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DIGITALIZATION OF BUSINESS PROCESSES AS A TOOL TO PREVENT BANKRUPTCY IN ENTERPRISES IN THE CONDITIONS OF VARIABILITY OF THE MARKET ENVIRONMENT

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Introduction. In the conditions of change in the market environment and innovative development in Ukraine, there have been fundamental shifts in the features of the functioning and development of business entities. In connection with the emergence of unforeseen negative processes in the international space, aggravation took place in the social, political, and economic spheres, which affected the economic situation in Ukraine in the form of the emergence of a financial and economic crisis at enterprises: loss of solvency and financial stability, decrease in profitability, deterioration of business activity, probability of bankruptcy. All this caused the need for enterprises to attract financial resources. In recent years, enterprises have seen an increase in competition, inefficiency of financial management, deterioration of work stability, and a sharp reduction in profitability. It has been established that the digitalization of business processes of enterprises will ensure an increase in the efficiency of conducting their own activities and will contribute to the prevention of the probable onset of bankruptcy.

Analysis of recent research and publications. The question of assessing the probability of bankruptcy and optimizing business processes is the subject of research by the following foreign and domestic scientists: M. DePamfilis [2], Blazhei Prusak [3], Marusiak N.L., Pylnyuk D.O. [5], Sytnyk N.S., Smolinska S.D., Yasinovska I.F. [6], Rudyka V.I., Velikiy Y.M., Zyoma O.D. [7], Dergacheva V.V., Vorzhakova Yu.V., Khlebynska O.I. [12], Struk N., Yevtushenko N., Khlevytska T., Nasad N., Ryazantsev R. [13, p. 218–229], Pavlovsky M.V., Gatska L.P., Zavadska O.M. [14], Kubrak K., Milani F., Nava J. [15], Ivanko K.O., Popov A.O., Ivanushkina N.G. [24, p. 6], Ohrenych Yu.O., Khaprova D.V. [26].

Objectives of the article. The task of the article is to compare the methods of assessing the probability of bankruptcy in foreign countries and in Ukraine; determination of the peculiarities of the implementation of business processes at enterprises; carrying out an assessment of the effectiveness of business processes in the context of the production sphere; research on robotics that could improve the production activity of enterprises and contribute to its robotization to increase the level of the operational business process; determine directions of digitalization of business processes at enterprises.

The main material of the study. In today's conditions, enterprises are negatively affected by factors of the external and internal environment, operate in crisis conditions, which can lead to the deterioration of financial indicators, cause the threat of bankruptcy. Accordingly, there is a need to use an effective mechanism for detecting crisis phenomena in order to diagnose the probability of insolvency of enterprises, to develop measures to overcome the crisis. Military operations significantly affect the performance of enterprises and can lead

to bankruptcy. Many enterprises involved in various industries, which do not have competitive advantages in the market of goods and services, eventually cannot meet their current and long-term obligations on time, and therefore lose their solvency. Therefore, an important issue is the formation of measures, ways to prevent bankruptcy at enterprises in the conditions of the changing market environment, and one of them is the digitalization of business processes.

As of the period 2020–2022, the number of bankruptcy applications, which were in the process of cases and materials (-6%), bankruptcy applications, considered cases and materials (-11%), bankruptcy applications that remained unresolved at the end of the reporting period (2%) [1].

The concept of "bankruptcy" has a wide meaning, therefore it is considered by the legislative sphere and domestic and foreign scientists from different aspects and points of view, due to which it has various interpretations.

The American scientist DePamfilis D. M. interprets the concept of "bankruptcy" as "the reorganization of an enterprise, being protected from its creditors, or the cessation of activity by selling its assets to satisfy all or part of the outstanding debt" [2].

Polish scientist Blazej Prusak defines "bankruptcy as an integral part of the functioning of enterprises in the conditions of a market economy" [3].

According to the Code of Ukraine on Bankruptcy Procedures, Art. 1 "bankruptcy is recognized by the commercial court as the inability of the debtor to restore his solvency by means of the rehabilitation and restructuring procedure and to repay the established order" [4].

Also scientists Marusiak N.L. and Pylnyuk D.O. define "bankruptcy" as "the inability to settle with creditors in a timely manner, which is documented through legal proceedings regarding the declaration of bankruptcy of an enterprise" [5].

Ukrainian scientists Sytnyk N.S., Smolinska S.D., Yasinovska I.F. interpret this concept in the following way: "bankruptcy is the inability of the subject to continue his entrepreneurial activity due to its economic unprofitability, unprofitability" [6].

A group of scientists Rudyk V.I., Velikiy Y.M., Zyoma O.D. define that "bankruptcy is the absolute insolvency of the debtor, which is a consequence of a deep financial crisis, as a result of which the enterprise cannot satisfy the demands made by its creditors" [7].

Therefore, it can be stated that in the event of bankruptcy, the company cannot fulfill its obligations to creditors in a timely manner, which is accompanied by a lack of funds for production, trade, innovation, sales and labor activities. From this follows the need for constant retraining of employees, modernization of production facilities and increase of investment attractiveness to potential investors.

We considered the experience of dealing with bankruptcy of enterprises in Germany. In Figure 1 shows the dynamics of bankruptcy in Germany as of 2022–2023. In general, there was an increase in the number of bankrupt companies from 1.154 to 1.548.

The German Insolvency Code and the European Regulation on Bankruptcy Proceedings (2015/848) are the main legal acts regulating insolvency proceedings in Germany [9]. In Figure 2 the main legal reasons for the insolvency of enterprises in Germany are indicated.

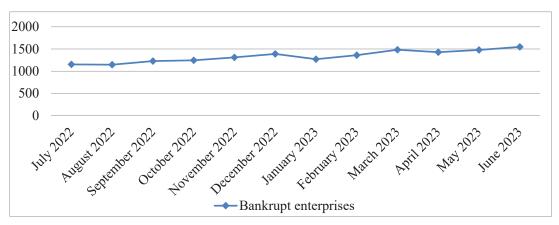


Figure 1. Dynamics of bankrupt enterprises in Germany as of 2022–2023

Source: compiled by the authors based on data [8]



Figure 2. Reasons for company insolvency in Germany

Source: compiled by the authors based on data [10]

From the above Figure 2, it can be noted that under German law there are the following reasons for opening insolvency proceedings: insolvency, excessive indebtedness and imminent insolvency.

Therefore, after considering the reasons for determining the insolvency of enterprises in Germany, an analysis of the probability of bankruptcy was carried out at the Ukrainian enterprise "Yagotynsky Butter Plant" LLC (Table 1). It should be noted that there is a very low probability of bankruptcy during 2022. However, every year the company functions less stably and lowers its financial indicators under the pressure of crisis economic phenomena that arise in conditions of variability of the market environment.

Table 1
Calculation of the probability of bankruptcy of "Yagotynsky Butter Plant" LLC
for the period 2020–2022

				Deviation 2022–2020		The level	
Models	2020	2021	2022	+/-	%	of probable bankruptcy	
Five-factor Z-model of E. Altman	3,07	2,54	2,85	-0,21	-7,00%	Low probability of bankruptcy	
Springgate model	1,62	1,20	1,53	-0,09	-5,63%	Low probability of bankruptcy	
J. Tuffler's model	0,71	0,56	0,65	-0,07	-9,47%	The probability of bankruptcy is low	
Model O. Tereshchenko	7.67	6.20	6.49	-1.18	-15.37%	Low probability of bankruptcy	

Source: compiled by the authors based on data [11]

According to E. Altman's five-factor Z-model, it is estimated that "Yagotynsky Butter Plant" LLC has improved its indicators and in 2020 the threat of the probability of bankruptcy is very low. A gradual decrease of the analyzed indicator is observed, and as of 2022 it is 2.85, which indicates ineffective management of the enterprise's functioning processes, although "Yagotynsky Butter Plant" LLC has a stable financial position.

Calculations using the Springgate model indicate a stable financial position, as during 2020–2022 the Z-index is in the range of 1.20 to 1.62, which is above the threshold value.

According to J. Taffler's model, as of 2022, the index Z = 0.65, i.e. Z < 0.3, which indicates that the probability of bankruptcy of "Yagotynsky Butter Plant" LLC is low. During 2020–2022, the indicator decreased by -9,47%, which indicates the possible emergence of negative trends in the company's solvency in the future.

Based on the calculations given in the table. 2 it is observed that for the model of O. Tereshchenko Z = 6,49 in 2022 the value of the legislation on the probability of bankruptcy is given. Such a value of the indicator indicates a stable financial position and the profitability of the enterprise. There is a trend towards a slight decrease of this indicator in 2022 compared to previous years, which indicates an improvement in financial stability.

Taking into account the results of the study, it can be noted that all models show a low probability of bank-ruptcy at "Yagotynsky Butter Plant" LLC, but there is a lack of innovation and rationalization in the production sphere. In order to prevent and avoid bankruptcy, the management of the enterprise must ensure the efficient operation of business processes.

Any technological development contributes to the digitalization of the enterprise through the gradual introduction of innovations. Accordingly, we conducted a study of the approaches of scientists to the definition of the concept of "digitalization of business processes".

In work Dergacheva V.V., Vorzhakova Yu.V. and Khlebynska O.I. define the concept of "digitalization of business processes" as "optimization of available resource potential, working time costs and increasing the efficiency of business processes, and, accordingly, increasing the efficiency of economic activity" [12].

Scientists Struk N., Yevtushenko N., Khlevytska T., Nasad N., Ryazantsev R. interpret "digitalization of business processes is a process that involves a fundamental reorganization and revision of existing restrictions" [13, p. 218–229].

Group of authors Pavlovsky M.V., Gatska L.P., Zavadska O.M. "digital transformation of business processes is the process of introducing innovative technologies into all aspects of business, from daily operations to making strategic decisions" [14].

Foreign scientists Kubrak K., Milani F., Nava J. note that "digitalization of business processes" represents "improvement of business processes by understanding how the possibilities of digital technologies can enable the redesign of business processes" [15].

Therefore, in our opinion, the concept of "digitalization of business processes" requires financial and personnel support, investment attraction, and the introduction of innovations, which will allow to improve production and sales activities, affect management activities and the use of Internet capabilities, the introduction of digital technologies will allow to form competitive advantages, increase profitability.

We have evaluated the effectiveness of digitalization of business processes at the "Yagotynsky Butter Plant" LLC according to the following stages: analysis of the effectiveness of business process indicators; drawing up a SWOT analysis matrix; study of the structure of enterprise financing sources; recommendations on the implementation of effective risk management, focusing on financial risks; forecast based on an econometric analysis of the economic entity's profitability for 2023. At the first stage, we examined the system of indicators for assessing the efficiency of business processes, which is indicated in the Table 2.

Table 2 Indicators of assessing the effectiveness of business processes at "Yagotynsky Butter Plant" LLC

Indicator	2020	2021	2022	Deviation 2022–2020	
Return on investment (ROI)	-1	0	-2	-1	180%
Return on assets (ROA)	0,08	0,00	0,08	-0,01	-8%
Return on net assets (RONA)	0,06	0,00	0,05	-0,01	-13,27%
Indicator of added value of cash flow (CVA)	326380	72171	17816	-308564	-94,54%
Return on investment (ROI)	-1	0	-2	-1	180%

Source: compiled by the authors based on data [11]

From the above data, it can be noted that the efficiency indicators of business processes at "Yagotynsky Butter Plant" LLC have significantly deteriorated. The following indicators had a negative value as of 2020–2022: return on assets (-8%); return on net assets (-13,27%); indicator of added value of cash flow (-94,54%). Growth is observed by the rate of return on investment, which was 180%. In general, the efficiency of business processes during 2020–2022 deteriorated.

At the second stage, we made a SWOT analysis of business processes for a better understanding of the level of development of various areas at "Yagotynsky Butter Plant" LLC (Table 3).

The following threats are typical for the enterprise: increase in the cost of production; falling rate of the national currency. Opportunities include attracting new partners and improving the company's image. As for the strengths, cooperation with reliable suppliers and partners, the availability of a wide range of products, the existence of an effective sales system and modern production technology have been identified. Weaknesses include: high transport costs, weak coverage of the territory by the sales network, and a weak communication network.

At the third stage, an assessment of the effectiveness of attracting internal and external financial resources for 2020–2022 at "Yagotynsky Butter Plant" LLC was made (Table 4).

It can be noted that the amount of financial resources has decreased from the available indicators, but the structure of funding sources has undergone certain changes. The main financial resource for 2020–2022 was equity (the share decreased from 38% to 33,76%). If we analyze the state of long-term liabilities, their share decreased during 2020–2022 (the share decreased from 13,00% to 12,51%). Negative trends are also observed in current liabilities, because their share decreased during 2020–2022. The dynamics of indicators reflect the deterioration of the company's financial activity.

Matrix of SWOT analysis of "Yagotynsky Butter Plant" LLC

	The external environment of the enterprise			
	Opportunities (O)	Threats (T)		
	1. Attracting new partners.	1. Growth in the cost of production.		
	2. Improving the company's image.	2. Fall in the national currency rate.		
Strength (S)	Strengths – Opportunities	Strengths – Threats		
 Cooperation with reliable suppliers and partners. A wide assortment of goods. Effective sales system. Modern production technologies. 	1. Improving the image of the enterprise due to the development of the trademark.	1. The possibility of concluding new profitable contracts with reliable suppliers, if the exchange rate or the cost of products increases.		
Weakness (W)	Weaknesses – Opportunities	Weaknesses – Threats		
 High transport costs. Weak coverage of the territory by the sales network. Weak communication network. 	1. Increase in the inflow of funds to the enterprise thanks to the economic development of the state.	1. Formation of an effective marketing communications policy to strengthen the company's competitive position.		

Source: compiled by the authors based on data [11]

Table 4
The structure of sources of financing of "Yagotynsky Butter Plant" LLC in 2020–2022

Sources of funding	2020	2021	2022	The relative deviation of 2022 to 2021
Own capital, thousand UAH	592784	529401	685040	15,56%
share, %	38,26%	33,62%	33,76%	-11,75%
Long-term liabilities, thousand UAH	201451	247574	253895	26,03%
share, %	13,00%	15,72%	12,51%	-3,76%
Current liabilities, thousand UAH	755170	797645	1090084	44,35%
share, %	48,74%	50,66%	53,72%	10,23%
Totally, thousand UAH	1549405	1574620	2029019	30,95%
share, %	100%	100%	100%	0,00%

Source: compiled by the authors based on data [11]

At the fourth stage, it was determined that in order to prevent the probability of bankruptcy at "Yagotynsky Butter Plant" LLC, it is advisable to implement risk management, focusing on the negative impact of credit, investment, currency risk, the risk of a decrease in financial stability, and innovative financial risk. Based on the results of the research, the following measures were formed: insurance, hedging, creating a reserve of funds to cover unforeseen expenses, diversification, asset and liability management, limiting.

At the fifth stage, an econometric analysis was carried out and the profitability of "Yagotynsky Butter Plant" LLC enterprise was analyzed, the relationship between gross profit, net income and operating expenses indicators was determined using the method of least squares and estimation of regression coefficients, the value of net profit was predicted using the method exponential smoothing for 2022 (Figure 3).

From Figure 3, it can be said that the actual net profit increased for 2020–2022 from 129,547 thousand UAH up to 155,639,000 thousand UAH. The forecast values of the indicator using the method of exponential smoothing, taking into account damping factors for 2020-2023 were: $\alpha = 0.3$ – we observe a decrease in net profit from 129,547,000 thousand UAH up to 96,872,8 thousand UAH; $\alpha = 0.5$ – we observe a decrease in net profit from 129,547 thousand UAH up to 94,376.5 thousand UAH; $\alpha = 0.7$ – we observe a decrease in net profit from 129,547 thousand UAH up to 107,309,5 thousand UAH.

Thus, the predicted values of the net profit compared to the actual ones have more positive results than the actual ones taking into account the data by the method of exponential smoothing. In addition, with different values of damping factors, the forecast of net profit in 2023 ranges from 94,872,8 thousand UAH to 107,309,5 thousand UAH.

It can be stated that the evaluation of the efficiency of business processes at "Yagotynsky Butter Plant" LLC for 2020–2022 made it possible to assess the financial condition. In order to ensure the revitalization of business processes and prevent the onset of bankruptcy, the management needs to implement the following robotics for efficient production of products (Figure 4).

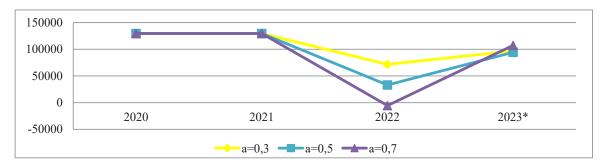


Figure 3. Actual and forecast values according to the method of exponential smoothing of the economic indicators of the net profit of "Yagotynsky Butter Plant" LLC for 2020–2022

Source: compiled by the authors based on data [11; 16]

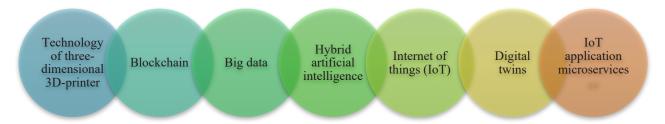


Figure 4. Robotics as a way to ensure efficient production of products

Source: compiled by the authors based on data [17–23]

Considering the above, it can be noted that industrial automation is constantly developing and gaining new momentum. The introduction of new technologies in the production sphere will contribute to increasing the competitiveness of "Yagotynsky Butter Plant" LLC and will contribute to increasing profitability in the future.

At the moment, an important component of preventing bankruptcy at enterprises is not only the timely detection of the probability of bankruptcy according to foreign and domestic models, but also the implementation of machine learning for employees of the "Yagotynsky Butter Plant" LLC.

Domestic scientists Ivanko K.O., Popov A.O., Ivanushkin N.G. defines the concept of "machine learning" as "a complex field of knowledge that is on the border of artificial intelligence theory, signal theory, mathematical statistics, and optimization methods" [24, p. 6]. In Figure 5 shows the main problems solved using machine learning.

However, the perception of information and subsequent machine learning could become much faster and easier if today there was a way to quickly memorize large volumes of material. Tom in us was formed by the idea of developing bio-slash technology, which is considered as "a device that combines biotechnology with robotics, which a person could insert into the brain to inject information waves". This device would somewhat resemble an earphone and have the structure of a human brain and a suction cup (Figure 6).

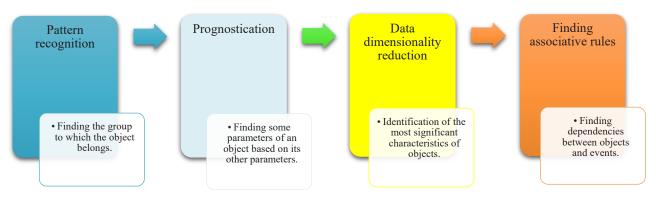


Figure 5. Main tasks solved using machine learning

Source: compiled by the authors based on data [24, p. 6]

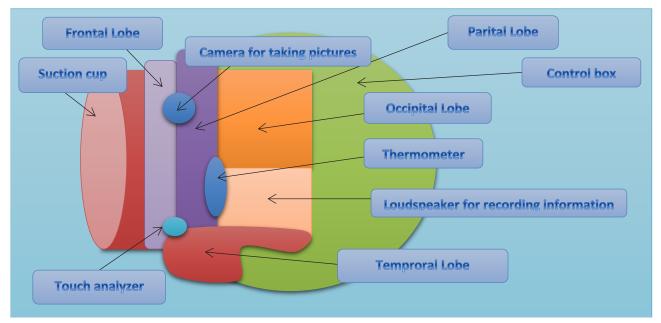


Figure 6. The main elements of building a bio-flash drive for machine learning at "Yagotynsky butter plant" LLC

Source: author's development based on [25; 29]

The main part has the structure of the brain and receptors for information perception, that is, eyes, ears, nose, touch and temperature perception.

"The suction cup is a super-flexible material, covers the entire mechanism and is able to heal scratches and cuts, as well as recognize touch. The skin-like material consists of a special hydrocarbon polymer and nickel nanopowder. Hydrocarbon chains have several useful properties at once: they are very flexible and mobile by nature and conduct electricity well. Nickel particles make the skin stronger, improve its conductive properties by combining separate strands of polymers into a single conductor" [25].

Through a camera for taking pictures, a thermometer and a speaker for recording information, the process of perception of the stimulus first takes place through the peripheral system. The process of assimilation of information takes place in the analyzer.

In general, it can be noted that the nerves in this system are white micro-wires that conduct current and ensure the operation of the bio-flash drive. The main sensor, which controls the other four, is located in the main part of the control box.

So, the place for storing information is somewhat similar to a hard disk on a computer, but very tiny in size and is called a micro-disk. The resulting material will be structured through 4 receptors.

The following are the main benefits of using a bio-flash drive: improvement of human memory and ability to remember, cure of eye diseases, all long-term information remains in the human brain, improvement of hearing aid level, normalization of body temperature in case of respiratory diseases. Among the disadvantages, we note a high risk of developing mental illnesses with long-term wearing of the device, addiction, chronic fatigue, lack of sleep, and decreased communication skills.

Taking into account the conducted research, the main problems of the introduction of digital technologies at domestic enterprises should be determined (Figure 7). Therefore, business owners need to implement innovations on a permanent basis in order to increase competitiveness and increase profit volumes for further expansion of their own activities (Figure 7).

From the above information, it was formed that in today's conditions, in order to avoid the probability of bankruptcy and to optimize business processes, an important issue is the modernization of technical equipment in various areas of activity of Ukrainian enterprises through the introduction of such technologies as: 3D printing, big data, Internet of Things, artificial intelligence, blockchain, digital doubles, microservices. Along with this, there is a need to develop own technologies in the field of machine learning in order to facilitate the process of perception by personnel of new material and to ensure rapid assimilation, as well as its further structuring for better use in practical activities.

Problems of digitalization of enterprises

- increase in accounts payable;
- inefficiency of technologies due to the presence of old software;
- reduction of financial resources of the enterprise;
- difficulty of implementation
- unprofitability of the enterprise
- constant destruction of infrastructure.

The main directions of digitization

- the field of Internet technology;
- production innovations;
- legal services Legaltech;
- marketing innovations;
- cloud computing and Grid technologies;
- HR management system;
- environmental innovations;
- innovations in the care of the enterprise.

Figure 7. The main problems of digitalization of business processes of Ukrainian enterprises during the martial law

Source: compiled by the authors based on data [26–29]

Conclusions. Thus, in order to prevent the probability of bankruptcy at enterprises, it is advisable to digitize business processes, which should be based on a financial strategy. The introduction of innovative software and modern technologies into the production sphere will improve financial, operational, investment, and innovation activities, which will contribute to the growth of work indicators and effective functioning. In turn, this will make it possible to strengthen the competitiveness and increase the profitability of enterprises. It is the development of new and the application of existing innovations that will contribute to the reduction of financial risks in the future and the prosperity of enterprises.

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Serhii Tkachenko, Ph.D., Associate Professor. Yuliia Ohrenych, Doctor of Economics, Associate Professor. Nataliia Kairachka, Student, Zaporizhzhia National University. Digitization of business processes as a tool to prevent bankruptcy at enterprises in conditions of variability of the market environment.

The article analyzes the essence of the concepts "bankruptcy", "business process" in terms of the enterprise. The level of bankruptcy at enterprises in Germany for 2022–2023 was considered. The causes of bankruptcy were determined, including: illiquidity, excessive indebtedness, loss of competitiveness. The legal framework that regulates the proceedings on the bankruptcy of an enterprise, namely the German Insolvency Code, has been studied. The probability of bankruptcy at "Yagotynsky Butter Plant" LLC was analyzed and the efficiency of business processes was evaluated in the context of the variability of the market environment. The importance of digitalization of business processes in order to prevent the probability of bankruptcy and improve innovative development has been proven. In order to assess the level of business processes at the enterprise, the efficiency of business process indicators was analyzed, strengths and weaknesses were identified using the SWOT analysis matrix, the structure of funding sources was characterized, financial risks were investigated (credit, investment, currency risk, the risk of reducing financial stability and innovative financial risk), which have a great impact on the financial situation, a profitability forecast was made. The essential characteristics of machine learning in a complex approach are considered. The main problems solved by machine learning are indicated. The "bio-flash" technology is characterized, its essence, meaning, scope of use, advantages and disadvantages of its use are determined. The structural elements of the development and the functional purpose of the mechanism are analyzed. Recommendations are given to enterprises that will contribute to the improvement of operational business processes and the production sphere at the factory, and it is also recommended to implement and improve the machine learning method of employees and managers to increase work productivity, competitiveness and financial stability of the enterprise in the future.

Key words: bankruptcy, business processes, digitalization, market environment, forecast, modernization of the production sphere, innovative solutions, innovative development.

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Ткаченко Сергій Миколайович, кандидат технічних наук, доцент. Огренич Юлія Олександрівна, доктор економічних наук, доцент. Кайрачка Наталія Василівна, студентка, Запорізький національний університет. Цифровізація бізнес-процесів як інструмент запобігання банкрутства на підприємствах в умовах змінності ринкового середовища.

У статті проаналізовано сутність понять «банкрутство», «бізнес-процес» в розрізі підприємства. Розглянуто рівень банкрутства на підприємствах у Німеччині за 2022–2023 рр. Визначено причини настання банкрутства, серед яких: неліквідність, надмірна заборгованість, втрата конкурентоспроможності. Досліджено законодавчу базу, яка регулює провадження справи про банкрутство підприємства, а саме німецький Кодекс про неплатоспроможність. Проаналізовано ймовірність настання банкрутства на ТДВ «Яготинський

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маслозавод» та здійснено оцінку ефективності бізнес-процесів в контексті змінності ринкового середовища. Доведено важливість питання цифровізації бізнес-процесів з метою запобігання ймовірності настання банкрутства, покращення інноваційного розвитку. З метою оцінки рівня бізнес-процесів на підприємстві проаналізовано ефективність показників бізнес-процесів, виокремлено сильні та слабкі сторони за допомогою матриці SWOT-аналізу, охарактеризовано структуру джерел фінансування, досліджено фінансові ризики (кредитний, інвестиційний, валютний ризик, ризик зниження фінансової стійкості та інноваційний фінансовий ризик), які мають великий вплив на фінансовий стан, здійснено прогноз прибутковості. Розглянуто сутнісну характеристику машинного навчання у комплексному підході. Зазначено основні проблеми, які вирішує машинне навчання. Охарактеризовано технологію «біо-флешка», визначено її сутність, значення, сферу використання, переваги та недоліки при використанні. Проаналізовано структурні елементи розробки та функціональне призначення механізму. Надано рекомендації підприємствам, які сприятимуть поліпшенню операційних бізнес-процесів та виробничої сфери на виробництві, а також рекомендовано впроваджувати, вдосконалювати методику машинного навчання працівників і менеджерів для підвищення продуктивності роботи, конкурентоспроможності та фінансової стійкості підприємства в майбутньому.

Ключові слова: банкрутство, бізнес-процеси, цифровізація, ринкове середовище, прогноз, модернізація виробничої сфери, інноваційні рішення, інноваційний розвиток.