

THE DIAGNOSIS OF ORGANIZATIONAL INTELLIGENCE FROM THE PERSPECTIVE OF OPEN INNOVATION- CASE STUDY

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Abstract

In the paper, the problem of the diagnosis of organizational intelligence in terms of implementation of open innovation and its impact on decision-making processes in the enterprise has been subjected to discussion. The whole of the presented considerations have been divided into three main parts. The first part of the paper presents the essence of organizational intelligence as the foundation for value creation in the enterprise. The considerations included in the second part include the characteristics of open innovation as an instrument for creating competitive advantage. The last part of the paper is the presentation of the results of the empirical research conducted on the basis of the case study in the assessment of organizational intelligence from the perspective of the open innovation implemented. The objective of the study is to find out and assess the relationships between organizational intelligence creation and implementation of open innovation in the enterprise. The issue of creating organizational intelligence is new and important due to its impact on decision-making processes in the field of efficiency of enterprise management, particularly, when this objective is accomplished using open innovation.

Keywords: Organizational intelligence, open innovation

1. INTRODUCTION

Nowadays, management science should respond to changes taking place in the economic reality of enterprises since it is a scientific discipline, both theoretical and empirical one. The changes in the area of enterprise management observed currently are, among others, the result of the technological revolution taking place on a large scale, which creates the need for taking into account a new perspective in the scientific approach. Therefore, among universal areas of manifestation of organizational intelligence of enterprises, there is indicated the significance of strengthening the strategy based on creativity and innovativeness and also development of the organization design which can help support its intelligence [1]. In this context, the research question arises: is it possible to observe the relationships between organizational intelligence creation and implementation of open innovation in the enterprise? It seems that it is worth taking a closer look at the ways of understanding of organizational intelligence and the relationships between this concept and implementation of open innovation in the enterprise. This is determined by the fact that, in the current economic conditions, enterprises need to rapidly respond to changes in the environment through proper implementation of innovative solutions. As a consequence of the formulated question, the objective of the paper has been to learn and assess the relationships between organizational intelligence creation and implementation of open innovation in the enterprise. The research methods applied to find out and evaluate the relationships between organizational intelligence creation and implementation of open innovation in the enterprise are: literature study, case study, trend analysis of return on sales (ROS) and value-added intellectual coefficient(VAIC)TM.

2. THE ESSENCE OF ORGANIZATIONAL INTELLIGENCE AS THE FOUNDATION FOR VALUE CREATION

In the subject literature, organizational intelligence is defined as the organization's ability to adapt to the changed tasks, create simple, flexible structures, operating independently and the ones which will provide perfect internal communication [2]. Some similar attributes of organizational intelligence were already



suggested about forty years ago [3] and subsequently clarified and subjected to conceptualization [4,5]. Organizational intelligence is also understood as the intellectual ability of the whole organization to develop and strategically strengthen the knowledge relevant to the effective achievement of objectives [6]. This means that organizational intelligence consists in facing the changing environment properly by means of the appropriate design of the organization, infrastructure, strategy and business model. At the same time, organizational intelligence, among others, allows for exploiting opportunities occurring in the market, by means of which, it affects the ability of the organization to create new products or services and innovative actions and allows for flexible adjustment to changes taking place in the business environment [7].

Organizational intelligence is also defined as the ability to deal with the complexity of the environment through capturing the meaning of signals coming from it [8] and can be perceived as a way of adjustment behavior, responding to the changing environment. As a result, an intelligent organization promotes the development of tacit knowledge in order to revive creativity [9], uses intellectual capital of the enterprise in order to increase performance and improve the effectiveness of decision-making processes.

While analyzing the presented approaches to the essence of organizational intelligence it can be noticed that its important component is intellectual capital. In the context of an intelligent organization, intellectual capital is the ability of the enterprise to transform new ideas into products or services [10]. However, it does not have a specific market value itself despite the fact that it reflects the gap between the market value and the book value of the enterprise [11]. According to L. Edvinsson, intellectual capital consists of two components: human capital and structural capital [11], which is presented in **Table 1**.

Table 1 Components of intellectual capital [Source: 11]

Human capital	Relational structural capital
Know-how	Logo
Education	Customers
Professional qualifications	Customer loyalty
Knowledge related to the work performed	Distribution channels
Professional and psychometric aptitude	Cooperation with other enterprises
Entrepreneurship, enthusiasm, ability	Concession contracts
Innovation	Beneficial contracts
	Franchise agreements
Structural and organizational capital	
Intellectual property	Infrastructural assets
Patents	Management philosophy
Copyright	Organizational culture
Design rights	Management processes
Trade secret	Information system
Trademark	Relationship system
Distinctive services	Financial relationships

It is believed that human capital is the primary resource of competitiveness of enterprises in the conditions of market economy and affects gaining competitive advantage by the enterprise in the conditions of hypercompetition [12]. The second most frequently listed component of intellectual capital is structural capital. It includes processes and operational systems in the enterprise [13]. Structural capital is defined as the adjustment of organizational skills of the enterprise to the requirements set by the market, taking into account



the organization of production processes of the company and its internal structure in order to ensure optimal use of the knowledge and competencies of employees [11].

While considering the role of intellectual capital in the identification of the essence of organizational intelligence, it is worth paying attention to the fact that the ability of prospective thinking, allowing for the construction of an intelligent company, translates to its creation [9]. Managers of intelligent enterprises focus their decisions and operations on the realization of the assumed results through the use of high efficiency, knowledge, creativity and innovativeness [14]. Such an approach allows for both maintaining and increasing competitive advantage on the market.

Summing up the above considerations, it should be noted that decision-making processes in intelligent enterprises should be directed to the cognition of the surrounding environment and adaptation to market trends. At the same time, intellectual capital and innovativeness are the basic carriers of value [15], determining the company value. The listed determinants of the enterprise value should be subjected to management processes in order to maximally use the value potential and generate its organizational intelligence.

3. OPEN INNOVATION AS AN INSTRUMENT TO CREATE A COMPETITIVE ADVANTAGE

In the conditions of hypercompetition [13], the emergence of innovation launched by enterprises forces competitors to take immediate decisions aimed at maintaining or gaining market advantage. W. Chan Kim and R. Mauborgne emphasize the role of generating the proposition of value based on innovation. The listed authors refer to value innovation in the blue ocean strategy which constitutes a strategic imperative of the development of modern enterprises [16]. The role of innovation in the processes of value creation is pinpointed by C.K. Prahalad and M.S. Krishnan. According to these authors, the most important component of the structure of innovation and competitive potential of the company is the business model which should serve its transformation [17]. This means that innovation is the basis for effective decision-making aimed at remaining in the market. At the same time, the construction of the innovation strategy requires, on the one hand, taking immediate decisions, allowing for maintaining market advantage [18], and on the other, it is a long-term process, which includes both technical, technological, production, service and market areas, realized on a micro- and macro- scale [19].

The innovation strategy is realized through the research and development activity (R+D), which includes product development, patent policy, license policy as well as innovative cooperation of enterprises. The emergence of innovative activities enforces the necessity to include their costs and benefits in business models. Therefore, the information generated in the business model should be *ex ante* in its nature [20], not *ex post*, since it can become the stimulus impeding and not creating the development of innovativeness of enterprises [21].

The concept of open innovation, suggested by H. W. Chesbrough, consists in using external and internal ideas in own innovation processes and external and internal channels for launching innovation into the market [22,23]. In the subject literature, there are presented different approaches to open innovation. Some researchers consider open innovation as an external source of innovation activity of the company informing on its openness [24]. For other researchers, open innovation amounts to systematic encouragement and study of internal and external sources of innovation, which integrate research with capabilities and resources of the company [25]. Open innovation is also considered as a set of activities to achieve benefits coming from running innovation and the modelling of creation, explanation and examination of these activities [26] by means of which they affect innovation activity of the company [27].

Summing up, it can be concluded that open innovation reflects the holistic approach to the strategy of innovation management. This means that open innovation consists in simultaneous exploration, study and use of various sources of opportunities for innovation and conscious integration of selected sources of opportunities for innovation with the potential and resources of the company [28]. At the same time, open innovation enforces the use of different instruments and tools for development and implementation of the identified opportunities

for innovation [25]. Therefore, it can be assumed that innovativeness of enterprises becomes a factor which actuates the situation in the industry, which creates challenges for other participants of the market game who must adapt to situations created by innovation.

4. METHODOLOGY OF RESEARCH AND STUDY SAMPLE

The objective of the research was to learn and assess the relationships between organizational intelligence creation and implementation of open innovation in the enterprise. While referring to the concepts of [H. Chesbrough in the field of open innovation](#) [22] and Ch.W. Choo, relating to organizational intelligence [6], it was assumed that the analyzed company makes use of the results of research and development works from the external sources of innovation on the basis of the cooperation with other enterprises, which increases its intellectual ability to develop and strategically strengthen knowledge and efficiently achieve the objectives.

The research procedure was conducted on the basis of the case study. The use of case study to accomplish the objective assumed in the paper allows for the presentation of the accurate image of the analyzed phenomena [29]. It should be remembered, though, that case study is a method of a probabilistic possibility of scientific cognition, having some constraints [30]. These constraints are intuitive and subjective judgements and low representativeness of results. However, a significant advantage of case study is the presentation of an in-depth image of the analyzed relationships.

The empirical research was based on the data from the financial statements of the heating industry company located in southern Poland. The analyzed company was selected on the basis of purposive sampling. The selection was determined by the availability of data essential for conducting the empirical research since the analyzed company uses open innovation in the form of contracts for R+D. The range of the empirical data includes the years 2007-2017.

In order to accomplish the objective, the applied research tool, enabling the measurement and assessment of the relationships between organizational intelligence creation and implementation of open innovation in the analyzed company, is return on sales (ROS). The trend analysis of this indicator will allow for obtaining the information on the change in the performance of the analyzed company as a result of implementation of open innovation. In order to detail the relationships between organizational intelligence creation and implementation of open innovation, the analysis of value-added intellectual coefficient (VAICTM) was carried out. This indicator is used for measurement of the efficiency of management of intellectual capital resources and consists in assessment of the value added, which is generated by the enterprise. In addition, there is defined the impact of the resources of physical and intangible capital on the value added [31,32], which allowed the examination of the detailed reasons for the emerging phenomena.

5. RESULTS AND DISCUSSIONS

In the analyzed enterprise, in 2008 there was an increase in the value of return on sales compared to the base year (**Figure 1**). In the years 2008-2010 the level of the indicator was characterized by a downward trend, which caused that, in the analyzed company, in 2010 there was made a decision on the implementation of open innovation. This innovation was in the form of the contract for R+D in modernization of operating activities of the analyzed company and, precisely, it consisted in the development and implementation of the technology of trigeneration. The cost of the contract amounted to 45 % of the budget of operating activities, however, already in 2011 the incurred costs brought the effects in the form of an increase in the value of return on sales. This means that the actions taken for the benefit of implementation of open innovation are effective and the decision-making process in the field of the sales policy generates an increase in return on sales, which is a normal trend.

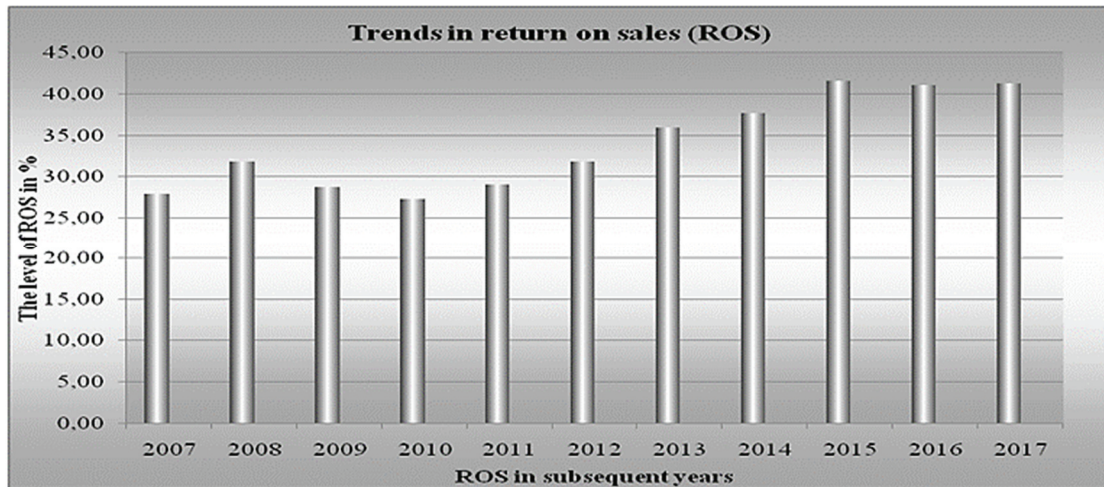


Figure 1 Trends in the level of ROS in the analyzed company in the years 2007-2017 [own study]

The research conducted using the return on sales ratio allowed the examination of the level of commitment of sales revenue to generate profit in the analyzed company. However, the presented indicator has limited fields of reception, therefore, it becomes purposeful to obtain a complete assessment in a dynamic section through the examination of value-added intellectual coefficient VAICTM, which serves the measurement of the efficiency of management of intellectual capital resources, which constituted the second stage of the research work. The trend analysis of value-added intellectual coefficient(VAIC)in the analyzed company (**Figure 2**) presents an increase in the ratio over the years 2007-2008. In the years 2009-2010 a downward trend of the analyzed indicator can be observed. The values of VAIC over the years 2011-2017 were subjected to a systematic increase, which means a favorable state of intellectual capital in the analyzed company.

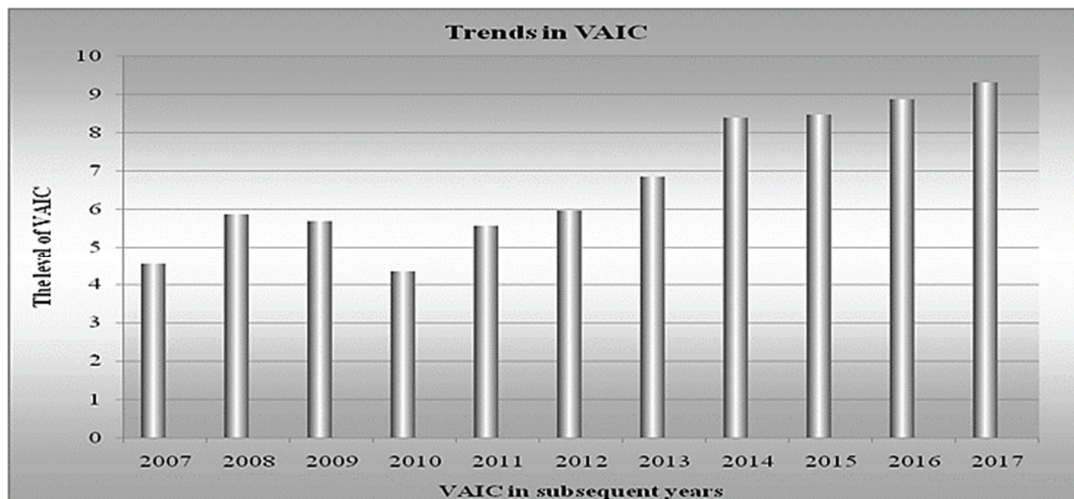


Figure 2 Trends in the level of VAICTM in the analyzed company in the years 2007-2017 [own study]

While attempting to assess the relationships between organizational intelligence creation and implementation of open innovation in the analyzed company, obtained on the basis of VAICTM, it can be concluded that the organizational intelligence of the analyzed company measured with the VAICTM model is determined by the efficiency of the use of intellectual capital. The research conducted on the basis of VAICTM allows the extension of the perspective of measurement of the organizational intelligence of the analyzed company. While comparing the results obtained from the analysis of ROS and VAICTM, the consistent and complex set of information enabling the measurement and assessment of the relationships between organizational

intelligence creation and implementation of open innovation in the analyzed company was obtained. It should be pinpointed that VAIC™ is an interesting model supporting decision-making processes although it is not free from disadvantages. However, the simplicity of the indicator calculation algorithm and easy access to financial information essential for its calculation increase the application pragmatism of the VAIC™ model.

6. CONCLUSION

The conducted research indicates that the measurement of intangible resources of the analyzed company and return on sales in the analyzed company provided consistent and complex information allowing for determining the relationships between the resources of physical and intangible capital and allowed the diagnosis of the organizational intelligence of the analyzed company as a result of implementation of open innovation. Such a research approach allowed the accomplishment of the assumed objective aimed at learning and assessing the relationships between organizational intelligence creation and implementation of open innovation in the enterprise. The main contribution of the paper is the in-depth understanding of the coexistence of relationships between implementation of open innovation in the enterprise and creating its organizational intelligence. A clear implication from the theoretical and empirical assumptions of the conducted case study is that maintaining high operational efficiency of sales requires the selection of appropriate instruments providing information on changeability of economic phenomena in the enterprise environment. Modern enterprises operate in the environment characterized by a high pace of changes, therefore the appropriate selection of instruments supporting decision-making in the area of implementation of open innovation should accelerate the process of adaptation to changes. Moreover, the turbulence of the environment brings about that enterprises, in order to maintain competitive advantage in the market, must create and diagnose organizational intelligence through the implementation of open innovation, which becomes the generator of profitability of the company. In order to accomplish the objective of the paper, there were used mainly literature studies and case study, trend analysis of return on sales (ROS) and value-added intellectual coefficient (VAIC™).

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