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TECHNOLOGY AS A FACTOR OF THE DEVELOPMENT STRATEGY OF INDUSTRIAL COMPANIES

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Abstract: Each way of gaining new technology has its advantages and disadvantages. In any case, the company should estimate the costs of acquiring a new technology, taking into account the technological growth, the possessed opportunities of the machine park and its finances. Companies must take development initiatives to take over technology with full awareness of their own objective capabilities. In any case, one should not overestimate one's capabilities. One can not put people in a position to make decisions or manage events that go beyond their knowledge.

Keywords: innovation, competitive advantage, technology

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Introduction

A company in the market economy that wants to exist in the industry should systematically carry out a restructuring process that will consist in developing and adapting to the changing conditions that have taken place in the environment. Designing a strategy without prior and accurate balance of opportunities, threats and weaknesses and strengths of the company will not be effective and reliable. The ideal solution for such an operation is to carry out a proper analysis to examine and then confirm the way and direction of the organization's operations compared to the competitive environment and its changes. This allows for the introduction of appropriate technology in both organizational and technical issues, ie introducing appropriate innovations.

Determinants of enterprise strategy selection

The processes of formulating an effective and realistic company strategy are connected with taking into account many factors determining the choice of strategy. The choice of methods and method of development depends, among other things, on the existing and future potential of the given enterprise. It allows to determine the strategic ability of a given company, ie the possibility to develop, implement and operate an effective development strategy. This is determined by the culture of the organization, the ability to manage using both, tangible and intangible resources (Dobiegała-Korona, Jasiewicz 2000, p. 89). The company's resources are everything that is at its disposal and can affect its functioning. On the other hand, the potential of competitiveness is a resource that the company should have at its disposal to build, strengthen and maintain its competitiveness (Adamkiewicz-Drwiłło 2002, p. 99-100). This is presented in *Figure 1* which builds the competitive potential in a two-stage division of resources. The potential of competitiveness is the basic, within the organization, reservoir of sources of competitive advantage, hence it allows to determine the relevant main dimensions, ie type, size and durability to a great extent (Porter 2011, p. 62-77).

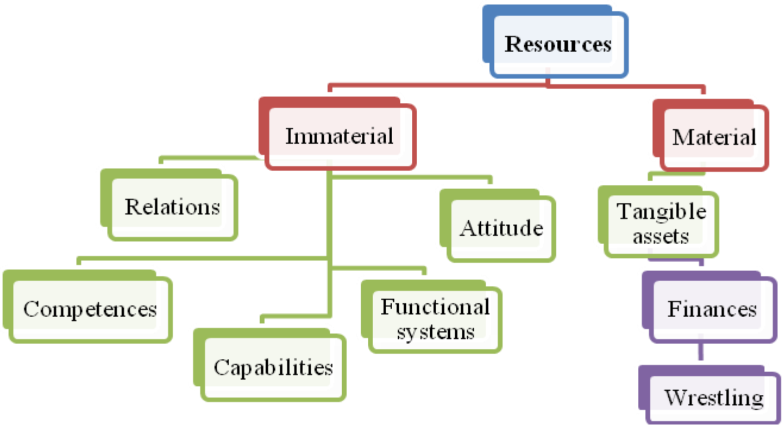

Figure 1. Schematic of resources present in the company

Source: Own study based on (Stankiewicz 2005, p. 105)

Competitive potential is a collection of resources that are used to achieve the set goals. It is a system that should be composed of subsystems that fulfill certain functions, thanks to which it is possible to achieve the system's goals. The emphasis is put on the best adaptation of the strategy to the company's strengths (Bossak 2006, p. 249). We rely on the competitiveness that we are able to maintain, expand thanks to our resources and competence. On the other hand, it is important to remember about the high level of difficulty of following the chosen strategy by competitors. This rule requires that the company chooses an advantage that is not yet used by competitors and can it defend it effectively (Borowiecki, Dziura 2016).

A separate group of factors determining the selection of the company's strategy are factors identified in the environment. The ability to use an opportunity is an important source of competitive advantage. There are different ways to develop a company that are often based on the use of opportunities. The basis for the company's development may be a strategy in the so-called opportunity language (or / and taking into account its structure of the opportunity ex ante) (Romanowska, Troicki 2002, p. 154-156). The combination of factors from the enterprise's area, strengths and weaknesses, as well as factors from the surrounding area, i.e. opportunities and threats, may take various forms and intensities. This allows us to distinguish four model strategic situations of the company.

The maxi-maxi strategy applies to situations where the company's strengths stand out, and opportunities play a significant role in the environment (Filipczak 2008, p. 23). Enterprises in this situation are characterized by strong expansion and diversified development. An example of such a situation are companies that have large production potential and modern technology. Such a company may, with a dynamically growing market, both invest in new products and enter new market segments (Żabiński 2000, p. 33). The mini-maxi strategy defines an enterprise in which there is an advantage of weaknesses over strong ones, but the arrangement of external conditions favors this company. The company should then reduce, correct internal shortcomings while taking advantage of opportunities. An example of such a situation are enterprises which, through a strategic alliance, try to take advantage of opportunities related to opening new markets, decide on their poor financial situation. The maxi-mini situation is disadvantageous for the company due to the poor arrangement of external conditions (Krupski 2014, p. 58). The action that overcomes this situation may be the use of its strengths and internal potential through a good competitive position, which in the conditions of shrinking demand, decide to apply the strategy of eliminating the purchasing or being purchased by competitors. The mini-mini strategy describes a company that has no development opportunities, operates in an unfavorable environment, and its potential for change is negligible. Such an enterprise has no strengths to fight threats and improve its weaknesses. This strategy often leads to liquidation of the enterprise or its increased efforts to survive (Krupski 2014, p. 58).

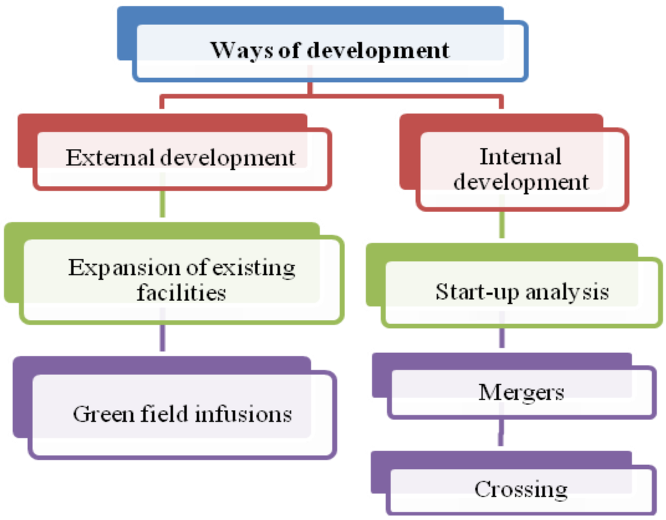

Figure 2. Ways of enterprise development

Source: Own study based on (Romanowska 2004, p. 201)

The growth of an enterprise can be achieved in two main ways, the expansion of the company from the inside and outside (*Figure 2*). Internal growth is defined by the fact that the main role is played by investment, still it is not the only factor. So often this form of growth is called investment one. External growth is primarily based on connections, which can be said as integrative, and potential investments as additional factor. This growth is called integration growth (Houben, Lenie, Vanhoof 1999, p. 126).

Internal development is a process that is primarily about expanding the company's potential. This is usually done by extending an existing company, for example by increasing employment, performing necessary repairs, investing in new production lines, and investing in new technologies or production organization methods. This process can be realized through greenfield investments that involve building a new company from scratch and attaching it to the parent company's capital or organizational structure (Lichtarski 2005, p. 245). Competitive advantage, despite being seen outside the company, is carried out inside the company. The internal roadmap of the development strategy consists of appropriate combinations of company strengths. These factors determine the ability of corporations to compete in the domestic and foreign markets. Knowledge and risk management must be taken into account so that we are able to recognize changes in the environment. Identifying changes allows you to adjust your goals, mission, and strategy. This has surely influence on the realization of the intended investment projects, the way of personnel management, quality or creating the appropriate organizational culture (Lichtarski 2005, p. 245).

The main criterion that divides growth from the outside is the economic potential. This is the way to treat the traditional way in which the company grows from the inside. The main roles are investments that enable greater tangible and financial or almost non-investment ways to achieve internal growth, including:

– increased production shift system,
– improvement of production, supply, inventory management and better use of machines,
– introduction of low-cost product and market innovations (Zastempowski 2010, p. 55-60).

The key factors in the implementation of the company's growth strategy are investments in the aspect of efficiency as well as finances and economy. Through the efficiency aspect, we understand that the process should allow the creation of the best combination of production factors. By the financial and economic aspect, we mean emphasizing inflows and expenses related to investments. Considering both aspects, the property owned by the company should be taken into account as its size determines the type and scale of the investment.

Most often the concept of investment is used as an increase in capital in relation to the stream of payment, which starts with expenditure, hoping that in the future receipts will exceed the former. Enterprises in a market economy invest market capital, e.g. in:

– securities - indirect and financial investments,

– property, plant and fixed assets - direct and tangible investments,
– staff training, R & D activity - material investments,
– other enterprises, resources, plans (Janasz, Kozioł 2007, p. 60-62).

This shows the evolution of the company's approach to investment, ie infrastructure development, modernization or the construction of new branches of a given enterprise.

Technology in the mechanism of creating competitive advantage

The competitive advantage of a company is due to a number of factors that such company implements in the design, manufacture, distribution and after-sales support processes. Competitiveness depends on many elements as well as internal and external mechanisms. The company does not have much influence on external factors because they are determined by the environment. Internal factors and mechanisms are the responsibility of the company (Nowodziński, Skowron--Grabowska, Kościelniak 2017, p. 16-18). These mechanisms should be used to gain and strengthen market position through appropriate management. This enables us to distinguish the basic conditions of correctness of the methodological approach to the competitiveness of a company: uniformity of the vision of competitiveness,

– separation of successive levels of competitiveness,
– comprehensive approach to the sources of competitiveness,
– consistency in related levels as well as internal consistency (Kozioł 2004, p. 60-62).

Uniformity in the vision of competitiveness means adopting one theory at a given level, or accepting different theories, but not contradicting ones. Competences are important, which is the development of the activity capacity to the ability to create a commitment and purposeful engagement and active use of resources in achieving the desired effect. This determines the appropriate premises of sources of competitive advantage:

– architecture - internal and external relationships of a company that define relationships with suppliers, employees, competitors and customers,
– reputation - that is, how customers perceive a business,
– innovation - means the creation of new products, technologies and methods by the company,
– strategic resources (Mizgajska 2002, p. 54-55).

Technology is one of the factors that determines the competitiveness of a company in the mechanism of creating competitive advantage. It is also possible to divide the technology by the scope of its use in the enterprise. From this perspective, four types of technology can be distinguished (Pomykalski 2001, p. 13):

– core technologies - widely used in a company, used in all companies with no competitive advantage,

– key technologies - technologies that currently provide competitive advantages (gaining and operating such key technology, reducing costs and increasing the flexibility of the manufacturing process, which include strategic and technology goals),
– development technologies - technologies in a state of development which use in current production is limited, but the prospects for their effective participation in competitive battle are promising,
– emerging technologies - technologies that are only emerging are in the given stage,
– research and trials (Mizgajska 2002, p. 65).

The company is motivated to technological changes through internal factors (created in the organization) and external factors (created under the pressure of the environment). Taking into account the first type of factors, the company's chances for success and the possibility of undertaking its own initiative are estimated, which means undoubtedly the asset of the entrepreneur. Opportunities are always perceived through the individual economic benefits in the form of income and profits increased or maintained at the current level. External factors may also affect the change of technology, the most important sources of change are legal, economic and social ones (Lemańska-Majdzik, Okręglicka 2017, p. 45-46). Often, these factors encourage or even force the company to make the right number of changes. From the entrepreneurs' point of view, these changes must take place due to changes in the environmental conditions (*Table 1*).

Table 1. Factors and mechanisms of creating a competitive advantage

Auxiliary functions

Strategic management of the enterprise		
Human capital management		
Implementation of marketing strategy		
Technological strategy		
Environmental protection		
I	**II**	**III**
A focus on cost leadership	Innovation and innovation management	Marketing management
Own R & D and design	Organization of management	Technology and organization of production
Time management	Knowledge management, staff training	Personnel and personnel management
Logitics management		
Creativity		

Basic functions

Source: Own study based on (*Oslo Manual* 2008, p. 48-65)

Larger relationships of science and industry also forces the changing nature of technology, which is complex and systematic. This means that companies must be able to solve complex problems with more variables. This leads to the creation of knowledge in enterprises, which is not only specific, but depends on the development of complementary and sometimes basic fields of science. In response to such companies' needs, many fields of knowledge arose, including theory, methodology and measurement methods, useful in solving complex problems. Companies are becoming more and more multi-tech and include many areas of knowledge in their problem solving mechanism (Kiełtyka 2017, p. 35). The flow of patents, numbers or product development in knowledge-based industries complements both scientific research and commercial activities. Links between science and industry can therefore be measured, among others through learning intensity (dependence on science) of individual industries related to a given technology or technological system.

The role of innovation

Enterprises can take advantage of these opportunities, which are sources of innovation, these are: unexpected opportunities, eg unexpected success or failure, unexpected external events, discrepancies between reality and imagination, innovation resulting from the needs of the process, changes in the structure of industry or market structure that surprises everyone, demography, changes in perception, moods, values, and knowledge, both in the field of exact sciences and others (Kiełtyka 2017, p. 32). The requirements of the environment, forcing the appearance of innovations in enterprises, include factors such as shortening product life cycles, strong competition from other enterprises, value migration based on changing areas of activity and entering new promising markets, blurring industry boundaries, technology development information technology contributing to the emergence of new forms of business, company organization and sales channels, thanks to the possibility of smooth data and information flows and globalization, which using the Internet and modern means of communication makes local enterprises more and more elements of global cooperative networks. Knowledge, talent and employees' time are the most valuable resources of the company in the face of increasing complexity and variability of the environment. Due to the ownership of the resources by the company, we can talk about the potential of internal and external innovation, i.e. the ability to effectively implement innovation (Milecki 2004 p. 24). One of the basic conditions for the functioning of each enterprise is to have adequate capital to run a business. Each company decision has its impact on its financial situation. The financial resources involved constitute a mechanism that drives the functioning of each enterprise. Without the appropriate amount of capital, it is not possible to develop or even to keep the enterprise on the market. The amount of financial resources for innovative activities depends on the type of business activity (Wojtowicz, Kozioł 2012, p. 211-223).

Proportions and financing period are different depending on whether it is a production or service activity. The methods of financing and the amount of capital resources obtained, which the enterprise needs to start innovative activities, depend on many factors, including the size of the enterprise, the form of ownership, the type of technology used and, above all, the project being implemented. Therefore, one perfect and universal method of financing an innovative activity can not be presented (Nowicka-Skowron, Pachura 2009, p. 45). It should be remembered that the methods of financing depend on various factors, for example on the type of enterprise or financial possibilities of the company. It is much more difficult to obtain long-term financial support for investment and development activities. Barriers of entry of private investors into the project, the possibility of exiting investments and profit taking, and the state of the institutional and legal infrastructure are factors determining the supply of capital for innovative activities. The essence and importance of innovation can be characterized as follows:

– the function of innovation is to introduce novelties in the economy, which in effect leads to development,
– the development of knowledge leads to innovation, and in turn innovations force the development of knowledge and scientific and technical progress,
– innovations have become the engine of progress in the economy and society,
– more and more often, innovations are the result of mutual relations between network participants in which knowledge management takes place,
– creating and implementing innovations related to changes in the organization or market becomes more effectively due to the organizational solutions in the form of networks in which innovative activity is carried out; they include clusters and science and technology parks,
– innovations implemented in organizations increase their competitiveness on the market, increase of the innovativeness of regions and countries leads to economic development (Dolińska 2010, p. 45-47).

The main goal of each company's activity is to make a profit and multiplication of capital (Barańska-Fischer 2005, p. 20), but this can not be achieved without the company obtaining a proper position on the market and then maintaining it. This, in turn, most often requires a proper development of the scale of operations and its profitability (Nowakowska-Grunt, Strzelczyk, Sałek 2017, p. 26).

Due to the fact that innovations form an integral part of the company's functioning mechanism, it is necessary to include them in the adopted operating strategies that set the goals of its operation. These goals can be divided from the point of view of different criteria for their differentiation. The *Table 2* presents an attempt to specify such a specification of the company's innovative activity goals.

Table 2. Objectives of the innovative activity of the company

Activity area	Innovative activity objectives
Production	Ensuring enterprise development. Increase in profit. Multiplication of the enterprise value (important for joint-stock companies). Providing new products to the market. Ensuring greater competitiveness of products on the market. Acquiring new domestic and foreign recipients. Improvement of product quality and functionality. Increase of the company's prestige. Other.
Production technology	Modernization of the company's technical base. Increased material and energy savings. Providing better health and safety at the workplace. Better use of expensive and hard to reach materials and raw materials. Minimization of environmental threats. Other.
Organization and management	Better adaptation to changing market needs. Increasing work efficiency and effectiveness. More efficient use of work posts. Rationalization of employee employment in the enterprise. Better use of machines and devices in the enterprise. Reduction or elimination of extraordinary losses in the enterprise. Improving in-house transport. Other.

Source: Own study based on (Brzeziński, p. 25-31)

Investment activity can be treated as a basis for introducing innovations. However, the creation and implementation of innovations should be associated not only with investments but also with the company's right capacity.

Conclusions

Polish enterprises that want to survive on the market should concentrate on searching for new, more advanced and effective solutions. Achieving a competitive advantage is only possible by adjusting to the changes taking place in the company, as well as in its environment. However, it should be remembered that implementing innovations in any company requires time and financial resources. Innovation is possible with simultaneous sustainable financial development of the company, thanks to which the company will have adequate financial resources, which will be devoted to the implementation of new, necessary technological investments. Enterprises should realize that innovative activities and continuous improvement of the company are now the key to overcoming competition.

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TECHNOLOGIA JAKO CZYNNIK STRATEGII ROZWOJU PRZEDSIĘBIORSTWA PRZEMYSŁOWEGO

Streszczenie: Każdy sposób pozyskania nowej technologii ma swoje wady i zalety. Przedsiębiorstwo jednak powinno oszacować koszty związane z pozyskaniem nowej technologii, biorąc pod uwagę wzrost technologiczny, posiadane możliwości parku maszynowego i swoje finanse. Przedsiębiorstwa muszą podejmować inicjatywy rozwojowe w celu przejęcia technologii z pełną świadomością swoich własnych obiektywnych możliwości. W każdym razie nie powinny tych możliwości przeceniać. Niewłaściwym podejściem jest stawianie ludzi w sytuacji podejmowania decyzji lub kierowania zdarzeniami wykraczającymi poza ich wiedzę.

Słowa kluczowe: innowacyjność, przewaga konkurencyjna, technologia