

THE USE OF THE BALANCED SCORECARD IN EVALUATING THE RESULTS OF THE INNOVATIONS IMPLEMENTED IN METALLURGICAL COMPANIES

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Implementation of innovations is the main factor of development of companies' competitiveness and effectiveness. Innovations result in creation of a value for both the client and the company. The article presents a method of evaluating the innovations implemented in industry which emphasises, on the background of qualitative changes, the measurable (quantitative) effects of various types of innovations. For the purpose of measuring the results of implemented innovations the Balanced Scorecard was used. The method developed by the authors of the paper was used to evaluate results of the innovations implemented in metallurgical companies.

Key words: innovations, customer value, process of innovation, balanced scorecard, metallurgical company

INTRODUCTION

Global competition and emerging crisis phenomena force businesses to increase their competitiveness and effectiveness which can be achieved through implementation of various types of innovations [1-5]. Innovations provide a possibility to create a new customer value (new products and methods of customer service) as well as new value for a business (effective business processes and models, supply chains, networks of cooperation) [6-9]. Various dimensions and aspects of value may be treated as the effects of implemented innovations. They have both a quantitative and qualitative nature and result from an individual or collective impact of innovations. The purpose of the paper was to develop and then apply the method of evaluating the effects of implemented innovations. In the context of business model changes (quantitative effects), multidimensional quantitative effects of implemented innovations were analysed and assessed. For measuring the value created through innovations and measured through results (effects) representing different perspectives of a company's activity, the Balanced Scorecard (BSC) was used. The problem on which the research focused was the multi-criteria evaluation of qualitative and quantitative effects of various types of innovations implemented in businesses. An in-depth analysis was carried out in two companies from the smelting sector and operating in the EU.

MULTI-CRITERIA EVALUATION OF INNOVATION EFFECTS

The starting point for the analysis of the results and changes brought by innovations to the functioning of

enterprises is their understanding and classification. Needs and experiences derived from management as well as multiple-aspect [8], [9] character of the innovation-related issues result in innovations being perceived as a process of implementation of new solutions which bring value and specific effects. Appropriate architecture of this process determines the effectiveness of investment creation (closed investments) and absorption (open investments) as well as diffusion of innovation which is very important for achieving market and financial results. On the other hand, adoption of the right classification makes it possible to choose the method of value creation. From among many classifications of innovation the classification used in the EU information system was chosen in which innovations are divided into product, process, marketing and organisational innovations [10]. Process and product innovations play a significant part in the case of metallurgical companies whilst the importance of organisational and marketing innovations has been increasing [11]. Implementation of innovations is a difficult and high-risk venture. Innovations have a multi-directional impact and therefore evaluation of their effects should be based on a couple of different criteria. The purpose of evaluation of innovation effects is to improve management of business processes and incentive systems. It is useful for developing new business models and strategies and the related investment programmes. It provides valuable experience in risk management and in gathering and application of good practices.

METHODOLOGY OF RESEARCH

The applied multi-stage research model is presented in Figure 1.

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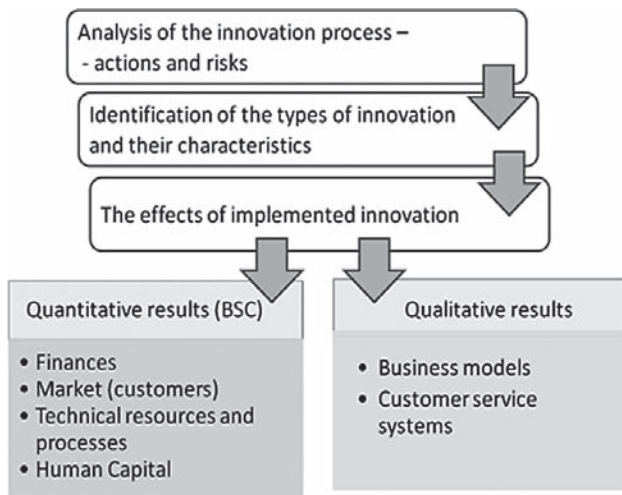


Figure 1 Model of evaluation of the effects of innovation implementation.

The first stage of the research consists in the drawing up and analysis of a map of the innovation process (Figure 1). This phase of the research resulted in determination of the most important operations related to the creation or absorption of innovations. The map of the process shows the course of preparing the decision on the implementation of innovation.

The next stage is identification and analysis of the used innovations grouped into process, product, marketing and organisational innovations. The latter two types of innovation are often associated with implementation of modern customer service systems and changes of business models.

Qualitative effects were analysed from the point of view of changes in the structure of the business model understood as a configuration of business processes and social and technical architecture. For quantitative evaluation of the values obtained through application of specific types of innovations elements of the BSC tool were used [12]. The value created through innovations was represented by the results (effects) obtained in four areas:

- financial
- market
- technical resources and processes
- human capital development.

STUDY RESULTS AND DISCUSSION

Results of the research were presented based on the example of the case studies of two businesses. The first one is a trading and service company which has been developing its steel service centres (Company A). The other one is a manufacturing company – a rolling mill specialising in hot-rolled, long steel products (Company B).

The research process started with a comprehensive analysis of the innovation map (Figure 2) presenting the main operations facilitating application of innovations. The aspects of innovation implementation which are

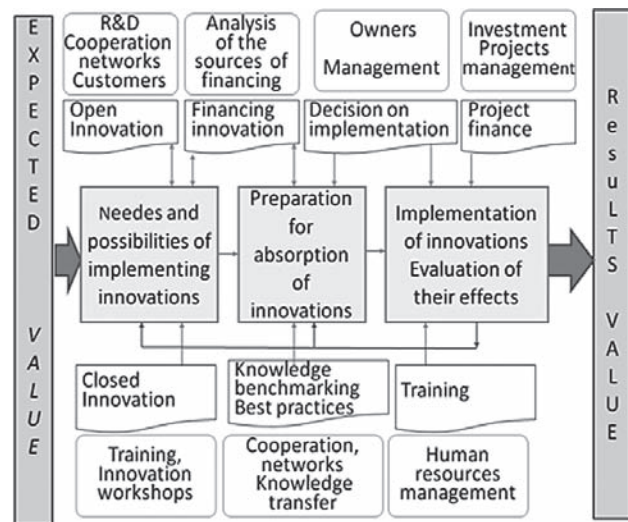


Figure 2 The map of the innovation process in a metallurgical company

worth noting include: risk assessment, procurement of financial resources, preparation of employees by ensuring their right qualifications or application of management through projects (Figure 2).

Qualitative effects included changes in business models. The Company A changed its business model from a company trading in metallurgic products into a steel and steel structures service centre. The other company developed, besides the manufacture of wire rods, the services of cutting, bending and welding metal products. Implementation of innovations in 2008-2015 allowed to obtain the effects presented in Tables 1 - 4. From analyses of the information presented in the table it follows that:

1. The values obtained in the financial area (Table 1) show that profitability of both companies increased. What is worth emphasising is a significant increase of EVA in the Company and of the return on sales dynamics.
2. In the area of customers (Table 2) product and process innovations (EU funds) allowed the Company A to achieve high dynamics of sales and its value per customer. The dynamics of these values was significantly lower the case of Company B which was caused by its limited investment operations (Table 3).
3. What is worth noting in the area of technical processes and resources (Table 3) is a broadened product offer resulting from the development of the steel product service centre.

Table 1 Results in the financial area- companies :A and B ()

Result	Measure	Value(years)	
		2008	2015
Economic value added (EVA)	million EURO	-0,19 (1,2)	0,42 (1,3)
Return on sales	%	1,3 (3,1)	7,6 (4,5)
Return on assets	%	5,4 (7,8)	7,2 (10,5)
Net income dynamics	2008=100%	100 (100)	442 (186)

Table 2 Results in the market area- companies :A and B ()

Result	Measure	Value(years)	
		2008	2015
Value of sale	million EURO	4,2 (30,3)	13,2 (46,2)
Value per customer dynamic	2008=100%	100 (100)	292 (139)
Percentage of satisfied customers,	%	75,5 (80,1)	85,4 (83,7)
Number of regular customers	quantity	74 (37)	133 (46)

Table 3 Results in the area of technical processes and resources - companies :A and B ()

Result	Measure	Value(years)	
		2008	2015
Value of machines and equipment	increase (%)	8,1 (-0,7)	88,6 (12,9)
Number of new processes	quantity	2 (0)	8 (2)
New product offers	quantity	3 (2)	19 (10)
Decreased number of complaints,	Decrease (%)	1,4 (0)	1,2 (0,9)

Table 4 Results in the area of human capital development - companies :A and B ()

Result	Measure	Value(years)	
		2008	2015
Innovativeness of employees	Number of innovations	5 (3)	5 (1)
Sales increase per employee	2008=100%	100 (100)	252 (152)
Personnel qualifications	Number of specialists	39 (7)	76 (16)
Percentage of satisfied employees	%	68 (76)	84 (86)

4. The results obtained in the area of human capital (Table 4) indicate the growth of employees' productivity increase of employees' innovativeness was observed which indicates that the companies covered by the research use open innovations. Increase of employees qualifications is noticeable.

SUMMARY

Analysis of the results (effects) achieved by the analysed smelting companies shows an increasing importance of innovation in the creation of customer value and value for the business. Qualitative results indicate changes in business models oriented at modernisation of technological processes and better customer service. Application of BSC in the companies covered by the

study allowed to evaluate the results of innovations implemented in 2008-2015 from the quantitative point of view, taking into account economic, technical (process) as well as human capital-related effects. Innovative changes in technological processes resulted in improved quality and broadened range of offered steel products and services which allowed the companies to compete in the market. Improved competitiveness manifested itself in increased sales and financial profit. To sum up, it might be concluded that BSC is the right tool for measuring effects by various types of innovations in companies.

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Note: I take a full responsibility for the above translation as a competent translator from Polish into English