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THE RELATIONSHIP BETWEEN INNOVATIVE TECHNOLOGIES AND COMPETITIVENESS OF THE ENTERPRISE PJSC «ZAPORIZHABRASIVE»

Cherep A.V., Hurska A.Y., Zakharian D.M.*Zaporizhzhia National University**Ukraine, 69600, Zaporizhzhia, Zhukovsky str., 66*

cherep.av.znu@gmail.com, bugaevaasia2000@ukr.net, d.m.zakharian@gmail.com

ORCID: 0000-0001-5253-7481

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In this paper, we have studied different approaches of scientists to the concepts of “innovation” and “competitiveness”, and formed our own definition of these concepts. The article describes the enterprise Zaporizhabraziv PJSC and its reaction to the hostilities. The indicators of the enterprise’s financial results, profitability threshold and financial stability margin are analysed, conclusions about its status are drawn.

An analysis of external and internal factors that determine the competitiveness of metallurgical enterprises is carried out. The methods of «qualitative» diagnostics of competitiveness of an enterprise, which are often used in practice, such as SWOT-analysis and PEST-analysis, are studied, after which a conclusion on the competitiveness of the enterprise is made. The development plans of Zaporizhabrasive PJSC for 2023–2024 are considered. The methods that should be implemented, given the importance of innovation, including expanding the market range, introducing environmentally friendly technologies and production processes, using information technology and analytics to optimise production, investing in training and development of personnel, entering into strategic partnerships with other companies or research institutions, are formed.

ЗВ’ЯЗОК МІЖ ІННОВАЦІЙНИМИ ТЕХНОЛОГІЯМИ ТА КОНКУРЕНТОСПРОМОЖНІСТЮ ПІДПРИЄМСТВА ПРАТ «ЗАПОРІЖАБРАЗИВ»

Череп А.В., Гурська А.Ю., Захарян Д.М.*Запорізький національний університет**Україна, 69600, м. Запоріжжя, вул. Жуковського, 66***Ключові слова:**інновації,
конкурентоспроможність,
аналіз, прибуток

У цій роботі ми дослідили різні підходи вчених до поняття «інновації» та «конкурентоспроможність», а також сформуваємо власне визначення цих понять. Надано характеристику підприємства ПрАТ «Запоріжжябразив» та його реакцію на бойові дії. Проаналізовано показники фінансових результатів підприємства, порогу рентабельності та запасу фінансової стійкості, зроблено висновки, щодо його стану.

Виконано аналіз зовнішніх та внутрішніх факторів, що визначають конкурентоспроможність металургійних підприємства. Досліджено методи «якісної» діагностики конкурентоспроможності підприємства, які часто застосовуються на практиці відносяться SWOT-аналіз та PEST-аналіз, після цього було зроблено висновок щодо конкурентоспроможності підприємства. Розглянуто плани розвитку підприємства ПрАТ «Запоріжжябразив» на 2023–2024 рр. Сформовано методи, що варто запровадити, враховуючи важливість інновацій, серед яких розширення асортименту ринку, впровадження екологічно дружніх технологій та виробничих процесів, використання інформаційних технологій та аналітики для оптимізації виробництва, інвестування у навчання та розвиток персоналу, укладання стратегічних партнерств з іншими компаніями або дослідницькими установами.

Problem statement

The unstable political and economic situation in Ukraine affects the competitiveness of Ukrainian businesses. Many international companies prefer to locate their business in countries where there is no hostilities. Therefore, it is important for Ukrainian businesses to maintain their competitiveness using various measures, including the use of innovations, which can open up new prospects for the development of the enterprise.

Analysis of the latest research

The role of innovations in the economy and society has been studied: S.A. Zvaryshchuk [1], V.Y. Lysak [2], O.I. Yankovska [3], The concept of competitiveness was formed by the following scientists: T.L. Zubko [4], A.O. Levytska [5], P.Y. Lizenkova [6], L. Minko [7], O.V. Moroz [8], N. Novikova [9]. A significant contribution to the study of the role of innovations in economic development and increasing the competitiveness of the national economy was made by the scientific works of domestic scientists: D.I. Babmindra [12], A. Galchuk [10], O. Reznikova [11], Y. Khomenko [11], O. Cherep [12, 13]. Thus, innovations ensure a high level of competitiveness and viability of enterprises in the context of the Russian-Ukrainian war and the post-war period. We believe that this research is timely and relevant.

Goal setting

The article is aimed at determining the relationship between innovations and competitiveness on the example of PJSC “Zaporizhzhia Abrasive Plant”.

Presentation of the main material

In today’s environment, businesses need to engage in innovative activities to improve their competitiveness. Implementing innovations in the company’s operations can reduce costs, speed up the company’s operations and increase its competitiveness. In 2022, Ukrainian enterprises lost their competitive position compared to European ones due to the hostilities in the country and

economic instability. Therefore, it is advisable to introduce innovative technologies in their work.

Scientists have different approaches to defining the concept of “innovation”, which should be analysed.

According to Table 1, it can be concluded that innovation is the process of introducing new ideas, technologies, products or services, or improving existing ones, which lead to an improvement in the structure, quality of production and competitiveness of the manufacturer, contribute to the efficiency of the production process and economic development of the enterprise.

Currently, Ukraine is ranked 55th in the Global Innovation Index, which means that it has risen 2 positions in the ranking and despite the hostilities, enterprises continue to develop.

Innovations at a company can include production automation, new product development, the introduction of energy-efficient technologies, the development of new marketing and sales methods, and the introduction of environmental initiatives. All these actions can lead to an increase in the competitiveness of the enterprise (Table 2).

According to Table 2, competitiveness is a complex characteristic that reflects the ability of an enterprise to achieve and maintain competitive advantages in the market, including the efficiency of resource use, the ability to adapt to changes in the external environment and the achievement of strategic goals.

During the war, Zaporizhabrasive faced the problem of a decline in competitiveness, although there are no analogues to ZAK in Ukraine for the production of normal aluminium oxide, silicon carbide and boron carbide. There is a lot of competition from Chinese, Russian and German companies: normal aluminium oxide – manufacturers in China; black silicon carbide – Volzhsky Abrasive Plant, Russia; boron carbide – manufacturers in China; cutting wheels – KLINGSPOR LLC, Germany, manufacturers in China [15].

In times of instability in Ukraine, foreign enterprises prefer Chinese and Russian manufacturers, so in order to change this situation, it is advisable to introduce innovations

Table 1 – Approaches to the definition of “innovation”

Author	Definition
The Law on Innovative Activities (Article 1)	Innovations are newly created (applied) and (or) improved competitive technologies, products or services, as well as organisational and technical solutions of a production, administrative, commercial or other nature that significantly improve the structure and quality of production and (or) the social sphere.
Yankovska O.I.	An innovation (at the micro level) is the end result of an innovation process that has led to qualitative changes in any area of the enterprise’s activity.
Galchuk A.A.	An innovation is an innovation that has brought positive changes to production in the form of cost reduction and profit maximisation. The effectiveness of an innovation is expressed in the additional benefit received by the innovator.
Zvaryshchuk S.A.	Innovation is an innovation, any positive change that has an independent value, is introduced into activities to improve the efficiency of any production process, competitiveness and economic efficiency of production.
Lysak V.Y.	Innovation as an innovation related to scientific and technological progress, which involves the renewal of fixed assets and technologies, and improvement of enterprise management. Innovation is a prerequisite for the development of production, improvement of the quality and quantity of products, and the emergence of new goods and services.

Compiled by the author on the basis of: [14, 3, 10, 1, 2]

Table 2 – Approaches to the definition of competitiveness

Author	Definition
Lizenkova P.Yu.	Competitiveness of an enterprise is its advantage in selected market segments over competitors at a given time, as assessed by external environment, determined by the competitiveness of its specific products and the level of competitive potential, which characterises the ability to develop, produce, sell and service goods (services) that are superior to the relevant analogues in terms of price and quality.
Levytska A.O.	Enterprise competitiveness is the ability of an enterprise to realise competitive advantages that allow it to develop effectively in comparison with other enterprises in the domestic and foreign markets.
Moroz O.V., Kuznetsov V.S.	This is a complex characteristic that describes the ability of an enterprise to ensure its competitive advantages and profitability at any given time, as well as to adapt to constantly changing environmental conditions.
Novikova N., Zubko T.	Competitiveness is a comparative characteristic of an enterprise that reflects the difference between the level of efficiency of using all types of resources compared to similar indicators of other enterprises in a certain homogeneous group.
Minko L.	The competitiveness of an enterprise is the ability of an enterprise to timely and effectively adjust the parameters of its activities depending on changes in the external environment in order to maintain existing and create new competitive advantages in order to achieve its own strategic goals”, which makes it possible to consider this concept not only as a result of activity, but also as a systemic category that reflects the process of an enterprise’s activity from the standpoint of its strategic goals

Compiled by the author on the basis of: [5–9]

that could increase the level of competitiveness in the enterprise and improve its financial performance.

Zaporozhabrasive PrJSC is the only manufacturer of abrasives in Ukraine and one of the largest producers of abrasives in Eastern Europe. It was founded in 1939. Currently, the company produces products in two areas: abrasives and tools. The company’s abrasives include normal aluminium oxide, silicon carbide, boron carbide and boron nitride. The company produces the following tools: ceramic-bonded grinding tools, bakelite-bonded cutting and grinding tools, bakelite-bonded cutting and grinding tools [15].

The company is located in a frontline city, so every day there is a risk of destruction or damage. However, even in the most difficult times for the country, during the large-scale invasion of the Russian Federation, it continues to develop, increasing its share of global sales and production, creating new jobs and paying taxes to the Ukrainian budget.

Analysing Table 3, the net revenue from sales decreased significantly by 12.75 %, which is due to low sales volumes. The cost of sales decreased by 19.31 %, which negatively affects the company’s gross profit, although according to the table it increased by 16.17 %, which indicates an improvement in production efficiency.

Table 3 – Analysis of the income statement of Zaporizhabrasive PrJSC for 2021–2022, UAH thousand

	2021	2022	Deviation	
	UAH thousand	UAH thousand	absolute, UAH thousand	relative, %
Net income from sales of products (goods, works, services)	1732021	1511138	-220883	-12,75
Cost of sales (goods, works, services)	-1411819	-1139168	272651	-19,31
Gross: profit	320202	371970	51768	16,17
Other operating income	30880	62676	31796	102,97
Administrative expenses	-101180	-95526	5654	-5,59
Selling expenses	-138493	-172317	-33824	24,42
Other operating expenses	-54802	-155756	-100954	184,22
Financial result from operating activities: profit	56607	11047	-45560	-80,48
Financial result from operating activities: loss	0	0	0	0,00
Other financial income	3960	2178	-1782	-45,00
Other income	0	0	0	0,00
Financial expenses	-3740	-2199	1541	-41,20
Losses from equity participation	-793	-180	613	-77,30
Other expenses	-18	-5941	-5923	32905,56
Financial result before tax: profit	56016	4905	-51111	-91,24
Financial result before taxation: loss	0	0	0	0,00
Income tax expense (income)	-11847	-969	10878	-91,82
Net financial result: profit	44169	3936	-40233	-91,09

Compiled by the author on the basis of [16]

There was also an increase in other operating income by 102.97 %, which indicates additional income that is not related to the company's core business.

Costs were mainly on the rise, with sales expenses increasing by 24.42 % and other operating expenses increasing by 184.22 %, and it should also be noted that the company's profitability decreased by 5.59 % due to an increase in administrative expenses.

The overall financial result before tax reflected a decrease in profit by 91.24 %. The company's net financial result decreased by 91.09 %, which indicates a significant decrease in profit in 2022 compared to 2021.

According to the analysis of the table of indicators of the profitability threshold and financial stability margin of Zaporizhabrasive PrJSC for 2020–2022, the financial stability zone and the financial stability margin of the enterprise have increased, which indicates an improvement in the enterprise's performance, but attention should be paid to the increase in operating costs.

Also, as we noted above, it is worth investigating the competitiveness of the enterprise, which depends on a number of external and internal factors (Table 5).

Table 5 shows that the competitiveness of steel companies is a complex issue that requires attention to both external and internal factors. Optimisation of technological processes, cost control, high product quality and investment in development are important components of success in this industry.

The methods of "qualitative" diagnostics of the company's competitiveness, which are often used in

practice, include SWOT analysis and PEST analysis, which allow to identify external and internal factors that affect the company's competitiveness.

According to the results of Table 6, the SWOT analysis of Zaporizhabrasive PrJSC indicates that the company has significant potential and strengths, production in Ukraine is unique, but also faces significant internal and external challenges and threats. In order to maintain competitiveness, it is important to actively use opportunities, improve internal processes and effectively counter threats, such as developing actions that can avoid the consequences of military operations.

The analysis of Table 7 shows that there are significant political and economic risks associated with the geopolitical situation and economic factors in Ukraine. However, there are opportunities for improvement and adaptation, such as the introduction of new technologies and product quality improvements, which can help the company remain competitive in the market. Therefore, it is important for the company to introduce innovations in production.

Currently, Zaporizhabrasive PrJSC has development plans for 2023–2024, including:

1. Maintaining positions in the international market during the period of stagnation of the abrasives market.
2. Capital and current repairs of fixed assets.
3. Implementation of new technologies.
4. Improving the efficiency of quality management systems, ecology, labour protection and health of personnel on the basis of international standards [15].

Table 4 – Indicators of the profitability threshold and financial stability margin of PJSC "Zaporizhabraziv", 2020–2021

Indicators.	2020	2021	2022
operating income, UAH thousand	1092220,00	1762901,00	1573814,00
operating expenses, UAH thousand	1084986,00	1706294,00	1562767,00
variable costs, UAH thousand	652353,37	1171309,17	848155,75
fixed costs, thousand UAH	353921,63	480182,83	558855,25
marginal income, UAH thousand	439866,63	591591,83	725658,25
financial result from operating activities, UAH thousand	7234,00	56607,00	11047,00
Share of margin income in operating income	0,40	0,34	0,46
Profitability threshold, UAH thousand	878812,48	1430910,22	1212050,19
Share of the profitability threshold in the OD, %.	80,46	81,17	77,01
Financial stability zone, UAH thousand	206173,52	275383,78	350716,81
Financial stability margin, %.	18,88	15,62	22,28

Compiled by the author on the basis of [16]

Table 5 – External and internal factors that determine the competitiveness of steel companies

External factors	Internal factors
Changes in prices for metallurgical raw materials	Improving technological processes and optimising production can improve a company's competitiveness
Level of demand for steel products	High-quality steel products can help to gain a competitive advantage in the market
Imposition of duties and other trade restrictions	Effective financial management and cost control allow us to maintain competitive prices
Development of new technologies in the production of steel products	Skills and qualifications of employees, as well as their motivation and job satisfaction
	Investments in research and development

Compiled by the author on the basis of: [17]

Table 6 – SWOT analysis of Zaporizhabrasive PJSC

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. The company has several production facilities, which are different in terms of their importance and technology. 2. The company exports approximately 90% of its products to European countries. 3. The scope of use of the products manufactured at the enterprise is quite wide, ranging from nuclear power, mechanical and aircraft engineering to dentistry and cosmetology. Refractory compounds such as boron carbide are also used in armour (body armour). 4. The company carries out a full production cycle (from raw materials to materials and products made of them) 5. Wide range of products 	<ol style="list-style-type: none"> 1. Large share of borrowed funds. 2. Low level of introduction of new technologies and new products 3. Strong competition from foreign enterprises.
Opportunities	Threats
<ol style="list-style-type: none"> 1. Stable and efficient production, maintaining its position in the international market during the period of stagnation in the abrasives market. 2. Capital and current repairs of fixed assets 3. Implementation of energy-saving technologies. 4. Improvement of efficiency of quality, environmental, labour protection and health management systems based on international standards. 	<ol style="list-style-type: none"> 1. Unpredictability of hostilities on the territory of the state. 2. Consequences of the introduction of martial law. 3. Instability and inconsistency of legislation. 4. Unforeseen actions of state authorities. 5. Instability of economic (financial, tax, foreign economic, etc.) Policy. 6. Unforeseen changes in the domestic and foreign market conditions. 7. Unforeseen actions of competitors.

Compiled by the author on the basis of: [15]

Table 7 – PEST-analysis of Zaporizhabrasive PJSC

Political	Economic
<ol style="list-style-type: none"> 1. The invasion of Ukraine by Russian troops 2. Changes in the rules for exporting goods abroad 3. Changes in the European Union’s rules on the sale of goods from Ukraine on its territory. 	<ol style="list-style-type: none"> 1. High inflation rate 2. High external debt of Ukraine 3. Fluctuations in exchange rates 4. Decreased purchasing power
Socio-cultural trends	Technological innovations
<ol style="list-style-type: none"> 1. Increased awareness of environmental issues requires the adoption of environmental standards and increased spending on environmental protection. 2. Changing consumer demand. 3. Decrease in the number of customers due to the destruction or closure of enterprises 	<ol style="list-style-type: none"> 1. The introduction of new technologies and automation can improve productivity and quality of production. 2. The use of digital technologies to manage production and logistics can improve the efficiency of the enterprise.

Compiled by the author on the basis of: [15]

But these measures are not enough to improve competitiveness, and other methods should be considered, given the importance of innovation:

1. Expanding the market range. Before expanding the range of products, it is advisable to research the international market and identify consumer needs.

2. Introducing environmentally friendly technologies and production processes, this initiative can improve the company’s reputation and open access to markets where sustainability and environmental protection are important, such as the European Union market.

3. Use of information technology and analytics to optimise production, logistics and customer management, which will increase the efficiency of operations and reduce time and financial resources.

4. Investing in staff training and development, which will improve the team’s skills and ensure the company’s ability to adapt to change.

5. Consider entering into strategic partnerships with other companies or research institutions to share knowledge and resources.

Taking into account these innovations, PJSC “Zaporozhabraziv” can strengthen its market position and increase its competitiveness in the face of industry stagnation. The key requirement is to constantly monitor and analyse the results of these initiatives and be ready to adapt the strategy in line with changes in the market and internal conditions.

Conclusions

Thus, according to our study, innovation is the process of introducing new ideas, technologies, products or services, or improving existing ones, which lead to an improvement in the structure, quality of production and competitiveness of the manufacturer, contribute to the efficiency of the production process and economic development of the enterprise. The concept of innovation is very closely related to the concept of competitiveness, competitiveness is a complex characteristic that reflects the ability of an enterprise to achieve and maintain competitive advantages in the market, including the efficiency of resource use, the ability to adapt to changes

in the external environment and the achievement of strategic goals.

In this paper, we have considered the impact of innovations on the competitiveness of Zaporizhabrasive PrJSC. The company does not face internal competition, as it is the only producer of abrasive materials in Ukraine, but in the international market, the company faces a lot of competition.

Examining the financial condition of the enterprise in 2023, there was a decrease in profit by 91.24 %, but in 2020–2022, the financial stability zone and the financial stability margin of the enterprise increased, which indicates an improvement in the enterprise's performance.

Analysing the SWOT and PEST analyses, we identified the weaknesses of the enterprise and the threats

it faces, including competition from foreign enterprises, the instability of the political and economic situation. However, there are opportunities for improvement and adaptation, such as the introduction of new technologies and product quality improvement, which can help the company remain competitive in the market.

The article proposes measures to increase the competitiveness of Zaporizhabrasive LLC and determines that it is difficult to ensure the competitiveness of an enterprise without the use of innovative technologies, since they allow responding to changes in the industry and consumer requirements quickly and efficiently, as well as reducing the costs of the enterprise.

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