

# **Opportunities, Threats and Risks of Implementation the Innovative Business Management Technologies in the Post-Pandemic Period COVID-19**

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*Abstract:* - This paper is devoted to the development of an approach to substantiate the feasibility of using innovative technologies for doing business in not innovative leaders countries in the post-pandemic period considering the associated risks. The main directions and technologies of successful business activity in the conditions of the COVID-19 pandemic are defined and systematized, their main characteristics are outlined. On the example of Ukraine, as a basis of relevant knowledge the possibilities of using this results for a reasonable

assessment to implementing the innovative technologies for doing business within selected areas in the post-pandemic COVID-19. Approbation of practical using this base to substantiate the choice of specific innovative technologies for doing business is performed. The methodological approach to the analysis and risk assessment of using the innovative technologies for doing business in the post-pandemic period is improved. It is based on the mathematical apparatus of fuzzy logic which allows to multifactor analysis risks of the innovative projects, considering the diverse vague effects of individual factors. This approach provides an opportunity to make decisions to justify the selection and implementation of innovative projects in the context of inaccurate, incomplete or contradictory information considering the associated risks. The obtained results prove that it can be used to justify innovative technologies for doing business in COVID-19 and post-pandemic period in not innovative leaders countries, which economic environment is characterized by incomplete certainty and high risks.

*Key-Words:* - business development directions, innovative business technologies, COVID-19 pandemic, opportunities and threats of innovative development, knowledge base, innovation risks

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## 1 Introduction

The COVID-19 pandemic has caused an economic downturn in almost every country in the world. Gradual economic recovery has been visible after the implementation of the system of measures to overcome the pandemic and its impact. However, during a pandemic, organisations within various industries made several innovative changes, which were introduced in the search for ways to survive and develop during the restrictions period due to the fight against COVID-19. In particular, the transfer of many activities online (communications with economic counterparties: product promotion, receiving orders, Internet consulting, etc.), remote work, expansion of the functions and scope of activities of product delivery services, and more. Some of these changes transpired to be temporary, and some introduced significant changes in the way business is conducted. Analysis of these changes shows that some of them provide opportunities for innovative growth in the post-pandemic period, while others are associated with specific threats. Thus, the problem of analysing and systematising the main opportunities and threats of innovative development of organisations during the post-COVID-19 pandemic arises.

This problem is especially relevant for not leaders countries in innovation growth, which are characterized by permanent instability of the economic and socio-political environment with significantly exacerbated by the COVID-19 pandemic. The instability and limited resources to ensure innovative growth make high requirements for the choice's justification of innovative development directions by business structures especially according to the conditions and trends of

the external macro- and micro-environment, their existing potential for innovative development, minimizing associated risks etc. Ukraine should be singled out among these countries, because a factor of war is added to these factors of instability and risks. It will significantly complicate economic recovery and the transition to its growth in the postwar period.

The importance to considering the risks in substantiating innovative technologies of doing business in the post-pandemic period is evidenced by the data of the risks analysis caused or exacerbated by the COVID-19 pandemic and their impact on the economy of Ukraine. Analysis and consensus forecast of risks (average forecast of groups of respondents) for the period 2020-2024 was performed by the Ministry of Economic Development, Trade and Agriculture of Ukraine together with the UNICEF Office in Ukraine [26]. Based on the results of the analysis the average values of the main forecast risk indicators are calculated as the median of expert integrated assessments of survey participants (leading experts and scientific youth) in the field of macro-analysis and forecasting (Table 1). Integral assessment is calculated as the multiplication of the risk probability score (significant probability (50% or more) - 4 points, average probability (30-49%) - 3, moderate probability (10-29%) - 2, low probability (less than 10%) - 1), the risk is not probable - 0) and score its impact on the economy of Ukraine (significant impact - 4; moderate impact - 3; weak impact - 2; minor impact - 1; no impact - 0). Accordingly the maximum integrated risk assessment is 16 points, the minimum is 0.

Table 1. Integrated forecast estimates (median values) of the main types of risks posed to the economy of Ukraine by the COVID-19 pandemic provided by groups of respondents

Risks	Youth				Experts			
	2021	2022	2023	2024	2021	2022	2023	2024
External risks								
New global crisis (due to the breakdown of established industrial communications, bankruptcy of industrial producers in the EU / world)	6	4	3	2	7	4	3	3
Lack of external financing and narrowing opportunities for access to international capital markets	8	6	5	4	9	5	5	4
Exit of non-residents from Domestic Government Bonds	7	3	2	2	9	5	5	5
Strengthening hybrid threats to Ukraine's national security, including active military confrontation in the east	7	8	7	6	8	8	7	5
Introduction of new trade barriers for domestic exports by other countries	7	5	4	4	5	3	3	3
Internal risks								
Reforms are not fast enough	10	7	7	7	8	7	6	5
Significant increase in the state budget deficit and cash gaps in the Pension Fund and other State Social Insurance Funds	10	9	8	6	10	6	6	6
Significant decline in effective demand of the population	10	7	4	3	9	6	5	4
Increasing the insolvency of the real economy sector	9	6	5	4	10	6	5	4

It should be noted that data in Table 1 do not take into account the factor of war with Russia, which significantly increases the risks.

## 2 Literature Review

The perspective of identifying ways to ensure the survival and development of organizations in the context of the COVID-19 pandemic and the post-pandemic period is studied in the works of many scientists, as well as analytical materials. These studies can be grouped into the following areas:

1. *Research is devoted to improving the methods of state support for business during the pandemic and post-pandemic period.* In the paper [6], the results of a survey of business structures on the work of Ukrainian business in the context of the COVID-19 pandemic were presented. In particular, the author determined existing problems; the degree of satisfaction with the measures taken by the authorities; requirements and vision of the future enterprise development, etc. The paper [19] is devoted to the analysis of means of ecosystem support for business in the COVID-19 pandemic, introduced in the EU countries and in Ukraine.

Within the framework, recommendations for improving ways of state support for business during a pandemic in Ukraine were proposed. In the paper [22], the problems of doing small business in Ukraine in a pandemic are disclosed, an analysis of legislative acts that should facilitate activities is presented, and their main drawbacks are identified. The most acceptable area of activity for small enterprises, in which they can be competitive, have been determined. The paper [12] is devoted to identifying priorities for the development and state support of entrepreneurship in Ukraine to accelerate the recovery in the context of the COVID-19 pandemic. In the paper [29] efficiency and accessibility of microcredits for small Ukrainian enterprises and the feasibility of strengthening government contributions in lending to ensure the sustainable development of small businesses substantiates are investigated and the need to strengthen state support for micro crediting of small Ukrainian enterprises in the context of the COVID-19 pandemic is justified.

2. *Research is revealed the problems and prospects of international support and regulation the business development in a pandemic.* A study of

Williams O.D. [28] is worth noting, it examines how the pandemic has produced a mass markets failure in private health services globally, particularly in the tertiary or hospital sector. In the paper [21] the cluster investment to solve the problem of “reorienting international investment flows, under the influence of the COVID-19 pandemic, from traditional directions to projects related to social transformation” is proposed. It is proved that first such transformations should be expressed in qualitative changes in education, medicine and employment”. In the article [10] the transformation drivers and technologies for responding the disruptions caused by the COVID-19 pandemic are investigated. In the paper [23] identified threats and opportunities of the Ukraine - EU Free Trade Area and priority forms of cooperation and determined the mutual economic interests to develop cooperation in the IT field of Ukraine and the EU, which “requires support and involvement of both parties in improving regulatory conditions and integration mechanisms”. The authors [3] analysed “the individual macroeconomic indicators that characterise the national innovation system between countries”.

3. *Research on various aspects of business digitalization as one of the main directions of ensuring its development in the context of COVID-19.* The paper [7] proposes strategic approaches to business digitalisation, based on the experience of leading world companies. It also shows that the leading companies in the world and Ukraine are actively introducing new products and services based on the active use of computer information technologies and these technologies are both effective for their manufacturers (suppliers) and convenient and safe for consumers. The paper [25] focused on defining the main directions for the introduction of information computer technologies to counter the negative impact of COVID-19 on various aspects of ensuring the life of the Ukrainian society, in particular: business, public administration, everyday life, and other. The author investigated the experience of digitalisation during COVID-19 in various countries of the world and outlined the possibilities of its use in Ukraine. In the paper [30] the analysis of digital business technologies, their advantages in the post-pandemic period are determined as: efficiency; productivity; security; adaptability; customer satisfaction etc.

4. *Research on methods of marketing and information support for business in a pandemic.* In the work [13], the specificities of doing restaurant business in the context of a pandemic were investigated. In the paper [11] strategic marketing

support according to sustainable development for green tourism business based on the results of COVID-19 pandemic impact is proposed. In the paper [2] the formation of innovative susceptibility of enterprises to low-potential energy innovative technologies is discussed. In the article [9] the conceptual model of network consulting and organizing communication processes to provide information support of entrepreneurial activity is proposed.

Analysis of literary sources shows that the main measures to ensure the survival and development of business and other types of enterprise activity in the COVID-19 pandemic are related to various aspects of digitalisation: marketing and logistics, the system of providing government and consulting services, etc. Actions related to the development of a system for delivering products to consumers by ordering via the Internet or by phone are effective. Innovative technologies for remote work of employees of organisations in various fields of activity are advancing production, consulting, schoolchildren and students teaching, etc. However, the issues of assessing the opportunities and threats of innovative growth based on these products and technologies in the post-pandemic period is still poorly researched. The answer to them will allow to analyse possible alternatives and purposefully choose promising directions for the introduction of these and other innovative products and technologies, considering their existing risks.

Thus, the purpose of the article is to determine the prospects and threats of business development in Ukraine based on innovative technologies that have proven their effectiveness during the COVID-19 pandemic and to develop an approach to assessing the feasibility of their use by not innovative leaders countries in the post-pandemic times, considering the associated risks. The main objectives of the research are:

- determination of the main directions of successful business activities in a pandemic.
- determination and systematisation of characteristics of directions and innovative technologies for business in a pandemic according to the following scheme: direction, types of activities within the direction, interests of manufacturers (service providers), interests of consumers, main threats to the implementation of this area of activity.
- testing on practice of the systematised characteristics as an information base for assessing the feasibility of developing specific organisations within the designated areas during the post-pandemic times.

- determination of an approach to the analysis and assessment of market risks of the application of innovative business technologies in the post-coronavirus period.

### 3 Materials and Methods

The following methods were used in the research process. Based on the analysis of literary and analytical sources, the main research directions were determined, within - innovative products and technologies used to solve problems related to doing business (protecting human life in general) in the context of the COVID-19 pandemic. Taking into account business practices of organisations in various industries and forms of management and using faulty generalization method for the analysis results, the paper indicates the existing problems and threats associated with the introduction of these innovative products and technologies. The SWOT-analysis method was used to assess the feasibility of freelance development in Ukraine as one of the most promising areas for organising remote work in post-pandemic conditions.

The methods of structural analysis and synthesis were used to improve the approach to assessing market risks for the introduction of innovative business technologies in the post-pandemic period. The mathematical tool - fuzzy logic method was used for multifactorial risk assessment in the opposing effects conditions. In this case, the risk factors influence was assessed using confidence coefficients (CC) - it reflects the degree of certainty of the true or false value about the presence of risk (on the influence of specific risk factors on its total value). The interval of the confidence coefficient values is shown in Fig. 1.

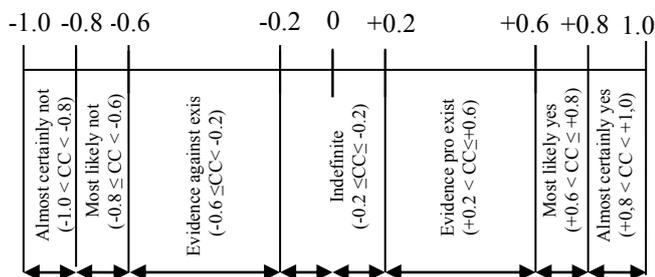


Fig. 1: Scale of the confidence coefficient (CC) values for the success or failure of an innovation project

Source: [4]

Positive values indicate the probable success of an innovative project (no risk), negative - about its probable failure (presence of risk).

As can be seen from Fig. 1, the confidence coefficients take values from -1 to +1. With a

confidence level of -1, it is considered that a negative event will surely occur, and with a confidence level of +1, it probably will not.

The left side of the scale in Fig.1 is designed to evaluate the falsity of favourable events occurring (failure of an innovative project), and the right one - to assess the veracity (success of an innovative project). The confidence factor is a combination of two scores:

$$CC = I - X, \quad (1)$$

I is the assessment of the veracity of a favourable event occurring (from 0 to +1), X is the assessment of the falsity of a favourable event occurring (from 0 to -1)

The combination of assessments of independent evidence of the presence or absence of risk (evaluation of the degree of influence of risk factors on its value) is performed according to the following rules [4]:

$$CC_0 = CC_1 + CC_2 \cdot (1 - CC_1), \quad \text{if } CC_1 > 0 \text{ and } CC_2 > 0 \quad (2)$$

$$CC_0 = -[ |CC_1| + |CC_2| \cdot (1 - |CC_1|) ], \quad \text{if } CC_1 < 0 \text{ and } CC_2 < 0 \quad (3)$$

$$CC_0 = \frac{CC_1 + CC_2}{1 - \min(|CC_1|, |CC_2|)}, \quad \text{if } CC_1 \text{ and } CC_2 \text{ have different signs} \quad (4)$$

When a combination of indications is with +1 and -1 coefficients, it is considered that  $C_0 = +1$ .

These rules, in contrast to other approaches, allow to obtain a cumulative (integrated) assessment of multidirectional vague influences of factors that determine the degree of risk in analysed project. It allows to make justified decisions in terms of inaccurate, incomplete or inconsistent information.

## 4 Results and Discussion

### 4.1 Definition and Classification of the Main Directions and Technologies for Conducting Successful Business Activities during the COVID-19 Pandemic, as well as Their Characteristics

The following main directions for conducting successful business activities (protecting human life in general) in the context of COVID-19 have been identified.

1. *Digitalization of activities.* Global and domestic practice shows that in recent decades active transfer of many types of human activity to

the Internet occurred [5; 14; 15; 17]. However, the pandemic has accelerated this process. This is beneficial both for businesses (sellers of goods and services), service providers, etc., and for consumers. Due to quarantine conditions, consumers began to buy products, which were previously buying in physical stores, like food, household items, cosmetics etc., via the Internet. On-line platforms for the purchase and sale of agricultural products: national, regional, local, and the like were created. Internet consulting (on-line or off-line) of medical workers, insurance companies, lawyers, sales consultants, etc. is developing. However, according to [1], access to the Internet in Ukraine (61.5% of households) is less than in leading countries that are leaders in innovative growth (about 90% of households and more). And this, because of the limited access of citizens to the Internet, threatens to increase discrimination and polarization of people.

*2. Remote work of the organizations' employees.* Quarantine restrictions for traveling, gathering, maintaining social distance, etc. initiated the development of remote work for those organisations, which do not need to use special machines, mechanisms and those tools are stationary. This created opportunities for businessmen and personnel to independently organize their time and space, constantly keep in touch and coordinate activities with delivery services and much more. In addition, it opens new opportunities for freelancing. Ukrainian freelancers have proven their proficiency both in the domestic and global markets. Ukraine is one of the world leaders in terms of growth of the freelance market, in 2019 it placed 5th in the global ranking [24].

It should be noted that in several Ukrainian organizations introduction of remote work shows high efficiency. In addition, workers have already formed certain habits and are not averse to working remotely even after the end of the pandemic. In a few cases, the management of organizations supports such an initiative, because they can save money on premises rental, personnel support, bills

for heat and electricity, etc.

However, there are many activities that cannot be performed remotely and require production facilities and special equipment. In addition, remote work is associated with the risk of decline in interaction of a workplace team, a decrease in socialization, etc. This can also entail certain negative consequences, such as psychological problems of employees that negatively affect their health and productivity.

*3. Development of logistics activities related to the delivery of products ordered online or by phone, etc.* Digitalization of business processes, in particular, Internet communications of manufacturers (service providers) with consumers, contributes to the development of delivery services, for example, Nova Poshta or Ukrposhta, and new ones. Survey of consumers on their experience with delivery services shows that they quickly get used to new opportunities and form new stereotypes of consumer behavior. This allows us to infer the growing popularity of the relevant services among consumers, as well as the prospects for the growth of this business after the pandemic.

However, there are problems in delivering products to distant consumers (for example, in rural areas). These problems are associated with the timeliness of delivery, maintaining product quality, etc.

It appears from the foregoing that these areas of activity involve the active use of information and communication technologies. In this case, both well-known, standardized software products are used, as well as new ones developed for a specific user. It should be noted that Ukraine's IT positions in the world are high, the country is one of the largest exporters of IT services (about \$ 5 billion per year), almost 100 Fortune 500 companies are among clients [18].

Data in the Table 2 can be further used as a basis of relevant knowledge in justifying the feasibility of growth of specific organizations within the selected areas in the post-pandemic COVID-19.

Table 2. Presents the results of the analysis and systematization of the opportunities and threats of the above-identified areas of doing business in the context of a pandemic and the post-COVID period

Direction	Type of activity (products or technologies)	Interest of producers (service providers)	Interest of consumers (recipients of services)	Threats
Digitalisation of activities	Electronic services for ordering the manufacture, purchase and sale of products (provision of	Affordability, does not require a lot of start-up capital; aligning the competitive opportunities of small and medium-sized businesses with large ones, because they all use almost the same Internet	Convenience, availability, possibility to save time and money, the ability to independently plan the time of receipt of products	Almost 40% of the population does not have access to the Internet. Reluctance (technological, financial) to use the Internet by the population of older age

	services)	technologies;	and services.	groups and those living in remote areas
Direction	Type of activity (products or technologies)	Interest of producers (service providers)	Interest of consumers (recipients of services)	Threats
Digitalisation of activities	Internet consulting: financial, insurance, medical, marketing, etc.	high communication ability, availability of appropriate services 24 hours a day, instant payments; the ability to communicate in real time and coordinate activities with delivery services, etc. Ability to quickly enter remote markets	Ability to quickly compare alternatives to obtain the desired item	As a result: geographical, age, technological discrimination; polarization of population groups
	Provision of administrative services			
Remote work	Work as an employee of the organization	Ability for employees to independently plan and organize time and space of activity. Savings on production facilities and operating costs	Ability to quickly make and receive orders from remote consumers, including periods during quarantine restrictions	Lack of direct communication and exchange of ideas with colleagues, psychological discomfort, constant self-organization, loss of social contacts
	Freelance	Attractiveness for young professionals looking for work. Attractiveness for highly qualified professionals seeking to work independently		Constant search for orders, instability of incomes, probability to be deceived, expenses for the arrangement of a workplace, lack of communication with colleagues
Logistics activities	Warehousing and storage of products	Growth in demand during quarantine restrictions, as well as projected growth in the post-pandemic period due to consumer habituation	Convenience for consumers: place and time of delivery, delivery volumes, complete set of products, etc.	Difficulties in servicing remote regions. Geographical discrimination of consumers
	Delivery of products to customers			

#### 4.2 Practical Approbation of the Use of Systematized Characteristics as a Knowledge Base for a Reasonable Assessment of the Feasibility of Business Development within the Selected Areas in the Post-Pandemic Period COVID-19

The consolidated assessment of expediency was performed by the method of SWOT-analysis. A part of such analysis performed to assess the feasibility of freelance development in Ukraine is given in the table 3-4. Listed in Table 4 strengths of freelance are significant and in combination with market opportunities indicate a high chance of success in the development of this type of employment. The weakest aspects of freelance are the lack of social guarantees and high chances of fraud from the customer (employer or client), other negative aspects

are less significant.

Table 3. Market opportunities and threats of freelance development in Ukraine

Opportunities	Threats
Expansion of activities that do not require the presence of an employee	Legislative unregulated activities of freelancers
Growing popularity and profitability of freelancing for clients	The need-to-know foreign languages to work in foreign markets
The possibility of going abroad and receiving a high salary	The need to form an image, rating, etc., which affects the payment
Availability of Internet services for employees	Limited work that can be done on a freelance

and customers	basis
Attractive working conditions	

Table 4. Strengths and weaknesses of Ukrainian freelancers

Strength	Weaknesses
Young professionals with a high level of education who cannot find a job	Profit instability
Qualified professionals who want to work independently	Constant self-organization and the need to perform various tasks
High image of Ukrainian freelancers	Probability of being deceived
	Constant search for orders
	Lack of communication with colleagues
	Lack of social guarantees
	Workplace costs

The obtained results prove the high chances of developing freelance form of employment in Ukraine. It provides employment, reduces unemployment caused by COVID-19 and the post-pandemic period, promotes the entry of domestic workers into international labor markets.

Similarly, the assessment of the feasibility of introducing other innovative technologies for doing business in the post-pandemic period, which are listed in Table 2.

### 4.3 Analysis and Risk Assessment of Introducing Innovative Business Technologies in the post-COVID Period

One of the main reasons hindering the introduction of innovative business technologies is the high-risk degree. In the general case, the following causes of innovation risks are identified:

- inaccuracy, incompleteness and inconsistency of knowledge on the basis of which innovative decisions are made;
- unexpected changes in the conditions of innovative activity caused by the action of factors of the external and internal environment;
- active opposition of other market participants that influence (may influence) the innovation process.

Insufficient risk accounting leads to the fact that, on the one hand, innovative technologies for doing business may not correspond to existing realities (this leads to direct losses), on the other hand,

technologies that have every chance of successful implementation (lost profit) are "cut off".

A significant degree of uncertainty and the risk caused by the introduction of innovative business technologies requires the development of measures to artificially reduce it, which requires an accurate assessment not only of the magnitude of possible losses and the probability of their occurrence, but also the impact of individual factors on overall risk corresponding the introduction of innovative technology (hereinafter referred to as an innovative project).

The following approach is proposed for risk analysis. The risk of each innovative project is considered as an equivalent set of elementary risks of different nature (they can be detailed by impact factors) at the stages of their implementation [8; 20; 27]. In particular, there are:

- external risks caused by macro-environmental factors: economic, political and legal, socio-demographic, environmental, technological;
- external risks caused by micro environmental factors: consumer, competitive, supplier, investment, intermediary, contact;

- internal risks caused by the actions of persons making decisions at the stages of development and implementation of an innovative project.

Since some of the elementary risks may occur simultaneously, and some are mutually exclusive, it is necessary to distinguish between compatible and incompatible risks.

In compatible unfavourable situations can be realized simultaneously, thereby increasing the possible total damage. For example, non-compliance by suppliers (full or partial) with the conditions of supply of raw materials, materials and components threatens losses, as the conditions of supply of finished products to consumers may be disrupted. The scale of losses will increase if at the same time there are delays in the receipt of payment for products previously shipped to other consumers.

In incompatible occurrence of one adverse event excludes another. For example, losses can be caused both by the decision to change the structure of a particular unit, and unwillingness to change it. However, these situations cannot happen simultaneously.

For the analysis and assessment of elementary risks can be used any of the known methods, comparative analysis of which is given in Table 5. By combining a set of compatible and incompatible risks determine the overall risk of the innovation project.

Table 5. Comparative analysis of quantitative methods of risk assessment

Method	Core	Required data	Accuracy of assessment	Advantages	Disadvantages
Statistical	The expected level of risk (risk ratio) of this type of activity is calculated and applies to one of the risk areas	Data on past management periods: reliable statistics for at least 3-5 periods; capital of the enterprise; enterprise assets; income, profit, etc.	Low	Simplicity of calculations	In the conditions of drastic changes of internal and external environment is almost never used. Focuses on affirming the existing situation, not on predicting future results
Analytical	Used to assess the effectiveness of investment and innovation projects (PP, NPV, IRR, RI)	Detailed information about the project or type of activity: project costs, results, number of years needed for project implementation, project life cycle, discount rate	Moderate	Simplicity of calculations	The impact of specific risk factors is not taken into account, so it cannot be used per se to accurately evaluate the risk of projects
Financial stability	Is used to assess the financial stability of an enterprise or to evaluate the feasibility of investing in an investment project. And on this basis, identify potential risk areas	Balance sheet of the enterprise: own funds (fixed and current); long-term, medium-term loans and borrowings; the total amount of stocks and their costs	Moderate	Simplicity of calculations	Ignores the impact of specific risk factors on the growth or reduction of the risk of the project (type of activity)
Normative	The values of financial ratios for a particular enterprise are calculated and compared with the normative values.	Balance sheet of the enterprise: the main financial indicators of activity	Low	Simplicity and efficiency of calculations	Leaves out the influence of individual risk factors. It can be recommended to "cut off" clearly unacceptable decisions.
Sensitivity analysis	The sensitivity of the estimated indicators of the project when changing the values of input quantities	Detailed information about the project or type of activity	Moderate	Objectivity, transparency, simplicity of calculations, clarity of results interpretation	With its help, the range of permissible changes in the input values can be distinguished, but the change value itself can't be determined
Method	Core	Required data	Accuracy of	Advantages	Disadvantages

			assessment		
Decision making tree	Used to identify specific risk factors and the consequences of their impact	Risk factors and consequences of their influence	High	Accounting the influence of individual risk factors	Difficulties in choosing solutions and assessing their impact on future developments.
Analogies	Information about a similar project is analysed: risk factors and the degree of its impact; scale and probability of losses, etc. Based on this information, the degree of risk is predicted	Data on similar projects that were performed under comparable conditions are used to assess the risk. Invariance of economic conditions	Low	Allows to evaluate the degree of risk, provided the project is similar	Each project has its own distinctive features and specifics of implementation, which does not allow to prepare a comprehensive set of scenarios
Expert assessments	Risk assessment is based on the subjective opinions of experts in a particular field	Lack of information	Low	Allows to assess risks with lack of information	Quite a subjective method

It is proposed to identify elementary risks according to the scheme: essence of risk - possible consequences - risk factors. For each of the elementary risks of an innovative project, a structure (model) is formed that combines risk factors (structure attributes) and the possible consequences of the influence of their various combinations. These models can be implemented as a decision tree or table.

So, the following scheme of calculations for the analysis and risk assessment to the use of innovative technologies for doing business in the post-pandemic period is proposed.

1. Analysing the innovation project essence and selecting the elementary risks of its successful implementation according to the scheme (causes and nature of risk, possible consequences, risk factors).
2. Constructing the tabular model of the project's overall risk to combine selected risk factors into single system according to paragraph 1.
3. Expert evaluating the factors' impact (direction and strength) into each elementary risks. The assessment is performed using the coefficients of confidence on the scale in Fig. 1.
4. Calculating the generalized assessment of each elementary risks by combining estimates of its factors according to rules (2-4).

5. Calculating the integrated risk assessment of the project by combining generalized assessments of elementary risks according to rules (2-4).
6. Analysing the calculation results. Making decisions on the feasibility of implementing the innovative project at certain level of risk. Development of measures to prevent, reduce or compensate for risk.

By combining a set of compatible and incompatible risks determine the overall risk of the innovation project.

The integral (resulting) coefficient of confidence is found by the rules (formulas 2-4):

$$CC_0^1 = \frac{-0.11+0.46}{1-0.11} = 0.39$$

$$CC_0^2 = 0.39 + 0.89(1 - 0.39) = 0.93$$

$$CC_0^3 = \frac{0.93-0.78}{1-0.78} = 0.68$$

$$CC_0^4 = \frac{0.68-0.12}{1-0.12} = 0.64$$

Therefore, the integral (resulting) coefficient of confidence is +0.64. This indicates that the threat of failure of the analysed innovation project, which involves the construction of a logistics terminal, likely does not exist (the risk of failure is minimal).

Table 6. Tabular model for multifactor assessment of risks associated with the decision to establish a logistics terminal in the Sumy region

Stages	Risk causes	Possible consequences	Risk factors	Influence factors degree (expert evaluation)	Total figure
1.	Inadequate definition of the main directions of development of the terminal and erroneous assessment of the possibilities of its placement	Difficulties or impossibilities to place the terminal in due time, deliver new products to the target consumers, difficulties with sales	- biased analysis; - underestimation or overestimation of opportunities; - insufficient qualification of experts; - errors in the assessment of logistics capabilities	-0.2 -0.4 +0.4 +0.1	-0.11
2.	Errors in the choice of market research areas, deficiency of the methodology of collecting marketing information, as well as methods of analysis of marketing information, their incorrect application, mistakes in the interpretation of the results	Location of the terminal far from the regions of production and sales, non-compliance of the service with market requirements, inadequate strategy of market entering with new products, increasing the cost of refining research	- violation of the representativeness principle in determining the sample for analysis; - lack of collected information; - focus on unreliable sources of information; - insufficient qualification of employees who collect information and analyse it; - bias of analysis and decision making; - ignoring local conditions and traditions in the regions of consumption	+0.6 -0.5 +0.7 +0.2 -0.3 -0.5	+0.46
3.	Errors of the organization or department conducting design and research work, inconsistency of actions of process participants	Irrational location of the terminal relative to suppliers, high transport costs and production costs	- work inconsistencies between employees of economic contractors; - insufficient or incorrect information; - low qualification of employees; - insufficient provision of resources in the region; - untimely settlements	-0.4 +0.2 +0.5 +0.9 -0.4	+0.89
4.	Incorrect assessment of opportunities and requirements of investors	Lack of funds, non-compliance with the terms of commissioning of the facility and, as a consequence, delays in the market entry and loss of market positions	- inconsistency of actions of management and investors; - dishonesty by both the investment recipient and the investor; - deterioration of the financial condition of the investor; - not predicted drastic changes in the economic or socio-political situation	-0.5 +0.3 -0.5 -0.4	-0.78
Stage	Risk causes	Possible	Risk factors	Influence	Total

s		consequences		factors degree (expert evaluation)	figure
5.	Incorrect understanding of the task, errors in forecast calculations, inconsistencies in the actions of all participants in the process	Loss of profit, project failure	- shortcomings committed in the previous stages (see above); - decisions bias; - not predicted drastic changes in the economic or socio-political situation	+0.2 +0.3 -0.5	-0.12

Therefore, the integral (resulting) coefficient of confidence is +0.64. This indicates that the threat of failure of the analysed innovation project, which involves the construction of a logistics terminal, likely does not exist (the risk of failure is minimal).

But you should pay attention to those stages where the coefficients of confidence values less than 0. Namely: assessment of the logistics terminal's own capabilities (some risk evidence are shown), in stage 1;

- search for funding sources and the formation of a mechanism for investment support of the project (most likely the risk is inevitable if the measures are not taken), stage 4;
- development of a proposal for decisions on project implementation and direct decision-making (the presence of risk is uncertain, but the possibility of its occurrence should not be ruled out), stage 5.

All listed in Table 6 risks are compatible, i.e. can reinforce each other. In this case, the possible losses at the stages of the project realisation must be added. To do this, it is necessary to calculate the magnitude of possible losses at the stages of implementation (considering the probability of an adverse event occurrence), adding them up and comparing with the total cost of the project. The formulas for calculating the coefficients of confidence (column 6 of table 6) in the probability are given in [4] and should be used.

Based on the results of the analysis, decisions are made regarding measures to reduce (prevent or compensate) the risk. Practice shows that one of the most effective ways to reduce innovation risks is to obtain the fullest possible knowledge about the specificities of the development and implementation of an innovation project and its possible consequences. According to [16] effective ways to acquire knowledge in Ukrainian enterprises are: marketing; R&D both in-house and outsource; purchase of knowledge; in-house and outsource

training. An analysis of these methods from the standpoint of the enterprise innovator also showed their high efficiency. However, the specifics of innovation also involve forecasting future improvements based on innovative solutions, which requires the use of specific methods of obtaining knowledge, in particular those mentioned in [14]: trend watching, trend hunting and others. The knowledge acquired this way provides an opportunity to increase the validity of innovative solutions and reduce risk.

Summarising, it should be noted that methodological principles have been developed to outline the prospects and threats of innovative business growth in Ukraine based on products and technologies that have proven effectiveness during the COVID-19 pandemic to reasonably assess their feasibility in the post-pandemic period. The composition and characteristics of innovative technologies of doing business in Ukraine in the post-pandemic period were determined and systematised, the provided information forms the knowledge base for a reasonable choice of technologies for specific types of business. A paper suggests approaches to associated risks calculation. The obtained results deepen the theoretical and methodological principles of innovation management in terms of substantiation of the approach to the formation of organisational and economic mechanism for managing the choice of innovative technologies of doing business in the post-pandemic Ukraine. This principals practical implementation will allow to choose the rational directions of innovative business development, considering the associated risks of each analysed areas (innovative projects for its implementation). Multifactor assessment of elementary risks and their total value (integrated assessment) allows you to assess the impact of each factors on the overall risk of the innovation project, and the impact of their

whole. This, in turn, provides an opportunity to reasonably develop measures to minimize risks.

## 5 Conclusion

In summary, the work identified and systematized the main directions and innovative technologies for running successful business in the not innovative leaders countries (on example Ukraine) during the COVID-19 pandemic. The systematisation of their characteristics was done according to the following scheme: direction, types of activities within the direction, interests of manufacturers (service providers), interests of consumers (clients), main threats to the implementation of this practice. Unlike the existing systematisation, it considers the groups of interests of the main market participants, as well as the main threats associated with the peculiarities of the implementation of these innovative technologies in in countries embarked on the path of innovative development.

This allows us to describe in more detail the existing prerequisites for innovative development, to increase the validity of the strategic directions of innovative development of specific types of business determination. The results of the systematisation form the basis of a relevant knowledge base about the peculiarities of the implementation of directions and, within them, innovative technologies for doing business in a pandemic and post-COVID period. It can be implemented to improve the validity of business technology decisions in countries embarked on the path of innovative development. Practical testing of justification of feasibility of freelance development in Ukraine using the specified knowledge base has confirmed the effectiveness of its application for making strategic decisions on business management in a post-pandemic time.

The approach to the analysis and quantification of risks of innovative business technologies that have shown its effectiveness during COVID-19 pandemic has been improved. The paper defined the risk of an innovative project implementation (a specific method for innovative business technology introduction) as an equivalent to basic risks caused by certain number of factors peculiar only to these threats. The division of the elementary risks into compatible - those that occur simultaneously and toughen each other, as well as incompatible - one excludes the other, was shown. Proposed approach allows to assess the overall risk of the innovation project and make more informed innovation decisions more precisely. This method excludes both double risks computing and ignorance of the

combined action of several types. The mathematical fuzzy logic apparatus provides a fundamental opportunity to consider the vague actions of risk factors and their combinations. It allows to make decisions to justify the selection and implementation of innovative projects in the context of inaccurate, incomplete or contradictory information considering the associated risks, objective and subjective factors.

For the practical testing author's approach the risks are analysed and the implementation feasibility in the conditions of COVID-19 and the post-pandemic period for the innovation project, which involves the creation of a logistics terminal in Sumy region of Ukraine is justified. Recommendations for reducing the risks of innovative business technology's for the project introduction are offered. Further research should focus on developing organisational and methodological principles of management following the formalised principles of the innovative technologies selection for doing business in the post-COVID period in countries embarked on the path of innovative development.

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### **Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)**

-Sergii ILLIASHENKO analysed and interpreted the data, prepared the manuscript text.

-Olena BILOVODSKA performed the literature review, compiled the data and manuscript edition.

-Tetiana TSALKO performed the literature review and some of the remained analyses.

-Olesia TOMCHUK helped in manuscript preparation, formed visualization and supervised data.

-Svitlana NEVMERZHYTSKA performed some of the remained analyses and helped in visualization and data curation.

-Nataliia BUHAS helped in the literature review, manuscript preparation and edition

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