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## **TECHNOLOGY ENTREPRENEURSHIP AND ORGANIZATION DEVELOPMENT STRATEGIES – THE RESULTS OF EMPIRICAL RESEARCH**

**Summary.** In the article the author presents the technology entrepreneurship construct as a mechanism of strategic organization development. The impact of the technology entrepreneurship phenomenon on organization development is presented on three levels, i.e.: processes, attributes, and results. The strategy of technology entrepreneurship is described theoretically as an alternative to a conservative strategy. Then, in the part concerning the empirical research of the Aviation Valley enterprises in Poland, the author presents the sketches of empirical models of the technology entrepreneurship strategy, based on the methodology of a qualitative case study of comparative nature.

**Keywords:** technology entrepreneurship, organization development strategy

## **PRZEDSIĘBIORCZOŚĆ TECHNOLOGICZNA A STRATEGIE ROZWOJU ORGANIZACJI – WYNIKI BADAŃ EMPIRYCZNYCH**

**Streszczenie.** W artykule autor prezentuje konstrukt przedsiębiorczości technologicznej jako mechanizm rozwoju strategicznego organizacji. Wpływ przedsiębiorczości technologicznej na rozwój organizacji jest przedstawiony na poziomie działań, atrybutów oraz efektów. Strategia przedsiębiorczości technologicznej została teoretycznie opisana jako alternatywa strategii konserwatywnej. Następnie w części dotyczącej prezentacji badań empirycznych przedsiębiorstw Doliny Lotniczej w Polsce autor na podstawie metodyki jakościowego studium przypadku o charakterze

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porównawczym prezentuje szkice empirycznych modeli strategii przedsiębiorczości technologicznej.

**Słowa kluczowe:** przedsiębiorczość technologiczna, strategia rozwoju organizacji

## 1. Introduction

The development of modern companies operating in the high technology markets is often based on a resource strategy, which in general consists in the accumulation of valuable technological resources (e.g. in the form of patents, licenses, utility models, unique equipment, and competencies of employees) as well as an aggressive policy of intellectual property protection. The enterprises with high development efficiency are additionally characterized by the ability to act proactively and reactively in good time, frequent and flexible product innovations, and the management capacity of effective coordination and allocation of external and internal competencies. In other words, the effective strategic development of an enterprise requires complementing the strategy of accumulation and protection of valuable enterprise resources with dynamic management competencies.

The above-outlined trajectory of strategic development of high technology modern enterprises corresponds to the currently emerging theory of technology entrepreneurship in the context of the management science<sup>2</sup>. In source literature, the category of technology entrepreneurship as a new phenomenon in the context of management sciences – especially in the fields of entrepreneurship and innovation theories – appeared in a special issue of the quarterly *Strategic Entrepreneurship Journal* of 2012, titled *Technology Entrepreneurship*<sup>3</sup>. It was defined therein as a phenomenon occurring when the scientific or engineering development forms a key element of chance, which is the basis for the emergence of new projects, markets, clusters, and even entire industries. Such an understanding of technology entrepreneurship provides a new cognitive perspective for the understanding of development processes within the organization.

This article attempts to outline the empirical models of the technology entrepreneurship strategy in the context of development trajectories of high technology enterprises. In the epistemological layer, the methodology applied includes the critical analysis of source literature in order to create theoretical constructs, and then in the empirical layer, due to the

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<sup>2</sup> Kordel P.: Przedsiębiorczość technologiczna jako mechanizm rozwoju strategicznego organizacji. *Prace Naukowe*, nr 356 (Belz G., Wierzbic A. (red.)). Uniwersytet Ekonomiczny, Wrocław 2014, p. 10-30.

<sup>3</sup> Beckman Ch., Eisenhardt K., Kotha S., Meyer A., Rajagopalan (eds.): *Technology Entrepreneurship*. “Strategic Entrepreneurship Journal”, 2012.

emerging nature of the technology entrepreneurship theory, the methodology of qualitative research, such as comparative case study.

## **2. Technology entrepreneurship as a motive force for organization development**

The phenomenon of technology entrepreneurship in the light of the dynamic capabilities theory<sup>4</sup> can be defined as a dynamic organizational capacity in the area of creation and discovery as well as the exploitation of technological opportunities. This dynamism refers to capability in terms of the strategic renewal of organization and the synchronization of organization development with the environment, while the capabilities relate to the organizational competence for acquiring and allocating external and internal resources. The development strategy, consisting in the dynamic process of creation and exploration, as well as the exploitation of technological opportunities for the purpose of achieving above-average development effectiveness, is a strategy of technology entrepreneurship. On the one hand, the strategy of technology entrepreneurship requires a conscious process of project management for continued development of product innovations (in the context of exploration of technological opportunities); on the other hand, it requires a conscious process of knowledge management for the ongoing process of construction and execution of business models (with respect to the exploitation of technological opportunities).

In order to analyze the technology entrepreneurship in the perspective of strategic development of the organization, three different cognitive levels can be assumed, i.e.: (a) the level of the motor development mechanism of the organization, understood as the process of technology entrepreneurship; (b) the level of attributes, understood as the characteristics of the organization and its environment; (c) the level of technology entrepreneurship process results or the performance indicators of organization development (see Fig. 1).

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<sup>4</sup> Teece D.J., Pisano G., Shuen A.: Dynamic Capabilities and Strategic Management. "Strategic Management Journal", No. 18, 1997, p. 509-533.

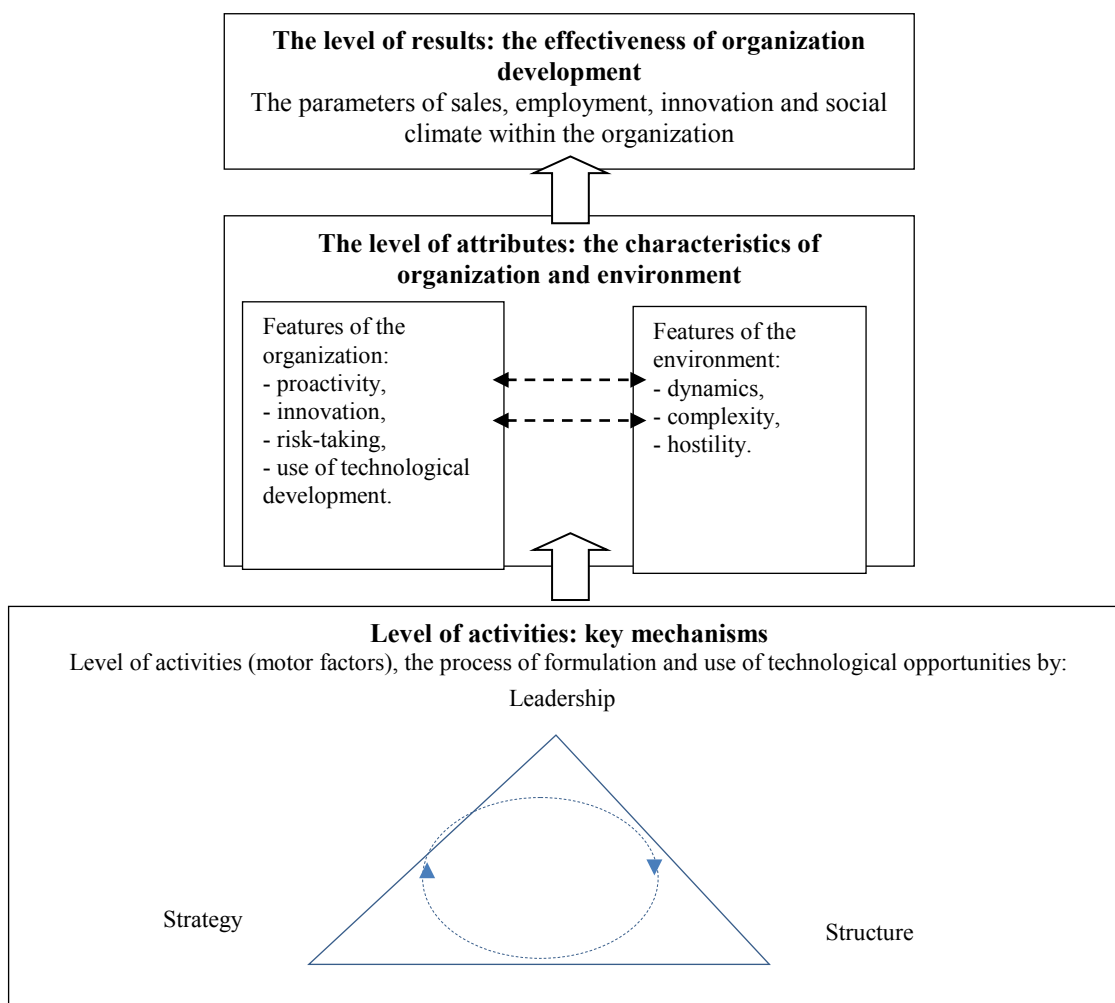


Fig. 1. Results, attributes, and process of technology entrepreneurship  
Rys. 1. Rezultaty, atrybuty oraz proces przedsiębiorczości technologicznej  
Source: Own study.

At the process level, in accordance with the configuration approach, technology entrepreneurship is understood as an ad hoc configuration of the managerial leadership elements, organizational structure, and development strategy. According to this approach, organizations are developing in jumps, rapidly changing their short-term equilibria<sup>5</sup>. At the level of attributes, we can talk about the attributes or qualities of entrepreneurial organization, and its environment. According to the concept of entrepreneurial organizational orientation, widely accepted among theorists<sup>6</sup>, there are three characteristic features of the entrepreneurial organization, i.e.: proactivity, risk-taking, and innovation. The characteristics of the

<sup>5</sup> Harms R., Kraus S., Schwarz E.: The Suitability of the Configuration Approach in Entrepreneurship Research. "Entrepreneurship & Regional Development", No. 1, 2009, p. 25-49.

<sup>6</sup> Jeffrey C., Lumpkin G.T.: Entrepreneurial Orientation Theory and Research: Reflections on a Needed Construct. "Entrepreneurship: Theory & Practice", No. 35, 2011, p. 855-872.

organizational environment can be performed based on the following three attributes<sup>7</sup>: hostility, complexity, and variability of the environment. At the level of technology entrepreneurship results, in line with the concept of high performance organization, the rational mechanism of organization development must be translated in a given time-frame into its above-average growth, measured with the use of various output parameters, including<sup>8</sup>: parameters related to revenue from the sales of products and services, revenue from the sales of innovation, the employment situation, and social parameters related to the organization's employees.

### **3. Technology entrepreneurship and organization development strategies**

The category of the organization development strategy, considered in the context of technology entrepreneurship, requires the inclusion of at least two theoretical fields, i.e.: the fields of entrepreneurship and the field of innovation on the basis of the dynamic capabilities theory. According to the classic approach in the area of strategic management, strategy is understood as the actions of the organization aimed to attract the customer, compete with the rivals as well as maintain and raise the position or competitive advantage. In light of the entrepreneurship theory, organization development should occur through behavior characterized by risk-taking, innovation, and proactivity. On the other hand, the theory of innovation within the path of organizational growth emphasized the importance of implementing innovations, understood as changes in terms of technology, product or market. The technology entrepreneurship strategy can be defined as the logic of attracting and retaining customers and competing with rivals in the market, with the simultaneous exploitation of the existing products and an active search for new ones. The key attributes of the technology entrepreneurship strategy include: (a) risk-taking, (b) continuous implementation of new or improved products, and entering new markets, (c) proactive behaviors that are synchronized well with the environment dynamics (d) continuous search and implementation of new technologies.

Given the above definition of the technology entrepreneurship phenomenon as a strategy for development strategy, the path of the organization's strategic development can be considered on a continuum defined by extremes of conservative growth and entrepreneurial development. Therefore, on the one hand, we are dealing with a conservative organization

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<sup>7</sup> Dees G.G., Beard D.W.: Dimensions of Organizational Tasks Environments. "Administrative Science Quarterly", No. 1, 1984, p. 52-73.

<sup>8</sup> De Waal A.A.: Characteristics of high performance organisations. "Business Management and Strategy", No. 3(1), 2012, p. 28-45.

with negligible occurrence of the technology entrepreneurship phenomenon, while on the other hand there is an entrepreneurial organization satiated with the phenomenon of technology entrepreneurship (see Fig. 2).

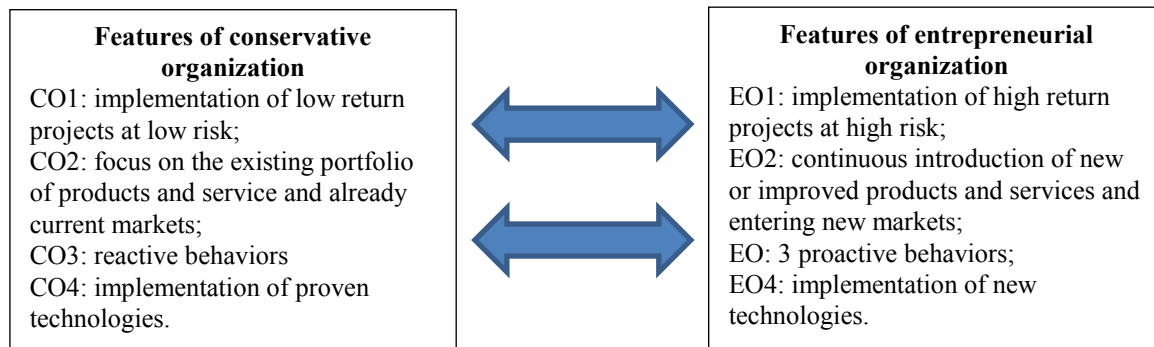


Fig. 2. Features of the conservative organization versus entrepreneurial organization

Rys. 2. Cechy organizacji konserwatywnej versus organizacji przedsiębiorczej

Source: Own study.

The basic attributes of entrepreneurial organizations include entrepreneurial flexibility, a high level of innovation and risk-taking. The strategies of such organizations are characterized by aggressive and proactive actions, while the competitive advantage of the entrepreneurial organizations is based on the ongoing process of implementing new or improved products and entering new markets with the use of the latest technological developments. In contrast, the essential features of conservative organizations include reluctance to take risks, lack of innovation and reactive behaviors. The strategies of these organizations are formulated on the basis of specialization in highly standardized products and focus on the supported segments of the market, while the competitive advantage of conservative organizations is based on high performance as well as the avoidance of risk and negligible innovation. In other words, the production of business annuity in the framework of conservative strategies is based on the continuous increase in the production capacity and thus competing on the basis of the lowest possible price while maintaining the quality standards of products and services. On the other hand, entrepreneurial organizations produce business annuity according to the logics of continuous product innovations and competition by offering quality that goes beyond the existing market standards.

Given the classical typologies of the organization development strategies, which generally function in source literature of strategic management, conservative organization development strategies refer to Mintzberg's adaptation strategies, defensive strategies of Miles and Snow or the cost leader according to Porter's model. What is more, the entrepreneurial strategies correspond to the entrepreneurial strategy of Mintzberg, prospector strategy of Miles and

Snow or differentiation according to Porter's model. Porter's model<sup>9</sup>, probably the most popular among the scholars of strategic management, assumes the existence of three main types of strategies, i.e.: strategies of the manufacturer with the lowest costs in a given industry sector (based mainly on the phenomenon of scale economics), product differentiation strategy (differentiation in comparison with the product characteristics as offered by competitors), and the strategy of focusing on a narrow segment of the market (often called a market niche strategy). Cross-referencing Porter's typology of strategy to the phenomenon of technology entrepreneurship, one can notice its similarity to the strategy of differentiation and market niche and the opposition in relation to the strategy of cost.

Considering the typology of the strategic development of the organization in light of the entrepreneurship theory, two contrasting approaches should be noted, i.e.: the cause and effect logics, and the logics of strategic development<sup>10</sup>. The traditionally understood organization development according to the cause and effect logics differs substantially from development according to the causation logic (*causation versus effectuation logics*). In the first logics, an entrepreneur first determines the objectives and then seeks resources for their implementation. In the second logics, an entrepreneur continually modifies the objectives according to the resources held. Management decisions in the first case are subordinated to the implementation of previously agreed targets, while in the second case the management decisions are made primarily on the basis of resources available at a given time. Entrepreneurial development trajectories are based on the logics of the organization strategic development. Organization development is caused by a temporary state of equilibrium, the configuration of the environment, strategy, structure and organizational leadership. According to the effectuation logics, the organization develops together with its environment. According to the traditional management approach, the process of organization development is based on the cause and effect logics of adaptive nature, in which the changes in the environment bring about the changes in the organization. One-way causal logics indicates the following sequence of dependencies: strategy results from changes in the environment of the organization, structure results from changes in the strategy of the organization, and finally, effectiveness results from the changes in the structure of the organization. Given the assumptions of effectuation logics and the cause and effect logics, it can be assumed that the strategy of technology entrepreneurship is based on the effectuation logics.

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<sup>9</sup> Porter M.: *Competitive Strategy*. The Free Press, New York 1980.

<sup>10</sup> Fisher G.: *Effectuation, Causation and Bricolage: A Behavioral Comparison of Emerging Theories in Entrepreneurship Research*. "Entrepreneurship: Theory and Practice", No. 36, 2012, p. 1019-1051; Kim J., Boh W.: *Technology Commercialization: Understanding Strategic Mechanism in the Effectuation Process*. Academy of Management Annual Meeting 2013, [in:] Kurczewska A.: *W jaki sposób myślą przedsiębiorcy? – czyli „Jeśli mogę kontrolować przyszłość, nie muszę jej przewidywać”*. „E-mentor”, No. 5, 2012, p. 2.

To analyze the typologies of organization development strategies in the field of innovation theory, two basic variables should be assumed, i.e. market and technologies<sup>11</sup>. According to the market variable, innovative strategies focus on the market changes by way of entering new markets; however, it might involve the deepening of the markets currently served, entering the markets of the customer which are new for the company, and entering the emerging markets. According to the technological variable (including process and product innovations), innovations consist in placing new or improved products on the market and can be of either incremental or radical nature. In the analysis of the above typology of innovative strategies, it should be assumed that the strategies of technology entrepreneurship will be focused more on process and product innovations rather than on market innovations.

The analysis summary of the development strategy typologies in the light of the strategic management theory, entrepreneurship theory, and the theory of innovation in relation to the trajectory of organization development can be found in the following table (see Table 1).

Table 1

The theoretical profile of entrepreneurial and conservative development strategies

	<b>Porter's strategies</b>	<b>Entrepreneurial strategies</b>	<b>Innovation strategies</b>
The strategy of technology entrepreneurship of the entrepreneurial organization	Differentiation strategies Market niche strategies	Effectuation strategies (logics of causation)	Strategies of technological and market-based radical innovations
Passive strategy of the conservative organization	Cost strategies	Analytical strategies (cause and effect logics)	Incremental innovation strategies

Source: Own study.

Epistemological analyses show that the strategies of technology entrepreneurship correspond to the strategies of differentiation and market niche from the area of Porter's classification, effectuation strategies from the field of entrepreneurship strategies, and radical innovation strategies from the field of innovation strategies. In contrast, the conservative strategies include Porter's cost strategies, analytical strategies from the area of entrepreneurial strategies, and incremental innovation strategies in the field of innovation strategies.

<sup>11</sup> Smith W., Tushman M.: Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams. "Organization Science", No. 16, 2005, p. 522-536.



#### 4. The results of empirical research

The empirical research was conducted at the turn of 2014 and 2015 and was related to the aviation industry in Poland<sup>12</sup>. The study trial included companies belonging to the Aviation Valley in Rzeszów. The selection of companies for research was intentional and involved two groups of companies: start-ups with no developed product portfolio and mature enterprises with developed product portfolio. The selection of companies was dictated by a clear occurrence of the technology entrepreneurship phenomenon in an enterprise (the businesses of the aviation industry belong to the high-tech industry)<sup>13</sup> and the desire to compare the mechanism of technology entrepreneurship at various stages of the organization development cycle (*start-up versus mature companies*). Start-up companies belonged to the Preincubator of the Podkarpackie Science and Technology Park, and mature companies belonged to the Podkarpackie Science and Technology Park. The use of the existing pro-innovation structures as part of the Aviation Valley facilitated the classification of businesses into two groups according to their level of development on the life cycle curve. The research survey was conducted on 20 companies, with 10 companies selected in each group.

Data and information was gathered using the methodology of direct free interview with senior management of the surveyed companies (in the case of start-up companies, they were simultaneously the owners or co-owners of the surveyed companies, and in the case of mature companies, the owners were members of senior management). The ownership structure of the surveyed companies is presented in the table below (see Table 2).

Table 2

Ownership structure of the surveyed enterprises

Group of companies	owner – inventor	owner – trader	owner – VC
In the implementation phase	10 (100%)	10 (100%)	0 (0%)
In the phase of sustained growth	6 (60%)	10 (100%)	0 (0%)

Source: Own study.

The frame structure for the free interviews conducted was the original questionnaire on technology entrepreneurship<sup>14</sup>. The essential elements of the questionnaire used in this article include: at the level of results – 8-element part relating to the measurement of organization

<sup>12</sup> As indicated on the title page, the research presented in this article has been carried out in the framework of the research project funded by the National Science Centre NCN, titled Technology entrepreneurship and organizational development. The article is the result of the completion of some specific research tasks relating to the strategy of technology entrepreneurship.

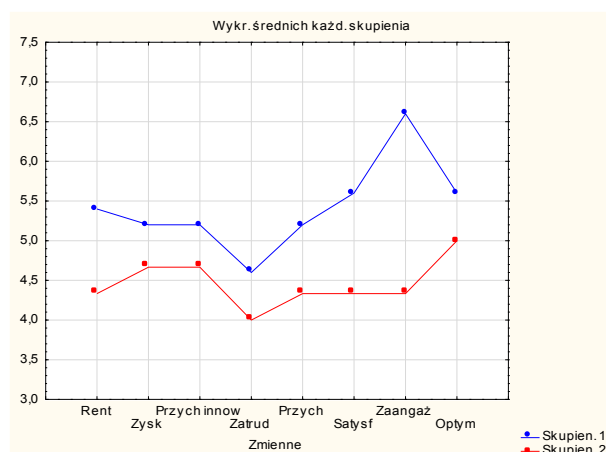
<sup>13</sup> High technology industries, category according to OECD classification, see [www.oecd.org/sti/ind/48350231.pdf](http://www.oecd.org/sti/ind/48350231.pdf). According to this classification, the aviation enterprises belong to high-tech industries, i.e. industries with the highest intensity of research and development.

<sup>14</sup> Kordel P.: The questionnaire of technology entrepreneurship. Silesian University of Technology, Zabrze 2014 (internal analysis as part of the research project of the National Science Center NCN, titled Technological entrepreneurship and organizational development).

effectiveness; at the level of attributes – 9-element part encompassing the entrepreneurial orientation of the organization and 6-element part concerning the analysis of the environment; and finally, at the level of mechanisms – 7-element part describing the development strategy of the organization. The individual variables of the questionnaire were evaluated using the 7-level Likert scale. Statistical analysis of the data obtained was divided into two stages, i.e. the stage of data analysis concerning start-up companies and the stage of data analysis concerning mature companies. The key logics of the analyses performed is to compare the organizations of high and average efficiency, and thus to identify positive and negative differences (positive differences indicate a greater intensification of the feature surveyed for highly effective organizations, negative differences indicate a greater intensification of the feature surveyed for the organizations of average efficiency). In the statistical analysis, the cluster analysis techniques were used in accordance with effectiveness achieved, and the dominant analysis in accordance with other measurements.

The chart below shows the cluster analysis in accordance with the multidimensional effectiveness measurement for a group of start-up companies.

*Intensification of a given parameter of organization development effectiveness against competition (rating according to the 7-point Likert scale)*



#### *Organization development effectiveness parameters*

*Abbreviations: rent. – earning capacity of sales, zysk – profitability of sales, przych. innow. – share of revenue from sales of innovations, zatrud. – increase in employment, przych. – increase in total revenue from sales, satysf. – level of employee satisfaction with their work, zaangaż. – level of employees' involvement in the work carried out, optym. – level of the optimism of employees concerning development prospects of the organization.*

*Cluster 1 – a group of organizations with a high development effectiveness*

*Cluster 2 – a group of organizations with an average development effectiveness.*

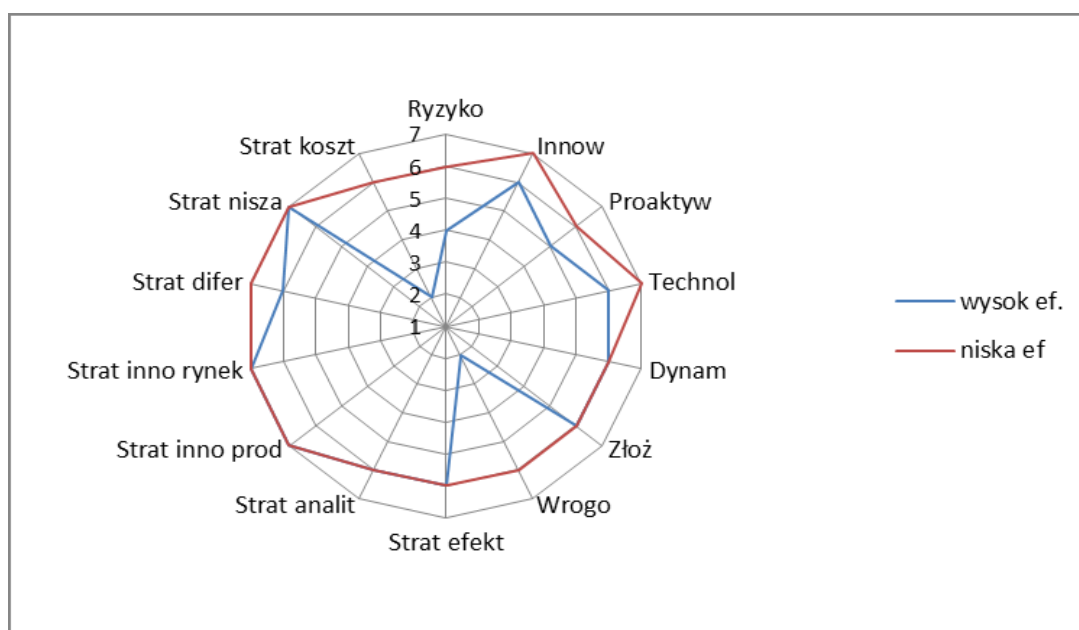
Fig. 3. Cluster analysis according to the effectiveness of start-up companies

Rys. 3. Analiza skupień wg. efektywności dla grupy firm w fazie wchodzenia na rynek

Source: Own study with the use of Statistica software.

Both groups of companies differentiate poorly with respect to quantitative measures of effectiveness (except the earning capacity of sales); a clear distinction can be observed in the social field, particularly in terms of involvement and satisfaction. It should also be noted that both groups of companies are placed in the area of positive effectiveness (above the neutral level – indicating the same results as in the industry).

The distribution of dominants concerning the level of attributes and the level of mechanisms of technology entrepreneurship of the organization with high and average effectiveness in the group of start-up companies is shown in the figure below.



Abbreviations: ryzyko – risk-taking, innow. – implementation of innovations, proaktywność – proactive behavior (i.e. initiating projects, getting ahead of competitive activities), technol. – use of technology development for the development of the organization, dynam. – variability of environment, złoż. – complexity of the environment, wrogo. – hostility of the organization, strat efekt – effectuation strategy, strat. analit. – analytical strategy, strat inno prod – strategy of product innovation, strat inno rynek – strategy of marketing innovations, strat difer – strategy of differentiation, strat nisza – market niche strategy, strat koszt – the strategy of cost leader.

high ef – a cluster of high-efficiency organizations,

low ef – a cluster of low-efficiency organizations,

All variables are rated in the 7-level Likert scale

Fig. 4. The distribution of dominants of the technology entrepreneurship attribute and mechanism levels in the set of start-ups with high and medium effectiveness

Rys. 4. Rozkład dominant poziomu atrybutowego i mechanizmów przedsiębiorczości technologicznej firm wysoce i średnio efektywnych w grupie przedsiębiorstw wchodzących na rynek

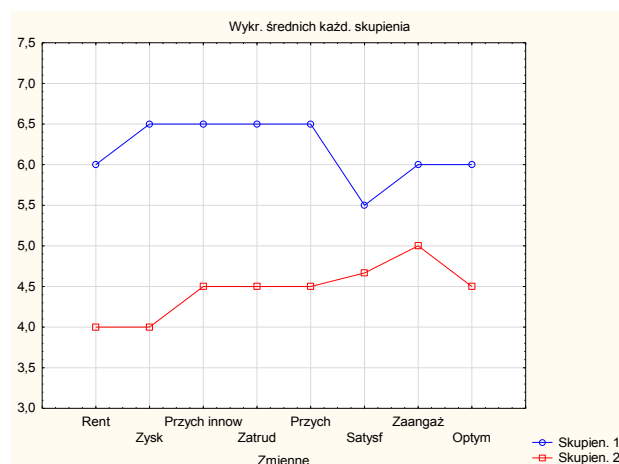
Source: Own study.

The comparative analysis of companies with high and average efficiency in the group of start-up companies at the level of attributes indicates the lack of positive differences, and negative differences occur in the dimension of environment hostility and the risk taken.

Highly effective enterprises perceive the environment as definitely non-hostile and take risks at the levels which are average for the industry. Other attributes remain at a similar, positive level, i.e. "I think so" replies for both groups of companies. Similarly, an adequate analysis at the level of mechanisms of technology entrepreneurship indicates the lack of positive differences, and there is a significant negative difference in the dimension of cost strategies. Highly effective enterprises do not definitely pursue the cost strategies. Other dimensions remain at a similar level of high intensity.

The chart below shows the cluster analysis in accordance with the multidimensional effectiveness measurement for a group of mature companies.

*Intensification of a given parameter of organization development effectiveness against competition (rating according to the 7-point Likert scale)*



*Organization development effectiveness parameters*

*Abbreviations: rent. – earning capacity of sales, zysk – profitability of sales, przych. innow. – share of revenue from sales of innovations, zatrud. – increase in employment, przych. – increase in total revenue from sales, satisf. – level of employee satisfaction with their work, zaangaż. – level of employees' involvement in the work carried out, optym. – level of the optimism of employees concerning development prospects of the organization.*

*Cluster 1 – a group of organizations with a high development effectiveness*

*Cluster 2 – a group of organizations with an average development effectiveness.*

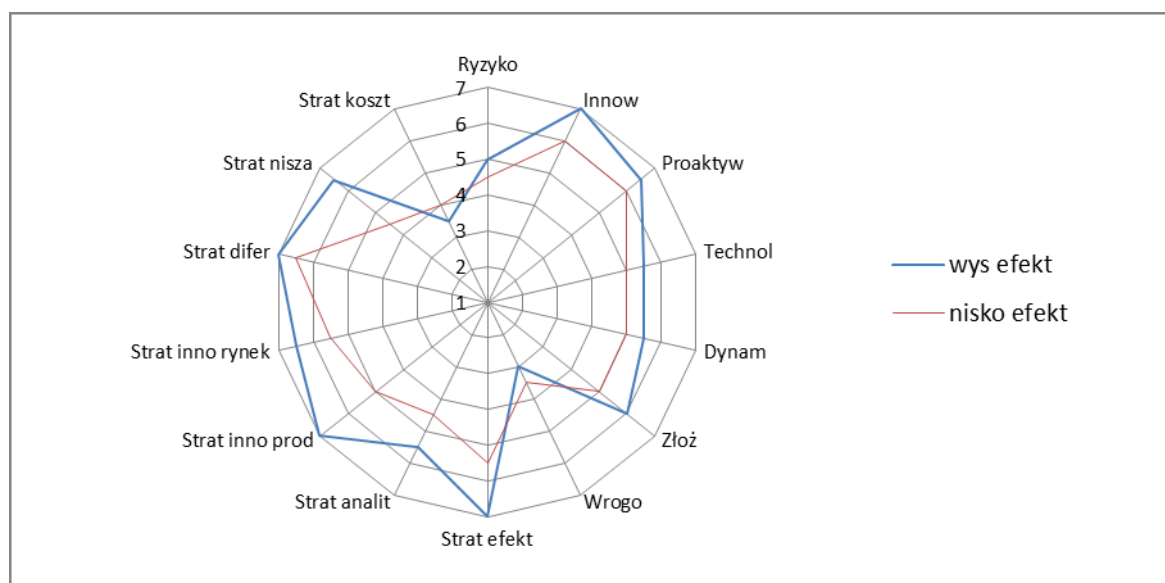
Fig. 5. Cluster analysis according to the effectiveness of mature companies

Rys. 5. Analiza skupień wg. efektywności dla grupy firm o utrwalonej pozycji rynkowej

Source: Own study with the use of Statistica software.

In contrast to the previously presented analysis of clusters, the groups of surveyed companies differentiate significantly due to the quantitative parameters of development, while in the area of social parameters the differences are considerably smaller. As before, both companies with high and average efficiency rank in the positive areas of effectiveness.

The distribution of dominants concerning the level of attributes and the level of mechanisms of technology entrepreneurship of the organization with high and average effectiveness in the group of mature companies is shown in the figure below.



Abbreviations: ryzyko – risk-taking, innow. – implementation of innovations, proaktywność – proactive behavior (i.e. initiating projects, getting ahead competitive activities), technol. – use of technology development for the development of the organization, dynam. – variability of environment, złoż. – complexity of the environment, wrogo. – hostility of the environment, strat efekt – effectuation strategy, strat. analit. – analytical strategy, strat inno prod – strategy of product innovation, strat inno rynek – strategy of marketing innovations, strat difer – strategy of differentiation, strat nisza – market niche strategy, strat koszt – the strategy of cost leader.

high ef. – a cluster of high-efficiency organizations,

low ef. – a cluster of low-efficiency organizations,

All variables are rated in the 7-level Likert scale

Fig. 6. The distribution of dominants of the technology entrepreneurship attribute and mechanism levels in the set of high and medium effectiveness mature companies

Rys. 6. Rozkład dominant poziomu atrybutowego i mechanizmów przedsiębiorczości technologicznej firm wysoce i średnio efektywnych w grupie przedsiębiorstw o utrwalonej pozycji rynkowej

Source: Own study.

The comparative analysis of companies with high and average efficiency in the group of mature companies at the level of attributes indicates the lack of clear positive and negative differences. The attribute profile of both groups of companies is balanced – apart from hostility, there is a greater intensification of all other attributes for the group of highly efficient companies. In the area of technology entrepreneurship mechanism analysis, clear positive differences can be noticed in the mechanisms of effectuation strategy, analytical strategy analysis, the strategy of product innovations and market niche strategy. A slight negative difference occurs in the cost strategy dimension.

## Conclusions

At the level of strategic mechanisms, the highly effective development model of start-up companies resulting both from effectuation logics and analytical logics. Innovative mechanism is related both to the product (including the process) as well as the market. In the market behavior the companies use the mechanism of differentiation in relation to their competitors and focus on a market niche in relation to customers. The companies definitely do not apply the mechanism of cost strategies. At the level of attributes, highly efficient start-up companies perceive the environment as definitely not hostile, dynamic and complex. These behaviors are characterized by a high level of innovation, average pro-activity and taking moderate risk. At the level of results, the efficiency of start-up companies is mainly built on the basis of sales earning capacity and social indicators, in particular commitment and job satisfaction.

In the case of highly effective mature companies, the development model achieved emerges as a result of both the mechanisms of effectuation and analysis. Innovations are related to products (including processes) and the market. In market behavior, the enterprises use the mechanism of differentiation and a market niche. These enterprises definitely do not apply the mechanism of cost strategies. At the level of attributes, highly efficient mature companies perceive the environment as definitely not hostile, dynamic and complex. Their behaviour is characterized by high innovation, pro-activity and taking moderate risk. At the level of results, the effectiveness of start-up companies is built primarily on the basis of objective parameters, i.e. sales revenue, sales earning capacity, profitability or revenue from innovation sales. Effectiveness is based on social parameters to a significantly lesser extent.

Comparing the strategic development models of the surveyed companies, it can be noticed that they are similar at the level of mechanisms and attributes. The difference occurs at the level of results, where the effectiveness of start-up companies is mainly based on their social parameters, while for the mature companies it is based on quantitative parameters (including those related to sales and employment). An interesting result of the research is combining contradictions at the level of analytical logics mechanisms and effectuation logics as the mechanisms for the creation of strategies, or the simultaneous development through diversification and focus on the market niche. What is also interesting is the perception of the environment as friendly and taking risk at a limited level.

To conclude, the presented models of the technology entrepreneurship strategy exploit both the potential of the conservative approach and the entrepreneurial approach. The cost strategies only, as a part of a conservative strategy, have been clearly rejected by all the surveyed companies.

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