USING SCORECARD PERSPECTIVES TO ASSESS THE BENEFITS OF SYSTEM IMPLEMENTATION: A CASE STUDY ANALYSIS

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The paper presents the results of case study analysis conducted to assess the benefits of system implementation. The research was carried out in Polish recruitment company. We assessed the benefits of recruitment system implementation using the perspectives of a Balanced Scorecard and, in particular, the modelling and measurement of the main processes of recruitment. We designed indicators of the organization's performance and we measured them before system implementation (as-is state) and after possible implementation (can-be state). This procedure allowed us to determine changes which the recruitment system could make, and also permitted to take a final decision on whether to invest or discontinue planning implementation.

Keywords: Balanced Scorecard, IT implementation assessment, business process modelling, performance indicators

1. Introduction

In recent years, development of IT technologies influenced the whole society and also changed the way of human behavior and performance. Using modern technology in everyday life as well as at work seems to be obvious. Lots of organizations have invested in many IT solutions in order to gain advantage over their peers on the market [2, 16, 18]. Nevertheless, direct impact of this technological changes on increase in companies' efficiency or their results has not been confirmed [13]. What is more, some studies even present the reverse tendency [17]. The rapid growth of IT sector as well as the number of systems put pressure on

management of companies to make more reasonable business decisions supported by evidence of success achieved by others. All of it leads to the need of examination of all pros and cons of new system implementation before the investment. Lack of consistency regardless the findings about whether system implementation give positive or negative effects on business led to the development of various analysis and measuring methods allowing to asses this impact.

Our aim is to present an approach to assessment of the benefits of system implementation based on a case study of Polish recruitment company. We use the method employing perspective of a Balanced Scorecard (BSC) and, in particular, the modelling and measurement of the main process of the company – recruitment process. We designed selected indicators of the organization's performance and measured them before system implementation (as-is state) and after possible implementation (can-be state). This procedure allowed us to determine the changes which the recruitment system could make and also permitted to take a final decision on whether to invest or discontinue implementation process.

In the first part of this study authors inspect current state of research in the field of assessment of impact of IT systems implementation. The goal is achieved by review of available literature on this subject, overview of methods applied by other authors and investigation on common challenges and approaches to resolving them. The next chapter is about research design and methodology. Authors focus on application of BSC as a tool and the role of describing, construction and analysis of business processes for it. The main part of the article is describing results of a case study. Authors present the BSC for implementation of the recruitment system (Applicant tracking system – ATS) and evaluate the benefits of the new IT system in a Polish recruitment company. In the final part, there is a discussion and conclusions on conducted research. Authors also note the limitations of the study and propose further research directions.

2. The assessment of benefits of system implementation: an overview of literature

The main topic of this paper is assessing the benefits of system implementation and their impact on the results of companies. It is necessary to focus on how companies are taking a decision about making an investment and what variables make them spend considerable amounts of money on this. The key issue is to define how IT technology can influence companies before checking the ways and examples of their decision process.

Review of literature shows that there is no single method for assessing the benefits of system implementation or to decide on investment in the IT system.

We can divide them into four categories [16]:
- Financial methods which present costs and benefits in terms of value;
- Multi-criteria methods which assign subjective ranking to all costs and benefits;
- Portfolio methods which assess IT projects by reference to one or more ordinal scale (they reflects the main criteria of measurement);
- Index methods which show cost-benefit ratio as indicators.

Afore mentioned classification is not complete because it doesn't contain others methods, such as strategic analysis and methods based on probability and decision theory. Adding complementing set of categories to the ones already proposed should allow to present the full picture of approaches to the assessment of IT projects [14]:
- Financial methods which include traditional indicators as NPC, EVA (Economical Value Added) or TCO (Total Cost of Ownership);
- Qualitative methods (heuristic) which include all the methods that assign a numerical value to the qualitative factors, including the Balanced Scorecard and Economics of Information and analysis portfolio;
- Probabilistic methods which are based on the use of mathematical statistics, probability, assessing the value of information and stochastic dependencies between the investment and the effort and also possible effects like: Real Options Method and Applied Information Economics.

The decision on starting an IT project may also be driven not by rational thinking, but rather by an impulse being an "act of faith" [6]. The reason for this might be the lack of a common widely-spread unified approach to defining and measurement IT investments in the literature [9]. The final conclusion is that there are a lot of analyses and research on decision making process regardless of investment in IT project, but none of them seems to be universal.

A literature review indicates the cases to carry out analysis before the decision on the implementation of system. The analysis of construction companies showed that half out of 250 interviewed companies from this market did not use any structured method to evaluate benefits and costs of planned IT projects. The other half used just simple financial measures such as NPV or simple rate of return [8]. None of the companies did any economic assessment of planned investment except for a comparison of cost for each offer [13]. The case study of the company which produces food shows that making decision about investment in the system is also a result of supporting the strategic initiative which involved changing the company's customer service. This venture was assessed through analysis of cost. The company had clear-cut and written strategy which was not possible to be implemented without this investment [13]. A company which manufactures identification elements

and outdoor advertising media required a system which could cut the time of service delivery. That company decided assess the economic viability of this implementation by comparing the current IT solution which was available in the company and the new project. They determined their business targets, economic objectives, causes of inefficiencies of the current business processes and also established that current IT system does not support business processes in an efficient manner. The conclusion was that they lacked sufficient IT support in particular business processes. As a result, they established models and maps of business processes which allowed them to produce a set of recommendations for the possible reengineering of processes. The recommendation was to change the processes, force employees to work with procedures and to make some modifications in the IT system. In conclusion, there was no need to implement a totally new, very expansive IT system [13].

Presented examples prove that in the economic assessment of the IT system implementation it is crucial not only took into consideration financial measures but also another like indicators regarding customers, business processes or development.

3. Research design and methodology

We used Balanced Scorecard for our research, which is defined as a tool to implement the strategy of the company. It is designed to indicate objectives of the company and measures which may be used by the management to track the strategy implementation. It combines financial and non-financial with long and short term measures. It is also composed of historical and expected (future success factors) factors comparison. It has four perspectives which are crucial during the analysis of effectiveness of an organization: financial, customer, internal business processes and learning and growth [11]. Nowadays, BSC can be used to measure achievements of the entire organization or its departments [15], to manage the organization or to build the strategy [5], to evaluate the effectiveness of existing IT system in the company [12]. We used its potential to structure measurement of the benefits of system implementation in the organization. The fact that almost all companies use IT shows that appropriate management with the additional use of systems can provide a significant advantage which may be reflected by increased financial performance [4]. The founders of BSC perceive the value of intangible assets, including IT from perspective of its impact on the ability to implement and realize strategy. They think that IT together with people or organization can contribute to the creation of enterprise value [10]. That is why BSC might be used not only to assess benefits of an IT project but also as a tool to manage a company.

This article is based on a case study analysis. According to Yin [19] this kind of researches are based on the mix of qualitative and quantitative evidence. They

cope with technically distinctive situations by employing more variables which allow to extend the number of dimensions in decision data points. They are aimed to illustrate certain topics in an easy-to understand way preserving the most important advantage – they present real-life context [19]. This paper covers a BSC application in assessment of implementation of an IT system in the Polish recruitment company. Approach of our research started from defining the current situation of the organization – it's business profile and organizational structure. Then authors analyzed historical data of the company which suggested that some changes are needed to gain better result and create basis for further development. The idea was to invest in IT system which could help in execution the most important process in the company recruitment. It was necessary to determine how the new solution may affect the current business in order to define the strategic and operational benefits of the implementation. It seemed reasonable to use business process models to analyze, measure and find functions and activities which might be automated by the computer system.

Business process models are combination of text and graphic notation assembled to illustrate so-called "real world" via as-is models or to reflect possible future state – the can-be model. IT technology allows to develop new distribution channels, new products or services as well as reorganize business processes [1]. While management of the company may have some vision of influence and changes which the new solution should bring to the company, the difficulty is to visualize the plans and ideas - also ones placed in BSC. IT specialists often do not have a reliable model that could display how the company works and what kind of role IT system will play in it. The easy solution for this challenge is mapping of business processes. Implementation of the strategy strongly depends on how the company will execute the work (internal processes) and will make its improvement (development), by whom action will be performed (client) and finally what will be the impact these actions on the financial situation of the company (finance). The analysis of all these factors at once and capturing the relationship between the data at the same time is very labor-intensive, but necessary while creating BSC. All indicators and objectives in BSC must be aligned with the company. Business process analysis allows to observe all relationships. Mapping of the processes is a way to streamline processes and their organization.

We created and analyzed two types of business process maps of recruitment processes used in the company: Direct Search and Search and Selection. Initially maps and analyses were made in as-is state (before system implementation). The final product of research process was SWOT analyze which was the starting point to the mapping and analyzing the possible future state after implementation of the system (can-be state). Authors collected data, which were used in the research, from January until April 2015.

That analyses allowed to create the project of BSC in can-be state after implementation of a new recruitment system. This state is based on the assumption that the company already implemented ATS. It reflects the possible conditions of the organization and is theoretical, twofold concept. Firstly, building BSC in can-be state enabled to assess the real benefits which organization can achieve from the new system. Those benefits were presented as changes in the level of indicators before and after implementation. Scheme of analysis is presented in Fig. 1.
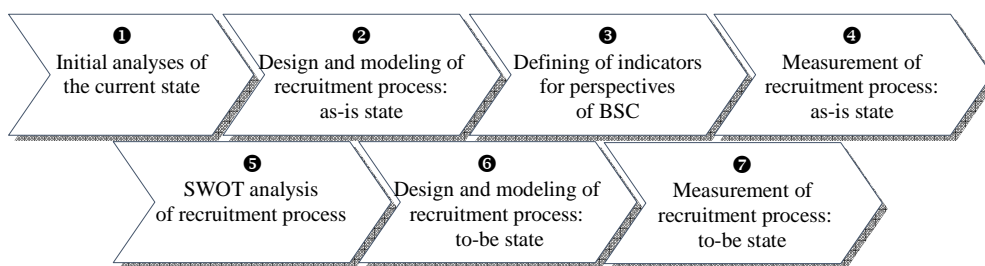

Figure 1. Scheme of the case study analysis

4. Results of the conducted case study research

Analytical project was launched before taking the final decision on investment in AST system. It aimed for assessing the economic viability of IT system implementation. Methodology described in this paper was used for evaluation. The analysis had nature of ex-ante evaluation – it compared the possible economic outcomes of business decisions to current situation in the company.

Deep analyses of the current situation in the company showed that the organization had suffered after the crisis on the financial market in 2008. Main clients of the analyzed recruitment company were banks. During crisis those entities started to reduce their costs - for example, by decreasing the number of employees. As a result, most of the projects in 2008 were cancelled and since that time number of projects commissioned to carry out was also decreasing. In 2012 company observed that the percentage of completed projects increased as compared to 2011 by 23 percentage points (from 36% to 59%). The company decided to focus on improving their recruitment processes. It was determined that the implementation of the recruitment support system would enable automation of the recruitment process and help to optimize its course. The company decided to conduct an analysis of implementation of an application for electronic recruitment service.

IT projects are often performed to support key business processes of the organization. The fiasco of such a project or it's execution in a different manner than business processes are conducted in reality may lead to significant impediments or

total blocking of the business. It is very important to be well prepared before any actions are taken. That is why the second step of the research was an analysis and mapping of two main recruitment processes in the company. First was Direct Search which is looking for senior staff on internet websites or via telephone and direct contacts. The second one is Search and Selection which is based on finding employees in the database of the company. The foundation of analysis was information gained from employees of the company financial reports and database of the company.

Maps and processes were analyzed using of business process modelling technique adopted by Adonis system. Authors carried out a survey and environmental interview among employees of recruitment company to describe current state of business processes. As a result, they obtained two basic models. Simulations on afore described processes were made after mapping them to Adonis system. The result was presenting cycle time schedule in breakdown to execution, waiting, resting, transport periods, as well as cost of process.

SWOT analysis of recruitment process in the next step allowed to identify that weaknesses are, for example, long processes cycle time, waiting time, difficulty in finding the best candidates (low probability), high costs, missing feedback from candidates or clients, lack of IT system to support recruitment, lots of possible mistakes caused by manual management of process, inconsistent, incomplete database of candidates which resulted in low performance of searches.

The results showed that processes take much more time than it was thought and this was the main challenge for the company. The capacity of the Direct Search process is 63,74% (time of execution to time of the whole process cycle) and Search and Selection is 80%. Moreover, costs of the processes are high and could be decreased. There were also identified challenges related to searching the appropriate candidate and low probability of finding such person.

The answer to those issues was the creation of business models in can-be state which presented the new course of processes. The analysis of the process in can-be state was the same as one in as-is but with new flow and functionalities.

Final conclusions and assessment of the benefits of system implementation were presented in four perspectives: financial, customer, internal business processes and learning and growth as Balanced Scorecard in can-be state. The authors defined strategy of the company which was "providing recruitment services at the highest level in the industry". They also analyzed groups of interest of the new system and what ATS can give them.

Balanced Scorecard consist of four perspectives and each one had strategic goal and assigned to them operational goals. Every operation goal had own indicator or indicators. Benefits of the new system were shown as a change of the level of certain indicators described by the formula: (as-is value – can-be value)/(as-is value). Target values originate from analysis of as-is and can-be recruitment processes and its simulations, SWOT analysis, benchmarking to the other recruitment companies which work with ATS system, maximum values of indicators achieved by

company in the past (indicators of continues improvement), analysis of the literature and research, analysis of groups of interest, environmental interview and assumptions of ambitious goals which are beyond the peaks reached in the past (development objectives). The final results are presented in Tab. 1, 2, 3 and 4.

Table 1. The results of the measurement in financial perspective

Financial perspective indicators		
Indicator	**Change in %**	**Desirable trend**
Net profit/loss	130%	↑
Indicator of deadlines	100%*	↔ or ↑
Labor efficiency indicator	350%	↑
Labor efficiency indicator per one employee	47%	↑
The value of foreign services	0%	↔
The amount of remuneration	-36%	↓

* target value was given as there was no current value

Target value of net profit/loss has fixed target value on the level of profit from 2008. That was last year when the company did not record a loss. Indicator of deadlines was new and did not have current value. We assumed that company will make all projects on time. Labor efficiency indicator (number of realizes projects) presented big change but if we looked at the historical data, we see that it is the lowest results from years 2005-2008 when company had stable position in the market and did not experienced effects of financial crisis in Poland. Target value of labor efficiency indicator per one employee (net profit per employee) was determined on the basis of the result from 2009 when there was financial crisis and company hired 9 people (currently 5). Value of foreign services is the lowest one in history of the company so the target was to sustain it. The amount of the remuneration should drop after implementing a new IT system.

Table 2. The results of the measurement in customer perspective

Customer perspective indicators		
Indicator	**Change in %**	**Desirable trend**
The percentage of additionally recruited people	25%	↑
Indicator of deadlines	100%*	↔ or ↑
The number of complaints	50%	↓
The percentage of invited for interview candidates	30%	↑
Indicator of the services' quality	4**	↔ or ↑
The waiting time for submitted queries	4 h.***	↔ or ↓
The percentage of submitted for implementation projects	90%	↑

* target value was given as there was no current value
** target value was given in scale from 1 to 5 as there was no current value
*** target time was given as there was no current value

Many of indicators in the customer perspective are presented as target value because company did check their objectives vs clients. As a result of ATS implementation the percentage of additionally recruited people should increase, because company will be able to find more than one person suitable for the position. The target is also to decrease the number of complaints to half of the current value. It is really important to increase the percentage of candidates presented to clients who are invited to the interview. The current value is highly unsatisfactory and the company is aiming to double it.

Table 3. The results of the measurement in internal business processes

Internal business processes perspective indicators			
Indicator		**Change in %**	**Desirable trend**
The percentage of implemented projects		100%	↑
Cycle time of process:	Direct Search	31%	↓
	Search and Selection	48%	↓
Execution time of process:	Direct Search	29%	↓
	Search and Selection	54%	↓
Waiting time of process:	Direct Search	35%	↓
	Search and Selection	29%	↓
Costs of process	Direct Search	22%	↓
	Search and Selection	49%	↓
Capacity of process	Direct Search	1%	↑
	Search and Selection	13%	↓
Amount of activities supported or made via ATS system in process:	Direct Search	5*	↑
	Search and Selection	7*	↑
Probability of creation of candidate's profile matching to customer's needs		19%	↑
The percentage of documented recruitments		100%**	↔ or ↑

* target value was given as current value is 0
** target value was given as there was no current value

Afore presented table is mainly based on results of simulations made in Adonis system. All indicators concerning time and costs have decreasing tendency. Company's target is to have a lot of activities made with usage of ATS system. It is also considered that ATS will help to find better candidate to customer's requirements. The percentage of implemented projects was counted on the basis of historical data and the goal is to accomplish all commissioned projects. The last one is about documentation and the goal is to describe and have data about all projects.

The last perspective's indicators on learning and growth were evaluated on the basis of interviews, analysis of the functionality of ATS, historical data and benchmarking. Company did not make any trainings for employees in 2014, but the decision that all of them will take part in training was made. Company's goal is to

develop and to implement new projects - it wants to expand into beyond its current sector of expertise. Also none of the ideas proposed by the employees was submitted. New trainings and realization of ideas will lead to increase of subjective assessment of job satisfaction. Not only will a new IT system help the employees to work but also is evidence of the use of advanced technology for customers.

Table 4. The results of the measurement in learning and growth

Learning and growth perspective indicators			
Indicator		**Change in %**	**Desirable trend**
Number of conducted trainings to employees		2*	↑
The percentage of trained employees		100%	↑
The number of sectors for which recruitment projects are made		50%	↑
The number of projects submitted for implementation		259%	↑
The percentage of implemented ideas submitted by employees		25%	↑
Subjective assessment of job satisfaction		25%	↑
The percentage of activities performed with usage of IT systems in process:	Direct Search	137%	↑
	Search and Selection	207%	↑
Average rating of use of modern technology		1**	↑

* target value was given as current value is 0
** target value in range from 0 to 1 was given where 0 is no and 1 is yes

Finally, the authors developed a proposal of improvement of the company's activity on the basis of the study and prepared BSC in can-be state. It is important to mention at the beginning that all changes between the base and the target in the level of indicators imply that implementation of recruitment system to the company is highly recommended. It is necessary that company regain its growth potential and needs new technology to do this. The first enhancement is system implementation which will support recruitment process. Another equally attractive proposal is implementation of management through objectives so via BSC. The company was not managed by objectives so far and there were no defined plans for the expected results or company's development. It was observed that currently employees are not motivated enough to improve business performance. The remedy for this might be automation of some of their responsibilities and also implementation of an incentive system regulated by BSC. Implementation of a new system will indisputably change performance of the company so the management should also review responsibilities distribution among employees. New solution can allow to decrease spending on wages, set up a new department which would find new customers and bring additional orders.

5. Discussion and conclusions

Created BSC in can-be sate allowed to assess the system implementation in four perspectives: financial, customer, internal business processes and learning and growth. Separate package of indicators was set for each perspective. Changes in the level of those indicators before and after possible implementation of the system displayed potential benefits. Setting target values of the indicators would not be possible without an analysis of business processes of the company which was the most important part of the research. Those target values imply that Balanced Scorecard is good for assessing the system implementation. The expected effects of the implementation are: shortening the duration of the recruitment process, reducing the costs of carrying out the recruitment process, increasing the number of customers, increasing the number of commissioned projects, increasing the percentage of completed projects, facilitating the evaluation of candidates, increasing the likelihood of finding a suitable candidate for the job, facilitating the access to data on conducted and completed recruitment processes.

The problem which was encountered by authors during analysis was that company didn't conduct some of the analyses which were necessary to determine the value of indicators. Fixed target values appear to be correct and they are justified in a variety of sources but without knowing the initial value it is hard to estimate the final values. It might be necessary to revise them again after implementation of the system and BSC.

BSC is a tool which shows the image and functioning of the whole enterprise. It is important to keep it constantly updated. If such approach is sustained assessment of the benefits from IT system will be constantly available. It will be possible to monitor the progress at any given time and to decide on corrective actions.

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