

EFFECTIVENESS OF THE INNOVATION PORTFOLIO IN POLISH ENTERPRISES – RESEARCH RESULTS

SKUTECZNOŚĆ PORTFELA INNOWACJI W POLSKICH PRZEDSIĘBIORSTWACH –
WYNIKI BADAŃ

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Abstract: A single innovation project has a low probability of success, while the company's chances of gaining a competitive advantage are low. Only a properly diversified innovation portfolio gives a chance for market success. The aim of the article is to analyze the issue of the effectiveness of innovation portfolio management in Polish enterprises, due to various external and internal factors, and also to identify clues determining the success of the innovation portfolio among enterprises in the future. For this purpose, a literature review in the area of the innovation portfolio was conducted. Also the method of analysis and criticism of the literature was applied. In the research process, empirical articles and Statistics Poland reports were analyzed. As a result of the analyses, effective ways to build innovation portfolio efficiency were identified by pointing out factors that can contribute to key optimization decisions (e.g., proper planning and diversification of the innovation project portfolio). Enterprises, in order to achieve innovation portfolio efficiency in difficult market conditions, should reallocate their resources to less risky innovation projects, and at the same time accepting the risks associated with introducing a transformational innovation.

Keywords: Innovation, Innovation Portfolio, Portfolio of Innovative Projects, Innovation Portfolio Management

Streszczenie: Pojedynczy projekt innowacyjny cechuje się niewielkim prawdopodobieństwem sukcesu, zaś szanse przedsiębiorstwa na uzyskanie trwałej przewagi konkurencyjnej są niewielkie. Dopiero odpowiednio przygotowany i zróżnicowany portfel innowacji daje szanse na sukces rynkowy. Celem artykułu jest analiza problematyki skuteczności zarządzania portfelem innowacji w przedsiębiorstwach polskich, ze względu na różnorodne czynniki zewnętrzne i wewnętrzne, a także zidentyfikowanie wskazówek decydujących o sukcesie portfela innowacji wśród przedsiębiorstw w przyszłości. W tym celu przeprowadzono przegląd piśmiennictwa z obszaru dotyczącego portfela innowacji oraz zastosowano metodę analizy i krytyki piśmiennictwa. W procesie badawczym przeanalizowano artykuły empiryczne i raporty GUS. W wyniku przeprowadzonych analiz wskazano na skuteczne sposoby budowania efektywności portfela innowacji poprzez zidentyfikowanie czynników, które mogą przyczyniać się do podejmowania kluczowych decyzji optymalizacyjnych (np. odpowiednie zaplanowanie i zdywersyfikowanie portfela projektów innowacyjnych). Przedsiębiorstwa, aby osiągnąć efektywność portfela innowacji w trudnych warunkach rynkowych, powinny umiejętnie realokować swoje zasoby na mniej ryzykowne projekty innowacyjne, akceptując jednocześnie ryzyko wiążące się z wprowadzaniem innowacji nowatorskiej/radykalnej/transformatywnej.

Słowa kluczowe: innowacja, portfel innowacji, portfel projektów innowacyjnych, zarządzanie portfelem innowacji

Introduction

Innovation is seen as one of the most important sources of competitive advantage, (Hamel, 2006; Sachpazidu-Wojcicka, 2017) and the main direction of development of modern companies (Dobrinsky, 2008; Porter, 1985; Verma, Bashir, 2017).

In the literature, we can find many ways of defining innovation and its various classifications. J.A. Schumpeter is widely regarded as a *pioneer of innovation* theory. He defined innovation broadly, specifying that it includes a new product or modern

solutions which already exist on the market, continuous improvement, development of the way of selling, purchasing, as well as opening new markets (Janasz, Koziół-Nadolna, 2011). According to J.A. Schumpeter, innovation should contribute to a positive economic outcome (Niedzielski, Rychlik, 2006). It can also be assumed that innovation is the introduction of out-of-the-box solutions to enterprises and the use of non-standard processes, technologies and products (Ober, Karwot, 2017). Innovations are determined by the need for change

(Janasz, Koziol, 2007). Therefore, we can find many different classification of innovations, such as:

- product vs. process innovation, technological vs. management innovation, or radical vs. incremental innovation (Damanpour, Aravind, 2012),
- routine, radical, disruptive or structural innovations (Pisano, 2015),
- core innovation, adjacent innovation and transformational innovation (Nagji, Tuff, 2012),
- static vs. dynamic innovation (Sopińska, Mierzejewska, 2017).

However, regardless of the perspective taken, innovation can refer to changes in technology, methods and organization of the production process, as well as in products (a narrow understanding of innovation), in the social system, economic structure and nature (a broad understanding of innovation) (Sopińska, Mierzejewska, 2017).

In order to succeed in a market dominated by innovation and innovative enterprises, it is worth implementing various types of innovations, characterized by different degrees of novelty. Such a strategy of innovation activity indicates that companies are guided by a diversified innovation portfolio (a collection of diverse innovations) in their innovation policy.

In many companies, innovation is increasingly taking the form of project activities (Stefaniuk, 2019). Hence, an innovation project is “a set of activities (actions) undertaken for the realization of specific goals, limited in terms of cost, time and quality, which, on the one hand, make it possible to generate innovation of a radical nature, which is usually associated with a significant complexity of the undertaking, on the other hand, carry a high risk of ending in failure” (Janicki, 2014). Speaking of an innovation project, its innovative nature should be clearly emphasized. Nowadays, the implementation and management of innovative projects as well as a portfolio of these projects is becoming a business necessity.

The purpose of the article is to analyze the issue of the effectiveness of innovation portfolio management in Polish enterprises, taking into account various external and internal factors and clues determining the success of the implementation of a portfolio of innovation projects among enterprises in the future.

Literature review

Every enterprise, regardless of the industry in which it operates or its size, if it wants to grow and survive in the long term, must consider the implementation of innovation projects in its operations.

However, a single innovation project has a low probability of success. Only a well-prepared portfolio of innovation projects will offer a chance for market success. Therefore, generating single innovations in an enterprise is the beginning of a way of managing innovation in the company. Only a properly process and an appropriately diversified portfolio of innovation projects lead to market success at the right time and at the right cost. Therefore, innovative companies actively build their innovation portfolio. It means that they make decisions on resource allocation between different types of innovations. These decisions are related to the consideration of a number of factors and criteria, both internal and external, which, taken as a whole, contribute to the success of an innovative enterprise in the market. Nowadays, most companies invest in initiatives along a broad spectrum of risk and reward. Their goal should be to construct the portfolio that produces the highest overall return that's in keeping with their appetite for risk (Nagji, Tuff, 2012).

To succeed in a market dominated by innovation and innovative companies, it is very important to properly design, prepare and manage an innovation portfolio. Proper innovation portfolio management involves consciously building an innovation portfolio to optimize and diversify innovation risk (Hoffmann, 2017).

Building an innovation portfolio by companies is often very individual and depends on a number of factors, such as: the specific market in which the organization competes or the technology in industry or other aspects that influence the selection and success of an innovation project. Success factors for innovation portfolio management can also be (Hoffmann, 2017):

- implementation of an innovation strategy that helps to understand the organization's innovative goals and preferred ways to achieve success. The innovation strategy must determine the criteria for selecting projects approved for implementation within the portfolio,
- taking into account the organizational culture of the whole organization and the team appointed to run the innovation projects (including taking action connected with modification of the culture),
- attention and vigilance of managers focused on the leadership competencies of the innovation manager, tracking project progress based on objective data, making decisions and motivating in the context of the success of the entire portfolio rather than the effectiveness.

The literature indicates that companies should allocate resources to the creation and implementation of a variety of innovations, with varying degrees of novelty in order to maintain a competitive advantage and increase the value of the company (Am, Furstenthal, Jorge, Roth, 2020; Pisano, 2015). The best results in this area are achieved by organizations that allocate about 70% of resources to innovations in core business areas (core innovations), 20% – to adjacent innovations, and 10% – to change initiatives (transformational innovations) (Nagji, Tuff, 2012). In contrast, returns on investment in innovation are characterized by the opposite dynamic: 70% of profits come from transformation, 20% – from adjacent innovation, and 10% – from core innovation.

It is worth building a diverse and balanced portfolio of innovation projects in terms of creating value for the company and its customers (Dziurski, Mierzejewska, 2022) and also managing it properly. Project portfolio management is the process of analyzing and allocating the organization's resources among projects and programs so as to

achieve the organization's goals and maximize stakeholder value. It is a dynamic decision-making process during which a set of active projects (or programs) is continually reviewed and updated (Martinsuo, Lehtonen, 2007).

In practice, the management of a portfolio of innovation projects involves the implementation of a number of activities that should be realized in the following stages (Żmigrodzki, 2023):

Stage 1 – establishing the definition of the innovation project,

Stage 2 – identification of sponsors,

Stage 3 – preparing a list of innovation projects,

Stage 4 – estimating the general labor intensity of innovation projects,

Stage 5 – preparing an *action plan* for the innovation project portfolio,

Etap 6 – regular review of the project portfolio.

The detailed characteristics of the various stages of innovation project portfolio management are presented in Table 1.

Table 1. Stages of innovation project portfolio management in practice

| Stages | Characteristics |
|--|--|
| Stage 1 – establishing the definition of the innovation project | This stage involves defining an innovative project definition that will be understandable, clear and unambiguous to all project participants, especially if the project is novel, requires the cooperation of many people and the outcome is not obvious (e.g., the company has never before organized such a task/assignment or never worked with a specific client). |
| Stage 2 – identification of sponsors | For effective management of a portfolio of innovation projects, it is crucial to accurately identify the project sponsor, who is a decision-maker, high up in the company's hierarchy. Such a person knows what the project is for, what results can be expected from it. The sponsor may also finance the ongoing project, and also authorizes its benefits, initiation and termination, or decides on its early closure. |
| Stage 3 – preparing a list of innovation projects | The company often does not have the chance to execute all ideas/projects and therefore it needs to focus on the most important ones. Innovative ideas are sometimes attractive to employees, develop competence or solve a problem in the team. However, they should also bring value to the organization. An official list of planned innovation projects and the need for sponsors to sign off on each one limit projects that are not very effective. |
| Stage 4 – estimating the general labor intensity of innovation projects | A company should evaluate its ability to execute a lot of projects in whole year in order to achieve the benefits. To do this, the easiest way is to ask project managers how much work it would take to complete their tasks. At first, a general estimate of labor intensity in man-days will suffice. Later, it is worth adding to this the capabilities of individual departments. |
| Stage 5 – preparing an <i>action plan</i> for the innovation project portfolio | The first criterion for portfolio planning is the importance of the project. So we plan the most important ones for the company first. The second criterion is the availability of resources. So, we first allocate those resources that are most in demand and most frequently used in many projects, identifying bottlenecks, taking into account the next days, weeks or months. |
| Stage 6 – regular review of the project portfolio | The final step in the context of project portfolio management is to constantly refresh knowledge of what is happening in projects. To do this, sponsors and department supervisors are invited to regular meetings, such as weekly or monthly, where changes in the portfolio are discussed. |

Source: own work based on: (Żmigrodzki, 2023).

An innovation project portfolio management is the proper process of preparing, stimulating, proceeding and reviewing projects at many stages.

Innovation project portfolio management is the proper process of preparing, stimulating, proceeding and reviewing projects at multiple stages. Publications on innovation project portfolio management emphasize that in order to achieve success we need: transparency, formalization of the process, and availability of the information needed for decisions. Less important to portfolio performance are the portfolio management techniques and methods used, as well as the type of project evaluation criteria used (Urhahn, Spieth, 2014). Another important area within portfolio management research is the issue of selecting initiatives for a portfolio of R&D projects (Verbano, Nosella, 2010).

Methodology and theoretical basis

The methodology used in the study is based on a review of the literature in the area of corporate innovation with an indication of the area concerning the portfolio of innovations. The purpose of the literature review is to analyze the factors determining the effectiveness of innovation project portfolio management in Polish enterprises and also to find guidelines for efficient realization of innovation project portfolio implementation in enterprises in the future. The literature review was conducted on the basis of available articles published in Polish in the Google Scholar database in 2020-2023, using the following assumptions: keyword: “enterprise innovation portfolio”. This resulted in a sample of 599 results, which were then verified for the inclusion of the word “effectiveness” (197 results) in the analyzed article. Then empirical articles that were relevant to the analyzed topic were selected for the research process. The study also used reports of the Statistics Poland and applied theoretical methods: analysis of the literature on the subject, synthesis and formulation of conclusions.

Results and discussion

In the paper, the effectiveness of the innovation portfolio in Poland in 2018-2022 is presented on the basis of surveys conducted by the Statistics Poland concerning the innovative activities of Polish enterprises. The results of the Statistics Poland surveys indicate the number of enterprises that are innovatively active before and during the pandemic period (Table 2).

Table 2. The effectiveness of the innovative activity of enterprises before and during the pandemic period

| Activity | 2018-2020 (pre-pandemic period) % | 2019-2022 (post-pandemic period) % |
|---|--------------------------------------|---------------------------------------|
| Innovation activity of industrial / service enterprises | 36,7 / 33,0 | 26,3 / 22,2 |

Source: own work based on: (Statistics Poland, 2023).

In 2018-2020, innovation-active industrial and service enterprises accounted for 36.7% and 33.0% of the total number of such enterprises, respectively. And after the outbreak of the pandemic, this ratio decreased to 26.3% and 22.2%, respectively. This result shows the strong influence of external factors on the level of innovative efficiency of industrial and service enterprises.

The effectiveness of the innovation portfolio in Poland after the outbreak of a pandemic related to the spread of the SARS-CoV-2 virus can also be verified on the example of empirical research conducted by P. Dziurski and W. Mierzejewska (Dziurski, Mierzejewska, 2022). The research was done on a sample of 74 large Polish enterprises. The study showed that the effectiveness of the innovation portfolio was reduced (significantly decreased), because the structure of the innovation portfolio was determined in a different way in order to reduce the cost of companies. In their research, the authors present the allocation of resources for the creation and implementation of core innovations, adjacent innovations and transformational innovations. The results show the significant impact of the pandemic on the innovation activities of enterprises in the area of efficiency and the structure of the innovation portfolio of enterprises. Table 3 shows the effectiveness of the innovation portfolio of enterprises before and during the pandemic.

Table 3. Effectiveness of companies' innovation portfolio before and during the pandemic (n = 74), in %.

| Types of innovation | before the pandemic | during the pandemic |
|------------------------------|---------------------|---------------------|
| Core innovations | 27,6 | 42,7 |
| Adjacent innovations | 47,5 | 39,3 |
| Transformational innovations | 24,9 | 18,0 |

Source: own work based on: (Dziurski, Mierzejewska, 2022).

The presented research indicates a number trends evidenced during this period. Companies are trying to optimize their operations by limiting the scale of expenses and investments and also focusing on core innovations and reducing transformational

innovations. The reduction of resources mainly concerns all projects whose effects are uncertain and have been postponed (Archibugi, Filippetti, Frenz, 2013), i.e. radical and transformational innovations. It is a natural reaction to a situation of risk and uncertainty in the environment.

However, it is worth pointing out that even then, managers should not completely stop carrying out innovation projects of a more radical nature, as this can cause negative effects for the entire enterprise (e.g., lower motivation and satisfaction of employees, negative mood at work, lower trust in superiors) and negatively affect its competitive position. Limiting innovative activity in times of change seems a natural, but also short-sighted strategy that can have negative strategic consequences in the long term (Dziurski, Mierzejewska, 2022).

In addition to external factors, internal factors should also be considered in ensuring the effectiveness of the implementation of innovation projects, such as: the size of a company's innovation portfolio and the degree of confidence in the success of the entire portfolio, or the preparation and implementation process of innovation projects, but also the organizational culture and the team and innovation manager appointed to implement innovation projects.

Another important internal factor that influences the effects of implementing innovative projects is also the appropriate planning of the project portfolio in terms of costs, project implementation time and the range of activities related to the work performed for the project portfolio (Redlarski, 2016). A narrow innovation portfolio leads to a limited probability of success for the innovation portfolio and at the same time reduces the degree of risk for the enterprise. On the other hand, when a broad portfolio of innovation projects is chosen, the enterprise spends more resources and requires a management team and significant attention from managers. As a result, there will also be fixed costs. And fixed costs mean less flexibility and more risk (Orlen, 2016).

However, for an innovation project portfolio to be effective and successful we need a number of independent projects in the portfolio, that is, projects that form a well-diversified portfolio of projects. There are several ways to increase the effectiveness of a project portfolio (Orlen, 2016):

- concentrate innovation management in a single decision-making center within the company – portfolio risk management requires a centralized view, as does the selection of projects for the portfolio. A portfolio that is diversified (in which the chances of two projects being

implemented are independent of each other) will naturally be smaller and less costly than when projects are duplicated,

- adopt a stage-gate procedure to account for the entire portfolio, there can be no failure for individual projects,
- improve the selection of companies for the portfolio through *mission-oriented portfolios*
- not to account for individual projects, but the entire portfolio,
- systematically, consistently, and based on transparent criteria, eliminate projects that are not promising for success – avoid prolonged project deadlines and situations where a project is maintained for historical reasons, only because of the expenses incurred,
- make company resources available to innovators (in the form of networking, access to technical and marketing specialists, laboratories, access to sales networks) – to reduce testing time, bring the project closer to real conditions and accelerate the innovative venture's achievement of scale,
- stimulate innovators, e.g., by helping them find alternative uses for technology, by building an environment for the exchange of ideas – the goal is not only to build the well-being of innovators, but also to increase the likelihood of monetizing innovations.

Conclusions

The innovation activity of market enterprises is associated with realizing many different innovation projects at the same time, optimizing their effects and targeting the market success of the enterprise. The effects of this activity depend on the appropriate building of the innovation portfolio, as well as the influence of various external and internal factors, which are important for the accurate selection of projects in achieving market success.

This paper has focused on analyzing the effectiveness of an innovation portfolio by pointing out factors that can contribute to key optimization decisions. These factors result from negative phenomena in the environment as well as inappropriate intra-organizational actions. The research indicates that the steps taken by Polish enterprises are adequate to the environment conditions and always refer to the capabilities of the enterprise, with the aim of minimizing the negative effects of changes. Enterprises, in order to achieve the effectiveness of the innovation portfolio in difficult market conditions, should reallocate their resources to less risky innovation projects (from adjacent and

transformational innovations to core innovations, connected with improving product range).

On the other hand, by giving up risk and deciding to projects that are financially, technological and market-safe for the company, we cut ourselves off from the source of success in innovation activities. A simple “modernization” or “improvement”, in contrast to novel/radical/transformational innovation, may not be enough in achieving competitive advantage. Hence, without a change in risk attitude and acceptance of risk and corporate responsibility may not succeed.

In summary, the following conclusions can be identified:

- an innovation policy is more active during periods of market stability. At that time, enterprises are more likely to take innovative risks to

ensure greater efficiency and effectiveness of selected projects,

- enterprises are more creative in the area of innovation and do not need to focus on actions aimed at survival and protection against the effects of adverse phenomena in difficult environmental conditions,
- companies are trying to optimize their operations by limiting the scale of expenses and investments, as well as focusing on core innovations and reducing radical and transformational innovations. As a result of such activities, companies are investing in a number of innovation projects, according to the principle: market success can be ensured by a well-chosen portfolio of projects.

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