time-series of internal company data and sometimes external and real-time data</td>
</tr>
<tr>
<td>Query and Reporting tools</td>
<td>Simple file systems, data-bases that provide the most elementary level of functionality</td>
</tr>
<tr>
<td>Data Warehouse Systems</td>
<td>manipulation of data by computerized tools tailored to a specific task and setting or by more general tools and operators provide additional functionality</td>
</tr>
<tr>
<td>On-line Analytical Processing</td>
<td>provide the highest level of functionality and decision support that is linked to analysis of large collections of historical data</td>
</tr>
<tr>
<td>Data Mining</td>
<td>the process of sorting through large amounts of data – databases and extracting out relevant, previously unknown and comprehensible information</td>
</tr>
</tbody>
</table>

Source: Power D.J., 2007

In today’s competitive environment, BI is therefore needed from the very first stage of the strategic management. There are very few organizations that fail to recognize the value of market data regarding demand, demographics or market share when defining their position in the marketplace. However, while companies gather data, this is viewed primarily as a means to assess and look for solutions to improve operational efficiency and quality - not as an initial input to the definition of strategy. Looking at the financial industry for instance, we can easily observe the importance of BI during the definition phase of the strategy. Global financial institutions at the top of the market are growing bigger and bigger while competitors in lower tiers are either merging or acquiring smaller institutions. Establishing a market position for these institutions is connected with the ability to profit from economies of scale and to provide the “one-stop shop” for all the clients’ financial needs. Even if consolidation at the top can lead to the superficial consideration that small community banks will soon disappear, a sharper look within the industry may show a slightly different image. Looking exclusively at mergers and acquisitions at all levels, you could still draw the conclusion that small banks will disappear. However, the number of requests for new bank charters and public offering are not saying the same story, as for each merger and acquisition it appears a new small bank in town. The new small banks usually tap the market for customers alienated by the consolidation process through mergers, customers that are usually willing to pay a premium for a more personalized service. Therefore, these banks will position themselves on

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12 Leibowitz J. *Strategic Intelligence: Business Intelligence, Competitive Intelligence and Knowledge Management*, CRC Press, 2006, pp. 34-35

the market emphasizing the local ownership and premium service. A key element for this positioning would be the delivery channels that the banks use to connect to their clients. Business intelligence can help identify what would be the correct approach of such a bank on a certain area, using empirical data about the clients. If this hypothetical bank wouldn’t take into consideration the particular factors that shape its clients’ community, it is likely possible they wouldn’t adapt the right strategy in terms of market positioning.

Once a company has set the market position and classified the operational processes it needs to further understand the competitive market performance for these activities and build a roadmap to successful implementation of the selected strategy. Each class of activities would imply a level of performance relative to the company’s competitor landscape. Performance in competitive enabling activities has to support the chosen level of market performance for the competitive differentiators. For compliance activities and business essential, the general goal is to meet the set expectations. Taking into account the fact that these activities don’t serve to differentiate the company, there is little return for leading the market in these activities. After the company sets the performance targets for each of the activities, it can constantly verify its status relative to the established performance level using BI techniques. When the firm is performing below the established target relative to its competitors, remediation plans must be made so that the competitive threshold required to fulfill the company’s strategic direction may be met. If the company is above its targeted performance level for a given activity, resources should be diverted from that activity, particularly if those diverted resources can be directed to areas where performance is lagging the targeted level.

Finally, when planning for the implementation of a revised or new strategy, business intelligence may also provide the company with a good plan for the level of investment and effort required to achieve its targets. If the firm is seeking to perform at the top of the market for a given competitive activity but currently sits in last position, achieving the targeted performance level will take more time, effort, and resources than if the company is currently an above average performer and has just one competitor to overtake. Considering the information provided through BI techniques, the management will analyze and will consider the complete or partial redesign of the plan for achieving the strategic goal.

3 Business Intelligence in Metallurgy

Improving the producing technologies has always constituted a main purpose and need for the entire industry. Metallurgy hasn’t been an exception. Technology comprises the processes assembly, the scientific methods used during the process started with the extraction and casting of the primary materials (minerals) and going further until the industrial products are produced and sold. As scientific research goes further, technological progress is probably the most dynamic factor influencing the industrial development of the world. As we already know, introducing technological progress into the industrial production process constitutes not only a need but also a competitive advantage. Whether the company chooses to modernize the

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14 Colibasanu, O. A., Between Intelligence and Espionage in the Contemporary Business Environment, Ekonomika a Management, Dec. 2008
15 Cunningham W., McNamara P, Business Intelligence and Strategic Choices, BenchMark Consulting International, Internal Documents, January 2007
17 Footnote.
existing production means or decides to invest in new machinery, implementing the changes will assure a higher profit and productivity.

The Information Technology has changed the world when it appeared. As explained above, the innovativeness of the field offers opportunities especially for strategic management. Metallurgical sector is one of the traditional sectors of the economy that bases its existence on long term strategies that are linked with the natural flows of the industry and the sector itself. Therefore, the BI technologies would naturally help the industry evolve. To make the links more obvious we have focused our attention to the steel enterprises, considering these are the core of metallurgical industry all over the world.

Reviewing the existent literature on the matter we have discovered that there are four main processes that distinguish themselves as very sensitive to technical progress: electrification, mechanization, chemification and automation. The electrification is related to the particularities of the electrical energy used during the production process. Currently there is tremendous effort brought by scientists willing to discover alternative ways of producing better and cheaper energy. As we know, electricity is vital for industry today as every mechanical process is now driven by the electrical force. In the steel industry, electricity is highly important as it allows reaching very high temperature that enriches the quality of the alloy, making it more uniform and increasing its resistance. Mechanization relates to the introduction in the production plants of new machinery, more and more sophisticated that allow that the human resource bring its creativeness and analytical talents as ingredients for a qualitative production. Chemification is referring to the use of chemical technologies for processing the products and creating new primary materials. It also relates to the renewable production system. Automation is referring to the fact that all the production processes – from getting the minerals from the warehouses to sorting and packaging the final product – need to form one program that is based on mechanization and electrification and doesn’t involve the human resource direct involvement. Practically, the human resource main role is that of analyzing and supervising the production program.

Automation is the continuous process that mostly links IT to the steel industry. It basically assumes that the more integrated the main production operations are the more profitable a metallurgical plant is. Ideally, a complete automation would integrate secondary processes as well: transportation, control, technical registration and regulation, as well as data analysis will be linked together into an assembly that provides the human resource complete information, making him able to support a real-time decision process.

Considering the main BI techniques as well as the automation needs of a steel plant, we have created a list for the main points in the production process where BI could be implemented:

- Acquisition system and speed processing of the mobile elements in quarto-reversible rolling mill making use of inductive translators, highly reliable, of the resolver type.
- Automatic system for the coke batteries.

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20 Acknowledgment: I am grateful to the useful information and consultancy provided by the Ferinvest Technik + Service SRL engineers as well for the access to their reports.
o Automatic system of acquisition and processing of acoustic signals (in view of recognising the damages) and the intelligent surveillance of some equipment in rolling mills.

o Automatic system of control and guidance of the cold rolled steel strips stripping process.

o Automatic system of control and guidance of the cold rolled steel strips coating process.

o Automatic system of control and guidance of the manufacture process of anti-corrosive straps for packing.

o Automatic system of control and guidance of the narrow and thin steel strips rolling process in a quarto-reversible rolling mill.

o Automatic system of control and guidance of the steel strips rolling process in a quarto-reversible rolling mill.

o Automatic system of control and guidance of the thermal treatment of annealing and recrystallisation process in bell-type furnaces.

o Automatic system of control of the process.

o Automatic system of control of the rolling process.

o Automatic system of diagnoses of technologic installations from the cold rolled steel strips manufacture process.

o Automated and computer aided production scheduling system

o Automation of a quarto rolling mill

o Automation of separation block – Oxygen Factory.

o Automation of the edge cutting scissors for the steel plates.

o Automation of the machine that introduces aluminium wire in the melting steel pot.

o Automation of the manufacturing process of dolomite bricks.

o Automation system at a slitting line.

o Automation system for a black oil separation-filtration installation.

o Automation system for accelerated cooling of rolled plates in a Heavy Plate Mill

o Automation system for an installation used for separating the hydrocarbon from water.

o Automation system for the guidance of the manufacturing process of cold rolled steel strips, with the integration of the manufacture process: cold rolling, thermal treatment, adjusting, stripping.

o Automation system of the centrifugal pouring machine.

o Automation system of the mechanical levelling process.

o Automation system of the rolling process of the thick plates.

o Data center and manufacturing control center

o Electronic equipment for the welding machine at high frequency currents.

o Energy management and environmental monitoring automation systems

o Implementation and use of real time database system

o Implementation of governance risk control system

o Industrial television system for the manufacture process.

o Information system of financial administration of supplies in warehouses, with the complete automation of the extraction / insertion system of pieces.

o Information system of guidance of the irrigation process.

o Information system of guidance of the process of metallic coatings in plasma jet.

o Informatization of company’s groups and departments and creation of communication networks and common database

o Integrated automation system afferent to equipment, mechanisms and field elements at the finishing stand in a Heavy Plate Mill

o Integrated automation system on the production flow of a Heavy Plate Mill
Integrated system for acquisition, storage, data monitoring and data transmission network for thermal treatment ovens.

Integrated system for monitoring of electrical and technological parameters on the plates production flow in a Heavy Plate Mill.

Methods of numeric adjustment of the strip thickness with the optimisation of parameters and constant values specific to the cold rolling process.

Numerical equipment with micro-controller for the automatic positioning on 1-3 axes, having as execution elements, D.C. current converters with speed reference, applicable in the metallurgy industry.

Process information system for the real-time control of the directed cooling process of hot rolled steel strips.

Structures and algorithms of image processing and shape recognition in control and guidance of the rolling processes of flat products.

System of control and guidance of the installation of separation of the hydrocarbon from water, for industrial purpose.

The main purpose achieved by introducing IT into the production process of a metallurgical plant is that of perfecting and increasing efficiency of the production and management processes. As we have observed above, in practice, automation of the production processes is not the only way a company can achieve a better market position even if this aspect is highly important for the metallurgical industry. Strategic management covers all the sectors and needs an integrated company to achieve and maintain competitive advantages for the enterprise.

The interconnections between departments and a managerial system that is enabling communication between all the members of the company is essential especially in the case of industrial plants where nowadays everything tends to me more dynamic than it once was. Research and development department becomes this way an important source for the formation of competitive advantages, as the company relies on it to integrate the different departments into a coherent productive and efficient dialogue.

**Conclusion**

Developing a strategy looks upon the long term goals and vision of the company, requiring significant investment of capital, effort and of time. It is therefore very important to maintain and reevaluate the strategy over time. This is where BI comes in to help management. The evolutions in technology, competition, regulations and other key components can dictate changes and enhancements to ensure the ongoing effectiveness of a company’s strategic choices. In addition to tracking all-important numbers regarding sales, market share, and customer perceptions; the company must continue to gather data on relative performance in its operations. Usually, if the strategy is a winning one, competitors will adapt, seeking to close the gap or to come up with a counter move. Clients tend to consider yesterday’s differentiating performance level as today’s minimum requirement. To maintain the gained position on the market, the company must constantly anticipate and respond to changes in market and regulatory expectations. This is why BI can help the marketing and sales departments when creating the competitive intelligence analysis, maintaining the firm position or even reevaluate its option and consider a new strategic approach of the market.

Business intelligence is prevalent in almost every level of corporate dealings, in every industry as today, technological advances require companies to make ‘round-the-clock decisions at a moment’s notice. The companies that are able to develop winning strategies in under the conditions of constantly increasing competition and data will triumph over their
competitors. Business intelligence products guarantee companies the confidence of knowing the current fact-based information they need will always be right at their fingertips.

Embracing BI technologies is crucial for metallurgical enterprises to improve management, enhance competitiveness, be adapted to globalization and realize sustainable development. Metallurgical industry is much dependent on the technological progress and looks to enhance productivity and efficiency. The Romanian metallurgical sector is still at the beginning of the way when it comes to implementing BI technologies but there are plants where modernization of existent technology can achieve integration and make room for an effective use of BI products. Informatization of company groups, departments, use of governance risk control, usage of real time database, energy management and monitoring automation processes or automatic and computer aided production scheduling are just few ways where BI technologies can help an efficient management for a steel plant. However, implementing these technologies depend also on the national BI market.

Globally, considering the impact that the world of Web 2.0 has had so far, it is expected an increase of BI sector along with the growth of companies that offer specialized information services to providers. The BI technologies are still in their incipient stage and the harsh competition on the global market will most probably bring them to maturity soon. What is a definite truth, however, is the fact that companies worldwide will become increasingly dependent on BI solutions, as dependent as they are on technological progress.

**Literature:**


Strategic Management using Business Intelligence Tools in Mettalurgical Plants

ABSTRACT

Mettalurgical industry is one of the key industries worldwide, feeling the globalization both as a traditional industry that, by definition doesn’t change in processes, and as a global industry that reacts to knowledge society through developing new managerial systems. Business intelligence refers to in-depth analysis of company data for better decision-making. With an effective BI tool, companies can easily track their own operations, their customers’ activity patterns, and industry trends. The article focuses on the importance of implementing business intelligence techniques in the metallurgical enterprises. The first part of the research is focusing on the main characteristics of the management based on business intelligence technologies. The second part of the article refers to the business intelligence market in Romania and the third analyzes the main ways that the metallurgical plans may introduce these techniques into their daily activities. The conclusions outline the advantages and opportunities that would derive for the metallurgical plants in Romania when implementing business intelligence techniques.

Key words: Business Intelligence, strategic management, metallurgical industry

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