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"If things are not failing,
you are not innovating enough"
Elon Musk

ANTI-PROGRESSIVE CONDITIONS FOR THE FUNCTIONING OF ENTERPRISES; INNOVATION IN THE OPINION OF PRODUCERS OF TECHNICAL MEANS OF AGRICULTURAL TRANSPORT – THE CONTEXT OF ITS IMPLEMENTATION AND ITS BARRIERS

Abstract

Aim: The subject of the study is the issue of innovation, or more precisely, an attempt to present potential barriers preventing or limiting its implementation. The main objective of the study is to identify key anti-innovation factors (composition of key barriers)

and to rank them (enterprise self-assessment). The study was conducted among enterprises representing the agricultural machinery sector (specialization: technical means of agricultural transport).

Methods: The above objectives resulted in detailed tasks including an in-depth literature search, verification of available expert knowledge and research of a representative group of entities. The research was carried out by defining a set of the most important barriers to innovation. This enabled further exploration of the issue as part of the work on the method, expert discussions and in-depth sectoral analysis (agricultural machinery – technical means of agricultural transport).

Results: The results confirmed that the adopted research method concept is a helpful evaluation instrument. Conclusions developed as part of the surveyed entities' assessment, related to anti-innovation determinants, proved to be important for the final decisions. Theoretical and empirical considerations were based on the formulated research hypothesis and the assumptions constituting the starting point. Although the research field has been narrowed down to the agricultural machinery sector, attention has been paid to the cognitive value of work in relation to other sectors of the economy. Not only academic postulates of innovation were formulated, but also practical advice leading to guidelines for entrepreneurs and managers of various sectors. The study takes into account professional expertise and experience. Therefore, it can support the activities of both creators and adaptors of innovations in all kinds of enterprises.

Keywords: *innovations, barriers, anti-innovation employee attitudes, agricultural machinery sector*

Introduction

In the practice of enterprises, there is still a need to discover and develop methodological patterns that enable effective adaptation to the requirements of a free market economy. The development standard is becoming a business model based on providing the market with an increasingly attractive offer while using qualitative-development factors. Thus, the essential components of the

enterprise' strategic development, the ones used to build competitive advantages, are the generating, adapting and effective implementing of innovations .

In spite this, in the Polish economy there are still barriers limiting openness to innovation, and no practical instruments supporting innovation processes. An attempt to overcome these fears, by changing the way of perceiving innovations and identifying their potential business benefits are an important premise for undertaking research. Its partial results are presented in this article.

The main aim of the work is to identify the key limitations preventing or hindering the implementation of innovations ("barriers"). In-depth literature studies and practical experience of the authors ("participant observation") have led to formulate additional detailed questions: (1) What factors – articulated in the literature on the subject – constitute barriers which prevent undertaking or limit the implementation of innovations? (2) Does the theoretical research model (literature research) reflect anti-innovative orientations reported by field experts?? (3) Is the theory-and-design research model consistent with the actual barriers identified in management practice? (3a) Are the anti-innovation determinants classified in the research model subject to prioritization (significance assessment)? (3b) Which barriers are crucial from the perspective of agricultural machinery producers?

The above questions resulted in detailed tasks including an in-depth literature analysis (literature query related to the subject of research), the verification of available expert knowledge (development of a theoretical research model) and the research of a representative group of entities (recognition of the significance of anti-innovative employee attitudes). Theoretical and empirical considerations were based on formulated research assumptions and hypotheses.

The research is the result of cooperation with selected experts representing agricultural machinery companies and representatives of research entities and scientific institutions. The study is a response to the needs of Polish enterprises in identifying employee attitudes that constitute barriers to innovative solutions. An important reason to take up the subject was the desire to compile, compare and systematize the current scientific achievements and confront it with the opinions of experts and enterprises.

The paper formulates not only academic postulates of innovation, but also practical guidelines for decision-makers and managers. Therefore, the study

comprises a theoretical and empirical research. Although it takes into account the knowledge, the experience and the views represented by a selected group of entrepreneurs, it can also support creators and adaptors of innovations in all kinds of organizations and institutions.

Although innovations tend to be perceived as complicated and costly processes with a high degree of complexity (investment with an extended payback period), they should be treated as micro-strategies to build the maturity of entities by development.

From progress to innovation – the point of reference

Both the category of innovation and the category of progress are widely described in the literature on the subject, with particular emphasis on management sciences (see AlAstal, 2023; Ayinaddis, 2023; Bessant, Tidd, 2015; Tidd, Thuriaux-Alemán, 2016; Drucker, 2006; Panek-Owsiańska, 2013; Myers, Sumner , 1969; Audretsch, Link, 2018; Zhang, Tang, 2017; Van der Duin, 2006; Bessant, 2003; Bessant, Tidd, 2014) and they are often mentioned in the context of production engineering (Tidd, Bessant, Pavitt, 2005; Nyström, 1990; Mangematin, Baden Fuller, 2008). Especially the category of innovation is directly associated with technological development (Krugman, 1979, pp. 253-266; Laursen, Salter, 2006, pp. 131-150; Ozturk, Ozturk, 2018, pp. 1406-1414).

The ambiguity of the concept of "innovation" and placing this concept outside the category of economic sciences, especially in the context of designing and manufacturing processes (mechanical engineering, production engineering, etc.), provoked an attempt to show the system of these concepts' interdependence in the "innovation-progress" relationship. An attempt to juxtapose "innovation" with "progress" makes it possible to describe them in a systemic way without difficulties related to the internal determination of the application scope. As the category of progress (having considered the theory of progress) is still paradigmatically close to the category of innovation – it mainly refers to the development or improvement, a transition from one stage to another – it seems to be appropriate for outlining the system of interdependence of these

two concepts. Therefore, the concepts of innovation and progress – as mechanisms that control development on two different levels – are understood in this paper as mechanisms that control development. In the case of innovation, one should talk about a change in the occurrence of a given category, while in the case of progress, one can postulate a change in the occurrence of the entire category. In this context, the category will be the value specific to the enterprise, and due to the high level of complexity, not specified in detail. This subtle difference relates to the extra-systemic perspective, which is appropriate for the category of progress, and the intra-systemic perspective, which will correspond to the category of innovation. Innovation and progress, as it seems, are nowadays the key concepts that are responsible for the development of a company in its technological and economic dimensions.

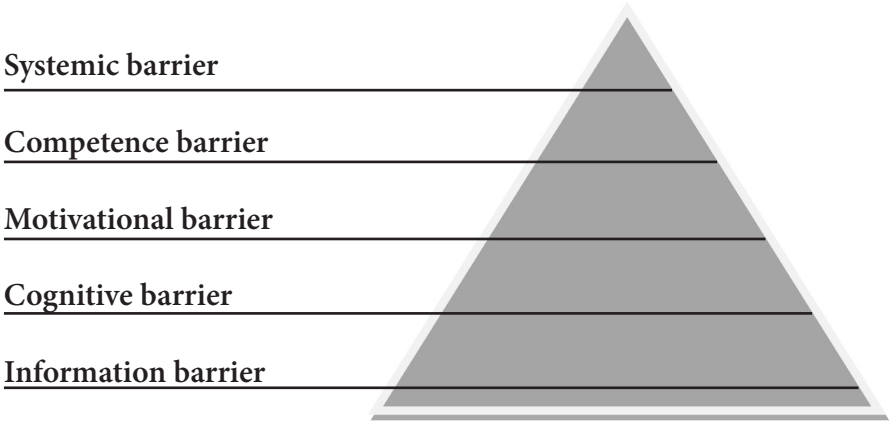
The authors of this study agree that the most important factor stimulating innovation in an enterprise is technical and technological progress, perceived as the improvement in the means of production, production methods, and the replacement of human labor with technical means. It includes e.g. mechanization, automation, robotization or digitization of the production. Although it outlines technological innovations, still the technical and technological progress is a more general concept and it assumes the application of scientific achievements and organizational progress in the production process. (Solow 1957; Fagerberg, 2000; Carree, 2003). Technical, technological and organizational progress contribute to economic progress (Grossman, Helpman, 1991; Knell, Radošević, 1999).

Technical, technological and organizational progress is considered to be the main drive of product innovation (Block, Thurik, Zhou, 2013, pp. 693-718). Research aimed at capturing its impact on innovation (more precisely, on a diverse product portfolio) is currently being conducted by a research team led by B. Nogalski and P. Niewiadomski. It concerns the analysis of connections between the number of implemented products and the technological development of enterprises. The analysis shows that companies with the highest level of technological development, i.e. those saturated with the latest technology, implement new products much faster and more often than companies with a technological gap defined as the difference between the currently used technology and the technology that can be used.

Progress makes it possible to increase the share of production in the market and limit the importance of technically-obsolete departments. The leading enterprises present a relatively high rate of production growth, they create "additional" technical progress and transfer it, through innovative products and technologies, to other sectors of the economy. A measurable manifestation of the technological progress impact on the economy is also the increase in productivity and competitiveness of the sectors in which this progress is being observed.

Although contemporary enterprises should be inclined towards the solutions that may be innovation-friendly (they may shape their growth rate, their competitiveness and their position in the international division of labour), the experience of companies proves that five significant barriers may appear on the path of their development: (1) Information barrier ("I don't know"), (2) Cognitive barrier ("I don't understand"), (3) Motivational barrier ("I don't want to"), (4) Competence barrier ("I can't"), (5) Systemic barrier ("I am not allowed to"). These barriers can be presented as a kind of "pyramid of problems" (Figure 1).

Figure 1. *Anti-innovation attitudes – the pyramid of five barriers*



Source: (Niewiadomski, 2022, p. 34).

The information barrier results mainly from the employees' ignorance concerning the plans and details of the innovations to be implemented in the company. It is fundamental to all other barriers hindering development, as it emerges as early as at the initiating innovation stage. The information barrier may be the source of the cognitive barrier, which arises as a result of no widespread information or explanation referring to the plans for changes concerning the enterprise. It may also result from the way of informing about the actions taken, e.g. related to specialized language regarding a new solution. It can influence the effectiveness of the activities related to the implementation of specific technological solutions, process transformation or new work organization. Failure to meet cognitive needs can be an important reason for resistance to innovation or postponing it. In combination with other barriers to innovation, a motivational barrier may appear. Its emergence may also be associated with a conviction of loss felt by various groups of stakeholders who oppose the change because it may threaten their interests (loss of position, sense of security, "loss" of competencies). The reason for a motivational barrier may also be an underestimate of the importance or urgency of change. This means that the recipients of the change do not understand what competitive advantage their company can gain as a result of the rapid implementation of innovative solutions. The stakeholders may also fail to see the personal benefits associated with such solutions.

Failure to manage the innovation process by the members of the team controlling its implementation (or the need to acquire new skills by the recipients of the change once the implementation of specific solutions has been completed) correlates with the competency barrier (competency gap). It manifests itself in ineffective actions taken by the team managing the implementation and in the behavior of employees aware of the changing situation. The competence barrier makes the innovation management process ineffective, e.g. an incomplete diagnosis is made, the formulated vision of the target state is unconvincing or does not define the expected target state well, the action plan is too general or too detailed, and the implementation is not monitored using appropriate indicators. On the other hand, employees who find out that their existing competences will not be fully used after implementing innovations face the challenge of learning new behaviors and turning them

into habits. If they do not receive support, they may feel helpless in the face of change or actively resist change.

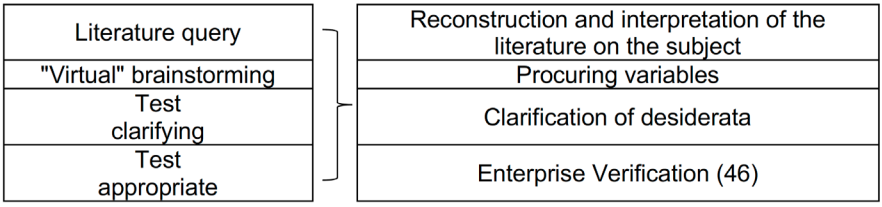
Stopping or significantly slowing down the implementation of innovations in the company and consequently demotivating the people in favour of change, may be caused by the so-called systemic barrier. It negatively affects the morale of the team implementing changes by creating the impression of wasted effort. What's more, it can strengthen the position of people negating new solutions.

As J. Rubin points out, all the discussed barriers to the changes should be analysed in relation to one another, and it should be a good practice for the initiators and leaders of innovation to check each time whether the planned activities related to innovations meet each of the conditions for effective implementation from the point of view of the innovation recipient ("I know", "I understand", "I want", "I can" and "I can").

Material and method

The authors decided to carry out a multi-stage process of activities to facilitate the understanding of a defined section of reality. In the submitted work, they used a three-stage procedure of research implied by the work purpose (Figure 2).

Figure 2. *Scheme of research implementation*



Source: own elaboration

The research technique that was chosen to collect the primary data was the reconstruction and interpretation of the literature on the given subject (among others: Ayinaddis, Taye, Yirsaw, 2023; Bate, Wachira, Danka, 2023; Byvshev, Parfenteva, Panteleeva, et al., 2023; Heller, Amir, Waxman, et al., 2023; Lubián, 2023;

Mitcheltree, 2023; Spännäri, Juntunen, Pessi, Stahle, 2023). The review of literature allowed for a formalized and objective synthesis of the hitherto scientific achievements and evaluation of the research conducted so far (Columb, Lalkhen, 1995, pp. 391-394). The process of creating the literature database assumed the use of a mixed approach, i.e. academic literature indexed in scientific databases (BSCO, Proquest, ResearchGate.net, Academia.edu.) and the so-called gray literature. Extending the process of creating a literature database with the so-called gray literature was considered important due to the possibility of including the latest scientific publications, publications of a less scientific nature, publications not necessarily peer-reviewed.

In the next stage, a collective search for ideas, a team of experts was appointed. The evaluation team consisted only of specialists in the problem being solved, which was verified on the basis of the competence coefficient determined on the basis of the expert's self-assessment (from 0 to 10 points) multiplied by 0.1 (informativeness coefficient (Ki)) and determined on the basis of an interview with a given argumentation coefficient (Ka) expert. Competence expressing the degree of qualification of an expert in the field was determined on the basis of an analysis of the expert's creative activity, knowledge of the field and understanding of the problems raised in the work. As one of the basic methods of searching for creative ideas (and identifying anti-innovation employee attitudes was recognized as such) is brainstorming, it was decided to choose this research method. The so-called "virtual" brainstorming was used. The use of an IT tool (ZOOM) made it possible to eliminate the obstacles associated with organizing and conducting traditional ideas-generating sessions. All members of the group were informed in advance about the topic and rules of the online meeting. In order to improve the research, they had previously received working materials that were a compilation of a literature query and the authors' own opinions. This facilitated the preparation of ideas which were, on the one hand, thematically convergent, and on the other, supplementary as a result of the participating experts' observations (practical experience). The interview with experts was prepared in accordance with the research needs. The form of a conversation was used, where the expert had full initiative in the conducted considerations, guided by the research goal (developing a research model).

Whenever the aim of the study was to identify and discuss with experts potential barriers preventing or limiting the implementation of innovations (composition of key barriers), a questionnaire was prepared on the basis of expert opinions as a tool for conducting the actual research.

The main stage of the research was carried out among 46 purposefully selected experts – representatives of enterprises. Respondents were asked to indicate to what extent the aspects identified in the research model constitute potential barriers preventing or limiting the progress and implementation of innovations. The respondents represented micro (10.87%), small (30.43%), medium (52.17%) and large (6.52%) enterprises operating in the agricultural machinery sector. They comprised the operating in Poland manufacturers of parts, subassemblies and complete agricultural machines.

Taking into account the distribution due to the predominant nature of production, they declared mass production or large-scale production (54.35%), short-series production (43.48%) or unit production (2.17%). The group of people between 41 and 60 years of age dominated among the opinion-makers; only 2.17% of respondents were aged up to 30 years old; 19.57% of respondents were aged between 31 and 40, 32.61% of respondents were between 41 and 50, 21.74% were 51 to 60, and 23.91% – over 60 years. The group of people with higher education definitely prevailed (58.70%), 26.09% of the respondents had secondary education, while 15.22% had vocational education. In order to carry out the assessment, a five-point scale describing the level of influence of articulated employee attitudes was adopted (Table 2).

The recognition of the significance of individual factors was made based on the average value calculated on the basis of indications of people participating in the study, which is a common practice when compiling survey results. The measurement strategy used in the survey questionnaires, thanks to which knowledge about the degree of acceptance of views was obtained, was a five-point Likert scale.

Results

Progressive changes in social, cultural, economic, political and demographic proportions and relations are leading to the emergence of a new reality, which is hard to predict. However, shaping the level of competitiveness of modern enterprises will undoubtedly be based on innovative activity. The shortening market life cycle of most products implies the need for permanent adaptation of modern enterprises to new environmental conditions, and thus, designing and implementing innovations, adequately to the needs of the market. Hence, it is necessary to systematically explore emerging market opportunities and problems related to the implementation, which were outlined in Table 1.

Table 1. *Barriers to the implementation of innovations – results of own research*

No.	Barriers to the implementation of innovations	Percentage of indications					Average
		1	2	3	4	5	
1	The need to incur high – unpredictable – costs of running a business; e.g. rising energy costs	-	2.2	10.9	23.9	63.0	4.48
2	Unfavorable legal and economic environment; the complexity and instability of regulations on conducting business, including research and development (research relief)	-	2.2	17.4	23.9	56.5	4.35
3	Staff turnover, poor access to qualified employees (as a result of poorly developed education system and adaptation of education profiles to the needs of the labor market). An aging workforce	-	-	15.2	39.1	45.7	4.30
4	Low transfer of knowledge and technology	-	-	17.4	39.1	43.5	4.26
5	Inability to predict the effects of the economic crisis; lack of vision and development prospects	-	2.2	10.9	47.8	39.1	4.24
6	Low utilization of scientific potential	-	2.2	15.2	41.3	41.3	4.22

7	Focusing on innovations only in the technological and manufacturing area	-	-	17.4	52.2	30.4	4.13
8	Dependence of activity on the economic situation in other sectors	2.2	4.3	13.0	41.3	39.1	4.11
9	Low motivation and commitment of the managerial staff	-	-	21.7	50.0	28.3	4.07
10	Equating innovation with employment reduction (robotisation, automation);	-	2.2	23.9	41.3	32.6	4.04
11	No financial resources; difficulties in accessing bank loans and higher costs of obtaining external financing for investments	2.2	4.3	21.7	32.6	39.1	4.02
12	Insufficient communication about the goals and essence of innovation, and the goals and essence of individual transformation projects	-	2.2	26.1	41.3	30.4	4.00
13	Low competences of strategic cooperators	2.2	2.2	21.7	43.5	30.4	3.98
14	Blocking initiatives by state institutions	2.2	-	26.1	43.5	28.3	3.96
15	Reluctant employees in the company; old habits, patterns or behaviors	-	-	30.4	45.7	23.9	3.93
16	Little awareness of the need to implement innovations; little understanding of the essence of innovation, especially among the executive staff	2.2	2.2	21.7	52.2	21.7	3.89
17	No innovation trainings	2.2	6.5	28.3	30.4	32.6	3.85
18	Inability to overcome resistance to change	2.2	6.5	32.6	32.6	26.1	3.74
19	Low recognition and underestimation of the sector's potential	2.2	4.3	37.0	34.8	21.7	3.70
20	Imposing specific solutions on employees; ignoring interpersonal relationships	6.5	8.7	52.2	17.4	15.2	3.26

Source: own study.

In the further part of the work, the obtained results were described, a discussion was conducted and the trends resulting from the research were specified.

Discussion and conclusions

High costs of running a business and their unpredictability are the challenges (barriers) most often indicated by companies that they have to face in their innovative activities (average score of 4.48; 63.0% of responses for a score of 5). For many producers, for example, the price of energy has become unacceptable. They are afraid that they will no longer be able to function. Many entrepreneurs are wondering about the future of their companies. At best, they think about shortening the working week, laying off employees, at worst – about closing the business. The more so that the prices of electricity and gas for companies are to increase several times next year. In addition to other constantly increasing costs of doing business, a surge in electricity prices drastically increases production costs. In the case of the agricultural machinery sector, sometimes even to the level of unprofitability. On the one hand, the above affects result in the lack of any activities in the field of implementing innovations; on the other hand, it should motivate the implementation of solutions aimed at minimizing costs.

A major obstacle to the implementation of innovations is the complicated and unstable law (average score 4.35; 56.5% of responses for a score of 5). Political will is needed to make a radical change in economic law. During the expert discussion, it was indicated that the law should be simple and understandable. It should be noted that while recent years have brought a deterioration in the conditions for conducting business activity, the tax area is particularly bad in this respect, including reliefs for research and development activities. In addition, new taxes and fees are introduced, and the law is still unpredictable. The competent ministerial bodies in Poland are constantly working on the creation of new taxes, the fruits of which are, for example: the solidarity levy, the tax on commercial real estate or the tax on retail sales. In connection with the above – as resounded during the expert discussion – it will be more and more common for companies to move abroad or conduct

business with the use of foreign legal structures and institutions. These are one of the most popular ways among entrepreneurs not only to protect the company's assets, but also to escape from fiscal and legal action, which will significantly reduce innovation measured on a national scale.

Attention was drawn to poor access to employees, an aging workforce and a lack of specialists (average score 4.30; 45.7% of responses for a score of 5). This is a result of a poorly developed education system and its low adjustment to the needs of the labor market. Although until now the gap in the Polish labor market was filled by workers from the East, the outbreak of war made tens of thousands of Ukrainians leave Poland and return to enlist in the army and defend the country against the Russian invasion. The lack of qualified employees, on the one hand, is a barrier to innovation, and on the other hand, it leads to higher salaries, which will probably be reflected in subsequent inflation readings.

Although employee turnover is still one of the major problems of Polish producers in the context of innovative activity, it must be emphasized that, additionally, the inability to predict the effects of the economic crisis, which intensifies the lack of vision and development prospects (average score of 4.24; 39.1% of responses for a score of 5 points), caused that after several months of continuous increases in the number of job offers, there was an unexpected decrease. This may be a sign of business adaptation to the upcoming economic slowdown caused by rising inflation.

In the economic system, every action, but also inaction, is burdened with a certain cost. This is particularly noticeable in the current economic crisis. Whenever the expenditure on innovative activities is reduced along with the economic downturn and the related reallocation of limited financial resources, it must be emphasized that knowledge, which is a resource that never runs out, ensures development. Moreover, knowledge by being distributed gains importance and investing in it gives higher returns. It is therefore reasonable to strengthen the mutual cooperation of academic centers and research and development institutions with the enterprise sector, or to increase the efficiency of expenditure on R&D activities conducted by these entities. The more so that the surveyed enterprises point to the relatively low transfer of knowledge and technology (average score 4.26; 43.5% of responses for a 5-point rating) and low

use of the scientific potential (average score 4.22; 41.3% of responses for ratings of 5 points). In the case of cooperation, not only partners, their number and diversity are important, but also the internal structure and position they occupy in the environment. It should be pointed out that Poland has a very large scientific potential and a relatively well-functioning infrastructure. Unfortunately, this is not enough, because there are no solutions that would enable the entrepreneur to use the available scientific and research facilities. Changes are therefore extremely desirable. But they must be introduced in an informed way and with the cooperation of all stakeholder groups, both enterprises and representatives of the research and scientific environment.

A production company is a certain economic and social system, therefore its development goals should always be a bundle referring both to the production process that takes into account all dimensions of sustainable development (economic, social and environmental), and to the people associated with it. Meanwhile, as postulated in the discussion, there is often a misinterpretation and associating innovations only to the sphere of production. That was also confirmed in the course of the conducted research (average score of 4.13; 30.4% of indications for a score of 5 points). Perceiving innovation only in terms of technology and production makes it impossible to achieve long-term benefits. Therefore, all innovative activities should be integrated and refer to all processes carried out in the enterprise.

Russia's aggression against Ukraine had a very negative impact on the purchase costs and the availability of e.g. steel, one of the main raw materials in the production of agricultural machinery. In addition, the uncertain political situation and changes in the policy on energy resources result in further increases in production and transport prices. Demand for raw materials, particularly visible in connection with the increase in production in Asian countries, also affects the prices and availability of materials. It is evident that producers are fully aware that they are facing a big challenge in order to avoid a sharp increase in the prices of raw materials and supplies, and (by accumulating funds) they limit expenditure on innovation (average score 4.11; 39.1% of indications for a score of 5 points).

A modern company, undergoing constant innovation, must have a leader in its structures, as this is the person to implement the vision of change.

The requirements for modern transformation leaders are, above all, being open-minded and far-sighted, placing employees at the center of the entire process, leading with consideration of emotions, motivating employees to persevere until the end of the revolution, and allowing honest communication. It should be emphasized that insufficient communication about the goals and essence of innovation as well as the goals and essence of individual innovative projects is an implementation barrier (average score 4.00; 30.4% of responses for a score of 5 points).

A transformation leader is a person responsible for overcoming employees' resistance to change, providing support to each employee in difficult tasks related to transformation processes. Meanwhile, attention has been paid to the problem of low motivation and commitment of the managerial staff (average score of 4.07; 28.3% of responses for a score of 5 points).

A typical "side effect" of innovation, as perceived by employees, is the reduction of employment. However, it should be communicated that automation, robotization, or digitization are not always synonymous with redundancies. Employees can be delegated to perform other tasks – more complex and more creative. Meanwhile, innovation is to a large extent identified with employment reduction, which is a significant barrier to its implementation (average score of 4.04; 32.6% of responses for a score of 5 points).

The conducted analyses indicated that production enterprises in Poland encounter barriers in access to financing. Attention was drawn to possible difficulties in accessing bank loans and higher costs of obtaining external financing for innovations (average score 4.02; 39.1% of responses for a score of 5 points).

External cooperation and open partnership discussions are best ways to innovate. Meanwhile, attention was paid to the competence problems of strategic cooperators (average score of 3.98; 30.4% of indications for a score of 5). Therefore, effective innovation should be in line with the traditions and values of the companies involved in its implementation. Loss of trust between partners may have a negative impact on the willingness to take initiatives. The mismatch of partners or the pessimistic attitude of any of them can cause failure to achieve goals and the consequent loss of competitiveness, revenue and brand value. Attention was drawn to the need to involve the widest possible group of employees of a given organization. Designing and implementing

changes if initiated and carried out only by the company's management (who often show limited knowledge of innovations) limits the employee participation, which contributes to limiting knowledge resources.

In the course of the conducted research, attention was drawn to the barrier to the development of innovation in the form of blocking initiatives by the state institutions (average score of 3.96; 28.3% of indications for a score of 5 points). A profound change in the model of economic policy is needed. It requires much greater cooperation with business circles, as it is not possible to externally shape economic policy by politicians without a thorough recognition of what economic and legal incentives can bring the expected results. During the expert discussion, attention was paid to Polish state-owned companies, which, having unlimited financial resources, are working intensively on implementing the latest achievements in science and technology. They create their own, original, highly innovative products. Regardless of the costs, they can build their competitive advantage. State-owned companies are primarily guided by their own interests, which are not always consistent with the needs of the country and the private enterprises operating there, and at the same time with the extensive expectations of its citizens. The direct effects of their impact are sometimes very severe for domestic enterprises.

Although in the modern environment where, paradoxically, change is the only constant element of activity for the company, it can lead to (sometimes unconscious) resistance, which can effectively block necessary innovative activity and the possible benefits of their implementation. Most people don't accept change. Even recruiting young people who declare openness to change does not guarantee that there will be no resistance once there is a need to reorganize the current way of operating. This is confirmed by the results of the conducted research, in which anti-innovative attitudes of particularly resistant employees were pointed out (average score of 3.93; 23.9% of responses for a score of 5 points). In the long term, anti-innovative employee attitudes will affect the deterioration of work results, resignation from work in a given team, chronic conflicts, hostility, slowing down the pace of work, as well as expressing loud and open doubts about the effectiveness of the planned transformation. In addition to the fear of change, there are also other reasons for resistance to innovation, such as: low awareness of the need to implement

innovations, and low understanding of the essence of innovation, especially among executive employees (average score 3.89; 21.7% of responses for a score of 5), lack of training on innovation (average score of 3.85; 32.6% of responses for a score of 5 points) or inability to overcome resistance to change (average score of 3.74; 26.1% of responses for a score of 5 points).

Many entrepreneurs mistakenly perceive innovation as the implementation of innovative technology that employees will be able to use immediately. The changes are then implemented in a chaotic, fragmentary way, based on old habits or patterns. Therefore, difficulties may result not only from the reluctance to change, but also from the patterns of thinking and processes developed over the years. This may result in imposing certain solutions on employees or disregarding interpersonal relations (average score of 3.26; 15.2% of responses for a score of 5), which is a significant barrier to innovation.

The innovation-implementing process begins long before the implementation of specific solutions. To be effective, it must be thoroughly thought out and prepared. It is therefore unacceptable to use ready-made patterns and solutions without adapting them to the conditions and context of the sector and the enterprise itself. Therefore, training is important, the purpose of which is to familiarize employees with how to approach innovation in a practical way. Meanwhile – already during the expert discussion – attention was drawn to the poor system of training on innovative activities, which in the long term may reflect limited knowledge of specific principles, methods and tools that effectively support enterprises at various stages of this process.

In the context of the expert debate, attention was paid to building brand awareness and maintaining company recognition. The importance of customer relations and the creation of a positive image of the business were articulated. The more so that the low recognition and underestimation of the sector's potential – in the opinion of the surveyed enterprises – is a barrier to the implementation of innovations (average score of 3.70; 21.7% of responses for a score of 5 points).

Recommendations

In the context of the conducted research, a catalog of barriers that significantly affect the implementation of innovations was indicated. An important point on the development map of the surveyed enterprises will be meeting the challenges related to the barriers' elimination. It is on the part of enterprises to take appropriate actions aimed at increasing efficiency and creating new management models. Despite the awareness of the great challenges resulting from macro trends and the effective adaptation of enterprises to the environment, there are still areas that require intervention and continuous improvement.

Based on the conducted research, there are three distinctively different groups of enterprises in terms of how they perceive innovations and barriers related to their implementation. What is more, by analyzing the collected results and the conclusions drawn from them, it was possible to notice certain tendencies among these groups.

The first group is the "*Optimists*". They evaluate themselves very positively. These are mainly companies in a good innovative position (defined as a relatively high level of overcoming barriers limiting the implementation of innovations), expecting that this position will not deteriorate in the near future. They have a very positive attitude towards innovation. In addition, these companies expect to break even more of the relatively small barriers to innovation in the future. According to interviews with representatives of these companies, many of them have already implemented or are currently implementing further innovations.

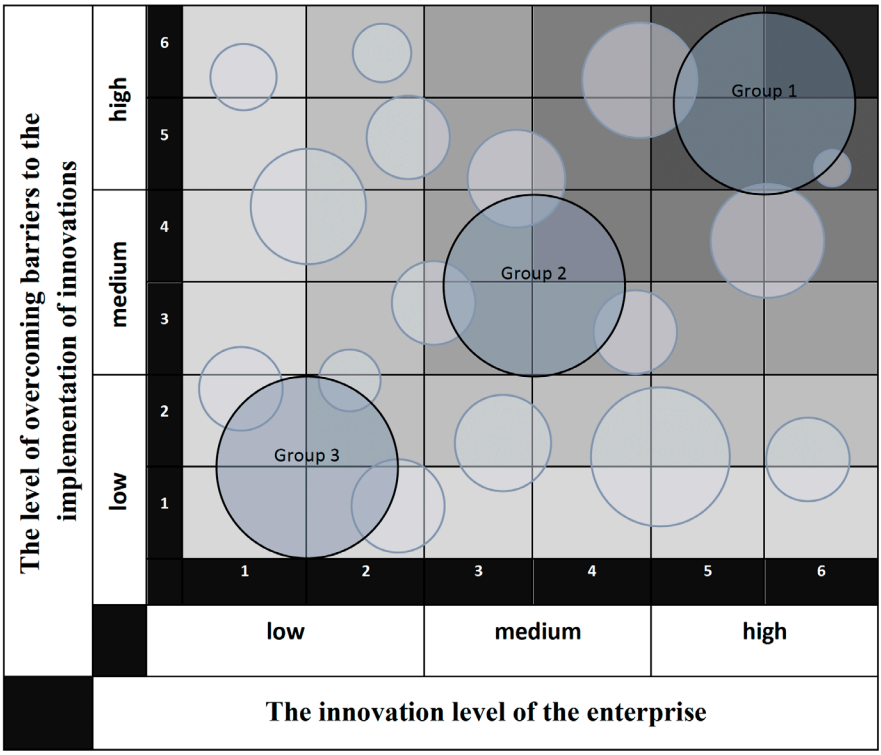
The second group is the "*Neutral Optimists*". The ability to implement innovations is rated as very average. This group includes companies with an average innovative position (defined as an average level of overcoming barriers limiting the implementation of innovations), but expecting improvement in the future (ability to self-assess). These companies have a positive attitude towards innovation and, at the same time, expect that the importance of these innovations will increase even more in the future, and thus introducing them into their organizations will be a necessity. They also try to implement these innovations through a strict assessment in the context of barriers limiting their innovative activity.

The third group includes companies with the weakest innovative position, defined as a relatively low level of overcoming barriers limiting their implementation. Currently, they are characterized by a skeptical approach to overcoming barriers to implementing innovations (the most skeptical of all groups). It can be suggested that these companies do not understand the importance of innovation, prefer traditional business models, or believe that the importance of innovation is greatly overestimated. However, "*Skeptical Now*" means "*Neutral in the Future*".

Enterprises from the first group well understand the importance of innovation. It can be assumed (as verified in the expert discussion) that a large part of innovations has already been or will be implemented in these companies. This applies primarily to companies with an established position. It can be said that innovations were one of the factors that helped enterprises to take the appropriate competitive position. On the other extreme, there are companies that do not yet appreciate the importance of innovation, perhaps because they are not at the point where innovation can take them to a completely different (higher) level of competition.

Another useful indication in the paper is the final conclusion about the justified (empirically verified) existence in the agricultural machinery sector of the so-called groups of differentiated perception of barriers to the implementation of innovations. The above is reflected in the developed *map of innovation barrier fields* (Figure 3). Juxtaposed here are selected groups in terms of their low, medium and high level of overcoming barriers to innovations. While three groups have been confirmed by research, the remaining fields are indicated as assumptions of potential (possible to take) positions and their corresponding characteristics. An assumption was also made that there are numerous combinations of other systems (positions) on the presented map (with different ranges and different densities), which is certainly determined by many different (demonstrated, among others, in the paper) factors. The presented map may be an opportunity for an individual comparison of a specific enterprise with the general assessment of representatives of the surveyed sector.

Figure 3. *Anti-innovative attitudes – a pyramid of five barriers*



Source: own study

Of key importance is an attempt to capture the determinants that inhibit the innovative activity of enterprises. And the most significant premise to further explore the problem raised in the paper is undoubtedly the confirmation of the existence of strong links and interdependencies between innovations and the ability to overcome factors limiting their implementation. This means in practice that enterprises carrying out innovative activities have the inclinations and potential to achieve a higher level of innovation in the analyzed sector. An important premise for the theory and practice is the confirmation of the validity to consider the development of an organization through the prism of their innovative activities as competitive advantages.

Summary

The material collected in the research made it possible to achieve the objectives and formulate conclusions of the general and cognitive nature. The determinants of innovation implementation were identified (the catalog of barriers was specified). Barriers that prevent undertaking or limiting the implementation of innovations were articulated. It was confirmed that the theoretical research model (literature) reflects the anti-innovative orientations reported by field experts. It was indicated that the theory-and-design research model is consistent with the real barriers identified in management practice. It has been shown that the determinants classified in the research model are ranked (significance assessment) and thus the key barriers from the perspective of manufacturers of the agricultural machinery sector have been indicated.

The results of literature query and empirical research, as well as the final conclusions presented in the work should not be treated as completed. This is due to the extremely high level of complexity when analysing conditions for innovativeness of enterprises. The obtained results are still only a fragment of the developing achievements of the authors. The above-mentioned premises present a certain set of proposals to increase the level of organizational innovation and competitiveness of the company. They should be treated as base elements for further discussions to find ways to stimulate innovative attitudes, providing a pretext for building innovative initiatives.

The results of the analysis presented in the paper constitute the basis and inspiration for more extensive exploring the issue in the future, in relation either to the presented sector of the economy or the related sectors. The developed research construct is characterized by such a degree of compatibility that it can be assumed to justify its use in the study of sectors different from the presented one.

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