The Application of Business Intelligence Systems in Supporting Managerial Decisions of Polish Enterprises

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Abstract. Business Intelligence (BI) class tools are helpful in analysing the market, selling certain products or services by providing useful information to decision makers. The tools facilitate the enterprise financial health monitoring and make it feasible to improve business analysts' actions. The conditions of applying BI systems in enterprises are presented in the article. One made considerations about the readiness of Polish enterprises related the BI class tool possibilities.

Introduction

Business Intelligence is a set of processes of data collection, processing, analysis and interpretation. As a result of the processes one obtains business information useful for a given user. The useful information possession at an appropriate time is a base of forming and maintaining an enterprise competitive advantage in the case of continuous environment changes, strong competition, and a customer's ever bigger expectations. As regards to the conditions, particular focus is put on constructing an information capital. It consists of information resources related to internal processes in the enterprise, its environment and the Information Technology (IT) systems that support the management of organisations by using the stored data [6],[7],[10].

A group of systems called Business Intelligence (BI) systems was distinguished due to the possibilities to provide compensated information addressed to a given user. This is based on using the latest IT achievements and analysing large amounts of data in short periods of time. The Business Intelligence systems (BI) are a valuable component of the enterprise information capital. BI is also defined as a system of supporting business decisions. The system combines such domains and technologies as statistics, econometrics, operational research, artificial intelligence, databases, business reporting, analytics, data mining or benchmarking. The BI essence is to collect and store giant amounts of information in so-called data warehouses. As such they are valueless. If the data warehouses are appropriately processed and complied by presentation mechanisms and techniques, they are a valuable
material to be analysed. It might be used to make forecasts in the context of forming the enterprise competitive advantage [1],[5],[11].

It should be always remarked that the Business Intelligence system application is still a process of data collection, processing, analysis and interpretation. The process results in obtaining business information that is useful for a particular recipient or a group of recipients. The difference in the approach is to use the latest IT tools – hardware and software to collect, process and analyse the data. Such an approach has an enormous potential in supporting business decisions due to the possibility to continuously define and measure measurers and indicators and fast and unlimited access to the collected data. Thanks to that it is possible to improve and automate business processes in the organisation [9].

**Business Intelligence in the Enterprise Management**

In R.W Griffin's view, the enterprise management is a set of actions which include planning, decision making, organising, supervising staff and controlling. These actions should be undertaken with respect to human, financial, material and information resources in order to achieve the organisation objectives in an efficient and effective way. Such management of a contemporary enterprise requires the possessed resources to be rationally managed. This should be simultaneously accompanied by effective reactions to signals from a broadly defined environment [2],[4]. Contemporary enterprises are endlessly bowed to pressure by the ever bigger competition, globalisation, innovation development and customers' expectations. In view of the large change dynamics and environment needs, contemporary enterprises need to invest in the organisation’s information capital, and particularly in the efficient knowledge management [2]. In Hisu-Fen Lin's opinion, the efficient knowledge attainment, processing and application both inside and outside the enterprise is a base of its appropriate management and also its financial success. Hisu-Fen Lin performed research on the influence of implementing a concept oriented to knowledge management on science and development, internal organisation processes, customer satisfaction, final enterprise financial results which are 4 Balanced Scorecard prospects [8]. The research was performed based on a sample of 244 Taiwan enterprises which represented 6 different branches. The research showed a direct or indirect positive influence of the actions in the knowledge management domain on the increase in the enterprise value and efficient competitive advantage construction. The beneficial knowledge management effects are a result of the organisation capability to obtain, adapt and share the knowledge. This would not be possible without forming a culture and environment that would be favourable to making the organisation open to new knowledge and experiences. In turn, this requires each employee and appropriate technological infrastructure to be involved [8]. A response to the needs is respective solutions as BI systems. If BI systems are skilfully used, they might efficiently support managerial processes and decisions. Managerial staff deal with supervising tasks from a subordinate area on a daily basis. The tasks might be divided into well and badly structured ones. The well-structured tasks are of routine and repetitive kind. But the badly structured tasks have no ready solution/performance concept. The tasks usually take place in the case of multidimensional risk or even uncertainty [2],[12]. As of now BI systems have effectively supported decision makers in managerial actions or well-structured tasks by providing exact information or by proposing managerial decisions. The information provided by the system is prepared based on certain quantitative data. The data are prepared based on complex algorithms and mathematical models. Nevertheless, the mere solution to the problem is context independent. The solution is usually
described by a procedure and the objectives are clearly defined. On the other hand, the badly structured tasks are the biggest IB system challenge. The tasks are unprogrammable decisions. They are usually characterised by undefined qualitative intuition- or experience-based data. The objectives of the tasks are ambiguous or often even subjective and their performance depends on the context. As regards to such tasks, BI systems must support the decision makers by providing information based on system resources. The systems simultaneously tempt to optimise business decisions. This is possible due to applying a set of concepts, methods and analytic processes. A significant role in the BI system functioning is played by data exploration, i.a. popular data mining. It makes it possible to supply the analytic systems online. Obviously, the information prepared by the system is conditioned by the quality and scope of the possessed data. On the other hand, the decision makers will need to assess the risk related to a given task and make a decision about its solution method. This will be based on the makers' knowledge and intuition [13].

**Business Intelligence as a Support for Managerial Decisions of Polish Enterprises**

It is insufficient to implement the BI system and fill it with data to provide the managerial staff with valuable managerial information. It is necessary to integrate the system with the business processes. The integration is a result of a relation sequence, i.e. strategies, processes, critical success factors, KPI indicators and the managerial information at the end of the system implementation. This means that enterprises need to have previously set measurable objectives and certain operational actions and a mechanisms to monitor the conformity of the achievements with the adopted business objective. All of them are necessary to perform the adopted development strategy. Thus, it is necessary to transform the organisation concept and strategy into a set of logically correlated key indicators by means of an appropriate performance measurement system (PMS) [2]. In this context the PMS systems play a key role in the organisation as they make it apparent whether the enterprise achieves its objectives and make it more precise where improvements are necessary. The literature research enables identification of more than 28 different models, methods and tools used in enterprises as a PMS system. Their overview was presented in the publication by P. Cyplik and L. Hadas entitled “Transformation of a production-logistics system in the enterprises of broad assortment offer and a varied customer service strategy. Premises, Methodology”. The results of the source research on the application of PMS tools and techniques in Polish enterprises in the organisation production-logistics system is presented in Figure 1. The research was performed based on the sample of 331 Polish production enterprises and the analyses were conducted at 3 management levels: strategic, tactical and operational.

The conducted research proves that not every Polish enterprise is ready to implement and effectively use the BI system capabilities. This is caused by a lack of an internal enterprise performance assessment system. However, this is true for a group of enterprises which are approximately 10 percent of the investigated sample. Two thirds of the investigated enterprises (66.16%) declare to use an internal dedicated assessment system (at least at one of the production-logistics assessment levels: strategic, tactical or operational). As to almost the same number of enterprises (64.05%), their production-logistics system assessment is based on the financial area analysis. The research results also indicate that more advanced tools and methods (The Activity Based Costing (ABC), Balanced Scorecard (BSC) and Supply-Chain Operations Reference Model (SCOR), elements and simulation tools) are used in large enterprises where there are more than 250 persons employed [2]. The enterprises with
efficient and effective information systems have a potential to effectively use the BI system capabilities. The efficient and effective information system is defined as a system which functions in an organisation in terms of its formality, procedures, the technical-technological infrastructure and the organisation maturity. The organisation maturity is defined as its openness to new knowledge, its attainment, processing and comprehension and its share both inside and outside the organisation. The organisational scope of activity is unimportant although it is easier for large organisations to make investment in such an information capital. This gives a bigger chance to fully use the BI system capabilities [8],[10]. This does not mean that the systems cannot applied in small- and medium-sized enterprises. As regards to smaller enterprises, the system application area might cover only part of the activities, e.g. financial or HR section. All the more, one of their advantages is the ability to implement them in a modular way and then to develop them proportionally to the organisation development and needs [10].

![Source: the authors’ own elaboration [2].](image)

**Figure 1. A percentage contribution of MS techniques and tools in enterprises.**

A positive BI system influence on constructing the enterprise value is not free of limitations. First of all, the BI system merely provides the information or suggestions based on the collected data. They are typical of historic events although they are collected in real time in the rapidly changing environment. Each system action should be regarded as a kind of inspiration or verification of the planned actions because each decision situation is specific and unrepeatable. It is unrealistic to expect the BI system to give simple and unambiguous answers or to indicate “the only right solution”. In this sense, the decision makers' knowledge and experience are essential. They will make it possible to use the system information. In addition, it is required by the system implementation to satisfy the conditions that determine the appropriate system functioning and application. First of all, the value of the system information depends on the reliability of the multidimensional data. The data should be continuously and systematically gained from the organisation and its environment. The next condition is to make connections between the BI system and business processes by means of the indicators structure at the strategic, tactical and operation level of the enterprise. It is also significant to consider a human factor which conditions an efficient system implementation and exploration [1],[11]. The investigated enterprises revealed to be uncertain of the
information processing security which is an enterprise secret. In this context the information
in historic data repositories should be properly protected. This is especially important in terms
of the information market value. In spite of fears and the risk the enterprises were interested
in the BI system capabilities. The problem of decision-making support systems in Polish
enterprises is being currently explored and gives a large potential to make future research
[2],[10]. However, the present BI systems are widely used in the supply chain management
process and logistics. They adopted part of ERP (Enterprise Resource Planning) system tasks
with respect to the enterprise resources related to maintaining and disposing the transport fleet
and inventory levels [5],[14]. The Business Intelligence is used by experts on building
customer and supplier relationships and support the shaping process of the price policy of
both the obtained materials and their own products [6],[7],[10],[14]. It is on-line possible to
specify between data and the search for cause-and-effect relationships between them due to
the application of the Business Intelligence systems in practice. In addition, the systems make
it possible to model various processes in the enterprise. An essential function is a possibility
to observe the market and competition actions.

Conclusion

The BI class tools are helpful in analysing the market, selling certain products or services
by providing useful information to decision makers. The tools facilitate the enterprise
financial health and make it possible to improve the actions of business analysts. The BI tools
will become a basic IT tool in enterprises over time. It is important for the BI system
information reports to be clear, reliable and understandable for a system user. The
implementation of such systems will make it possible to enhance the efficiency of the
information exchange between the enterprise sections and staff. Nevertheless, the price-
benefit relation should be undoubtedly taken into consideration. Based on the performed
analysis the benefits are higher than the costs paid to the modern BI software implementation.

Undoubtedly the BI tools will be applicable in all enterprise functioning areas. Before they
are widely applied, they should enter a development path similar to spreadsheets. Similarly to
the spreadsheets, the BI tools will be much better at supporting the definitions and will be
autonomous in making decisions in the future as this is now true for automatic transactional
systems.

Will BI solution be applied in Polish enterprises? It is difficult to give an unambiguous
answer to this question. However, one might exemplify instances of BI concepts in our reality
[3]. It should be stated that they will be applied over time. It is an open question when and if
the Polish enterprises will keep up with their foreign competition in the BI system application.
The BI systems arouse positive interest among the Polish enterprises. However, it is required
for many of the enterprises to make investments in the information capital before it is feasible
to make decision about the BI implementation.

References

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