


Strategic Management of Factories in Conditions of Innovation-Marketing Orientation in the Industrial Market

Nataliia Stebliuk, University of Customs and Finance, Ukraine*

Nataliia Volosova, Dniprovsk State Technical University, Ukraine

Serhii Koberniuk, Dnipro State Agrarian and Economic University, Ukraine

Olena Rybak, Banking and Insurance National Aviation University, Ukraine

 <https://orcid.org/0000-0002-1576-7189>

ABSTRACT

In order to maintain competitive positions in the industrial market, an enterprise should use innovative approaches based on constant analysis of the economic environment and forecasting of possible technological changes in it. The purpose of the study is to investigate the problem of strategic management of an innovative marketing orientation enterprise in order to determine its competitive position in the industrial market. The article deals with an example of the practical application of the methodology for constructing innovative development scenarios and describes the results of the application of each step with the help of reframing theory and methods of economic and mathematical modeling. The integral indicators of the state of the external and internal environment of the enterprise are determined, which allows to take into account the uncertainty factor in the selection and development of the strategy. As a result of the research, scenario modeling was proposed to determine the scenarios of enterprise innovative development.

KEYWORDS:

Scenario Approach, Scenarios, Strategic Management, Innovative Potential of Enterprise, Innovation Development, Innovation Strategy, Reframing, Frame

INTRODUCTION

Transformational changes in the economy necessitate the adaptation of Ukrainian industrial enterprises to the new economic environment, its requirements and laws. Under the pressure of external circumstances, enterprises are forced to constantly develop, to create additional competitive advantages, which is possible only in the system of adequate and timely changes. However, changes

in the economic environment are happening so quickly that businesses need not only to be prepared for them, but also to have a case-by-case scenario (Meshko,2008). Developing and evaluating several scenarios in the future will help you choose your enterprise development strategy. These arguments determine the relevance of this study. The first step to improving the strategic management of any enterprise in the management system is to assess its readiness for strategic change, namely: it is necessary to determine the feasibility and feasibility of their implementation. The possibility of change depends both on the conditions existing inside the enterprise (internal factors) and on the conditions prevailing in the external environment (external factors) Voronkov (2010), Pereverza (2012). In the construction of the model, one of the most important tasks is the choice of indicators that characterize the activity of the enterprise, as well as the identification of internal and external factors, the degree of their influence and limit values in different production processes and situations.

The development of a specific approach with its tools for analyzing the development of complex systems is due to the need for strategic prediction, especially in cases where in a short time the factors of micro and macro environment change dramatically, new opportunities for business expansion or diversification arise, or the framework conditions of enterprise activity change Robinson, Burch, Talwar, O'Shea & Walsh (2011), Van Notten (2006).

PJSC "Interpipe Nizhni-Dnipro Pipeline Plant", specializing in the production of seamless pipes for the extraction and transportation of products in the oil and gas industry, special purpose pipes for the engineering and energy industries, general purpose pipes and bundles transport.

The lack of sufficient funds should not impede the implementation of promising innovative projects. The activity of the enterprise should be guided by creation and attraction of those innovations which in the current conditions will allow to create sustainable competitive advantages.

So, we can identify the marketing management problem that PJSC "Interpipe" is facing: assessing the current economic status of the enterprise, as well as deciding how to choose key areas for strategic change management through scenario modeling, depend on where the enterprise frame is in the current period, and in which it plans to be in the future.

The purpose of this work is to investigate the problem of strategic management of an enterprise of innovative marketing orientation in order to determine its competitive position in the industrial market. To achieve this goal in the work set the following tasks:

- to substantiate the feasibility of implementing the scenario approach as a mechanism for implementing the strategic objectives of the enterprise;
- to evaluate the external and internal conditions of change and to provide an integrated assessment of the external and internal environments of the enterprise;
- to determine the scenarios of the enterprise development on the basis of calculations of integral indicators of the state of the external and internal environments of the enterprise.

The paper is organized as follows. In the next section discusses the research method followed by a comprehensive review of the literature on the topics covered in the study. Then, empirical findings are reported. Finally, the last section provides valid conclusions and suggestions for further research.

LITERATURE REVIEW ON ERP DEPLOYMENT

In order to explore this issue and to better understand management issues, a literature review was conducted to study the available theoretical and empirical work on scenario modeling. The results of the preliminary review are presented in another study (Stebliuk, 2017), where the possibility and feasibility of carrying out a number of changes related to the innovative development and reorientation of the enterprise to strategic advantages were identified through the scenario modeling of the conditions for strategic changes in the enterprise and the construction of the frame structure.

It should be noted that the issues of script planning began to be actively developed by American and German economists, futurists and specialists in the field of technology development. Scenario planning has been applied in strategic management, from the standpoint of ensuring the development of organizations in a changing and uncertain environment Van Notten (2006), Rindgland (2009), Lindgren & Bandhold (2009).

The scenario approach involves conducting a scenario study, during which several alternative scenarios are constructed. Analyzing constructed scenarios, researchers can formulate a strategy for the object under study Ayodele, Innocent, & Garba (2019), Omarov (2011), Kwilinski, Pajak, Halachenko, Vasylichak, Pushak, & Kuzior (2019), Popov (2008).

The research identified the need for a scenario-based approach to analyze the economic processes of industrial development, which allows one to determine with certain degree of probability the possible trends and relationships of macroeconomic factors that shape the business environment of enterprises Schoemaker (2004), Shandova (2017).

Porter (2005) saw the development of alternative scenarios as an important tool to take into account the uncertainty factor when selecting and developing a strategy. Application of scenarios allows the company to avoid dangerous, narrowly directed forecasts of the future.

However, at this time, the practical application of the scenario approach is not comprehensive enough. In the field of forecasting and management decisions require further elaboration of the development, including the models and information bases needed to select the most effective option for implementing the overall strategy of the company.

Therefore, updating marketing effectiveness and finding optimal strategic solutions is one of the problems that needs to be addressed first Kovalchuk (2012), Sibirskaya (2004), Rach, Rossoshanska, Medvedieva, & Yevdokymova (2019).

An essential part of the scenario study in the paper is the chosen methodology of scenario construction using the theory of reframing (Voronkov, 2010), which provides a certain sequence of steps and methods on each of them. The choice of methodological approaches based on economic and mathematical modeling depends on the nature of the information available, the possible methods for obtaining it and the conditions of the research. Compared with the previous studies, the proposed methodological toolkit provides an alternative to the strategic choice of scenarios of enterprise development in the conditions of innovation and marketing orientation in the industrial market.

According to the study, the use of modern valuation methods in the formation of strategic positions of the enterprise in terms of innovation-marketing orientation is necessary to increase its competitive status (Farhshatova, O., Zaharov, S., Vereskun, M., & Kolosok, 2019). In order to maintain competitive positions in the industrial market, an enterprise should use innovative approaches based on constant analysis of the economic environment and forecasting of possible technological changes in it.

The main question of the research is to determine the feasibility of forming enterprise development strategies using a scenario approach to determine its competitive position in the industrial market.

RESEARCH METHODOLOGY

The methodology for constructing scenarios of innovative development of the enterprise in modern conditions is presented. The proposed methodology consists of three steps (assessment of the state of the external environment, assessment of the state of the internal environment, definition of the scenario of enterprise development), for each of which methods, character of input and output information, practical recommendations are described. Different methods may be used at each stage, depending on the tasks of the particular study, system, or object for which the scenario is being modeled.

In modern conditions there is a considerable number of methods of estimating the level of investment potential of enterprises, the main of which are: expert and scoring methods, rating comparative analysis, method of analogies, factor analysis, modeling methods and economic-mathematical methods. One of the complex approaches of estimation of the investment potential of

the enterprise is its estimation on the basis of integral index and comparison with the reference value. Analyzing different approaches and techniques for evaluating innovation potential Kovalchuk (2012), Pereverza (2012), Shandova (2017), we consider the theory of reframing Voronkov (2010). The essence of reframing is to see things in different perspectives or in different contexts. The frame is considered as a multicomponent concept, a semantic representation, a model containing a certain amount of information, describing a stereotypical situation, a fragment of reality. It is a unit of knowledge that is hierarchically organized around a certain concept, containing information about the essential, typical and possible for this concept, which consists of nodes and connections between them. Therefore, frames are the framework for considering the need and direction of strategic change in the factory.

The theory of reframing is based on a scenario approach. There are 9 frames, which are determined by the integral state of both the external and internal environment of the factory. They meet certain scenarios of innovative development of the enterprise. Determine the intervals of values of the integral indicator of the state of the external and internal environment. Considering the possible variants of the relation between the internal state of the factory and the state of the external environment, it is necessary to define certain scenarios of innovative development of the factory.

Before implementing a development strategy, it is necessary to evaluate the firm's resources using the following methods: PEST analysis – to identify the political, economic, social and technological factors of the environment that influence the activity of the enterprise; reframing – to evaluate the innovation potential of the enterprise Voronkov (2010); ABC-XYZ analysis – to evaluate the stability of sales and purchase of enterprise products; expert analysis – to evaluate enterprise competitiveness, corporate culture and personnel policy effectiveness; Competitiveness polygon – for visualizing the strengths and weaknesses of competing firms relative to each other; “price-quality” matrix – to determine the competitive position of enterprises; correlation-regression analysis – to evaluate the relationship between the national currency exchange rate and the main macroeconomic indicators; taxonomy – to determine the optimal capital structure of the enterprise; SWOT-analysis – to develop a strategy of enterprise innovation activity; D. Kirkpatrick's model for assessing training and staff development Kirkpatrick (1996); personal type of interviewing – for conducting questionnaire of employees and management of the enterprise.

Thus, the construction of a frame structure by means of scenario modeling of conditions of implementation of strategic changes at the enterprise provides an opportunity and expediency of carrying out a number of changes concerning the innovative development and reorientation of the enterprise to strategic advantages.

An analytical review of the works Shapovalova (2016), Lotariev (2016), Meshko (2008), Kwilinski, Pajak, Halachenko, Vasylichak, Pushak, & Kuzior (2019) showed that the majority of authors did not pay enough attention to the practical application of the scenario approach in the sphere of metallurgical enterprises activity management, and no clear methodology for its application was formed. It should be noted that the methodology varies depending on the specific area of operation of a particular enterprise. In this case, it is appropriate to apply a scenario approach widely used by foreign companies, which are the main competitors for domestic producers.

RESULTS AND DISCUSSION

In the scenario study, the following steps can be distinguished:

- to evaluate the external conditions of change and to provide an integrated assessment of the external environments of the enterprise;
- to evaluate the internal conditions of change and to provide an integrated assessment of the internal environments of the enterprise;
- to define scenarios of enterprise development on the basis of calculations of integral indicators of the state of external and internal environments of the enterprise.

Step 1. Assessment of the External Environment of the Enterprise

The assessment of the external environment is based on scenario modeling (reframing theory). The state of the external environment is to be evaluated using the integral indicator of the state of the external medium A, which has three levels: favorable external environment (A3), neutral external environment (A2), unfavorable external environment (A1). To determine the current level of indicator A, it is proposed to use the integral estimate a.

Taking into account the unclearness of the indicator A and based on the calculated value of a, a diagnosis of the state of the external environment of the enterprise, which is unclear, is made. To recognize the condition A use the intervals of values of the integral index (Table 1).

According to the results of PEST analysis, political and economic factors have the greatest influence on the activity of the enterprise.

Evaluation of Markets – a_1

Let us analyze the volumes of production and sales of the main products in Table 2.

To determine which product group is most profitable, and to focus on its development, we use the ABC-analysis method. We present the results of the analysis in Table 3.

These tables show that in group “A” includes 40% of positions - wheels, pipes seamless hot-deformed and cold-deformed general purpose, which make up 75.55% of the total volume of the order portfolio. In this case, 19.02% of the total number of orders is provided by seamless hot-formed pipes for pipelines, bearings, machine-building. The last 3 positions were in group “C”. Their share in the total number of orders was 5.43%.

Table 1. Fuzzy intervals of values of the integral status indicator the external environment of the enterprise

Characteristic external environment	Levels of integral indicator of the external environment		
	unfavorable environment	neutral environment	favorable environment
Levels of integral index A	A1	A2	A3
Fuzzy intervals of values of integral index A	0-0.4	0.3-0.7	0.6-1

Table 2. Production volume of main products of PJSC “Interpipe” in 2015-2017

Indicator	Amount, thousand UAH			An absolute change over the period 2016/2014 (+,-)	The pace of change, %	
	2015	2016	2017		2016/2015	2017/2016
Production volume, thousand UAH	5164225	4919060	4504745	-659480	-4.747	-8.423
Production volume, thousand tons	401792	247665	249588	-152114	-38.360	0.776
Including species:						
Seamless steel pipes	114653	96994	100993	-13660	-15.402	4.123
Solid rolled railwheels	120543	93599	105298	-15245	-22.352	12.499
Casing pipes and couplings thereto	166596	57072	43297	-123299	-65.742	-24.136
Cost of sales, thousand UAH	5080381	5166529	4272759	-807622	1.695	-17.299

Table 3. The results of the analysis of the product order are summarized

Group	Number of orders	Share of total orders, %	Number of items	Share in the total number of positions, %
A	64528	75.55	4	40
B	16244	19.02	3	30
C	4637	5.43	3	30
Total	85409	100	10	100

To compare the stability of sales of goods of the enterprise we will carry out XYZ analysis according to 2017. We combine ABC and XYZ results to identify key products and reasons that affect order quantity. According to the classification of goods of the enterprise by their profitability and stability of sale the distribution of goods by groups is shown in Figure 1.

Product types AX, AY, BX provide the main commodity turnover and are steadily sold, so it is necessary to ensure their constant availability. The category AZ, BY, CX needs attention as these are important products with volatile sales or low profitability. The category BZ, CY, CZ requires careful

Figure 1. Distribution of goods by groups by profitability and sales stability

AX <i>High profitability, stable sales, high predictability</i> <hr/> Pipes seamless general purpose h / f	AY <i>Average profitability, sales stability, high predictability</i>	AZ <i>Low profitability, stable sales, high predictability</i> <hr/> Wheels, pipes of general purpose, pipes of bearing
BX <i>High profitability, frequency of sales, average level of predictability</i> <hr/> Pipes seamless h/f bearing	BY <i>Average profitability, frequency of sales, average level of predictability</i> <hr/> Pipes seamless h/f mechanical engineering	BZ <i>Low profitability, sales frequency, average predictability</i> <hr/> Pipes seamless h / f for pipelines
CX <i>High profitability, subpar sales, low predictability</i> <hr/> Coupling billets	CY <i>Average profitability, subpar sales, poor predictability</i>	CZ <i>Low profitability, subpar sales, poor predictability</i> <hr/> Pipes seamless h/f for KVD, pipes h /f for KVD

analysis. These products can be removed from the range if they are in residues. Based on the results obtained, we assign a_1 to 0.27.

Estimation of Human Resources – a_2

Every year the basic educational establishments of the city and the region release young specialists, who are the main source of labor reserve for PJSC “Interpipe”. According to Table 4, it is evident that there are labor resources in the labor market, which are represented by persons who have been educated in higher educational establishments of the city and region by specialties that meet the requirements of the employers of PJSC “Interpipe”.

The analysis of the vacancies open on the sites of PJSC “Interpipe NPP” ua.jooble.org, neuvoo.com.ua, dnepropetrovsk.trud.com. As the list includes a small number of vacancies to replace, and the number of university students is much larger, it can be concluded that the labor market is full of man power. Therefore, you can assign a_2 to 0.7.

Competition Assessment – a_3

For the assessment of competition the enterprises that compete with PJSC “Interpipe” in the pipe industry were selected: JSC “Dnipropetrovsk Pipe Plant”, PJSC “Dnepropetrovsk Metallurgical Plant named after Comintern”, PJSC “Sentravis Production Ukraine”, PJSC “Khartsyzsk PP”.

Competitive analysis is performed in three stages: monitoring of factors of competitive environment and assessment of market attractiveness; research of competitors; assessment of the enterprise’s competitiveness and identification of its competitive advantages. There are three main competitive advantages: organizational; functional; based on relationships with the environment.

After analyzing the results obtained and calculating the relative level of competitiveness, we can conclude: a high level of competition is observed between PJSC “Interpipe” and PJSC “Centravis Production Ukraine” – sum of weighted estimates of 93 and 90 points respectively (maximum possible – 110).

As competition between companies dictates rigorous technological discipline, requires high quality products at the best price for the consumer, it is advisable to consider what strategies PJSC “Interpipe” and PJSC “Centravis Production Ukraine” follow.

On the basis of existing data, it is proposed to construct a “price-quality” matrix (Figure 2) to determine the competitive positions of the companies of “Interpipe” and “Sentravis Production Ukraine”, which are assigned numbers “1” and “2”, respectively.

Table 4. Availability of labor resources for PJSC “Interpipe NTZ” in the labor market of Dnipropetrovsk region

Educational institution	Speciality	Number of graduates by speciality	Together with the graduates of the educational institution
National Academy of Metallurgy of Ukraine	– management	30	376
	– ecology	20	
	– metallurgy	326	
Dniprovsk State Technical University	– management	25	165
	– ecology	20	
	– metallurgy	120	
Dnipro Industrial College	– management	60	145
	– metallurgy	85	
Dnipro College of Metallurgy	metallurgy	60	60
Total			746

The constructed matrix made it possible to see that PJSC “Interpipe” adheres to the strategy of high value, which provides that high quality goods at low prices are extremely profitable. That is why we propose to assign a value of 0.4 to a_3 .

Valuation of Promotion Products – a_4

Most domestic industrial enterprises, including metallurgical companies, use official websites to promote their products and market positioning. We analyze the website of the investigated enterprise in comparison with the main competitor of PJSC “Centravis Production Ukraine” in the following directions:

- home page;
- informative section;
- information refresh rate.

To determine which site users prefer, the peer review method was used, which involves scoring on a 5-point scale. Since the Home page direction includes several evaluation criteria, it is advisable to calculate the number of points using the arithmetic mean. An analysis of the companies’ websites showed that the Internet resource of the enterprise PJSC “Centravis Production Ukraine” has a higher score of 14.5 points, while the PJSC “Interpipe” has 9.5 points, which allows to assign a factor of a_4 to 0.33.

Assessment of Tax Burden – a_5

The level of taxation has a significant impact on the economic performance of the enterprise. The intensity of tax planning activities depends on how high the level of tax pressure the enterprise is experiencing (Table 5). Calculations show that the tax pressure in the period from 2013-2017 is less than 1%, a_5 corresponds to 0.3.

Figure 2. Matrix “price-quality” analysis of competitive positions of PJSC “Interpipe” and PJSC “Centravis Production Ukraine”

Quality	High	premium markup strategy	deep penetration strategy	a strategy for increasing value 1	
	Medium	an overpriced strategy	2 middle price strategy	quality strategy	
	Low	robbery strategy	strategy flashy brilliance	low value strategy	
		High	Medium	Low	Price

Table 5. Calculation of the tax burden of PJSC “Interpipe”

Indicator	Year				
	2013	2014	2015	2016	2017
The tax burden, thousand UAH	7921	9274	9326	9149	10940
Gross value added, thousand UAH including	940780	815966	881981	1231174	760679
gross profit	338966	270531	259101	917131	325837
labor costs	354686	460001	314518	276672	278239
amortization	1634432	1546498	1455600	2424977	1364755
The level of tax pressure, %	0.48	0.60	0.64	0.38	0.8

Assessment of the Dynamics of Exchange Rates – a_6 .

An assessment of the dynamics of exchange rates is necessary to minimize currency risks by properly selecting the currency of the price, balancing payments and receipts in foreign currency, accelerating or delaying payment for the delivered goods (Table 6).

To identify exchange rate factors, let us analyze the relationship between the dynamics of fundamental factors and the hryvnia exchange rates for 2012–2017 (Y1 is a pair of UAH / USD, Y2 is a pair of UAH / EUR). Fundamental factors are represented by macroeconomic indicators: X1 - the balance of exports and imports of goods and services, USD million; X2 - money supply (M3 unit), UAH million; X3 - NBU discount rate,%; X4 - volumes of sale of government securities in the primary market, thousand pieces; X5 - money outside banks (unit M0), UAH million; X6 - consolidated budget deficit, in% of GDP; X7 - fixed capital investments, UAH million; X8 - external debt (direct and guaranteed), USD billion; X9 - NBU gold and foreign exchange reserves, million USD; X10 - money velocity, number of revolutions; X11 - Consumer Price Index,% . Common to both exchange rates is the materiality of such a factor as the external debt and the insignificance of the investment in fixed assets. With other fundamental factors, the coupling density of each pair of exchange ratios differs. Therefore, we assign

Table 6. Correlation coefficients between fundamental factors and exchange rates

	Y1	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Y2
Y1	1	0,581	0,797	0,758	0,781	0,979	0,533	0,951	0,181	0,858	0,529	0,997
X1		1	0,673	0,808	0,805	0,475	0,128	0,352	0,875	0,227	0,794	0,608
X2			1	0,508	0,971	0,760	0,311	0,757	0,306	0,702	0,296	0,773
X3				1	0,627	0,679	0,015	0,529	0,631	0,390	0,953	0,792
X4					1	0,742	0,212	0,676	0,511	0,641	0,454	0,769
X5						1	0,635	0,956	0,103	0,936	0,426	0,972
X6							1	0,719	0,384	0,803	0,264	0,518
X7								1	0,092	0,925	0,255	0,935
X8									1	0,124	0,738	0,222
X9										1	0,098	0,835
X10											1	0,574
Y2												1

the value of a_6 to 0.38. After evaluating the external environment of PJSC “Interpipe NPP”, we calculate the integral indicator A as the arithmetic mean of all indicators. The results are shown in Table 7.

According to the calculations and Table 1, we obtain the level of the integral index A and the neutral medium (0.42).

Step 2. Assessment of the Internal Environment of the Enterprise

The state of the internal environment is to be assessed using the integral indicator of the state of the internal environment B, which has three levels: crisis state (B1), state of stabilization (B2), state of innovative development (B3).

It is suggested to use the integral estimate b to determine the current level of indicator B. Taking into account the lack of clarity of indicator B, fuzzy intervals of values were developed to identify the state of the enterprise (Table 8).

Assessment of Financial Position – b_1

In order to assess the impact of the economic environment of PJSC “Interpipe”, it is necessary to find the optimal relationship between equity and loan sources of financing. The calculations and the obtained results are grouped in Table 9. As a result of the analysis, a negative trend in the level of taxonomic index was revealed. Therefore, the value of b_1 must be assigned a value of 0.43.

Assessment of the technical condition of the enterprise – b_2

An assessment of the technical level of development has shown that PJSC “Interpipe” requires technical re-equipment, which remains one of the main conditions for competitiveness of products in the world markets. In the field of pipe production, where markets are extremely capacious and competitive, the issues of production modernization are of particular relevance. The processes of introduction of new technologies and equipment, development and development of production of new types of products by definition must be continuous. Thus, the index b_2 is 0.32.

Table 7. Assessment of the external condition of the enterprise

Designation	Indicator	Value
a_1	Evaluation of markets	0.27
a_2	Estimation of human resources	0.70
a_3	Competition assessment	0.52
a_4	Valuation of promotion products	0.23
a_5	Assessment of tax burden	0.4
a_6	Assessment of the dynamics of exchange rates	0.38
a	External assessment	0.42

Table 8. Fuzzy intervals of values of the integral status indicator the internal environment of the enterprise

Characteristic internal environment	Levels of integral indicator of the internal environment		
	unfavorable environment	neutral environment	favorable environment
Levels of integral index B	B1	B2	B3
Fuzzy intervals of values of integral index B	0-0.4	0.3-0.7	0.6-1

Table 9. Elements of taxonomy coefficient calculation

Years	Distance between indicator and benchmark (c_{10})	Indicator $_i$	Integral taxonomy indicator (I)
2013	6.60	$6.60/10.45=0.63$	$1 - 0.63 = 0.37$
2014	6.20	$6.20/10.45=0.59$	$1 - 0.59 = 0.41$
2015	3.68	$3.68/10.45=0.35$	$1 - 0.35 = 0.65$
2016	9.10	$9.10/10.45=0.87$	$1 - 0.87 = 0.13$
2017	8.13	$8.13/10.45=0.78$	$1 - 0.78 = 0.22$

Assessing the scope of innovation – b_3

SWOT analysis involves the development of an expanded matrix for the development of enterprise innovation strategy. Innovation and enterprise are seen as internal factors and market and consumers as external. The analysis reveals the strengths and weaknesses of each internal factor, as well as the opportunities and threats that flow separately from the consumer characteristics and features of the market to which the enterprise is innovating. The construction of the extended SWOT-matrix allows to choose the optimal variant of strategies for preparation for its further implementation. At present, the company has satisfactory financial support for current inventories and costs. The implementation of innovative development strategies requires the involvement of significant external funding. Based on the data analyzed, we can conclude that the index b_3 is 0.32.

Assessment of Training and Staff Development – b_4

To evaluate the area of training and staff development, the model of Kirkpatrick was proposed. Its use allows to evaluate the satisfaction of employees with the educational program, to determine their ability to use the acquired knowledge in practice. In order to evaluate corporate culture, a survey of 100 employees and 100 management representatives of the enterprise was conducted. As a result, minor differences were found between their views, which are not critical.

Assessment of Corporate Culture – b_5

The corporate culture of PJSC “Interpipe NPP” was quantified by questioning and interviewing employees of the enterprise. 100 employees and 100 management representatives took part in the survey.

The evaluation questions are divided into three blocks. The rating scale proposes a 3-point system, according to which 3 points correspond to the highest level, 2 points to an acceptable level, 1 point to an unsatisfactory level. As a result of the corporate culture of PJSC “Interpipe NPP”, there were no significant differences between the views of the employees and the management, but they are not critical. As a result, b_5 is 0.53.

Assessment of the Effectiveness of Personnel Policy – b_6

Table 10 shows the results of the expert survey in accordance with the proposed approach. It is proposed to divide the respondents into 2 groups: internal experts of the personnel of the personnel of PJSC “Interpipe NPP”, external experts of the representatives of scientific circles.

It can be traced that the personnel policy of PJSC “Interpipe NPP” has characteristics of active and reactive type, which show that the management monitors problems in work with personnel, analyzes the causes of their development and solves them with the help of anti-crisis personnel programs. Therefore, the factor b_6 can be assigned a value of 0.49.

The results of the evaluation of the internal state are presented in table 11. According to the calculations and table 8, the level of the integral index B is the stabilization state (0.46).

According to the calculations and table 8, the level of the integral index B is the stabilization state (0.46).

According to the results of the study, the external environment of the enterprise was estimated at 0.42 and the internal environment at 0.46, then the enterprise got to the point with coordinates (0.42; 0.46), that is, in frame C5 - state of stabilization of the enterprise in the conditions of neutral external environment (see Figure 3).

Step 3. Defining the scenario of enterprise development

Based on the performed calculations we can ascertain in addition to a sufficiently developed external environment, an enterprise cannot keep its internal environment at a high level, but the enterprise still has significant prospects for strategic change. That is, changes in the enterprise can lead it to frames: C8 is an option in which the state of the environment will deteriorate but the internal environment, on the contrary, will improve;

- C9 is the best of all options when a high environmental score is combined with a high internal rating.

The following enterprise development scenarios can be proposed to get into the C9 frame:

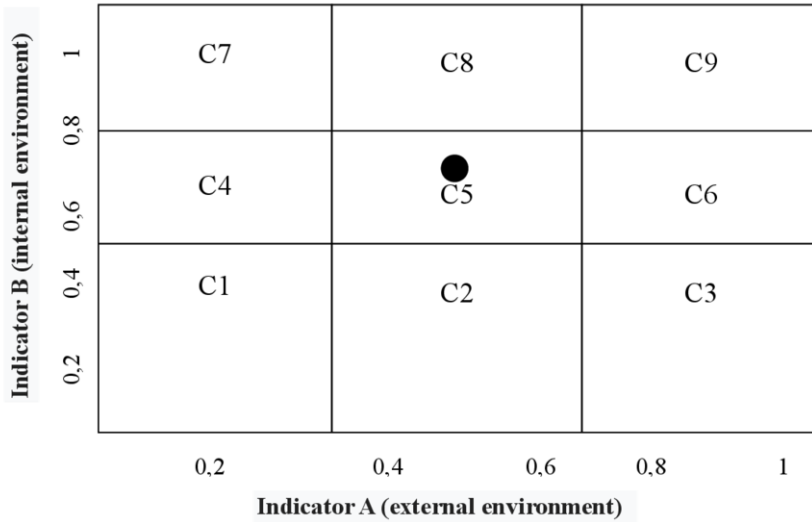
Table 10. The weight and the degree of implementation of the principles of personnel policy according to experts

Principle of personnel policy of the enterprise	Internal experts		Internal experts	
	Weight	The degree of implementation, %	Weight	The degree of implementation, %
Compliance with the HR policy course of the enterprise strategy	8.6	44	6	19
Promotion to senior positions only their employees	3.1	10	4.5	28
Scientific validity of personnel policy	7.2	25	4.5	30
Orientation to the current localization of destructive phenomena in the field of work	2.2	35	3.9	10
“Transparency” for employees of any level when taking on any position	5.1	40	2.2	15
Resource Support for Personnel Policy	7.0	45	8.1	32

Table 11. Assessment of the internal state of the enterprise

Designation	Indicator	Value
b ₁	Evaluation of financial indicators	0.43
b ₂	Assessment of the technical condition of the enterprise	0.32
b ₃	Assessing the scope of innovation	0.32
b ₄	Assessment of training and staff development	0.67
b ₅	Assessment of corporate culture	0.53
b ₆	Management evaluation	0.49
b	Assessment of internal status	0.46

Figure 3. Frame structure of PJSC “Interpipe NPP” enterprise development



- stabilization and improvement of the financial sector (for example, to establish a system of settlements with creditors through establishing relations with debtors);
- introduction of innovations at the enterprise;
- establishing values and traditions of corporate culture, while supporting other factors (production, internal communications, staff training and development, management).

As a result of scenario modeling, it is possible to come up with a strategy that will be acceptable in any scenario.

Before determining the development strategy for the selected scenarios, it is necessary to evaluate the firm’s resources. The creation and implementation of basic innovation requires adequate logistical support and highly qualified scientific and technical staff. The activity of the enterprise should be guided by creation and attraction of those innovations which in the current conditions will allow creating sustainable competitive advantages.

The tool of choice of strategy of enterprise development can serve as a matrix of alternative variants (table 12).

Table 12. A matrix of alternative options for enterprise development strategies

External conditions			
		Favorable conditions	Adverse conditions
Internal environment	Strong innovation potential	Active R&D, differentiation, absorption of innovators	Differentiation, joint ventures
	Weak innovation potential	Attraction of investments from the side, merger with other firms	Elimination of unprofitable business

Each of the scenarios of innovation development is responsible for its own system of indicative assessment of the potential for change and its own set of management decisions for their implementation. The development of alternative scenarios allows to take into account the uncertainty factor when selecting and developing a strategy.

CONCLUSIONS

The practical significance of the results obtained is to use reframing theory to determine the scenarios of an enterprise's innovative development. The considered economic and mathematical model allows to determine the optimal situation scenario and to develop strategies of enterprise development for its successful implementation.

The conducted research gives grounds to argue the feasibility of solving an urgent problem - the formation of enterprise development strategies using a scenario approach to determine its competitive position in the industrial market.

The paper presents a model example of applying a scripting methodology to complex social systems. According to the research, the use of modern valuation methods in the formation of strategic positions of the enterprise in terms of innovation and marketing orientation is necessary to improve its competitive status. In order to maintain competitive positions in the industrial market, an enterprise should use innovative approaches based on constant analysis of the economic environment and forecasting of possible technological changes in it.

The theoretical and practical provisions proposed in the paper can serve as a basis for improving the assessment of the external and internal environment of the enterprise.

CONFLICT OF INTEREST

The authors of this publication declare there is no conflict of interest.

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Nataliia Stebliuk is an Associate Professor of International Economic Relations and Regional Studies, Ph.D. in Economics, University of Customs and Finance, Ukraine. Research interests: economic and mathematical modeling in marketing research; investment project management, marketing management in the higher education system, artificial intelligence.

Nataliia Volosova is an Associate Professor of Applied and Higher Mathematics, Ph. D in Mathematical Modeling and Computational Methods, National Metallurgical Academy of Ukraine (2008). Research interests: mathematical modeling of technological processes; economic and mathematical modeling in marketing research; methods of teaching mathematical disciplines to students of non-mathematical specialties.

Serhii Koberniuk is an Associate Professor of Marketing Department, Ph.D. in Economics, Dnipro State Agrarian and Economic University, Ukraine. Research interests in: agrarian marketing, innovative activity of agricultural enterprises, regional economy, marketing research.

Olena Rybak is an Associate Professor of Finance, Banking and Insurance Department, Ph.D. in Economics, National Aviation University, Ukraine. Research interests in: formation of a positive investment image of the state; capitalization of investor confidence in the digital economy; attraction of financial resources for the implementation of innovative activities.