



## MANAGEMENT

## МЕНЕДЖМЕНТ

UDC 658.8

### ASSESSMENT OF THE PRODUCT COMPETITIVENESS ON THE EXAMPLE OF JSC «ELVORTI»

Zhanna Torianyk<sup>1</sup>; Viktoriya Shevchenko<sup>1</sup>; Sergey Tkach<sup>2</sup>

<sup>1</sup>*Educational and Research Institute «Karazin Banking Institute»*

*V. N. Karazin Kharkiv National University, Kharkiv, Ukraine*

<sup>2</sup>*JSC «Elvorti», Kropyvnytskyi, Ukraine*

**Summary.** The competitiveness of products is a key element of a business entity's success on the market. It has been proven that to improve effectively the competitive positions of products in the sales markets, it is important to conduct an objective and timely evaluation of the product competitiveness. Without such an assessment, any measures aimed at supporting competitiveness will remain only intentions, as they will not have an objective basis for determining their real effect. The evaluation of the competitiveness of the equipment of the machine-building industry was carried out using an integral indicator that allowed comparing various indicators of the competitiveness of the studied products with the corresponding indicators of competitors' products. The factors that affect the competitiveness of products are systematized according to the following main blocks: technical parameters of products, cost and service parameters, and market parameters. The backhoe loader ELEX 81 was selected as the basis for evaluating the level of competitiveness of the products of JSC «Elvorti». It is a multi-purpose high-performance machine designed for excavation, loading and unloading works such as territory planning, development and loading of soil, digging pits and trenches. The market of backhoe loaders in Ukraine was analyzed. The calculation of the integral indicator of product competitiveness was carried out taking into account the detailed analysis of group and individual indicators of products; consumer market segmentation; weighting coefficients of product competitiveness indicators. The results of the calculation of the integral indicator show that the ELEX 81 backhoe loader is not competitive in comparison with similar products manufactured by JCB (England), CAT (USA) and Hidromek (Turkey). In order to increase the level of competitiveness of products, it is proposed to improve the key competitive aspects of the studied products, which are the most valuable for consumers. It is justified that the achievement of sustainable competitive advantages is possible by ensuring the optimal quality of products, increasing the level of service and effective marketing promotion of products to the market.

**Key words:** product competitiveness, integral indicator, competitive advantages.

[https://doi.org/10.33108/galicianvisnyk\\_tntu2023.06.132](https://doi.org/10.33108/galicianvisnyk_tntu2023.06.132)

Received 11.09.2023

УДК 658.8

### ОЦІНЮВАННЯ КОНКУРЕНТОСПРОМОЖНОСТІ ПРОДУКЦІЇ НА ПРИКЛАДІ АТ «ЕЛЬВОРТІ»

Жанна Торяник<sup>1</sup>; Вікторія Шевченко<sup>1</sup>; Сергій Ткач<sup>2</sup>

<sup>1</sup>*Навчально-науковий інститут «Каразинський банківський інститут» Харківського національного університету імені В. Н. Каразіна, Харків, Україна*

<sup>2</sup>*АТ «Ельворті», Кропивницький, Україна*

**Резюме.** Конкурентоспроможність продукції є ключовим елементом успіху суб'єкта господарювання на ринку. Доведено, що для ефективного вдосконалення конкурентних позицій продукції

на ринках збуту важливо проводити об'єктивне й своєчасне оцінювання конкурентоспроможності продукції. Без такого оцінювання будь-які заходи, спрямовані на підтримання конкурентоспроможності, залишаться лише намірами, оскільки вони не матимуть об'єктивної основи для визначення їх реального ефекту. Проведено оцінювання конкурентоспроможності техніки підприємства машинобудівної галузі за допомогою інтегрального показника, який дозволяє порівнювати різні показники конкурентоспроможності досліджуваної продукції з відповідними показниками продукції конкурентів. Систематизовано чинники, які впливають на конкурентоспроможність продукції за такими основними блоками: технічні параметри продукції, вартісні й сервісні параметри та ринкові параметри. Базою для оцінювання рівня конкурентоспроможності продукції підприємства АТ «Ельворті» обрано екскаватор-навантажувач ELEX 81 – це багатоцільова високопродуктивна машина, призначена для виконання екскаваторних і вантажно-розвантажувальних робіт, таких, як планування території, розроблення й вантаження ґрунту, риття котлованів і траншей. Проаналізовано ринок екскаваторів-навантажувачів в Україні. Розрахунок інтегрального показника конкурентоспроможності продукції проведено з урахуванням детальнього аналізу групових і окремих показників продукції; сегментації ринку споживачів; вагових коефіцієнтів показників конкурентоспроможності продукції. Результати розрахунку інтегрального показника показують, що екскаватор-навантажувач ELEX 81 не є конкурентоспроможним у порівнянні з аналогічною продукцією виробництва JCB (Англія), CAT (США) та Hidrotek (Туреччина). Для підвищення рівня конкурентоспроможності продукції запропоновано поліпшити ключові конкурентні аспекти досліджуваної продукції, які є найціннішими для споживачів. Обґрунтовано, що досягнення стійких конкурентних переваг можливе шляхом забезпечення оптимальної якості продукції, підвищення рівня обслуговування та ефективного маркетингового просування продукції на ринок.

**Ключові слова:** конкурентоспроможність продукції, інтегральний показник, конкурентні переваги.

[https://doi.org/10.33108/galicianvisnyk\\_tntu2023.06.132](https://doi.org/10.33108/galicianvisnyk_tntu2023.06.132)

Отримання 11.09.2023

**Introduction.** First of all, the success of the enterprise depends on how much its products are in demand on the market in comparison with similar products of competitors. The need to find new ways to increase the competitiveness of the products of domestic machine-building enterprises and improve production management strategies is due to the relevance of the researched topic, caused by the intensification of competition in the market of the machine-building industry and the emergence of new threats, such as war, the loss of sales markets and the low level of competitiveness of domestic machine-building products compared to foreign counterparts.

**Review of the latest research and literature.** Such scientists as: I. Ansoff, V. Andriichuk, I. Burachek, O. Bilenchuk, Yu. Danko, P. Druker, L. Ivachenkova, K. Zheludenko, F. Kotler, M. Porter, O. Pavlova, R. Fathutdinov and others. However, some tasks related to the assessment of competitiveness and the formation of competitive advantages of products of machine-building enterprises are not fully disclosed, and in modern conditions, they require special attention.

**Main purpose of the article.** The purpose of the article is to justify a methodical approach to assessing the competitiveness of the products of the studied enterprise and to provide practical recommendations for its improvement.

**Task setting.** To achieve the goal, scientific tasks have been defined. They include the establishment of group indicators of the competitiveness of the researched technology and the calculation of the integral indicator of competitiveness on a specific example.

**Statements of main issues of the study.** We chose ELEX 81 backhoe loader as the basis for evaluating the competitiveness of the products of JSC «Elvorti». It is a multi-purpose, high-performance machine designed for excavation, loading and unloading operations, such as territory planning, soil development and loading, digging pits and trenches, and the range of work expands even more with the use of attached equipment. The backhoe loader ELEX 81 meets all the requirements of European standards, as well as technical regulations of the Customs Union.

If we analyze the market of backhoe loaders and manufacturers with which we will compare products, then there are foreign manufacturers of products on the market and there are no competitors among domestic manufacturers (Table 1) [1].

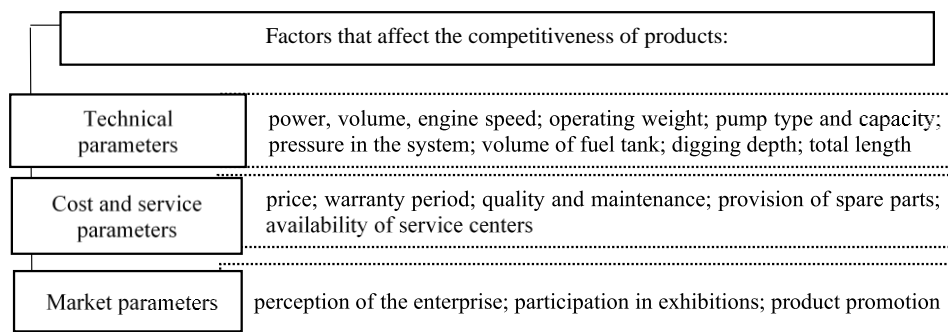
**Table 1.** The dynamics of the backhoe loader market in Ukraine for 2020–2021

Brand	2020	Market share, %	2021	Market share, %	Deviation, %
JCB	759	65,7	597	64,3	-1,4
CATERPILLAR	143	12,4	112	12,1	-0,3
HIDROMEK	39	3,4	61	6,6	3,2
BOBCAT	23	2,0	24	2,6	0,6
KOMATSU	14	1,2	20	2,2	1
ELEX	18	1,6	21	2,3	0,7
VOLVO	21	1,8	13	1,4	-0,4
TEREX	27	2,3	10	1,1	-1,2
CASE	23	2,0	7	0,8	-1,2
NEW HOLLAND	6	0,5	4	0,4	-0,1
others	82	7,1	60	6,5	-0,6
Total	1155	100	929	100	

Therefore, the volume of the backhoe loader market in 2021 decreased by 226 units compared to 2020. For the second year in a row, the top three remain unchanged, namely: JCB (64.3%), CATERPILLAR (12.1%) and HIDROMEK (6.6%). ELEX 81 Backhoe loaders occupy only 2.3% of the market share in 2021, but it should be noted that compared to 2020, the market share increased by 0.7%. Next, we will compare the backhoe loader ELEX 81 (made in Ukraine) with JCB (made in England), CATERPILLAR (made in the USA), HIDROMEK (made in Turkey).

Excavator-loader ELEX 81 is most in demand among consumers who are characterized by an average level of solvency and who are satisfied with an average level of product quality. Considering that the needs of a specific consumer are formed under the influence of a certain combination of factors and are characterized by an individual character, the evaluation of the same product by different consumers may differ. The products that are able to satisfy a specific need, which ensures its success in the competition, receive recognition among consumers.

Thus, Figure 1 systematizes the factors that affect the competitiveness of products and by which we will assess the competitiveness of the backhoe loader ELEX 81 of JSC «Elvorti».

**Figure 1.** Factors that affect the competitiveness of products

Taking into account the above, a complex indicator of the level of competitiveness of the enterprise's products is proposed to be calculated using the formula [2]:

$$K_{int} = K_1 * x_1 + K_2 * x_2 + K_3 * x_3,$$

where  $K_{int}$  is an integral indicator that combines group indicators of product competitiveness;

$K_1$  – group indicators of quality and reliability of products;

$K_2$  – group indicators of the price and service of products;

$K_3$  – group market indicators.

$x_1, x_2, x_3$  – coefficient of weighting of indicators (equals to one).

If the integral index of competitiveness of  $K_{int}$  is more than 1, then the products are competitive, if  $K_{int}$  is less than 1, then the products are inferior in their properties to the products of competitors, that is, they are not competitive. If  $K_{int}$  is 1, then the products are at the same level as the products of the competitor.

Technical parameters of backhoe loaders are given in Table 2 [3–6].

**Table 2.** Basic technical parameters of backhoe loaders

Product parameters	ELEX 81	3CX	428	102	Parameter weighting factor
	Elvorti Ukraine	JCB England	CAT USA	Hidromek Turkey	
Engine power, kW/hp	81/102	63/85	75/102	74,5/100	
Engine volume, l	4,4	4,4	4,4	4,4	
Engine RPM	2200	2200	2200	2200	
Operating weight, kg	7950	8136	8275	9100	
Pump type	Gear pump	Gear pump	Adjustable axial piston	Gear pump	
Pump capacity, l/min	130	154	160	147	0,3
System pressure, bar	230	251	250	227	0,1
Fuel tank volume, l	130	160	160	140	0,2
Depth of digging, mm	5410	5460	4782	5627	0,4
Total length, mm	6420	5910	5744	6049,6	

According to the expert assessment, the following technical indicators were selected and their weighting factors were determined, which characterize the value for the consumer, namely: hydraulic system pump productivity – 0.3, pressure in the hydraulic system – 0.1, fuel tank volume – 0.2, digging depth – 0.4.

The calculation of the group indicator of reliability and quality of the backhoe loader ELEX 81 manufactured by JSC «Elvorti» in comparison with:

JCB (England):  $130/154 \cdot 0.3 + 230/251 \cdot 0.1 + 130/160 \cdot 0.2 + 5410/5460 \cdot 0.4 = 0.25 + 0.09 + 0.16 + 0.39 = 0.89$

CAT (USA):  $130/160 \cdot 0.3 + 230/250 \cdot 0.1 + 130/160 \cdot 0.2 + 5410/4782 \cdot 0.4 = 0.24 + 0.09 + 0.16 + 0.45 = 0.94$

Hidromek (Turkey):  $130/147 \cdot 0.3 + 230/227 \cdot 0.1 + 130/140 \cdot 0.2 + 5410/5627 \cdot 0.4 = 0.27 + 0.1 + 0.19 + 0.38 = 0.94$

The results of the calculation of the group indicator of reliability and quality indicate that the backhoe loader ELEX 81 manufactured by JSC «Elvorti» is uncompetitive in comparison with backhoe loaders JCB 3CX (England), CAT 428 (USA) and Hidromek 102 (Turkey) in terms of technical characteristics and quality parameters.

The price and service characteristics of backhoe loaders are shown in Table 3.

**Table 3.** Cost and service characteristics of backhoe loaders

Indicators	3CX	428	102	ELEX 81	Parameter weighting factor
	JCB England	CAT USA	Hidromek Turkey	Elvorti Ukraine	
Price, thousand UAH	4103	4322	2890	2800	0,3
Warranty period	5	5	5	5	0,1
Quality and maintenance	5	5	4	3	0,2
Provision of spare parts	5	4	3	2	0,2
Availability of service centres	5	5	4	1	0,2

Source: own development.

The calculation of the group indicator of the price and service of the backhoe loader ELEX 81 manufactured by JSC «Elvorti» in comparison with:

JCB (England):  $2800/4103*0.3 + 5/5*0.1 + 3/5*0.2 + 2/5*0.2 + 1/5*0.2 = 0.2 + 0.1 + 0.12 + 0.08 + 0.04 = 0.54$

CAT (USA):  $2800/4322*0.3 + 5/5*0.1 + 3/5*0.2 + 2/4*0.2 + 1/5*0.2 = 0.19 + 0.1 + 0.12 + 0.1 + 0.04 = 0.55$

Hidromek (Turkey):  $2800/2890*0.3 + 5/5*0.1 + 3/4*0.2 + 2/3*0.2 + 1/4*0.2 = 0.3 + 0.1 + 0.15 + 0.13 + 0.05 = 0.73$

The results of the calculation of the group indicator of price and service indicate that the backhoe loader ELEX 81 manufactured by JSC «Elvorti» is uncompetitive in comparison with backhoe loaders JCB 3CX (England), CAT 428 (USA) and Hidromek 102 (Turkey). ELEX 81 backhoe loader has no advantages over competitors even with the lowest price, in order to improve positions, you need to pay attention and manage not only the cost of production, but also develop service and improve product quality. The company has an advantage among other manufacturers only in the case when for the consumer a sufficiently large weighting factor is only the price, and all other indicators are unimportant.

Market indicators for evaluating the backhoe loader are shown in Table 4.

**Table 4.** Market indicators for evaluating the backhoe loader

Indicators	3CX	428	102	ELEX 81	Parameter weighting factor
	JCB England	CAT USA	Hidromek Turkey	Elvorti Ukraine	
Perception of the enterprise	5	5	4	3	0,5
Participation in exhibitions	5	3	5	2	0,2
Product promotion	5	5	5	4	0,3

Source: own development.

The calculation of the group market indicator of the backhoe loader ELEX 81 manufactured by JSC «Elvorti» in comparison with:

JCB (England):  $3/5*0.5 + 2/5*0.2 + 4/5*0.3 = 0.3 + 0.08 + 0.24 = 0.62$

CAT (USA):  $3/5*0.5 + 2/3*0.2 + 4/5*0.3 = 0.3 + 0.13 + 0.24 = 0.67$

Hidromek (Turkey):  $3/4*0.5 + 2/5*0.2 + 4/5*0.3 = 0.38 + 0.08 + 0.24 = 0.7$

The results of the calculation of market indicators show that the backhoe loader ELEX 81 manufactured by JSC «Elvorti» is also not competitive in comparison with similar products of competitors. This is primarily due to the consumer's perception of the manufacturer's enterprise, since ELEX 81 backhoe loader has been on the market only since 2015. Therefore, it is difficult to compete with the products of well-known manufacturers that have been in production for more than a dozen years. A more aggressive advertising campaign is required to improve product recognition.

Having calculated the group indicators of the competitiveness of construction and road engineering products, namely: price and service indicators, technical characteristics and product quality, market indicators, we will calculate the integral indicator of the competitiveness of ELEX 81 loader excavator in comparison with analogues, taking into account the weighting factors of the relevant indicators (Table 5).

**Table 5.** Calculation of the competitiveness integral indicator of the backhoe loader ELEX 81 in comparison with analogues

Indicator	Weight coefficient of group indicators	3CX	428	102
		JCB England	CAT USA	Hidromek Turkey
Product performance and quality indicators	0,3	0,89	0,94	0,94
Price and service indicators	0,6	0,54	0,55	0,73
Market indicators	0,1	0,62	0,67	0,7
Integral indicator	1	0,65	0,68	0,79

Source: own development.

Therefore, according to the results of the calculation of the integral indicator, ELEX 81 backhoe loader is not competitive in comparison with similar products manufactured by JCB (England), CAT (USA), Hidromek (Turkey). The conducted analysis shows that ELEX 81 backhoe loader is most similar to the Hidromek (Turkey) backhoe loader, as well as the inability of ELEX 81 to compete with JCB and CAT without improving technical characteristics and quality indicators.

In order to increase the competitiveness of ELEX 81 backhoe loader, it is proposed to improve some competitive positions of the studied products, which have the greatest value for consumers (Table 6).

**Table 6.** Results of the management influence on the competitiveness growth of ELEX 81 backhoe loader

Indicator	Weight coefficient of group indicators	3CX	428	102
		JCB England	CAT USA	Hidromek Turkey
Preliminary indicators of product characteristics and quality (before changes in indicators)				
Product performance and quality indicators	0,3	0,89	0,94	0,94
Performance and quality indicators after changing the «pump performance» indicator from 130 l/min to 160 l/min.				
Product performance and quality indicators	0,3	0,95	1	1
Preliminary price and service indicators of product competitiveness (before indicators change)				
Price and service indicators	0,6	0,54	0,55	0,73
Price and service indicators after changing the indicator «spare parts provision» from 2 to 5 points, and changing the indicator «availability of service centres» from 1 to 5 points				
Price and service indicators	0,6	0,82	0,86	1,13
Preliminary market indicators of product competitiveness (before indicators change)				
Market indicators	0,1	0,62	0,67	0,7
Market indicators after changing «ELEX brand perception» indicator from 3 to 5 points, and changing the «participation in exhibitions» indicator from 2 to 5 points				
Market indicators	0,1	0,94	1,1	1,1
Integral assessment of product competitiveness (before changes in indicators)				
Integral competitiveness indicator		0,65	0,68	0,79
Indicators of integral assessment of competitiveness after change of indicators				
Integral competitiveness indicator		0,87	0,93	1,1

Source: own development.

Thus, the results of the influence of management actions on increasing the competitiveness indicate that the backhoe loader ELEX 81 will be competitive in comparison with similar products of Hidromek (Turkey). Today, the backhoe loader under study has only two modifications compared to its competitors, which have dozens of modifications aimed at different market segments and meeting different consumer needs. The expansion of the range of excavators and loaders of JSC «Elvorti» should increase the number of satisfied consumers who will find their advantages in the quality of the product and at the appropriate price. With improved technical characteristics of the product, an increase in service centres and provision of spare parts, there is an opportunity to attract consumers from the premium segment, which will allow to increase the market share in Ukraine and enter the international market.

**Conclusions.** Therefore, the proposed methodological developments regarding the assessment of the integral indicator of the competitiveness of products are of significant importance for increasing the efficiency of the enterprises of the machine-building complex of Ukraine. The application of the above approaches makes it possible to compare various types of products of domestic manufacturers with existing analogues, to identify the objective positions of the evaluated products in certain market segments, to establish competitiveness factors that determine these positions and are able to influence their change, to find weak points

in quality and promotion of products and determine promising directions for strengthening the competitive positions of domestic producers in the market under study. It has been proven that stable competitive advantages can be achieved by ensuring the rational quality of products, improving the level of service and marketing promotion of products to the market.

#### References

1. Zvit pro upravlinnia AT "Elvorti" (2021). URL: <https://www.elvorti.com> (accessed: 12 July 2023). [In Ukrainian].
2. Pavlova O. V. (2009). Konkurentospromozhnist produktii pidpriemstv silskohospodarskoho mashynobuduvannia [Products compatibility of agricultural machine-building enterprises]: dys ... kand. ekonom. nauk: 08.00.04. Zaporizhzhia. [In Ukrainian].
3. Tekhnichni kharakterystyky ekskavatora–navantazhuvacha ELEX 81 [Technical specifications of an excavator-loader ELEX 81]. URL: <https://elex.kr.ua> (accessed: 13 July 2023). [In Ukrainian].
4. Tekhnichni kharakterystyky ekskavatora–navantazhuvacha JCB 3CX [Technical specifications of an excavator-loader JCB 3CX]. URL: <http://www.arenada-tehniki.in.ua/ua/katalog-spetstekhniki/ekskavatori/69-ekskavatory/ekskavatory-pogruzchiki/jsb/322-ekskavator-pogruzchik-jcb-3cx-super-tekhnycheskie-kharakteristiki> (accessed: 12 July 2023). [In Ukrainian].
5. Tekhnichni kharakterystyky ekskavatora–navantazhuvacha CAT 428 [Technical specifications of an excavator-loader CAT 428]. URL: <https://zeppelin.ua/products/backhoe-loaders/428/> (accessed: 12 August 2023). [In Ukrainian].
6. Tekhnichni kharakterystyky ekskavatora–navantazhuvacha Hidromet 102 [Technical specifications of an excavator-loader Hidromet 102]. URL: <https://www.lectura-specs.com.ua/ua/model/budivel-na-tehnika/ekskavator-navantazuvac-hidromek/hmk-102-s-alpha-11749521> (accessed: 12 August 2023). [In Ukrainian].

#### Список використаних джерел

1. Звіт про управління АТ «Ельворті» за 2021 р. URL: <https://www.elvorti.com>. (дата звернення: 12.07.2023).
2. Павлова О. В. Конкуренгоспроможність продукції підприємств сільськогосподарського машинобудування: дис. ... канд. економ. наук: 08.00.04 / Класичний приватний університет. Запоріжжя, 2009. 249 с.
3. Технічні характеристики екскаватора-навантажувача ELEX 81. URL: <https://elex.kr.ua>. (дата звернення: 13.07.2023).
4. Технічні характеристики екскаватора–навантажувача JCB 3CX. URL: <http://www.arenada-tehniki.in.ua/ua/katalog-spetstekhniki/ekskavatori/69-ekskavatory/ekskavatory-pogruzchiki/jsb/322-ekskavator-pogruzchik-jcb-3cx-super-tekhnycheskie-kharakteristiki> (дата звернення: 12.07.2023).
5. Технічні характеристики екскаватора–навантажувача CAT 428. URL: <https://zeppelin.ua/products/backhoe-loaders/428/> (дата звернення: 12.08.2023).
6. Технічні характеристики екскаватора-навантажувача Hidromet 102. URL: <https://www.lectura-specs.com.ua/ua/model/budivel-na-tehnika/ekskavator-navantazuvac-hidromek/hmk-102-s-alpha-11749521> (дата звернення: 12.08.2023).