

Evaluation of Functionality of Business Management Systems for Effective Implementation in Complex Business Processes

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Abstract. The goal of this research is to clarify the main peculiarities of continuous improvement phases of implementation of business management systems (BMS). The large company have complex business environment and specifics of implementation BMS. We would like to show the possibilities of continuous improvement of BMS implementation and realization it for business processes based on the example of company re-engineering process. Our aim is to provide recommendations for efficient implementation of complex BMS in the local market. An approach is based on the analysis of main features of BMS and the realization of life cycle phases of BMS in large enterprises using real-life examples. We analyze the criteria importance for re-engineering of business processes and how to choose and implement the best BMS for business needs. After analyzing the main peculiarities of BMS implementation, the recommendations are made in relation to their improvement perspective. Ways of better realizing life cycle phases of BMS in large companies were introduced.

Keywords: business management system (BMS), business process, system implementation, enterprise resource planning system (ERP).

1 Introduction

Almost all large companies use computer technologies to manage their activities by BMS in nowadays. But the average exploitation period of a newly installed BMS within an enterprise is 5-10 years and enterprises are practiced the re-engineering of ICT implementation by changing old version of BMS into new one. The length of the period is often determined by the emergence of new computer technology (e.g., cloud computing and mobile technologies) or significant improvement of existing technologies. It may also influence by the ongoing notable changes within the company, by launching of new business directions, etc. Company's goals and financial opportunities have direct impact in the selection of a new ERP system. That product may be from the same manufacturer or corresponding to the latest technologies, or from another producer which better corresponds to the company's needs. In most cases they employ business management systems (BMS) of such kind as ERP as SAP, MS Axapta, MFG, JD Edwards, Scala, etc.

The aspects of BMS systems implementation in the large enterprise with distributed international companies have not yet been analyzed by view point of

recommendations to continuously improvement of business processes and information infrastructure development during the re-engineering processes.

We have recommendations from developers of ERP as well as analysts such as Boston Matrix developers. One of recent analysis of problems and opportunities of ERP implementation for local organizations were conducted by (Grublienė and Šimkus, 2014). They have surveyed two types of organizations that use ERP: those that undergo the implementation process and those that employ it already. The authors underlined that the key factors of successful implementation include clear project aims, objectives and steps, efficient project management, tools of ERP implementer, support from management, readiness of users. Furthermore, the importance of all-round knowledge for successful ERP implementation, i.e.: ERP software functionality, project and change management, business process, trainings organization etc. was also emphasized by (Ratkevičius, 2011). However, replacement of an existing system by the new one or by the new version of the existing system is pretty complicated. The project also requires significant human and financial resources and it usually lasts from 9 to 12 months. Very often such project is a big "shock" to the employees: on top of their daily activities they are asked to participate in the project activities and prepare to work with the new processes, which will come with the new system.

The purpose of this research is to further clarify the main aspects of ERP implementation in the context of the large company in general.

2 An approach of analysis of main features of BMS during life cycle phases of implementation

Companies mainly focus on 2 methodologies of BMS implementation: Agile and Waterfall methodology. BMS can be defined as "*set of policies, practices, procedures, and processes used in developing and deploying strategies, their execution, and all associated management activity*" (Business Dictionary, 2014). BMS can also be explicitly described as "*a set of tools for strategic planning and tactical implementation of policies, practices, guidelines, processes and procedures that are used in the development, deployment and execution of business plans and strategies and all associated management activities*" (Lewinson, 2010).

Waterfall methodology represents a sequential process, usually used in software development processes, in which progress is seen as steadily flowing downwards (like a waterfall) through the implementation phases. According to this methodology, the project scope should be determined at a very early stage of the project and cannot be changed until the project is finished. Agile methodology, on the other hand, allows frequent checkpoints throughout the project where all parties converse on the project's status to ensure that any new information is incorporated into the design and the project plan is adjusted accordingly (Cobb, 2011).

Both methodologies have pros and cons (Agile vs. Waterfall, 2014). The choice behind methodologies depend on many factors (Cadle et al., 2010), such as project team's experience, project type (repeated "roll-outs" to harmonize business processes across multiple countries or implementation in a single country, etc.), project timing, budget.

BMS phases were analyzed based on a case study/review of SAP implementation at large company. It was carried out through comparison of theoretical aspects of BMS

implementation phases and implementation methodologies with the empirical case of the company.

BMS features, such as Functionality, Adaptability, Testability, Data Integrity, Flexibility, Interface with other systems, Implementation Timing and Cost were taken into consideration (Fig.e 1) while defining the scope of resources and skills required at each project phase (Pre-implementation; Project preparation; Business blueprint; Realization; Go-live preparation/Go-live and Support). For example, functionality, adaptability and implementation cost were analyzed at the Pre-implementation phase. Adaptability were investigated at Business blueprint phase; Data integrity – at Go-live preparation/Go-live, etc.

Two implementation methodologies: Waterfall and Agile, which predominantly impact project timing and project scope change opportunity at a later stage of implementation, were briefly reviewed.

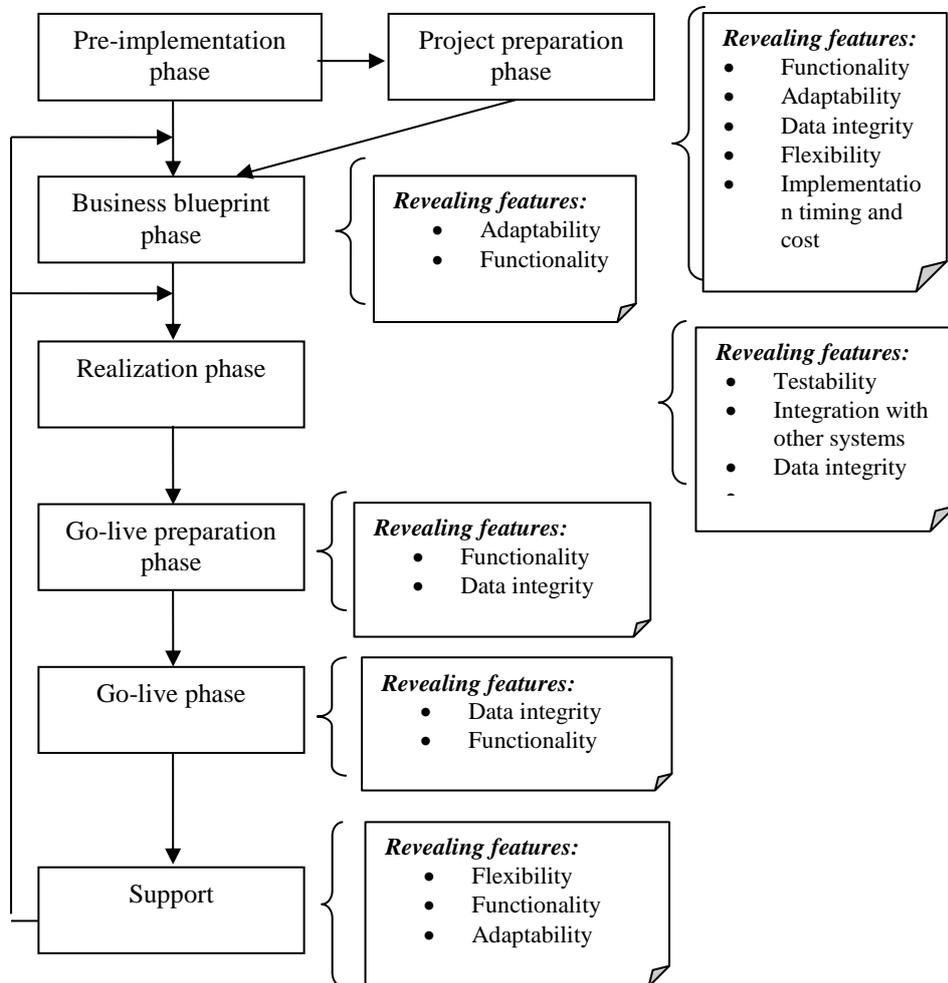


Fig. 1. Revealing features during the BMS life cycle phases

It is important that the BMS provides a foundation for successful implementation of both strategic and tactical business decisions regarding current activities, processes, procedures and tasks for the purpose of meeting existing goals and objectives of a profit organization and satisfying customer needs and expectations.

3 Peculiarities of functionality and implementations of BMS in the large enterprise

The main question arise during BMS implementation stages: how are process changes and improvements implemented in the existing ERP during its exploitation period? This is quite a complex process involving several services, such as: Business processes continuous improvement team, BMS maintenance team and project portfolio management service. Business processes continuous improvement service consists of the representatives from different departments, who are familiar with their business unit processes and development trends. This service is usually managed by the Integrated Supply Chain process expert who has first level manager's position. This is a prerequisite, because the person should be empowered to initiate and coordinate business process improvement activities.

BMS maintenance team is responsible not only for 24/7 operation of the system, but also for the implementation of "small" projects related to business process change. Dozens of such projects may be run over the ERP life cycle (5-10 years).

Project portfolio management team must flexibly respond to the business processes change requests initiated by C and allocate necessary funding, usually through the projects' reprioritization process. This is because some of the initially planned projects may no longer be high priority or become obsolete due to recent business strategy change, etc. and, therefore, their funding could be reallocated to budget small projects that have become obsolete, and redistribute their funds on topical projects.

The urgency to change / improve the processes is often dictated by the market in order to gain, improve or maintain company's competitive advantage.

But equally important are the following reasons:

- Process improvement in order to reduce process execution time or eliminate process activities that do not create any value does for the company.
- Reuse of the best practice from the industry or other company's departments.

It is very important that process changes are aligned with company's goals and strategy.

Process improvement projects and the necessary funds are often difficult to define at annual Project Portfolio planning stage. Therefore, funding is being solved through the quarterly projects reprioritization exercise. Typically, all of these three services cooperate closely by meeting every 4 weeks to review process improvement needs. Business Process Diagrams are being used to adjust financial and human resources required for implementation of process change.

ERP is described as business management software usually as the suite of integrated applications – that a company can use to collect, store, manage and interpret data from various business activities (Rouse, 2014), including:

- Product planning, evaluation costs;

- Manufacturing control and service delivery;
- Marketing and sales management;
- Inventory management;
- Shipping and payment operations.

Now, let us have a look into ERP implementation lifecycle phases.

In (Ray, 2011) is stated that Enterprise Resource Planning applications have a long life cycle from a point company plans to implement such a solution, budget for it, select the right package, select the consulting partner, start the actual implementation, become operational with it and finally starts using it for day-to-day life when the application needs to be supported. However, most of methodologies divide such life cycle in phases like:

- Pre-implementation;
- Project preparation;
- Business blueprint;
- Realization;
- Go-live preparation and Go-live;
- Support.

ERP life cycle is about all these activities. In most cases, such life cycle is divided into particular phases and name of the phases may differ as per implementation methodology adopted.

4 Related works of analysis of BMS selection process

Market offers a lot of BMS. For choosing the one of them that is best for the enterprise and its business processes need could pose a challenge. Selection and acquisition of BMS system is quite a long and complicated process, which must meet certain requirements and fulfill the main goal – a clear and motivated decision-making.

The selection of BMS is an important step governing the success of the system implementation process. Choosing the BMS includes many factors and system distributors' selection, determination of system applicability for enterprise business processes and practical testing of the systems (Wei *et al.*, 2005) and refers to Analytic Network Process (ANP) as the BMS selection process, which divides into four stages:

The first stage involves the exploration of the strategy and business processes. This phase plays an important role in the further selection process. This this information-gathering stage not only about business management systems, but also about the company – the specifics of its business processes. Information collection includes interviews with managers, employees, analysis of business management systems documentation. At this stage the company has to answer whether it is required, i.e. necessary to implement business management system and how it could improve the company's business processes. In order to understand the key business processes and identify the required business process improvements, the author proposes to make the company's business processes SWOT analysis – that is, to distinguish company's weaknesses, strengths, opportunities and threats.

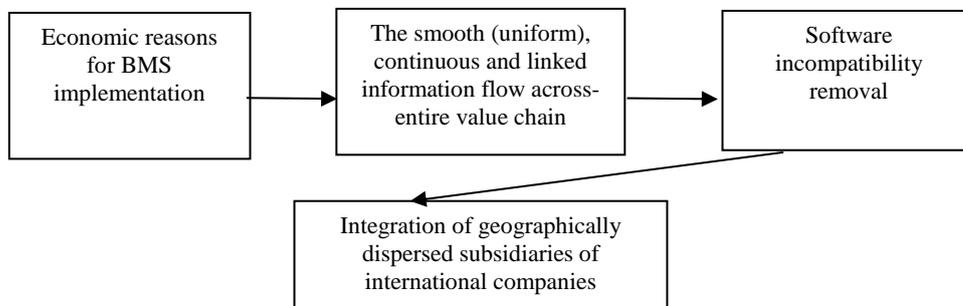
The second stage is comprised of creating multiple criteria for business management systems market analysis and selecting several major candidates. At this stage the main criteria for conducting market analysis and identifying business management systems that meet the minimum requirements of companies should be created. The selection criteria regarding BMS have to be determined by the company

itself based on the targets set at the first phase. The following selection criteria: type of industry, company size, technical area can be suggested.

The *third stage* is analysis of selected BMS and building a list of the main candidates. At this stage, the comparison of BMS, chosen for selection, is done. That would provide a very clear outlook on the specifics of their operation. The team nominated to execute business management system selection has to determine each candidate's strengths, weaknesses, and create a list of the main candidates. This is difficult because the advantages of ERP systems that are most often analyzed are similar, so it is difficult to decide which business management system is better. In order to better distinguish weaknesses and strengths of the BMS. When comparing the BMS one needs to take into account certain criteria.

Each company has to choose different criteria for BMS analysis. This can be a cost criterion – firm must take into account the price of BMS license, modules, maintenance cost, consultancy and data conversion costs. Moreover, how and what assistance to the company business management system vendors will be able to provide – instructions, consultancy, timely provided access, technical support staff, active research and development. It is necessary to take into account technological risks – cases of weak and incomplete BMS packages with limited terms for software and equipment BMS.

How the software suites can support company's business: is it feasible for company's activities; is the functionality sufficient. Easy installation: is the implementation time shorter; simplicity for the users, variety. Flexibility to the business changes, adaptability, openness to the system taker's development, openness to work with other programs. System integration: whether the external connection is implemented along with the internal one. The author believes that only after such analysis of BMS it is possible to move to the next – the fourth phase of BMS selection (Fig. 2).



Source: adapted by (Wei *et al.*, 2005)

Fig. 2. Factors influencing the BMS selection stage

ERP selection is primarily based on the company's analysis of the execution of its business processes, what it currently has and what it is going to have in the future. The analysis of BMS – according to certain criteria – must meet the company's processes. Seven steps of BMS selection and installation process can be recognised, where the first four steps point to BMS selection phases and the last three stages – the ERP implementation process.

BMS implementation is a part of Strategic Plan. It is important that the need to acquire a business management system would come from the organization's strategic plan, where an implementation of business management system is indicated as one of the top initiatives. There are many areas where the company could spend the money, so it is very important to investigate whether the BMS implementation is necessary in the first place. The criticality of business management system implementation must be confirmed as a beneficial use of company's resources – it must be presented as a strategic goal of the company. The main goal of this step is to build foundation and define business goals that will lead toward business management system implementation.

The one of most important things is to assess company's readiness – to define company's readiness and organizational understanding. BMS implementation is probably most difficult project the company has faced. To implement this step, it is necessary to distinguish company's strengths and weaknesses, i.e. find out whether the company is capable of carrying such a project. As stated by the author, self-evaluation is one of the essential things, but it is, unfortunately, often not the case.

In order to assess the readiness of the company to deploy BMS, the preparatory work is to be performed. It should include:

Technical preparation - the adequacy of the network setting; servers and software (including client software) verification; assessment of IT personnel skills (available and required).

Functional readiness – setting of personnel experience and department's basic functional skills. Other factors such as leadership, communication, resources and cultural background still to be included.

The most important thing regarding company's pre-determination of readiness lies in achieving organizational understanding of what the company is going to do, where the company is now and where it should be after BMS is implemented.

It is important to prepare for the BMS vendor selection. Two important things must be done prior to choosing business management system. Firstly, a list of specific requests, referring to what the company expects from a business management system must be expanded. Secondly, one needs to clearly understand how the company's business practices will be affected by the BMS system.

In order to create the list of specific requests, the author proposes to explore future business management system users and their preferences in respect to the business management system. To achieve this, the author proposes to create focus groups from different departments of the company. Using this method one should not forget to distinguish between those requirements which are necessary, and that are “good to have”, were they implemented.

Choose business management system suppliers (vendors). Highlights that there are two types of BMS of suppliers (vendors): those who themselves develop and sell software and those who only sell software that was developed by other manufacturers. In the first case, companies can also obtain functional and technical training and consulting after BMS implementation, in the second case, the company can only get consultations necessary to implement business management system.

Both, the first and the second classification of BMS selection involve the same stages: business process analysis, building the criteria for selection, analysis of chosen BMS systems and selection of BMS. In summary, it can be said that while choosing a BMS, one must answer the questions such as: where the company is now and what it would like to achieve by implementing BMS.

5 Peculiarities' of ERP implementation in X large enterprise

Let us have a more insightful look into each of ERP implementation phases. Pre-implementation activities start before the start of actual implementation and may involve things like Project core team creation, ERP selection, Business Case development, selection of consulting partner.

Ratkevičius (2011) underlines the importance of ERP selection at this stage based not only on ERP functionality analysis but also on organization's readiness for implementation.

Ganesh et al. (2014) provides a comparison of recent ERP packages, including SAP, Oracle, Microsoft and other products.

At the Project preparation phase, the project scope is to be finalized; project plan completed, project charter prepared, as well as project organization structure and reporting relationship should be finished.

Blueprint starts with identifying a set of business requirements/expectations from ERP. Gaps are analyzed between the customers' needs and system's capabilities to be identified here, as well.

At the realization phase the system is being built through configuration and development. Configuration and developments must then be tested. The objectives for the testing phase are to validate system functionality alignment with requirements. Key-users and End-users are trained how to use the system.

Go-live preparation includes master data migration, cutover planning and pre go-live audit. By the end of this phase of the project, the entire organization will have switched to the new ERP system with clean, reconciled financial and operational data.

Support phase is typically just after Go-live, there are more issues and it takes time before the system is finally stabilized. It is important to have proper knowledge transfer from project team to support team.

Let us have a look at SAP implementation in former CEEMA (Central & Eastern Europe, Middle East, and Africa) region of Mondelēz International, Inc. – one of the world's largest snacks companies with global net revenues of \$35 billion in 2013 (Mondelēz International, 2014). The Company comprises global snack and food brands of the former Kraft Foods.

The region spanned across three continents and 13 time zones, included ~21,000 employees and ~5,000 end users, 45+ manufacturing facilities, operations in 28 countries and sales in 70+ countries.

The business objectives the company initially intended to realize through the project were:

- As example, put all X Enterprise Regions on 3 Instances in 3 Years (Americas, EMEA and Asia Pacific);
- Harmonize and standardize business processes and increase integration across countries and regions;
- Build foundation to enable growth, increase business process maturity and implementation of next set of SAP Solutions.

The project has faced the following challenges in the Region and for SAP:

- Geographic spread and diversity: time zones, language, religion (different working week);
- Different size of countries: small (<\$100MM), medium (\$200-500MM) and large (>\$1B);

- Different maturity of countries and markets: legal and statutory requirements; manual versus automated, large degree of change;
- Region(s) has been restructured twice within a very short time;
- Significant Business Change that came with rolling out a Corporate Template

Now let us once again have a look into the peculiarities of ERP SAP implementation but this time from the perspective of the Company.

5.1 Peculiarities of pre-implementation phase and Project preparation

In order to implement SAP in the Region, a so-called Corporate Template, developed for SAP implementations in Western Europe countries, was applied. The roll-out of the Corporate Template was a more efficient way for the new system implementation. In addition, the project was based on the Waterfall methodology due to the objective of not changing its scope throughout the implementation process.

Furthermore, a central project team with the project office in Bratislava was established. Countries were clustered into 5 implementation waves. The first wave included the mature countries – the majority had been using Legacy SAP systems for a number of years. Therefore, these countries were expected to switch to SAP Corporate Template considerably easier compared to those who had been on a different system. However, the harmonized business processes under the Corporate Template were different from the Legacy ones in the majority of cases.

Each country established a local project team, combined of the best country business users (key users) so that it would facilitate the implementation at domestic level.

Kick-off meetings, sponsored by the local management and led by the central project team, took place in each of the countries to establish trust and bring awareness about project implementation objectives. Furthermore, to make sure the local project teams were fully focused on the common objective, country-level business processes reviews and process gap analysis were predominantly scheduled at the Central Office. The main goal then was to identify the gaps between the country business processes and the Corporate Template. Eventually, the country-level processes were altered to meet the template requirements. Only legal and statutory driven domestic changes to SAP were allowed.

To further ensure smooth preparation of the project, plans with clear deliverables for each implementation phase were developed by local project teams with strong support from the central implementation team.

Finally, business change and communication strategies were established at this stage and continuously executed across next phases – until the system was implemented.

Business blueprint

At this stage master data were reviewed to agree on configuration of a new system, which was then approved by the management of respective country. Moreover, Training, Testing, Data conversion, Authorization, Non-SAP Systems and Support strategies were developed.

Realization and testing

During the realization and testing phase, the system was built with the support of external partners. In addition, other key activities, such as the preparation of business process documentation and key users' training were completed.

Testing is being done in 3 cycles: 1 cycle – at this stage. The following two – during Go-live preparation phase. Such approach allows to properly managing the bug fix process. Cut-over plan has been tested.

Go-live preparation and Go-live

At this stage the testing was being completed (including Regression testing, Authorization testing). End-user training – provided. Master Data was being completed for production load. Cut-over plan had been executed.

Support/Post Go-live. Intensive support (usually scheduled for 1 month) was being provided by the Central and Country project teams. After the intensive support was completed, the support team took over the support from the project team.

5.2 Evaluation possibilities of benefit of re-engineering of BMS implementation

After enterprises learned the need to manage their business by using new technologies, the companies must consider all the positive and negative aspects related to business management systems acquisition and deployment. Therefore, when selecting a solution for their company, first of all, they have to understand the benefits it will bring them.

Benefits of ERP systems can be understood differently. For some, it may be cost reduction, improved production planning, income and capital gains. For others that could include better quality of service, integration of enterprise all data and reduction of time spent.

Usually BMS buyers and sellers name the system benefits differently. Companies carefully study its advantages and the real benefits of BMS implementation. In contrast, information systems vendors tend to highlight many advantages of BMS, even non-existent features of business management system they desperately want to sell.

Table 1. Tangible and intangible benefits of ERP systems and provided advantages

<i>BMS tangible benefits</i>	<i>BMS intangible benefits</i>
Production volumes planning	Better allocation of company's resources
More accurate forecasts of demand	Improved communication between the departments of the company
Easier system adaptation to users	All company information is integrated into a single system
More flexible production process	Speeding up the decision-making
Cost reduction	Minimizing the time from order-taking to providing the answer to the customers
Better quality of products	Information is available in real time
Faster new product production cycle and time to market	Improved quality of service
Faster new product production cycle and time to market	Improved customer satisfaction and loyalty
Shorter order-taking time	
Achievable operational excellence	

Source: according to (Wei et al. 2005)

Authors Li-Ling Hsu and Chen Minder propose to split business management systems advantages in two areas – tangible benefits, which can be measured and intangible benefits, which can only be perceived (Table 1).

Tangible benefits of BMS are those which provide financial benefit to the net income of an organization (Reményi et al., 2000), a direct impact on the company's profitability. Non-tangible, in contrast to the tangible, does not provide economic benefits and is difficult to measure (Hare and Royle, 1994), but they have a very significant impact on the business.

According to a consultative examination, a study which surveyed 164 individuals from 62 one of the most successful companies (in the 500 most successful companies in the list), tangible and non-tangible benefits of BMS come through cost reductions and revenue growth, the reduction in stocks of goods and personnel, increased productivity, improved order management information, processes, and customer reaction (Responsiveness) (Benchmarking Partners, 1998). Other authors emphasize the following business management system advantages:

Table 2. Evaluation of criteria of benefits of BMS re-engineering

<i>Extracted criteria of BMS benefit</i> following (Nguyen and Shanks, 2009)	<i>Possibilities to evaluate BMS benefit</i> following (Brown and Vessey, 2003)	<i>Proposed priority of criteria by evaluating BMS</i>
Cost reduction	Debts and cost reduction	Cost reduction (no overlapping functions remain, "nobody's" functions are removed)
Productivity increase	Purchasing power increase	Turnover and work efficiency increase
Quality improvement	Financial cycle reduction	Loss and reduction (arrangement of communication between processes)
Improving customer service	Customer satisfaction through the integration and stability	Information remains as company's assets
Better management of resources	Accurate and timely received information	Precise results planning and forecasting
Better planning and decision-making	Globally integrated information close to the company and supply chain	Creates a user-friendly control mechanism
Company's role improvement	Ability for E-business	Growth in the number of loyal customers
Creation of new innovations	Achieving flexibility of changes and business configuration according to the changes in the market	Elimination of problem of missing or unknown document entry

All distinguished authors in the table underline cost reduction, productivity gains and a better and more accurate information acquisition and management for various decision-making. Shang and Seddon (2000) additionally emphasizes quality

improvement, better resource management, development of new innovations and better quality of customer service (non-tangible benefits).

The companies hope to improve their role through business management systems usage, i.e., reduce debt and costs, facilitate decision-making, obtain more accurate and timely information, reduce the financial cycle, increase purchasing power. Thus, by using the integrated business management solutions, the enterprises can significantly improve their daily business operations, use their staff more efficiently, and reduce operating costs.

BMS provides more precise information, executes computerized accounting. No matter how competent a person is, probability of errors is still high. By using information system this risk can be reduced to minimum and accurate information can quickly be obtained.

BMS influence better control and decision-making opportunities. Having data summarized by the system can achieve better decisions.

Rationalization of business processes. By using BMS the business processes could be executed much more efficiently and with less time.

The reducing of the number of accounting staff is influencing by the reasons that IS system can more quickly process the data with only one person being involved.

BMS improves the quality of customer service. When using a business management system, all data is stored in a database – both sales and purchases, as well as information about customers or suppliers. This enables better customer service because they can be provided with particular products that are the most useful for them at a particular moment. The speed of the service improves and more detailed information could be provided. All of this is presented to the customers in a quick and convenient way, and the overall result is higher customer satisfaction with the company.

BMS improves company's employee communication and relations with business partners. Employees can better communicate with their co-workers. They can easily see which tasks are performed by other employees or what operations are carried out with venture partners or suppliers.

BMS allow cash flow management. It can be seen where the money has been used, how much has been used, and was that use effective.

Machine-determined movement of goods, inventory levels decrease. The information system allows you to quickly see how many items are in stock and where, to whom and when it was sold, how many of them were returned and so on.

Thus, BMS have many advantages. However, their relevance depends on a company. Therefore, companies should be aware of the benefits they want by implementing business management systems and choose exactly one that best suits their needs.

Conclusions

The BMS implementation is more complex as the implementation of single information system and must to be viewed as Business project. That would ensure stronger business commitment to the project. Central (Core) project team should be combined of Enterprise Area Lead (EAL) (by stream/function) and IS expert. However, to avoid conflict, the functional streams must be led by EALs.

The structure of Central and Country project teams should include Change Manager's role, held by experienced person, who is respected by the team. The role ought to be strongly supported by the local management.

Project scope (and what is not in scope) should be clearly defined at the planning phase and signed-off by country management. No changes are accepted to the project scope during project implementation.

Limited customization – only legal/statutory driven. List of deliverables for each project implementation phase should be defined, communicated to the team upfront and strictly followed. Learning from previous implementations must be shared with new project teams to avoid pitfalls and reuse the best practice.

References

- Agile vs. Waterfall. Comparing project management methods [accessed 2014-11-9]. <<http://manifesto.co.uk/agile-vs-waterfall-comparing-project-management-methodologies/>>.
- Brown, C. V., Vessey, I. (2003). Managing the Next Wave of Enterprise Systems: Leveraging Lessons from ERP. *MIS Quarterly Executive*, 2 1: 45-57.
- Cadle, J.; Paul, D; Turner, P. 2010. *Business Analysis Techniques: 72 Essential Tools for Success*. The Chartered Institute for IT.
- Cobb, C. G. (2011) *Agile Project Management*. Making Sense of Agile Project Management: Balancing Control and Agility.
- Ganesh, K., Mohapatra, S., Anbuudayasankar, S. P., Sivakumar, P. (2014). *Enterprise Resource Planning. Fundamentals of design and implementation*. Springer International Publishing Switzerland. 17–24.
- Grublienė, V., Šimkus, M. (2014) *Ekonomika ir vadyba: aktualijos ir perspektyvos*. 1 (33). 91–104.
- Lewinson, M. (2010) *Business Management System (BMS) – Definition and Functional Groups*. My Management Guide [accessed 2015-03-09]. <<http://www.mymanagementguide.com/business-management-system-bms-definition-and-functional-groups/>>.
- Mondelez International, 2014. Unleashing a Global Snacking Powerhouse., Inc. Fact Sheet [accessed 2015-03-09]. <http://www.mondelezinternational.com/~media/MondelezCorporate/Uploads/downloads/mondelez_intl_fact_sheet.pdf>.
- Nguyen, L., Shanks, G. (2009) A framework for understanding creativity in requirements engineering *Information and software technology* 3(31)
- Ratkevičius, D. (2011). Implementation-related ERP selection criteria. *Social studies*: 3(4), 1359–1374.
- Ratkevičius, D. 2011. *Programiniai verslo valdymo sistemų atrankos veiksniai*. Buhalterinės apskaitos teorija ir praktika: mokslo darbai. Kaunas: Lietuvos buhalterinės apskaitos tyrėjų ir švietėjų asociacija, 9. 97–112.
- Ray, R. (2011) *Enterprise Resource Planning. Text and Cases*. Published by Tata McGraw-Hill, 2011.
- Rouse, M. (2014) *Enterprise resource planning*. Tech Target [accessed 2014-11-9]. <<http://searchsap.techtarget.com/definition/ERP>>.
- Wei, C.C., Chien C.F., Wang M.J. J. (2005) An AHP-based approach to ERP system selection. *Int. J. Production Economics* 96: 47–62.

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Received August 3, 2015, accepted August 12, 2015