

## CASE STUDIES: STRATEGY MANAGEMENT – GAINING COMPETITIVE ADVANTAGE IN THE INDUSTRY, THROUGH THE IMPLEMENTATION OF ERP AND BUSINESS INTELLIGENCE

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***Abstract:** Main topic and the purpose of the research relate to the analysis of trends in knowledge management in business organizations as a source competitive advantage. To illustrate the complexity of the problem of the use of BI tools as a source competitive advantage used eight cases studies presented in Drelichowski and all [5] with a few successes and failures. Test method provides case studies, the scope of which depends on the severity of the processes under investigation. The aim of the present study is to identify the possibility of increasing the use of BI tools in different types of organizations and identify the needs of conscious differentiation expectations depending on the outlays and the scale of achievable outcomes.*

**Key words:** Trends in knowledge management in business, benchmarking roles BI applications, source competitive advantage.

**JEL Classification Codes:** D83, H72.

### 1. INTRODUCTION

The aim of this research study is to analyze case studies aimed to assess the results of the Management Strategies, the goal of which was to obtain a competitive advantage in the industry, resulting from the effective implementation of ERP systems and Business Intelligence tools.

A group of eight organizations represented in the case studies involved large and medium-sized enterprises, which while being active in global market must adopt BI applications solutions, thus using its reports, coupled with flexible management of the organization, in decision-making processes.

That last condition becomes difficult to meet, determining the effectiveness of implemented solutions, the scale of which include case studies presented in the monograph [5]. This standard presents a tough challenge in managing the corporation and synthetic presentation of research results, more fully presented in the cited publications, can help interested readers to find a way to solve this type of problem.

### 2. METHODOLOGY

According to M. Kwieciński, the use of BI in knowledge management of the enterprise, is "a collection of ideas, methods, and processes that support business decision making through planning and conscious information processing from a variety of sources, the use of accumulated experience and knowledge for the understanding and prediction of the business dynamic" [11].

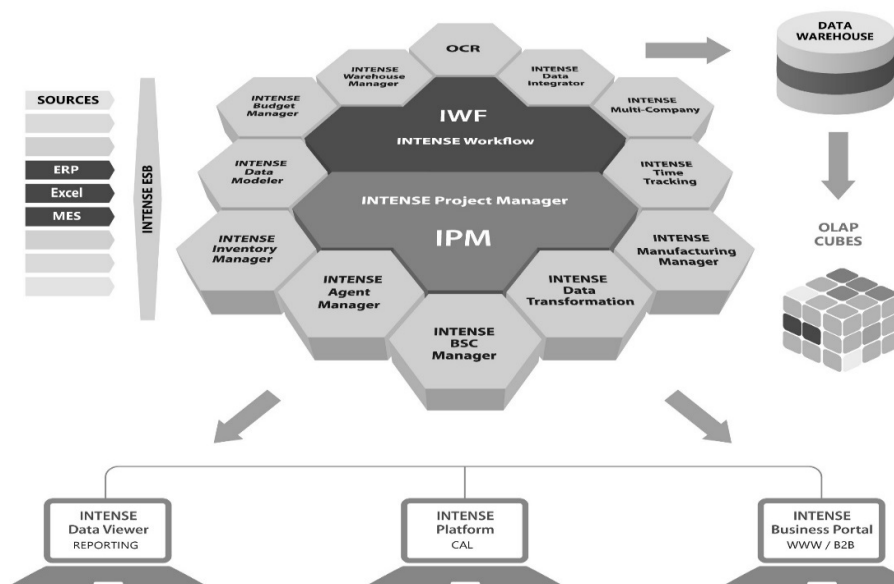
The structure of Business Intelligence is made up of several layers of technology: data sources, tools that implement the process of cleansing and data structuring, data warehousing, analytics and presentation [13]. BI supports knowledge management in your organization at every stage. It can be used for acquisition, integration, and information analysis, as well as to convert that information into organizational knowledge [13].

The solution offered by the INTENSE Group is a comprehensive instrument that assists in controlling the process, business management, and advanced techniques of management-analysis. INTENSE Platform is built from modules that support the company in such areas as: work flow, project management, costing, budgeting, equipment warehousing and transport, property management, controlling and multidimensional data analysis, reporting, and automatic alerts, as well as many others.

INTENSE Platform allows you to record data at the operational level, it's integration and analytical processing, as well as transformation into information underpinning decisive process at the strategic level. Designed by professionals, INTENSE Group systems are implemented in dozens of companies from different industries including design, construction, real estate development, printing, food industry, the accountancy offices, automotive, cosmetics and more. Implementations to be carried out by the INTENSE Group apply to both medium-sized and large companies, corporations and multi-company structures, as well as groups of cooperating companies.

Figure 1. shows the most important components of the BI structure, the implementation and quality of which will be carried out on the basis of synthetic quality evaluation deployments in eight objects. A more precise characterization of the INTENSE PLATFORM and assessment criteria can be found in publication [5] titled "BI Application Tools in Knowledge Management and Strategy Development, Methodological aspects and case studies".

The theory of key success factors, which may be a helpful methodological approach while researching conditions that affect the success of the BI project, assumes that these factors should come from a limited number of areas where satisfactory results will give your organization a competitive edge [1], [3]. In the context of Business Intelligence systems, success factors can be seen as a collection of tasks and procedures, which should be followed through in order to ensure the efficient completion of the project [14], [16].



**Figure 1. INTENSE Platform Schema**

Source: Materials provided by INTENSE Group Sp. z o.o.

Data analysis may be based on the design of a data warehouse and the creation of dedicated multidimensional analytic areas.

The basis for the effective analysis, interpretation of information and drawing ex ante conclusions from economic events involves gathering the relevant data presented in figure.

It is about the basic parameters that characterize the project: cost, time and scope [14]. The breakdown of criteria for the assessment of the degree and quality of the implementation of the BI system was presented in accordance with the chronological order of the stages of the project adopted in the INTENSE Group methodology. Those criteria are: [12]

- a) Preparation and analysis of the project (pre-production stage)
- b) System configuration and implementation phases of the project
- c) User training
- d) Technical Assistance

Featured criteria can also be easily defined as dimensional terms. Each of the indicated factors can be grouped within a specific area: organizational, technological, business, economic or psychological.

The idea of working on a project is based on the synergy effect, and thus cooperative work of a few persons should bring better results than if each of them worked separately [13]. That, in accordance with the definition of the term “team” by J.R. Katzenbach and D.K. Smith [8], should be a small group of people endowed with complementary skills, involved in the implementation of a common goal, with the help of commonly established activities and standards, for which they are responsible in a face of each other [13].

The success of the implementation of IT solutions undoubtedly depends on the team members of the IT Department. Typically, in larger companies these departments belong to the organizational structure of the enterprise, and especially in smaller entities, management and infrastructure maintenance is the responsibility of the third party. C. Imhoff [7] states, that during the deployment of BI system "the business community must work hand-in-hand with the IT personnel to ensure that the requirements are understood and time frames are reasonable (...) What you find is that knowledge work becomes distributed from the "job of the few" to the “task of the many”. This means that the move to a BI environment requires that IT and the business community work closely together, forming a new breed of cross-disciplined professionals who understand both technology and the business"[11], [16].

### **3. COMPARATIVE ANALYSIS OF THE IMPLEMENTATION RESULTS OF ADVANCED BI SYSTEMS' SOLUTIONS USING INTENSE PLATFORM TOOLS.**

Analysis has been developed by scores progress relating to the implementation of the cooperation within the framework of the project, and the scope and effectiveness of its implementation and operation. Detailed methodological assumptions and synthetic evaluation of each parameter is stated in the monograph [4 p. 214-217]. In the three sections following will be posted synthetic conclusions of the analysis carried out.

#### **3.1. EVALUATION OF THE RESULTS OF THE BI SYSTEM IMPLEMENTATION CLASSIFIED AS THE LEAST EFFICIENT**

Two companies have been classified as the least effective after analyzing the results of their projects.

Project No. 8 was carried out in the Polish branch of a large international company within manufacturing industry. The present scope of the implementation of business intelligence applications was one of the components of a much larger and complex undertaking, involving the implementation of a comprehensive, integrated solution to manage the company, which provided

for the implementation of the new ERP system, software production support software, automatization process of the business procedures, as well as implementations of WMS system.

Project - an ambitious, modern, expensive and economically rational one – ended up only partially successful. After 3 years of implementation, only ERP and WMS systems were used, while the remaining parts of the strategy, including the implementation of Business Intelligence, have been suspended. The inclusion of a new worker on a team was of a great importance to the project. New person with a large fastening in the structure of the company majorly destabilized the work of the entire team, with the desire to realize their original concepts which differed from the original vision and the planned system architecture.

Cooperation between the supplier of systems and IT team on the client side also could have been more fruitful. Due to the fact that the supplier was represented by an external company providing services, its commitment to the project and cooperation left much to be desired. The IT team did not feel part of the project team and worked more on the basis of satellite, however they felt co-responsible for the successful execution of the project and made it their priority. The only positive aspect of the preparation and implementation stages of the project was the support of the board and top management of the company. Organizational culture, attitude conducive to the implementation of innovative solutions, and awareness of the urgent need conducive to carrying out the work. Active participation of the board in analytical meetings raised the status of the project and forced the involvement of other persons.

Despite the desire to change, good idea and modern approach, too many factors stood in the way of successful completion. Unfortunately, a large part of the project objectives related to support strategic decision making and providing adequate information to interested organizations cells, has not been reached. The main reasons for this are apparent lack of adequate preparation for the implementation project and the low level of motivation of the crew.

Project No. 7 was carried out in the group operating a network of medical centers located throughout the country. The entire implementation project consisted of three smaller sub-projects. One of them involved the implementation of controlling and budgeting processes based on BI, that project chronologically started first. The other two focused on streamlining business processes by implementing workflow and automation of service and customer/ business partners relationship management through the CRM system. System provider in each case was the company INTENSE Group. Although the configuration and preparation processes was in advanced stages, the project was officially suspended. Despite this, unofficially, part of the functionality provided is used in everyday work of the organization.

In contrast to the above described project No. 8, in this case, each of the three digitalized areas of sub-projects was characterized by a high degree of autonomy and independence. Each sub-project had a different composition of the project team and different manager. The whole project also heavily relied on the autonomy of the three projects carried out and their chronological order. BI is a kind of data repository (catalogued in other systems / modules), properly processed and presented.

For this reason, it should be implemented at a time when applications that will provide data sources to the data warehouse have a fixed form. Implementation of BI without the knowledge of the shape of the system, from which the information will be drawn, requires planning, delaying of some configurations in time or introducing simplification. Internal company policies and a very strong position of the board, who led the organization in a centralized manner, left to employees at lower levels very limited ability to report bottom-up initiatives. This type of management, in the case of described implementation, led to the interests of workers been ignored and to the shift of the priorities to other areas of business.

These two examples show the results of projects, the implementation and results of which were limited due to the lack of effective cooperation between the supplier and the user.

### **3.2. EVALUATION OF THE RESULTS OF BI SYSTEM IMPLEMENTATIONS CLASSIFIED AS MODERATELY EFFECTIVE**

In the second group of companies classified in terms of efficiency and quality of the performed implementation of Business Intelligence, there were three entities.

Project No. 6 was carried out in a medium-sized development company specializing in the construction and lease of modern office space. In parallel with Business Intelligence system, using INTENSE Platform, project management and business process management support tools were implemented, as well as an ERP system. All systems were synchronized to create a single integrated solution. The main objective of the project was to improve the management of the main activities of the company, such as budgeting and scheduling of investment projects, creating material and financial schedules, taking into account the critical path, the registration of certain documentation, and its circulation, supervision of tenants' declarations and control over their implementation, alerting important and critical events recorded in the system.

The only obstacle on the way to the full and effective use of the system was the agreements with tenants, due to the fact that the process is very complicated and multi-dimensional and in addition is subject to frequent changes. By implementing those processes the developer has gained a flexible tool that is able to manage advanced analysis and controlling in the company, because the solution covers the planning, implementation, budgeting and scheduling investments. In addition, it allows analysis of customer relationships (CRM), records of complex structures of assets, analysis of the processes of lease agreements registration, the automatic settlement along with support services. As part of the created data warehouse we have prepared several dedicated areas of analytical cooperation with reporting tools providing the generation and distribution of a variety of reports, automated alerts and notifications for both operators and customers. What's more, the system is constantly being developed and implemented functionality is improved.

Cooperation with the project team on the client side in the initial stage of the project took place in adverse conditions. Despite a good knowledge of their business processes, at first a team had difficulty explaining how they imagine it been reflected in system. There have been cases when, because of the improper use, some elements stopped working properly. In the initial stage of implementation, the vision of the final shape of the individual functionalities was often changed. Various functionalities have been received without prior testing. The transmission of key information in the form of mediation between two other participants often resulted in the extended work time, often some of the information did not reach the intended recipient or reached him in a distorted form. Reported numerous errors and inconsistencies in the application led to growing frustration in teams. It became necessary to carry out an internal audit of the system and confrontational meeting with a client, followed by taking reciprocal steps to repair relations. The objective was the successful completion of the project, which was achieved by setting new rules of cooperation, repairing errors, and preparation of the instructions, describing how to use the program.

Over time, the effectiveness of cooperation and communication with external consultants has greatly improved. Currently, the company itself is looking for new possibilities of using the system and reports the need for further development.

Project No. 5 was carried out in a medium-sized enterprise engaged in the production of water supply and sewerage facilities. The project involved the implementation of the BI system enabling electronic circulation of documents, including the registration and operation of tenders and supporting advanced conduct reporting results of individual business areas.

The implementation proceeded in changing and difficult conditions. The work of the implementation team on the client side was a bit chaotic, which conditioned the lack of communication between departments in the company and a different look each department had on

the problem at hand. The level of motivation in the sections related to the project was mediocre, with more involvement shown by department of control. Major personnel changes (within two years the entire team had been changed) also contributed to destabilization of the team's work.

Changing customer's requirements, the constantly growing needs, and the rotation of the project team members contributed to significant delays in the implementation schedule. Controlling reports in the course of work evolved into more complex forms. The negative impact on the project was also the IT team on the client side. Since the beginning of implementation, it seemed as a matter of fact, that the implementation of the new solution will reduce its current role in the company. Existing tools used by the company were created by members of the existing IT team. After a period of a very strong resistance and attempts to bring the project to the suspension, the IT department has been shut down.

Thanks to determination of a controlling team and effective management of the newly elected head of the project, we've managed to overcome the existing conflicts between the teams and bring the project to a successful conclusion. Implemented multi-source data warehouse collects, processes and integrates data from several databases / systems. Power HD is performed incrementally on the basis of RTL mechanisms and data integration is carried out according to configurable criteria. The hub is one, unified basis for operational strategic and controlling reports. It effectively supports the construction of extensive studies for the purpose of budgeting construction projects, including advanced allocation keys. The system also supports, key for optimizing business, scheduling and analysis of the progress of works and the profitability of individual departments and projects.

Project No. 4 was carried out in a large enterprise which is a construction contractor in the sanitary industry, hydraulic engineering and the drainage. Implementation of Business Intelligence was part of the project, which also included the new ERP system. Both systems were supposed to jointly create a solution that supports such business areas as finance, human resources, warehouse management, management of company information, management of construction projects and controlling. The main goal of the project was to increase employee productivity and improve the functioning of the company through optimization and automation of business processes and the introduction of a reporting system providing reliable analyzes of the ongoing projects. The course and rapid completion of the project significantly influenced the authoritarian attitude of the project manager – who represented the IT department - and the passivity and low level of involvement of other team members. Such power relation allowed for smooth and fair determination of the internal needs of implementation, which can be considered as a big advantage. However, it advocated the vision of one employee and ultimately did not allow to develop optimal solutions for all departments. The dominant attitude had also often hindered dialogue with “outside” consultants. Project manager's independence in decision making was also conditioned by the lack of the involvement of other team members. One reason for this passivity was the corporate culture, according to which the role of the board of the company boils down only to the control function, and decision-making in the areas of finance. No active participation in the project from the board resulted in the lack of development of the project team awareness of the need for changes in the organization and a low level of motivation and commitment to the team. The second reason for this was the negative attitude towards change. Conditioning of this reluctance was in turn a traumatic experience with the implementation of the previous ERP system and the fact that it's being replaced.

The project was carried out relatively quickly and efficiently, in spite of quite a sizeable area of the company that has been subjected to several computerizations and modifications of the part of the functionality. Budget-managing process had a significant impact on the effectiveness of the project and, above all, the duration of its implementation. Value implementation is rigidly determined in advance and is not a subject to change during the project. Despite the existing

obstacles the project has been finalized according to the earlier set work order. The new system greatly supports the daily operations of the company and strategic decision-making at the management level. A positive aspect is the continuous development and improvement of implemented features, carried out by employees of the IT department.

### **3.3. EVALUATION OF THE BI SYSTEMS' IMPLEMENTATIONS RESULTS CLASSIFIED AS THE MOST EFFECTIVE GROUP OF COMPANIES IMPLEMENTING BI PROJECTS**

There have been three businesses, that have been classified as the most effective in implementing BI systems.

Project No. 3, was focused on the implementation of corporate data warehouse in the group of businesses, a leader on the Polish automotive market. The aim of the project was to replace the old inefficient data warehouse with integrated complex analysis presenting structured and reliable data. The project turned out to be a large and complex undertaking.

The success of such a complex, extensive and highly technologically advanced project would not be possible were it not for the simultaneous existence of appropriate conditions for the project. The different thematic areas within which they had created adequate analysis and statement were distributed among smaller groups working in parallel design. This allowed us to shorten the duration of the course and condition the effective cooperation, without interference from people, whom this process does not touch directly.

The project manager and the Head of the board also played positive role in the implementation process. of the group. The person in charge of the project was characterized by a lot of experience and substantive knowledge, as well as a good understanding of technical issues. Despite the extensive scope of the project we have been able to effectively coordinate all threads and project groups. The top management group was also heavily involved in the project, constantly supervising it's progress, motivating their employees' actions and building an atmosphere conducive to the use of modern IT tools to support the work of the company.

Of course, even in this project there were adverse effects, which made it impossible to carry out the project at an even higher level of efficiency. These include: not meeting deadlines which lengthened the duration of the project, the poor quality of the data transmitted from the old to the new data warehouse and an overload of the project team. Failure to meet planned deadlines resulted from different levels of involvement of the different participants in project groups. An effective attempt to address such problems was to organize regular meetings of implementation teams with company management, consisting of the reporting status, strict control of planned and actual deadlines for the various stages of implementation, the sharing of tasks in terms of their maturity and setting priorities for their implementation.

In the framework of implemented multi-source data warehouse, processed and integrated information from dozens of databases (financial and accounting systems, payroll, intranet, sales and CRM-Unix) operating in the companies of the group. Finally, HD powering is done incrementally on the basis of the original ETL mechanisms and is configured for an easy further uploading of the diverse data sources, which, in the case of rapidly growing group, is a big advantage. The success of the project and the satisfaction of end users is the impetus for a permanent expansion of the functionality implemented and further improvement of the system.

Project No. 2 focused on the division of one of the largest construction groups in Poland. The specificity of this project in the first intention was reduced only to optimize processes within a single segment of operations of the branch - tool and transportation database management and related to this area reporting system based on the BI system. After successful completion of the project and it's high evaluation marks, however, a natural need for expansion, improvement and

automation coverage of other areas of the organization showed. The development of the implementation was so massive that it required the appointment of new project teams, in-depth analysis of the new process / functionality, thus boiled down to its essence, to create a range of new implementation projects. Organizational culture conducive to the implementation of innovative, high-tech tools - in their business organization has used many systems to support its operations. This was conducive to a positive attitude towards innovative IT solutions. Employees distinguished themselves with an elaborated awareness of the benefits that entails the implementation of another system and accepted the toil and additional duties in this respect during the implementation. Highest ranking managers' work style supported the introduction of modern solutions for improving quality and productivity at work and by ensuring adequate funding of projects.

As part of a project on the implementation of the data warehouse, were implemented several areas of analytical OLAP that enable multidimensional preparation of statements from various / selected / designated areas of the business. Data Source Platform INTENSE was implemented together with the ERP system, which catalogues financial and accounting data. In addition, some data from other applications than those mentioned above is uploaded into the data warehouse indirectly through Excel files. Prepared reports support both operational work by providing the most current information entered into the system, and relate to strategic issues of the company. The BI project also used the opportunity to create a Platform INTENSE configuration models. Based on costs and revenues reports, an advanced analytical model has been prepared, presenting the results of projects built on four levels of the assumed margin.

Expansion of the solutions continues today and there're still a lot of different plans regarding usage of Business Intelligence. These are tangible evidence of the high level of effectiveness and efficiency of implementation and company satisfaction with the implemented system.

Project No. 1 was carried out in a medium-sized enterprise within the printing and publishing industry. After the modernization of its production lines, which greatly improved the efficiency and quality of work and shortened the duration of the contract, the company sought a technology solution that would support the analysis of the processes from the management side and provide reliable analysis. The rationale for the implementation of knowledge management BI applications in the company was also increasing competition in the region, forcing them to search for innovative solutions to gain competitive advantage. Area that needs special attention in the company was the area of order management and analysis of production costs in terms of ABC methodology. The purpose of the activities carried out has been fully achieved, contributing to the implementation of data warehouse and business intelligence systems supplied by INTENSE Group. In addition to the Platform INTENSE source of data for analysis created on the basis of deployed HD it was also the ERP system. The majority of the reports was created on the basis of two main areas of analytical OLAP. The first of them gathered financial and accounting information and related inventory management and production costs. The second enriched information contained in the first one with additional analytical dimensions of the Workflow system and analytical disciplines in the areas of payments analysis, sales analysis, and time usage. Those statements prepared in a transparent way, combining information from different data sources, currently play a big role in making strategic decisions in the company. The high degree of submission and specific accounting costs for individual orders contributed to the decision to implement an advanced analytical model that allows analysis of these costs in terms of activity based costing methodology.

The success of the project would not have been possible without the favorable conditions in which the implementation was carried out. The project team consisted of three leaders representing the Management Board, the Accounting Department and the IT department. In addition, its members were directors and professionals associated with the departments of production and trade. This configuration allowed to involve those people who were the most interested in its



implementation, while having different views on digital processes. The implementation period was preceded by analysis of needs and business processes. It was characterized by partnership cooperation with the provider of IT solutions and strong commitment of the company's employees, who themselves were trying to develop concepts and the final shape solutions, and only at conflict points between team members did they reach for the support of the consultation team, in some cases business owner made the decisions regarding the implementation. The involvement of team members was also apparent in the course of implementation work, it was supported by an overall corporate culture focused on gaining a competitive advantage by using modern and technologically advanced methods available on the market. Motivation has also become a good solid foundation for the testing system enabling it to learn, adjust and adapt to their needs and to participate effectively in the conduct of training.

#### **4. SYNTHESIS OF THE STATE AND RESULT OF THE IMPLEMENTATION FROM THE POINT OF OBTAINING A COMPETITIVE ADVANTAGE**

Presented eight case studies relating to the organization's management plans to obtain a competitive advantage in the industry, through the implementation of ERP systems, data warehouses and BI tools.

It can be said that, with regard to cases No. 8 and 7, which were classified as a failure, it is difficult to qualify the partial results of the project as a source of competitive advantage. Take advantage of a separate analysis of the causes of failure as a warning threats of success - underestimating organizational shortcomings in the organization of the project, and team collaboration of system provider with its user.

The analysis of the average level results in case studies 4, 5, 6, incline to the opinion that they were cases of different progress blocking reasons, which then after the delayed implementation inclined to assess that implemented projects enabled the launch a new quality of information feeds in decision-making processes. This means that in the case of projects where during the realization of project occurred crisis, it was possible to achieve the results of its implementation as a source of competitive advantage in the industry.

Leaders set apart within the cases No. 1, 2, and 3 are examples of the realization that even with some conflicts between staff and deployment solutions provider of software, the team's system was implemented smoothly. The results of implementation entitle to state that the boards of all discussed in this group businesses achieved the goal of finer competencies of staff at various levels of management systematically using advanced reports in the daily decision-making processes.

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