МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ АВІАЦІЙНИЙ УНІВЕРСИТЕТ

Кафедра ***менеджменту зовнішньоекономічної діяльності підприємств***

ДОПУСТИТИ ДО ЗАХИСТУ
Завідувач кафедри
_____ ***Кириленко О.М.***
“____”_____2021 р.

КВАЛІФІКАЦІЙНА РОБОТА

(ПОЯСНЮВАЛЬНА ЗАПИСКА)

ВИПУСКНИКА ОСВІТНЬОГО СТУПЕНЮ
“МАГІСТР”

спеціальності 073 «Менеджмент»

ОПП «Менеджмент зовнішньоекономічної діяльності»

Тема: ***“Управління ризиками ДП “Міжнародний Аеропорт Бориспіль” на міжнародному ринку транспортних послуг”***

Виконав: ***Скалацький Назар Сергійович***

Керівник: ***к.е.н., доц. Коваленко Юлія Олександрівна***

Консультанти з розділів:

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Нормоконтролер з ЄСКД (ЄСПД): _____***(Коваленко Ю.О.)***

_____***(Серьогін С.С.)***

Київ-2021

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL AVIATION UNIVERSITY

Management of Foreign Economic Activity of Enterprises Department

ALLOW TO THE DEFENSE
Head of the Department
_____ ***O. Kyrylenko***
*"____"_____**2021***

QUALIFICATION WORK

(EXPLANATORY NOTE)

by Specialty 073 "Management",

Educational Professional Program "Management of Foreign Economic Activity"

Topic: ***"Risk management of the State Enterprise "Boryspil International Airport" in the international market of transport services"***

Performed by: ***Skalatsky Nazar Sergiyovych***

Scientific adviser: ***Ph.D. in Economics, assoc. prof. Kovalenko Yuliya Oleksandrivna***

Consultants for the parts:

_____

_____

_____

Norm-controller of USCD (USPD): _____ ***/ Y.O. Kovalenko/***

_____ ***/S.S. Seryogin/***

Kyiv-2021

NATIONAL AVIATION UNIVERSITY

Faculty ***TML*** ***Department Management of Foreign Economic Activity of Enterprises***
Specialty: ***073 "Management"***
Educational Professional Program: ***"Management of Foreign Economic Activity"***

APPROVED
Head of the Department
_____ ***O. Kyrylenko***
"_____" _____ 2021

TASK
to perform Qualification Work by student
Skalatsky Nazar Sergiyovych
(surname, name, patronymic)

1. Topic of work: ***Risk management of the State Enterprise "Boryspil International Airport" in the international market of transport services***
approved by the Rector order of ***12/10/2021***, № ***2217/cm***
2. Deadline of work: ***from 11/10/2021 to 31/12/2021***
3. Initial data for work: ***Accounting reports of SE "Boryspil International Airport". Consolidated financial reports for 3 years, scientific works, Internet resources, library resources.***
4. The content of the explanatory note (list of issues to be developed):
Required: ***to examine the essence of risk and risk management, methods and approaches of risk management; to analyze the features of risk management of airports; to perform the analysis of financial and economic activity of SE "Boryspil International Airport"; to analyze the risk environment of the enterprise; to identify main risk groups of the enterprise; to give proposals for the risk optimization for the enterprise operating in international transportation market.***

The list of mandatory graphic material:
Theoretical part: tables –3, figures -4.
Analytical and research part: tables – 23, figures – 4;
Project and advisory part: tables – 2, figures – 2.

SCHEDULE

№	Stages of Qualification Work performing	Deadline of stages	Comment
1.	Collection and analysis of necessary information about SE "Boryspil International Airport" according to the topic of the work	11.10.2021-12.10.2021	done
2.	Determination of peculiarities and approaches of risk management including the features of aviation industry	13.10.2021-18.10.2021	done
3.	Design the references used for analysis of risk management and usage of different measures for risk optimization	19.10.2021-28.10.2021	done
4.	Preparation and presentation of the theoretical part	29.10.2021-02.11.2021	done
5.	Preparation and execution of analytical and research part of the work	03.11.2021-11.11.2021	done
6.	Developing proposals for risk optimization of SE "Boryspil International Airport" considering foreign experience, taking into account the work specification	12.11.2021-23.11.2021	done
7.	Design of project and advisory part of the Qualification Work	24.11.2021-01.12.2021	done
8.	The final design of the Qualification Work (contents, introduction, conclusions, appendices, etc.)	02.12.2021-11.12.2021	done
9.	Report and presentation preparation	12.12.2021-17.12.2021	done
10.	The signing of necessary documents in the established order, preparing to defend the work and preliminary work defense on graduating department meeting	20.12.2021-24.12.2021	done

Student _____(Skalatsky N.S.)

Scientific advisor of Qualification Work _____(Kovalenko Y.O.)

АНОТАЦІЯ

Кваліфікаційна робота присвячена дослідженню проблемних аспектів ризик менеджменту та вивченню ризиків діяльності аеропорту, а також шляхів оптимізації ризиків з урахуванням зарубіжного досвіду на базі ДП "Міжнародний аеропорт Бориспіль".

У вступі визначено актуальність та практичну цінність обраної теми дослідження, основну його мету та завдання, зазначено предмет та об'єкт дослідження.

Перший розділ присвячено теоретичним основам сутності поняття «ризик» та «ризик менеджмент». У розділі розглянуто також світові школи управління ризиками, різновиди ризиків в діяльності аеропорту та методи ідентифікації, оцінки та оптимізації ризиків на підприємствах. Також проаналізовано роль ризик менеджменту, та оптимізацію ризиків на підприємствах.

У другому розділі наведена загальна характеристика досліджуваного підприємства, проведено аналіз його фінансово-економічної діяльності, визначена сильні та слабкі сторони, можливості та загрози підприємства а також його середовище ризиків.

У третьому розділі вказані основні шляхи оптимізації ризиків, розроблені рекомендації щодо впровадження найбільш підходящих заходів та використання найбільш ефективного способу оптимізації ризиків, згідно особливостей авіаційної сфери та загрози пандемії, проведена оцінка ефективності пропозицій.

У висновках та пропозиціях узагальнено результати дослідження.

Ключові слова: ризик, ризик-менеджмент, авіація, підприємство, аеропорт.

ABSTRACT

The qualification work is devoted to the study of problematic aspects of risk management and the study of the risks of airport operations, as well as ways to optimize risks, taking into account foreign experience on the basis of the State Enterprise "Boryspil International Airport".

The introduction defines the relevance and practical value of the selected research topic, its main goal and objectives, the subject and object of research is indicated.

The first section is devoted to the theoretical foundations of the essence of the concept of "risk" and "risk management". The section also discusses the world schools of risk management, types of risks in airport operations and methods for identifying, assessing and optimizing risks at enterprises. The role of risk management and risk optimization at enterprises is also analyzed.

The second chapter provides a general description of the studied enterprise, analyzes its financial and economic activities, identifies the strengths and weaknesses, opportunities and threats of the enterprise, as well as its risk environment.

In the third section, the main ways to optimize risks are indicated, recommendations are developed for the implementation of the most appropriate measures and the use of the most effective way to optimize risks, according to the specifics of the aviation sector and the threat of a pandemic, and the effectiveness of proposals is assessed.

The findings and suggestions summarize the research results.

Key words: risk, risk management, aviation, enterprise, airport.

АННОТАЦИЯ

Квалификационная работа посвящена исследованию проблемных аспектов риска менеджмента и изучению рисков деятельности аэропорта, а также путей оптимизации рисков с учетом зарубежного опыта на базе ГП «Международный аэропорт Борисполь».

Во введении определены актуальность и практическая ценность выбранной темы исследования, основная его цель и задачи, указан предмет и объект исследования.

Первый раздел посвящен теоретическим основам сущности понятия «риск» и «риск менеджмент». В разделе также рассмотрены мировые школы управления рисками, разновидности рисков в деятельности аэропорта и методы идентификации, оценки и оптимизации рисков на предприятиях. Также проанализирована роль риска менеджмента и оптимизации рисков на предприятиях.

Во второй главе приведена общая характеристика изучаемого предприятия, проведен анализ его финансово-экономической деятельности, определены сильные и слабые стороны, возможности и угрозы предприятия, а также его среда рисков.

В третьем разделе указаны основные пути оптимизации рисков, разработаны рекомендации по внедрению наиболее подходящих мер и использованию наиболее эффективного способа оптимизации рисков, согласно особенностям авиационной сферы и угрозы пандемии, проведена оценка эффективности предложений.

В выводах и предложениях обобщены результаты исследования.

Ключевые слова: риск, риск-менеджмент, авиация, предприятие, аэропорт.

LIST OF SIGNS, ACRONYMS AND TERMS

IA – International Airport

IATA – International Air Transport Association

ICAO – International Civil Aviation Organization

SE – State Enterprise

UAH – hryvna, Ukrainian currency

Ths. – thousands

AMC – airport medical center

KBP – International airport “Boryspil”

ACI – Airports Council International

CONTENT

INTRODUCTION

The order of market relations objectively determines the existence of risk in all branches of economic functioning. Over the past few years, the role of risk management at the global level has become increasingly important. The risk management process becomes an integral element of the daily functioning of companies. In modern business, risk management is integrated into strategic planning processes, taking a significant place in the management of the company. It is known that the degree of influence of the risk to which companies are exposed during their operation depends on the number of factors of the external and internal environment. The need to implement specialized anti-crisis management is growing. In other words, to function effectively in a competitive environment, the company's management needs to be aware of the nature of risk; how to assess its level and avoid losses, what it may entail; how to manage risk and how to develop a risk protection process at the enterprise.

It is worth noting that the requests for the formation of risk management were constantly in the view of scientists, specialists and practitioners and were duly reflected in the scientific works of a large number of domestic and foreign scientists. But, despite the significance of the research carried out, some aspects of enterprise risk management, unfortunately, have not found their solution and remain the object of scientific research and discussion.

There is no doubt that 2020 will go down as a year to remember. While the COVID-19 pandemic has had an enormous impact, the year has brought many challenges — from the forest fires in Australia at the beginning of the year to the Taal volcano eruption in the Philippines — followed by a long list of high- force hurricanes and widespread social unrest here in the US. All of these have highlighted the reality of persistent, disruptive volatility.

And there is no reason to think that volatility will decrease; in fact, it is only likely to increase. As Matthew Bishop, an editor from the Economist, said in 2015, “In the rest of our lifetimes the pace of change will never again be as slow as it is

today.” Within the last 20 years, we have seen the dot-com crash, the attacks of 9/11 and the global war on terror, the global financial crisis and now the pandemic. Extraordinary events are becoming the norm.

No individual or organization can predict specific risks. But organizations can and need to prepare for an uncertain and volatile future that includes climate change, technological disruption, geopolitical risk, threats to the global supply chain, and issues related to cyber-crime, data protection and privacy. As we have seen during the pandemic, some modern business practices (such as globalization and just-in-time inventory management) create risks of their own. And regulatory authorities around the world continue to evolve and expand their scope, addressing matters such as data protection and privacy along with money laundering, financial crime, violations of sanctions, bribery and corruption.

The problem of maintaining business operations in an increasingly volatile and complex business environment calls for proactive, integrated solutions encompassing people, data and infrastructure. Organizations should establish well-defined direction from the top level so that there is clarity on how to act when challenges arise.

The aviation industry regularly deals with enormous risks, from fluctuations in currency exchange rates and the price of jet fuel, to massive capital outlays, volatility in passenger demand, and competition from low-cost carriers. COVID-19 disrupted almost every aspect of our lives in 2020. In addition to the devastating human toll of a pandemic that claimed over 1.8 million lives by the year’s end, daily routines were turned upside down by lockdowns, travel restrictions, new safety rules, and an economic crisis that shrunk the global economy by 4.3 percent.

The aviation industry was among the hardest-hit sectors. Seemingly overnight, the pandemic brought air connectivity to a near standstill. Although recovery is already underway, just how it plays out remains anyone’s guess. After all, no one saw what was coming in 2020 and no one can say with certainty how the pandemic will develop or when people will feel comfortable flying again.

Thus, I think successful risk management is needed today like never before. It is the key that may help to save and recover aviation industry today in this difficult times that is caused by COVID-19.

The relevance of the research is justified by the reality of the existence of risks in the functioning of most companies.

Well-known foreign and domestic scientists worked on the issue of risks: T. Andersen, T. Bedford, D. Galay, H. Gruning, I.V. Goncharov, OE Kuzmin, A. Kempf, K. Kuchner, J. Kalman, M. Krui, L.G. Melnik, G. Monahan, K. Mosler, M. McCarthy, F. Knight, B. Reisberg, O.R. Savchenko, II Sahartseva, D. Slivka, OV Slag, etc. Scientists study the essence of filling the category of risk and risk management varieties of risks arising in the economic activities of enterprises, as well as approaches to their management. However, in the unpredictability of the process of economic activity and rapid changes in the foreign economic environment of enterprises, the formation of risk management requires in-depth study.

The object of research is risk management of the enterprise operating in the sphere of international transportation services.

The subject of research is theoretical and methodological approaches to risk management of State Enterprise International Airport “Boryspil”.

The purpose of qualification work is to research the theoretical bases of risk management of transport services and to substantiate the directions of risk optimization on the example of airport.

The tasks are following:

1. Determine the essence, types and process of risk management;
2. Investigate risk management schools;
3. Reveal airports risk management features, its specificts and ways to estimate it;
4. Find out features of risk management in the aviation industry and airport risk management;
5. Study and analyze financial condition and risk environment of the SE AI “Boryspil”;

6. Give recommendations to optimize risks of studied enterprise

Methods, which were used in the research process and materials processing - system approach (to study the problems of risk optimization in the airport); financial and economic analysis (to study the state of economic activity of the enterprise); graphic (for visual presentation of research results), SWOT-analys, and method of expert evaluation.

The factual basis of the work is materials of periodics, Ukrainain state documents, approved information about the SE «Boryspil International Airport», materials of the financial reporting of the airport, the results of research performed on the basis of the obtained data.

The structure of work. The first section is devoted to the theoretical foundations of the essence of the concept of "risk" and "risk management". The section also discusses the world schools of risk management, types of risks in airport operations and methods for identifying, assessing and optimizing risks at enterprises. The role of risk management and risk optimization at enterprises is also analyzed. The second chapter provides a general description of the studied enterprise, analyzes its financial and economic activities, identifies the strengths and weaknesses, opportunities and threats of the enterprise, as well as its risk environment. In the third section, the main ways to optimize risks are indicated, recommendations are developed for the implementation of the most appropriate measures and the use of the most effective way to optimize risks, according to the specifics of the aviation sector and the threat of a pandemic, and the effectiveness of proposals is assessed.

PART 1. THEORETICAL ASPECTS OF RISK MANAGEMENT OF THE AIRPORT

1.1. The essence, types and process of risk management

Scientists O.R. Savchenko [20] and L.G. Melnik [14], understand the risk as "the probability of loss by the company of its own resources, loss of profits or the occurrence of incidental costs as a result of the implementation of specific production and financial activities". In his work, B. Reisberg defines risk as "the threat of potentially allowable loss of resources or loss of profits in comparison with the option calculated for the reasonable use of the company's resources" [3]. This view is held by O.Y. Kuzmin, characterizing the risk as "the threat of unforeseen losses caused by changes in operating conditions or certain unfavorable situations"[61]. And from I.V. Goncharov [7] explains the risk as a threat of adverse consequences of the proposed phenomenon, and the option of a positive deviation at constant measurements called "chance". Well-known domestic scientists I.I. Sakhartseva and O.V. Shlyaga [21] see the risk of "situational characteristics of the operation, combined with the uncertainty of its outcome and the possibility of adverse effects of activities as a consequence of failure". Uncertainty is an inevitable condition of management, and therefore the risk is a fragment of the results of the economic decision [7]. Elements such as uncertainty and risk will be important parts of doing business. Comparing them, we can conclude that the main difference between them is that risk is measurable, and uncertainty, unfortunately, no. It is known that project planning and implementation takes place under conditions of uncertainty, which form the conditions for changing both internal and external environments. Therefore, by uncertainty I mean the lack of complete and reliable data on the principles of the project. Uncertainty itself may be related to the potential chance of adverse conditions, situations or consequences, called risks. Uncertainty is caused by incompleteness, untimeliness, a small degree of specification associated with the activities of business entities. Therefore, as the level

of uncertainty increases, the risk of economic activity of the enterprises increases. Corporate or as it is often called entrepreneurial risk by its nature has an unbiased basis due to the uncertainty of the external environment relative to the company (organization). The external environment is characterized by various conditions within which the company implements its own activities and the flexibility of which it is forced to get used to. That is, the uncertainty of the state is due to the fact that it depends on a large number of volatile factors. Thus, the reasons for the uncertainty of entrepreneurial activity are: ignorance, chance and counteraction. The emergence of uncertainty is due primarily to the fact that the vast majority of actions related to entrepreneurial activity are not determined market conditions, consumer preferences, the emergence of various natural and climatic adverse conditions, etc.).

Groups of factors that are the causes of uncertainty in business:

- ignorance (lack of knowledge of data about the internal environment, about the unexpected consequences of activities carried out on a particular object).
- randomness (unexpected changes in the use of certain products produced by the company, unexpected difficulties associated with sales, accidental difficulties with supply, equipment failure, problems with innovation, etc.).
- counteraction (lack of knowledge of the expected level of demand for goods and problems associated with its implementation, caused influences competitors, conflicts performers with customers, non-compliance with contractual obligations to suppliers, disorganization of the workforce, etc.)

Despite a very large number of scientific developments in the field of risk management, there is currently no clearly defined classification of risks. Thus, a group of scientists analyze the risks on the principle of occurrence according to the main types of business activities, distinguishing them into production, commercial, financial [7]. It is quite legitimate, also to add to the risks in the field of legal and legal organizational, investment and insurance risks [5]. It should be noted that one of

the founders of risk theory, economist F. Knight [72], despite all available classifications, most simply and clearly divided the insucrance risks into two groups:

- the so-called insurance risk, the probability of which can be statistically calculated, in other words - insure (for example, the risk of fire in a warehouse with products for sale);
- and risk, which is simply included in the scope of insurance (for example, the risk in relation to which there is no demand for a new range of goods, in the development and manufacture of which the company has invested).

The risks of the first group do not cause large losses and do not have fatal elements, while the company takes responsibility for the risks of the second group, taking into account all production decisions related to pricing or creating strategies to promote products on the market. That is, according to the research of the American economist F. Knight, profit or loss is a win or a loss in a game with an unexpected end.

Any company, operating in the market, operates in an environment of a certain number of risks. Therefore, in our opinion, there is a need to effectively ensure the work in the field of risk control.

The ambiguity of the interpretation of such a concept as risk management is due to the lack of a single position on the formulation of management philosophy. The essential content of the term "risk management" is the process of decision-making and implementation of measures that are aimed at ensuring the minimum possible risk. began in the far 40s of the twentieth century. In order to consider in more detail the stages of formation of a relatively new science, we propose to consider the periodicity of risk management development presented in Tab. 1.1.

It is known that risk management is an auxiliary tool in the enterprise management system. The ability to manage risks is one of the key factors for the successful functioning of an enterprise. In other words, it is an opportunity (risk management) that helps to predict financial losses with the slightest losses, and in the event of an incident with their occurrence – the ability to limit the favorable results.

Table 1.1.

Development Stages of the Risk Management Process

№	Years	Periods and their features	Events of the period
1	40-60s of the twentieth century	Formation of risk management	The term "risk management" appears. In 1966, the Insurance Institute of America introduced the practice of passing three types of exams to obtain the first in the insurance industry qualification certificate in the field of risk management (Associate in Risk Management)
2	70s of the twentieth century	Micro risk management, risk management takes place at the level of individuals	Gustav Hamilton, risk manager of the Swedish company Statsfretag, in 1974 developed a "circle of risk management", which clearly depicts the interaction of all elements of the risk management process – from evaluation and control to financing and communication. American Society of Insurance Management Organization in 1975 changes its name to Risk & Insurance Management Society (RIMS)
3	80s of the twentieth century	Asset and liability management at the treasury level. Strategic asset and liability management through planning and control	In Washington 1980, The Society for Risk Analysis was created to bring together risk management professionals. The Institute for Risk Management was established in London in 1986. In the late 80's was the creation of the concept of Value-at-Risk. The concept of the risk metrics system, which was developed by J.P. Morgan based on market risk assessment, was implemented.
4	90s of the twentieth century	Market risk management through its control within the financial department, the emergence of the function of "risk management". Credit risk management through its control within the financial department, the development of "risk management" Operational risk management through internal audit, the use of "risk management"	In 1993, GE Capital. for the first time uses the term Chief Risk Officer to denote the position of top manager, dealing with all aspects. And in 1996 the Global Association of Risk Professionals was created, which unites risk managers who are responsible for operations in financial markets. In 1997, Risk Metrics Group (a subsidiary of J.P. Morgan) unveiled a method of calculating the Credit VaR indicator (similar to the VaR indicator in the field of credit). In 1999, the Russian branch of GARP was opened.
5	The beginning of the XXI century	Corporate risk management (ERM) is based on an integrated approach to risk management, capital and operational asset and liability management	In 2002, the Sarbanes-Oxley Law on Investor Protection was passed. During this period was established the International Professional Association of Risk Managers (PRMIA)

Source: developed by the author based on scientific developments [9]

The efficiency of this system is mainly distinguished by its quality interaction between its constituent elements. Risk management as a management process stimulates the creation and adoption of strategic and tactical decisions by the enterprise as components of the management of this process. The strategy of risk management is a specific long-term direction of achieving goals, the principles of which are risk forecasting and ways to reduce its impact. Given the chosen strategy, there is planning for further operation of the enterprise in both environments.

But the purpose of tactics is to introduce specific methods and techniques for the selection and implementation of the most optimal and most effective solution to achieve goals (results) with the existing risks and uncertainties. These two concepts are very important elements in risk management. The risk management process has two subsystems: the object (risk or dangerous investment of funds and financial relationships with those involved entities in the operation of the enterprise) and the management entity (which includes a specific category of persons engaged in purposeful activities object of management, while using various special techniques and ways of organizational influence).

The main functions risk management subject are:

- organization of the management process;
- process associated with reducing the impact of risk;
- insurance and prevention of risky situations;
- managing the process of dangerous investment funds;
- control over the process of financial relations of entrepreneurs;
- forecasting and control.

In accordance with the above, the fundamental tasks of risk management can be considered:

- risk assessment;
- reduction of losses caused by risks;
- increase side income, through an effective risk management process.

Based on this, there are the following functions of risk management:

1) Forecasting (planning);
2) Organization;
3) Control;
4) Regulation;
5) Coordination;
6) Motivation;

The risk forecasting function has a great influence on the management decision-making process. It is to develop effective methods of managing the latter in any possible changes in the state of the object. Forecasting is done by statistical calculations and expert methods. Organization, as a function of risk management aims to create and organize system techniques, aimed at reducing the degree of risk on the basis of specific principles that are characteristic of a particular enterprise. Control, as a function of risk management involves a system of inspections in the process of enterprise activities, the purpose of which is to reduce the impact of risks. The regulatory function is an opportunity to influence the object of management, the purpose of which is to implement urgent actions to restore the possibility of normal management of the object. Coordination unites the object and the subject of management, while ensuring control over the effective functioning of all risk management actions.

The purpose of motivation in risk management is to create interest in the results of their work. Systematized implementation of the above functions risk management will characterize this process from the standpoint of a specific approach to management, as a series of logical management actions.

Based on this, it can be formed a derivative risk management system, which is presented in Fig. 1.1.

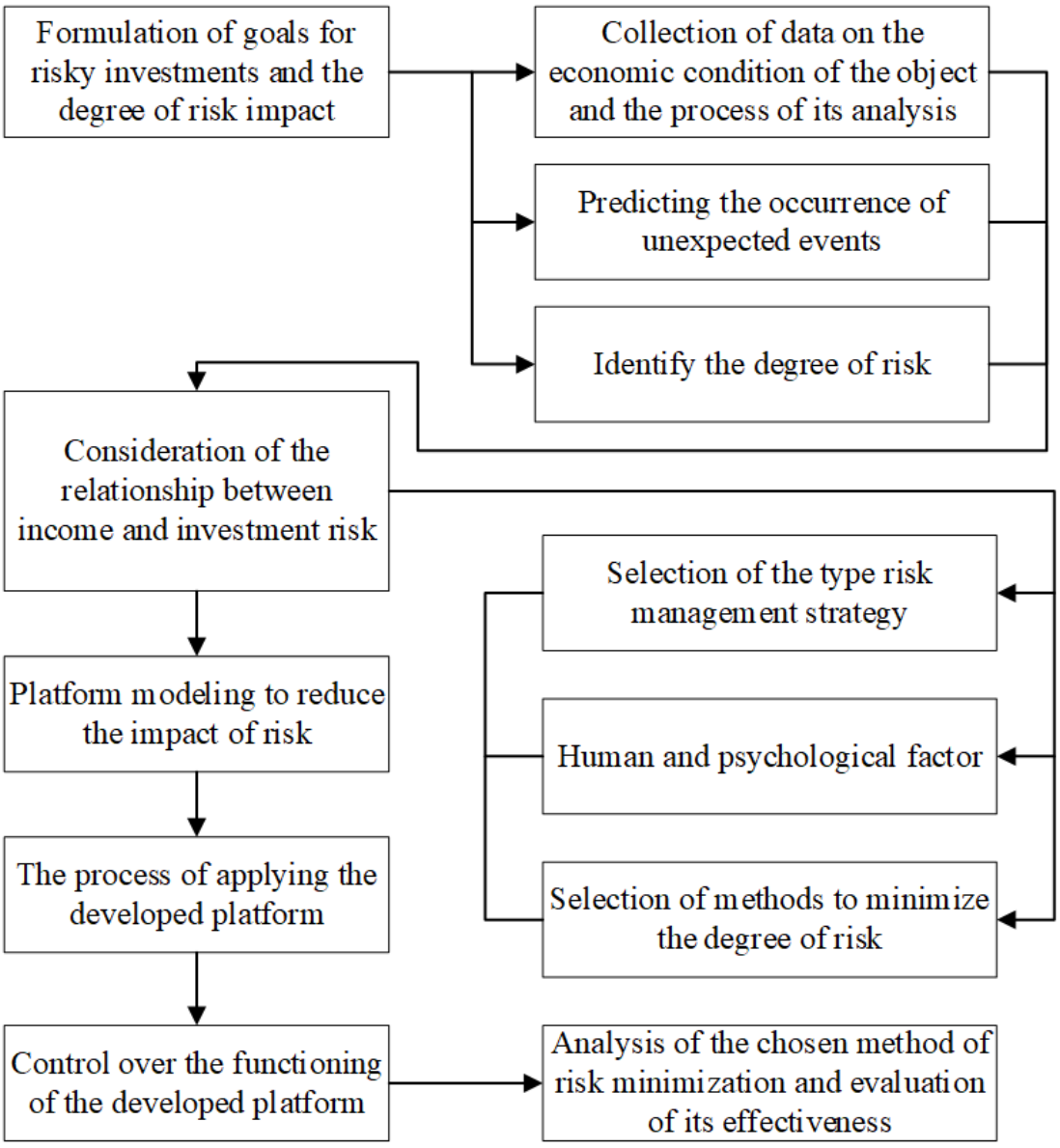

Fig. 1.1. Model of the Risk Management Process at the Enterprise

Source: developed by the author based on scientific developments

The basis of risk management decisions is the presence of clear and truthful data on the sources of possible risks and their consequences. Therefore, it is information support, along with organizational skills and financial resources, occupies a fundamental position in the process of risk management of the enterprise. But risk management cannot be presented without prior assessment and identification. Risk identification is a process of identifying, describing, documenting risks that pose potential problems (losses) for the entrepreneur.

Professional risk assessment allows you to identify risks, their nature, intensity and impact on the company. The main objectives of risk assessment and identification include: detection of a potentially dangerous situation, the use of appropriate methods to assess the likelihood of danger, providing an alternative solution to reduce the amount of work to eliminate minor risks (elimination or reduction of any possibility of danger, limitation of any negative consequences of danger), evaluation of the effectiveness of problem solving, monitoring information for the risk management decision base, documentation of the analyzed risks.

1.2. Main approaches to organize the system of risk management

An urgent problem today is the creation of driving mechanisms for economic development of Ukraine. Stimulating the sustainable development of the national economy is not possible without effective risk management, which requires research of foreign experience and scientific publications on risk management of foreign scientific schools. This will improve both the theory and methodology of domestic science of risk, and the practice of risk management. The most famous school in the theory of financial risk and risk management since 1955 is the American school. Among its modern representatives are: A. Damodaran [49], H. Gruning [12], F. Jorion [68], J. Kalman [70; 69], M. Krui [46], M. McCarthy and T. Flynn [78] and other famous scientists. General information about foreign schools of risk management is presented in Tab. 1.2.

H. Gruning made a significant contribution to the study of banking risks, corporate and financial risk management [12]. A. Damodaran is a specialist in finance, an employee of the Stern School of Business at the University of New York (specialist in corporate finance and capital valuation). He was interested in assessing the level of capital, the management process of portfolio capital and strategic risk management. In the 1994 A. Damodaran was recognized as one of the best professors who teach in business schools in the United States.

Table 1.2.

Foreign Scientific Schools of Risk Management

School	Representatives
American	A. Damodaran, H. Gruning, F. Jorion, J. Kalman, M. Krui, M. McCarthy, R. Mark, T. Flynn
English	T. Andersen, T. Bedford, A. Griffin, A. Zaman, R. Cook, P. Sweeting, P. Hopkin, P. Schroeder
Australian	IGSRM, G. Monahan
German	A. Kempf, K. Kuchner, K. Mosler, I. Koch, D. Slivka, G. Skradin, T. Hartmann-Wendels, D. Hess, K. Homburg, F. Schmidt
Swiss Laboratory of Risk Management	V. Bignozzi, M. Wutrich, A. Giesler, P. Derpe, P. Embrecht, M. Hofert
Japanese	Mamdani, Sugeno, Tsukamoto

Source: [9]

His work focuses on capital assessment, as well as corporate finance, and for the first time gives its full picture; shows how to build an organizational relationship between the company's risk management functions: strategy, finances and current activities, so that the tools and results of the assessment are determined by the decision-making process, and not vice versa; on practical examples argues the positive effect of risk, its use to increase company profits.

Dr. J. Kalman [70; 69] known specialist in management, risk control and their financial management. Dr. J. Kalman is the owner of Kallman Consulting Services (KCS), which provides practical application of risk management in enterprises. Dr. J. Kalman is a member of various committees for the American Risk and Insurance Association and the Western Risk and Insurance Association. Many books on risk management have been published in the West. But with regard to the book by M.

Krui, D. Galai, and R. Mark, "Fundamentals of Risk Management," one can hardly say "another." The book by M. Krui, D. Galay and R. Mark "Fundamentals of Risk Management" [46] is one of the best available not only to risk managers, but also to a wider audience interested in understanding modern risk management. Attention is paid not to models (which provides a certain level of mathematical training), but to the essential and practical side of risk management.

An important contribution to the development of theoretical and practical basics of risk management made representatives of the English school of risk management: T. Andersen [35], T. Bedford [58], A. Griffin [62], A. Zaman [100], R. Cook [58], P. Sweeting [89], P. Hopkin [64], German P. Schroeder [35] and others.

Scientists T. Andersen and P. Schroeder [35] believe that with the rapid growth of the economy and the presence of a large number of obstacles to the successful operation of the enterprise, the relevance of effective risk management increases. In the written book, an important place is given to the variety of ideas and techniques developed to manage various risks, in accordance with the industries where they are present.

Thorough concepts of uncertainty are analyzed in the scientific work of economists from Great Britain T. Bedford and R. Cook [9]. Their book also addresses the relationship of uncertainty with probability and its limits with quantitative assessment.

Based on experience in the analysis of theoretical and practical principles of risk, scientists have focused their work on conceptual and mathematical principles, which were taken as the basis for quantification, explanation and risk management. They include such a serious topic as the application of expert uncertainty assessment.

It is the presence of considerable experience in the process of managing the reputation of the company, helped A. Griffin [62] to analyze the effective and incorrect actions of corporations from the organization, personal reputation management and reputational risks on specific own examples.

In the process of functioning, corporations are forced not only to defend their personal reputation under the pressure that increases on them from the state and society, but also to create a system for its control.

Reputational risks are the main factor of the company's competitiveness nowadays. Thus, the famous British scientist A. Zaman [100] researching this issue has made a significant contribution to its study:

- compared the issue of value formation with reputational risk;
- gave a single vision of reputational risk;
- demonstrated methods of risk management;
- analyzed the impact of the board of directors and management on reputational risk management.

P. Hopkin [64], a well-known economist from England, argues that the urgency of risk management has increased due to world events such as terrorism, natural disasters and the global financial crisis. In today's world for corporations important in the course of their operation is the ability to respond to all emerging risks.

P. Sweeting [22], a famous scientist from the UK, suggests that the process of financial risk management provides all the necessary tools to implement a risk management system. In this process there are qualitative and quantitative methods needed to identify, model, assess risks and describe strategies to reduce the number of risks.

German scientific school has some achievements in the theory of risk management and is based on the works of L. Zade. Its achievements are significant results risk assessment using fuzzy logic and sets.

Well-known scientist E. Koch, in his publication "Modeling of fuzzy and genetic algorithms for data analysis and research" [45], deals with the use of fuzzy models for data analysis. Fuzzy systems are a very important tool for managing all types of data, and the best way to develop and debug data systems will be evolutionary programming techniques. This book offers complete instructions for using fuzzy models that you can use in your own projects. The author presents

various examples in which fuzzy models are used to design a special planning system.

In Germany, the University of Cologne has established a higher school of risk management, which is an experimental team in the field of risk management. The main task of the school is to help young scientists.

Well-known professors such as A. Kempf, K. Küchner, K. Mosler, D. Slivka, G. Skradin, T. Hartmann-Wendels, D. Hess, K. Homburg, F. Schmidt conduct various studies in the field of risk management in this school.

Modern microeconomics and empirical interpretations are the basis on which the research of this school is based.

At this school, scientists in econometrics and professors from different fields of the Faculty of Business, achieving their goal, work together. It is for risk management and risk analysis of the enterprise and designed research program. This method is quite necessary because it has close relationships with different types of risk and different risk management process. The first step in any course of risk management is the manifestation and quantification of enterprise risks. Thus, it helps us to identify and assess risks and the process of managing them in accordance with the goals of the enterprise, and data on other risks can be communicated to all employees of the enterprise (who are involved in the risk management process).

Quality and confidence in risk management are directly proportional to the quality of their definition. Thus, this system of studies is quite complex and requires the cooperation of scientists from different industries.

A fruitful contribution was made by leading Swiss scientists V. Bignozzi, M. Wutrich, A. Giesler, P. Derpe, P. Embrecht, M. Hofert, who work in the risk management laboratory of Risk Lab Switzerland, and scientists of the Basel Banking Committee, who are developers of world standards.

Significant achievements in the design of today's theoretical foundations for risk assessment, using the technique of fuzzy logic and fuzzy sets made by representatives of the Japanese scientific school [75].

Representatives of the Australian School of Risk Management have made significant progress in the field of risk management. Thus, the eminent economist M. Gregory [60], developed a marketing strategy for credit and operational risk management. Also, this well-known analyst and manager-practitioner of risicology participated in the development of the first version of the program for risk management.

In his book "Enterprise Risk Management: A Methodology for Achieving Strategic Objectives" [60] the author highlights the following:

- risk management process, ways to achieve strategic goals;
- operational risk management methods;
- methods of increasing the competitiveness of the enterprise.

Referring to the results of the study M. Gregory [60], identifies the most promising ways to develop research, which is inherent in the implementation in our country: enterprise risk management strategy, risk-based enterprise development strategy, political and social risks in the investment strategy of the enterprise, development and analysis of models and mathematical methods and methods of quantitative risk assessment, financial risk analysis, its methods and models, development of the latest techniques in the field of assessment and management of various risks, analysis of macroeconomic risks of states in the process of globalization integration, risk analysis of major industrial and banking organizations.

1.3. Ways to identify, to assess and to mitigate risks of the airport activity

Aviation risks are a part of the daily operations of the aviation industry. They can put passengers to face time delays, price hikes, uncertainty or even the loss of life. Though it uses radars, which spot intrusion into the controlled airspace and other navigational aids, the aircrafts face threats of losing its path. Today, though a large

number of instruments aid aviation operations accurately in real time, aviation business is prone to hazards, risk, and threats.[96)

Risks in aviation is a potential loss or damage of property, information or lives (assets) that can happen due to a threat. Literally, there is a risk if the assets, vulnerabilities, and threats are present together.

Common aviation risks include operational, strategic, compliance, or financial risks that than put the assets into problem. There can be several types of risks for aircraft as well as airport:

- bad weather conditions for a flying aircraft;
- aircraft about to run out of fuel while in flight;
- a person in the aircraft or airport needs medical aid critically;
- failure of electrical, electronics, or mechanical component;
- pilot's mistake;
- bird-strike at the time of aircraft movement;
- an inexperienced employee or unknown person at the airport;
- unscreened passengers or their articles allowed to board the aircraft;
- repayment of loan;

It is often stated that, when conducting risk assessments, that suitable and sufficient controls should be implemented to ensure that the residual risk is reduced to a tolerable level so work can be carried out without serious consequences.

It should be noted that tolerable risk is defined as being risk that is bearable in a specific context based on the current values of society. It follows that, over time, protective measures may have led to an acceptance of the residual risk (resulting from identified hazards) that may need to be reviewed to determine if residual risk levels are at tolerable levels. This is because tolerability is not a static entity.

Some organizations use a cost benefit analysis to justify when a risk is tolerable, there is a flaw in this process. Utilitarianism thinking closely align with cost-benefit analysis where most of the cost-benefit analyses gives the initiator the costs and benefits, and not the costs and benefits to everybody. In addition, it will be a brave person that will put a monetary cost to an employee's life.

In a Figure 1.2. adapted from a publication by Richard J.T. Klein about acceptable, tolerable, and intolerable risks in relation to adaptation limits repeated below one can see the two limits he defined.

When determining these limits, it should be noted that the area of tolerability as defined in this graphic is not fixed or linear but can vary from site to site as well as over time at a site. This variability makes the determination of tolerability even more complex.

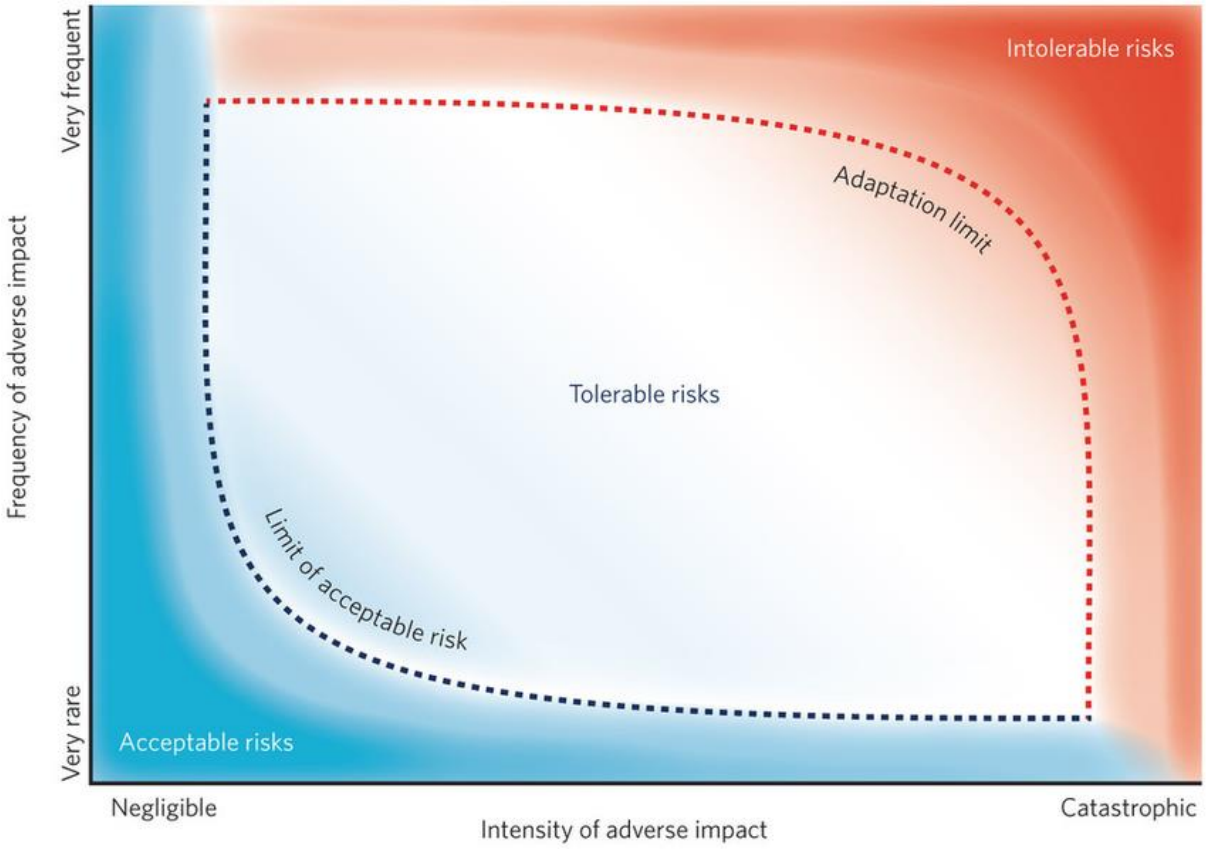

Fig. 1.2. Tolerable and Intolerable Risks Graph [73]

Risk assessment is performed to uncover the loopholes in the systems and take corrective actions. Risk analysis is done to find out the particular cause of the accident or incident and reduce the likelihood of further risks.

Vulnerability in aviation is a weakness or a loophole in the security system. A threat can take undue advantage of a vulnerability to breach the security and destroy assets. [50]

The following can be the different vulnerabilities that the aviation industry undergoes:

- access to airside area of the airport to non-traveler/non-staff people
- poor screening methods for passengers and baggage
- poor aircraft or airport maintenance
- overcrowding near adjacent gates at the time of departure
- poor security in handling information regarding flight plan

A threat is a particular source of attack. Can someone forget the most notorious and perilous 11 September attack where four airliners were hijacked to carry out a suicidal attack on World Trade Center and Pentagon. On December 24, 1999, Air India IC 814 with 178 passengers and 11 crew members was hijacked by terrorists and taken to Kandahar, under the then Taliban control. Today the terror methods have potentially increased with sophistication in destroying.[93]

There are many such incidents when the aircrafts are hijacked by terrorists or extremists and this often leads to the loss of assets. These threats are mostly intentional. In some rare cases, mentally unstable people have been found to be the cause of such incidents.

The following can be the common aviation threats:

- unattended or unclaimed baggage found at airport.
- a person carrying weapon without declaration.
- a person not cooperating with the security staff.
- a person carrying sharp objects with him.
- a call from an unknown person for destruction.
- a person with suspicious gestures and appearance.

Since numerous passengers travel by air frequently, there are objections related to risks, vulnerabilities, and threats.

The airport security systems and staff together work towards the safety of the airport, the aircraft, and also the safety of the passengers. To manage the airport as well as the aircraft security, the following measures are employed:

- aircraft and airport employees are trained on security and safety issues, as well as crisis handling procedures;
- aircraft are equipped with emergency exit way and procedures for passengers;
- airport areas are monitored by cameras;
- a dedicated team of trained police force is employed for airport and aircraft safety;
- security staff takes the help of sniffer dogs to detect any unclaimed object lying around the airport.
- airports are equipped with fire-fighting alarm and fire-extinguishing systems.
- sensitive airside areas in airports, such as ramps and operational spaces, are restricted from the general public.
- every traveler who arrives at the airport needs to enter into the airport only from the departure entry, the traveler can go in further only after showing a valid journey ticket, an identity proof, and a passport if required.
- non-passengers need to obtain a gate pass and face security checking to enter the secure area of the airport.
- traveler check-in baggage and handbags are strictly screened through X-ray machines.
- travelers are screened by metal detectors before they board. But they can be subjected to later screening if required.
- travelers are not permitted to enter the cockpit area of the aircraft.
- food joints at the airport use containers and glasses made of plastic instead of those made of glass as they can be used as weapons.

Travelers are prohibited from carrying any personal stuff that can be harmful in the airport premises or in the aircraft. These objects are:

- personal stuff (razors, scissors, manicure kits, knives, ropes or strings);

- liquids (personal water-bottle, flammable or non-flammable liquids, fuels, gels);
- explosives (gas cans, fireworks or fire-extinguishers);
- food items (jellies, soups, syrups, dips, salad dressings, vinegar, sauces, and alcohol);
- tools (crowbars, catapult, hammer, saw, drills and drill bits, screw-drivers, wrenches, pliers, metal or plastic wires)
- sports equipment (hockey sticks, cricket bats, bows and arrows);

The Air Navigation Service Provider (ANSP)[29] needs to set up contingency strategies to handle future mishaps that may arise due to various risks and threats.

The contingency strategies are of two types:

1. Alternate airspace strategies.
2. Alternate location strategies.

Contingency planning involves:

- Finding out if there is an already existing plan to manage the consequences of the incidents or accidents.
- Inventory of the units/services/functions of an Air Navigation Service Provider (ANSP).
- Identifying realistic events which increase the likelihood of the mishaps and lead to the loss of assets.
- Developing or changing contingency measures that meet safety and security requirements.
- Developing a plan for contingency assessment to ensure that contingency requirements are met.
- Developing plan and procedures to resume the normal operations.

Another threat is collision with birds and it is one of the major challenges for aircraft safety. Aircrafts can sometimes damage themselves after colliding with birds. To avoid such mishaps, the airports need to install Airport Bird Control System, which is specifically created for repelling birds and other wandering animals away from airports and runways.

Some airports use Bird Aversion Liquid or Gas, which upon spraying creates an invisible barrier between birds and aircraft. This spray irritates birds' sensory system, which is harmless for their life but keeps them from flying near airport.

Some electronic bird repellent systems also have high-output amplifiers with multiple speakers installed in tower design. These systems are weatherproof and are capable of repelling birds up to 30 acres with a sound output around 125 DB.

It is not just the combination of a bird and an aircraft flying into each other that is dreadful. An animal on the runway also can cause a great hazard as flipping an aircraft while taking off or landing. There are chances of wild animals entering the runway if it is not properly secured. To determine animals' entry, the airports are surrounded with partially buried fencing.

Safety is the state in which the risk of harm to persons or property damage is acceptable. The state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management [32]. Risk analysis is the process during which a hazard is characterized for its likelihood and the severity of its effect or harm. Risk analysis can be either quantitative or qualitative; however, the inability to quantify or the lack of historical data on a particular hazard does not preclude the need for analysis [33]. Risk assessment is the process by which the results of risk analysis are used to make decisions. The process combines the effects of risk elements discovered in risk analysis and compares them to acceptability criteria. A risk assessment can include consolidating risks into risk sets that can be jointly mitigated, combined, and then used in making decisions. According to ICAO, a hazard is a "condition or object with the potential of causing injuries to personnel, damage to equipment or structures, or reduction of ability to perform a prescribed function." The FAA uses this definition – "a condition that could foreseeably cause or contribute to an accident".

Some hazards are obvious, like a worn out tire. When driving, a flat tire may cause loss of directional control or braking capability, which may lead to an accident. Other hazards are more intangible. A passenger bridge operated by personnel with

inadequate training may cause damage to an aircraft arriving at the gate [30]. Some hazards are common to all airports-jet blast or rotating propellers, and hazardous materials like fuel, oil and hydraulic fluid. The existence of these materials and equipment by themselves does not set up a hazard; but when humans are exposed to them, or operations are conducted contrary to normal procedures, these materials and equipment can become hazards [92].

The risk management process is a framework for the actions that need to be taken. There are 3 basic steps that are taken to manage risk; these steps are referred to as the risk management process. It begins with identifying risks, goes on to analyze risks, then the risk is prioritized, a solution is implemented, and finally, the risk is optimized. In manual systems, each step involves a lot of documentation and administration.

Risk management process consists of 3 essential elements:

1. Hazard identification – identification of undesired or adverse events that can lead to the occurrence of a hazard and the analysis of mechanisms by which these events may occur and cause harm. Both reactive and proactive methods and techniques should be used for hazard identification.
2. Risk assessment – identified hazards are assessed in terms of criticality of their harmful effect and ranked in order of their risk-bearing potential. They are assessed often by experienced personnel, or by utilising more formal techniques and through analytical expertise. The severity of consequences and the likelihood (frequency) of occurrence of hazards are determined. If the risk is considered acceptable, operation continues without any intervention. If it is not acceptable, the risk mitigation process is engaged.
3. Risk mitigation – if the risk is considered to be unacceptable, then control measures are taken to fortify and increase the level of defences against that risk or to avoid or remove the risk, if this is economically feasible.

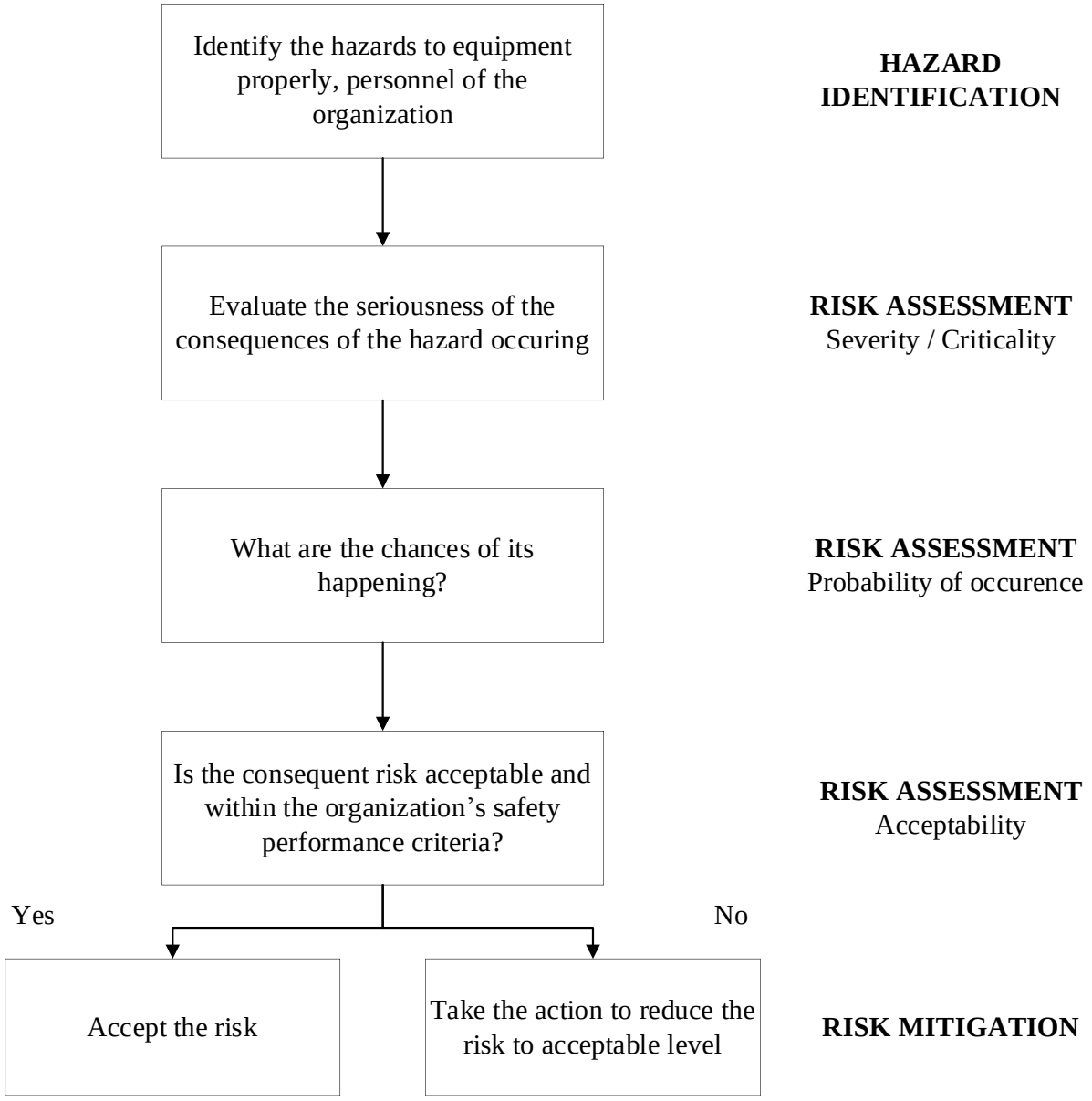

Fig. 1.3. Risk Management Process [64]

Each individual airport will also have unique hazards based on their configuration and procedures. Airport personnel recognizes and understands many of these unique conditions. These well-known hazards may affect many systems or situations in different ways and, therefore, are routinely identified during the management process. Developing a preliminary hazard list (PHL) is a timesaving management technique. The PHL can be a catalyst for proper hazard identification. Figure 1.3. lists some common airport hazards [36].

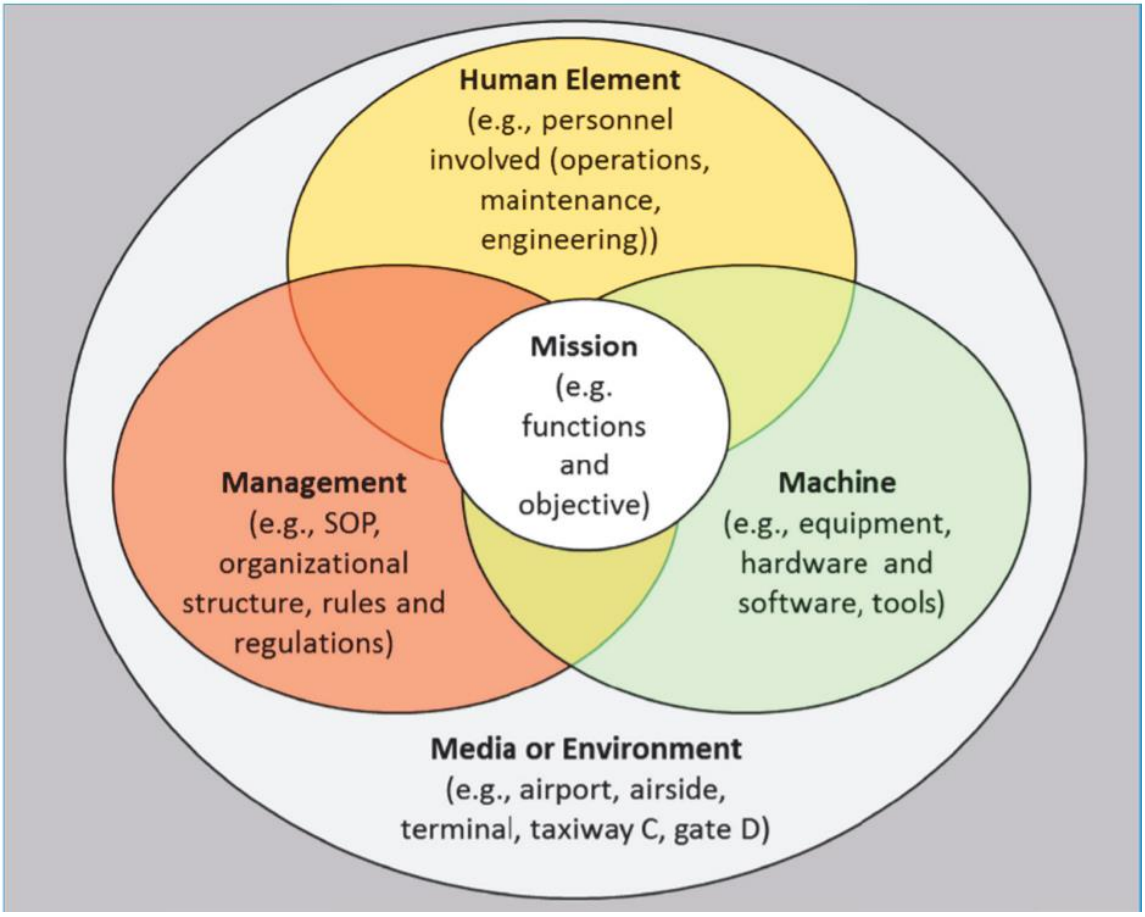

Fig. 1.4. Relationships in the 5M Model [36]

Ways to identify risks at an airport follow:

- checklists prepared for self-inspections;
- observation and experience – operations inspector is continuously searching for anything that may pose a safety risk to airport operations, even when not listed in the self-inspection checklists;
- brainstorming – this is the most common method, a group of stakeholders meet to identify hazards and analyze risks;
- accident/incident investigations – when studying the causes of accidents and incidents, the risks and contributing factors to the event are identified;
- job risks analysis – this is a technique that uses job tasks to identify hazards.

- Preliminary hazard lists (PHLs): based on the safety issue or activity, preliminary lists of hazards can be prepared using a PHA [54, 58].

Table 1.3.

Definitions for Risk Severity to Airport

Minimal	Minor	Major	Hazardous	Catastrophic
No damage to aircraft but minimal injury or discomfort risk to passenger(s) or workers	Minimal damage to aircraft, or Minor injury to passengers, or Minimal unplanned airport operations limitations (i.e. taxiway closure), or Minor incident involving the use of airport emergency procedures	Major damage to aircraft and/or minor injury to passenger(s) /worker(s), or Major unplanned disruption to airport operations, or Serious incident, or Deduction on the airport's ability to deal with adverse conditions	Severe damage to aircraft and/or serious injury to passenger(s) /worker(s); or Complete unplanned airport closure, or Major unplanned operations limitations (i.e.. runway closure), or Major airport damage to equipment and facilities	Complete loss of aircraft and/or facilities or fatal injury in passenger(s) /worker(s); or Complete unplanned airport closure and destruction of critical facilities; or Airport facilities and equipment destroyed

Source: [36]

System safety is a specialty within system engineering that supports program risk management. It is the application of engineering and management principles, criteria and techniques to optimize safety. The goal of system safety is to optimize safety by the identification of safety related risks, eliminating or controlling them by design and/or procedures, based on acceptable system safety precedence. The causes of an accident are factors, events, acts, or unsafe conditions which singly, or in combination with other causes, result in the damage or injury that occurred and, if corrected, would have likely prevented or reduced the damage or injury. A hazard is any condition, event, or circumstance, which could induce (cause) an accident. Risk is defined as the probability that an event will occur. A risk is “the combination of the probability, or frequency, of occurrence of a defined hazard and the severity of the consequences of the occurrence”. A risk is thus an attribute of a hazard [58].

Risk assessment and risk management are important tools for understanding risks, defining acceptable levels of risks, and reducing risks. Risk management is based on the philosophy that it is irresponsible and wasteful to wait for an accident to happen, then figuring out how to prevent it from happening again. We manage risk whenever we modify the way we do something to make our chances of success as great as possible, while making our chances of failure, injury or loss as small as possible.

Risk management is the systematic application of management and engineering principles, criteria and tools to optimize all aspects of safety within the constraints of operational effectiveness, time, and cost throughout all mission phases. To apply the systematic risk management process, the composite of hardware, procedures, and people that accomplish the mission or produce mishaps, must be viewed as a system.

An airport has a lot of interfaces with the outside world, air traffic control has radio and telephones; there are navigational aids that communicate with aircraft, such as the distance measuring beacons and instrument landing systems; there are road links; there may be rail links; etc. We will consider an airside interface, the runway. It is “A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft“ (ICAO 1995). It is the interface between the air navigation system and the ground handling area [36].

In the present risk assessment methodology we use quantitative measures to determine the probability, and qualitative measures to determine the severity associated with single hazard.

The risk assessment is based on the following formula:

$$R = P \cdot S$$

Where:

R = the risk of the event (overrun, veer-off, collision or landing short)

P = probability that the hazard will occur

S = severity of the hazard

The probability is proportional to the cumulative probability of the causes identified for the hazard, so we used the total probability theorem in order to calculate the probability: if the events C_1, C_2, …., Cn are pairwise mutually exclusive, have positive probabilities and together form the whole space the following holds for every event A that is:

Hypothesis n° 1: $C_1, C_2, \ldots, C_n \in A$

where: $C_1, C_2, \ldots$, Cn = n causes;

A = space of the total probability.

Hypothesis n° 2: $Ci \cap Cj \emptyset \; \forall \; i \neq j$; i,j = 1,….,n

Hypothesis n° 3: $P(Ci) > 0 \; \forall \; i = 1,\ldots,n$

Work:

$$P(E) = \sum_{j=1}^{n} P(\frac{E}{C_j}) P(C_j)$$

where:

$P(E/C_j)$ = probability that, in presence of the cause i (e. g. heavy rain), the hazard (e. g. landing overrun) will occur (Conditional probability).

$P(C_j)$ = probability that the cause i (e.g. heavy rain) will occur.

$P(E/C_j) \cdot P(C_j)$ = probability that the cause i will produce the hazard.

We assume the frequency as the value of probability.

$$P\left(\frac{E}{C_i}\right) = \frac{N_E}{N_{MC}}$$

where:

N_E = number of events occurred during take-off (landing), in a stated period, generated by the cause i.

N_{MC} = number of take-offs (landings), in a stated period, occurred in presence of the cause i.

The probability $P(C_i)$ of the cause i is assumed equal to the frequency, at which the cause occurred in the airport studied.

$$P(C_i) = N_{MC(A)}/N_{MA}$$

where:

N_{MC} = number of flight take-offs (landings), in a stated period, in the airport studied occurred in presence of

the cause i (e.g. number of landings occurred in presence of snow).

N_M = total number of take-offs (landings), in a stated period, occurred in the airport studied.

The total number of take-offs and landings occurred in the airport and the number of flight movements occurred in presence of the causes belonging to environmental and surface conditions categories are provided by the airport management company. The probability of the causes belonging to the aircraft performance characteristics category is not dependent on the airport where they occur, so data about failures, for each type of aircraft, should be provided by airlines companies. The formula for $P(C_i)$ assessment belomes the following:

$$P(C_i) = \frac{\sum_{j=1}^{n} N_{Fj} * N_{MC(A)j}}{\sum_{j=1}^{n} N_{M(A)j}}$$

where:

N_{Fj} = number of failures associated with the cause i suffered by the aircrafts of the type j, in a stated period, to refer to total number of take-offs (landings), which an aircraft makes in the same period (e.g. if aircraft of type j had one engine failure).

N_{Mj} = total number of take-offs (landings), which an aircraft of type j makes, in a stated period, in the airport studied.

The probable cause of more than 70% of commercial aircraft hull-loss accidents has been cited as “human error”. Today, more accident/incident

investigations have been focusing on the human factors in each operation during flight. This includes flight crew operations, air traffic control, ground operations, and maintenance operations. Human factors shall be systematically integrated into the planning and execution of the functions of world aviation authorities and activities associated with system acquisitions and system operations [79].

CONCLUSION OF PART 1

In simple terms, risk is the possibility of something bad happening. Risk involves uncertainty about the effects/implications of an activity with respect to something that humans value (such as health, well-being, wealth, property or the environment), often focusing on negative, undesirable consequences. Many different definitions have been proposed. The international standard definition of risk for common understanding in different applications is “effect of uncertainty on objectives”.

Risk management is an important factor in the effectiveness of the organization, because without it it is almost impossible to define their goals for the future. And if a company sets goals without taking risks into account, there is a high probability that it will suffer losses.

Entrepreneurship without risk does not exist. The greatest profit, as a rule, is brought by market operations with increased risk. The risk must be calculated to the maximum allowable limit. As you know, all market assessments are of a diverse nature. It is important not to be afraid of mistakes in your market activity, since no one is immune from them, and most importantly, not to repeat mistakes, constantly adjust the system of actions from the position of maximum profit.

There are 6 schools of risk management, among them: American, English, Australian, German Swiss and Japanese. The most famous school in the theory of financial risk and risk management since 1955 is the American school.

It was analyzed steps of risk management process. The methodology consisting of the following steps: risk identification, risk assessment, risk mitigation.

The original points in this methodology are the causes identified associated with each risk by analyzing other studies and the risk probability assessment through to the cumulative probability of the causes identified.

Total probability theorem is the conditional probability assessment $P(E/C_i)$ and was established by analyzing the national database for causes belonging

environmental and surface conditions categories and by analyzing the international database for causes belonging aircraft performance characteristics category and hazard severity assessment by analyzing of national database.

The risk management concept is equally important in all aviation sectors and should be implemented in a consistent manner by airline operators, air navigation service providers, certified aerodrome operators, maintenance organisations and training organisations. Its strategies include identifying the risk, assessing the risk, avoiding or mitigation the risk or accepting certain risks.

PART 2. MECHANISM OF RISK MANAGEMENT OF THE STATE ENTERPRISE "BORYSPIL INTERNATIONAL AIRPORT"

2.1. General characteristics of the State Enterprise "Boryspil International Airport"

Boryspil International Airport also known as ATA: KBP, ICAO: UKBB has official name – state enterprise "Boryspil International Airport" is the main and largest international passenger airport in Ukraine and its capital, serving Kyiv, the Kyiv agglomeration and other regions of Ukraine, providing almost 2/3 of the country's air traffic[60][3]. Boryspil is the only airport in Ukraine that carry passengers to transcontinental directions. It serves more than 15 million domestic and foreign passengers per year.

Due to jet developing requirements for infrastructure quality were increased. Boryspil was not the first airport at that time International Airport Kyiv has already existed for about 20 years but it was not enough for jets with weight over 100 tone. It was decided to build a new airport near the air force complex in Boryspil. This was facilitated by the presence there of a motorway, a suitable paved runway, and the possibility of a temporary base in conjunction with the military. In May 1959, the Council of Ministers of the USSR adopted a resolution on the establishment of the airport of the Civil Air Fleet Kyiv (Central) on the basis of the Boryspil military airfield and decided to provide it with modern aircraft, ground equipment and radio equipment. On June 30, 1959, the Chief of the Main Directorate of the Civil Air Fleet signed Order № 265 on the establishment of an airport. On July 7, 1959, the first flight was accepted. It was carried out by the crew of the Moscow Department of Civil Aviation on the Tu-104 on the route Moscow – Kiev – Moscow. There were 100 passengers on board (mostly aviation managers and journalists) and 1,600 kg of cargo. In 1960, Boryspil Airport began accepting international flights to Budapest, Vienna, and Sofia. On May 20, 1965, a new Boryspil airport was opened. Boryspil

Airport was equipped for automated landing of aircraft with meteorological minimum of the 1st category. At that time, the capacity standards were 1,400 passengers for domestic and 200 – for international flights. The airport was the second largest after Moscow's Domodedovo Airport and one of the largest in Europe. Until 1990, Boryspil Airport had the best performance among Ukrainian airports. The crisis after the collapse of the Soviet Union affected the airport. The closure of the enterprise was avoided thanks to the found investors. On March 11, 1993, Boryspil Airport received the status of a state international airport[9].

On April 1, 1993, the second legal establishment of Boryspil Airport took place. According to the order of the Minister of Transport of Ukraine, Boryspil State International Airport was established on the basis of Boryspil Airlines as a legal entity, the regional directorate of Ukraine Airlines and Kyivcentraero. In 2002, the airport received an international certificate of conformity (ISO 9001:2000) for the implemented quality management system.

The airport is located 29 km southeast of Kiev and 6 km from the center of Boryspil. Passenger terminals and the Boryspil-Airport railway station are located in the city of Boryspil, and the runways are located within the Boryspil district of the Kyiv region.

Boryspil is successfully located at the intersection of many air routes connecting Asia with Europe and America. More than 40 national and foreign airlines carry out passenger and cargo transportation from Boryspil on 77 regular routes around the world. Boryspil International Airport has two runways with a length of 4,000 m and 3,500 m and four passenger terminals (among which only two newer ones, "D" and "F", are in operation). The main runway 18L/36R with a length of 4000 meters and a width of 60 meters can accommodate aircraft of all types around the clock, including in conditions of limited inspection during bad weather and ice.

The second runway 18R/36L is currently used in a limited mode by the sides of Terminal F and according to the development strategy will be reconstructed by 2020. The airport is a member of the International Air Transport Association (IATA), the

International Civil Aviation Organization (ICAO) and the International Airport Council (ACI Europe).

Boryspil has two active terminals. Terminal "D" is the newest terminal, which was inaugurated on May 28, 2012. The check-in areas of the new airport complex have a large number of check-in counters (60 in the area of international flights, 16 in the area of domestic flights and 6 for web check-in), 18 aviation security checkpoints in the area of international flights and 6 in the area of domestic flights, 28 passport control booths, which avoids queues. The terminal is equipped with 11 stationary air bridges with an automated docking system (for landing / disembarking), which allow you to simultaneously receive six Boeing 747 aircraft and five Boeing 737 aircraft. The terminal can serve up to 10 million passengers a year, 3,000 passengers per hour on departure and the same amount on arrival. For the convenience of passengers, elevators, escalators, travolators are installed. A total of 20 passenger and 2 freight elevators, 20 escalators and 12 travolators by Schindler (Switzerland) have been installed. The speed of the latter is 0.5 m/s, the length of the tape is from 28 m to 58 m, which allows to increase the capacity of the terminal.

The terminal has a playground, several business lounges and a separate VIP lounge.

The area of the terminal is 107 thousand square meters, making it the largest terminal complex in Ukraine.

The second terminal is Terminal "F" that was opened on September 21, 2010. The capacity is 900 passengers per departure and 900 - per arrival. Prior to the opening of the main terminal "D", terminal "F" was the base for UIA (Ukrainian international airlines). The terminal served international and charter flights of 22 airlines: UIA, UM Air, Utair Ukraine, Air Baltic, Armavia, Adria Airways, Belavia, Caspian Airlines, Austrian Airlines (Austria), Georgian Airways, Germanwings, Libyan Arab airlines (Libya), Lufthansa (Germany), Finnair (Finland), S7 Airlines (Russia). From October 27 2013, Terminal F was closed, and all flights were transferred to Terminal B, and later to Terminal D. In early March 2019, it was

announced that from March 31, the terminal would serve Ryanair and SkyUp flights [1].

On March 31, 2019, the terminal was deconserved and began to test low-cost and charter flights in test mode.

Boryspil also has some closed terminals. There are terminals “A”, ”B”, “C”.

Terminal “A” specialized in servicing air passengers traveling through the territory of Ukraine. There was a waiting room (2nd floor), toilet (ground floor), currency exchange offices and air tickets. The terminal also housed representative offices of airlines operating domestic flights. There were cafes and guarded car parks near Terminal A, as well as airport lockers. From September 15, 2011, all domestic flights from Boryspil are operated from Terminal B, and Terminal A is closed.

Terminal “B” was opened in 1965. All operations on departure and arrival of domestic passengers were carried out on the ground floor of the central part (under the dome). The zones were separated by a ramp leading to the second floor. In the left section there were 10 check-in desks, which accepted luggage for all flights, as well as drives for departing passengers; on the right – a baggage claim area for arriving passengers and a cafe. An innovation of that time was the construction of the terminal on the principle of “everything under one roof”. For the first time in the USSR, international and domestic flights were served in one building. The international sector was in the right wing and occupied a small area. On the second floor in the right corner was a cafe and a waiting room for international passengers. From September 15, 2011 to December 2014, the terminal served all domestic flights for departure and arrival. After the completion of terminal “D” and the opening of racks and corridors for domestic flights, terminal "B" is preserved. In the design of the terminal there is a problem with the attachment of the dome over the central hall. The cost of its restoration is commensurate with the cost of deconservation of terminal “F”.

Terminal “C” was opened in 1995 to serve VIP-passengers. It was designed primarily to service personal business aircraft. Located to the right of Terminal “B”, equipped with its own guarded parking. In the hall – separate recreation rooms,

communication services, halls for press conferences, meetings and banquets. Closed in 2012, and the service of VIP-passengers was transferred to Terminal "D".

The cargo terminal is designed to service cargo flights. Next to it is a station for trucks. It has a parking lot for 17 aircraft. In 2018, the construction of a new cargo terminal began.

Boryspil is a member of the Association of European Airports (ACI). Following the results of 2016, Boryspil International Airport became one of the leaders in the ranking of European airports according to the ACI Europe classification (International Airport Council), ranking 3rd in terms of growth among airports that annually serve from 5 to 10 million passengers. The leaders in this category were the airports of Berlin (36.7%) and Larnaca (24.2%).

During the European Football Championship 2012, on the day of the final match in Kyiv, Boryspil Airport set its highest record - it served 630 flights. The total number of passengers who used the services of the airport that day was set by 39 317 people (the previous record was set in 2008, when the airport accepted 423 flights). A new record was set in 2018 during the UEFA Champions League final. On June 2, 2019, the airport served 51 853 passengers and 352 flights, which is a new record for the airport.

On December 24, 2019, Boryspil Airport served 15 million passengers, for the first time in its history.

Passengers can reach the airport by bus,taxi or train.

The bus connection with Kyiv is carried out on the route № 322 (Sky Bus) – from the South station of the Kyiv-Pasazhyrsky railway station with an intermediate stop at the Kharkivska metro station.

Also perform intercity flights (with arrival at the Central Bus Station) companies “Gunsel”, “Autolux”, “Ukrbus”. From Kiev to the airport is also cheap to get by bus through the city of Boryspil (№ 316 metro station "Livoberezhna" – Boryspil, № 317 metro station "Kharkivska" – Boryspil, then change to a local bus № 2 (Kakhovska Street – airport).

Prior to Euro 2012, it was proposed to build a high-speed railway line Kyiv-Zhulyany Airport – Kyiv – Kyiv-Boryspil Airport.[9034]

At the end of 2017, a project to extend the Syretsko-Pechersk metro line to Boryspil Airport was proposed. [11] [4] Its main advantage is that from anywhere in Kyiv you can easily and inexpensively get to the airport. The cost of this project is estimated at about $ 300 million, and the term of its implementation will be at least two years, with partial overlap of the Boryspil highway.

On March 28, 2018, at a meeting of the Cabinet of Ministers of Ukraine, the implementation of the project for the construction of a railway connection between Kyiv and the capital's Boryspil Airport was approved. On October 25, 2018, the first test flight of the express station between Kyiv-Pasazhyrskyi station and Boryspil airport took place. The project cost 580 million hryvnias, and construction was completed earlier than planned. The official opening of the express movement took place on November 30, 2018, with the participation of the President of Ukraine and the Prime Minister of Ukraine.

The new railway station was named “Boryspil Airport”. In addition to the two platforms, an overpass was also built over the M03 (Kyiv-Kharkiv) highway, and almost four kilometers of running meters were laid. Four Pesa rail buses run to the station. The Kyiv-Boryspil Airport Express Railway runs around the clock and stops at designated stations: Boryspil Airport, Darnytsia, Vydubychi, and Kyiv-Pasazhyrskyi. You can get to the airport in 42 minutes and 80 UAH.

Connections between terminals are carried out by airport transport.

Boryspil Airport is the first state-owned enterprise that has effectively transformed its business model and in a few years has transformed from a stagnant and unprofitable to a highly efficient and highly profitable European leader in terms of growth. The “hub” strategy of the Airport development, implemented since 2015, is aimed at attracting additional transfer passengers from foreign markets in conditions of low solvency of the majority of domestic passengers. Attracting a significant number of additional/transfer passengers allowed to reduce the cost of servicing one passenger. This has reduced the cost of the Company's services and

made it more attractive to airlines and passengers. Thus, the Company, together with the airlines based in it, created an aviation product that is attractive in the Ukrainian and international markets. This strategy has provided a significant increase in the number of passengers attracted by the company.

On November 25, 2015, the government banned flights of all Russian airlines over the territory of Ukraine. For some Russian airlines operating flights to the Crimea, the ban was introduced on October 25, 2015.

Boryspil International Airport took the fourth place in the rating of airports with passenger traffic from 10 to 25 million passengers[49]. This is stated in a report for July 2021, which was published by Airports Council International is presented below in Tab. 2.1.

Table 2.1.

Group 1 more 25 millions passengers/year		Group 2 10-25 millions passengers/year		Group 3 5-10 millions passengers/year		Group 4 less 5 millions passengers/year	
DME & SAW	-11%	LED	-8%	AER	68%	NVI	5,02
AYT	-28%	ADB	-21%	ADA	-5%	BNX	251%
SVO	-30%	ESB	-26%	PMO	-14%	OMR	61%
IST & ORY	-35%	KBP	-28%	TFN	-20%	SLM	53%
ATH	-38%	VKO	-30%	HER	-25%	UGC	45%

Source: developed by author on the basis of [2]

Passenger traffic is recovering and we see positive traffic dynamics every day. The airport team is actively working to attract new airlines and improve airport services. So, this month, Eurowings began flying to us and on September 26, after a long break, Uzbekistan Airways will resume flights. Therefore, another hit in the authoritative ratings is natural, "said Alexey Dubrevsky, General Director of Boryspil International Airport.

Recall that Boryspil airport entered the top 15 largest airports in Europe in terms of the number of passengers according to the ASI Europe report for four months of 2021. And also this year, Boryspil was included in The World's Best Airports in 2021 rating by the British consulting company Skytrax, taking fifth place among the best airports in Eastern Europe.

According to the results of 2020, the passenger traffic at Boryspil International Airport amounted to 5.1 million passengers, which is 66% less than in 2019 (15.2 million passengers) due to COVID-19 pandemic[15].

It is noted that in December 2020, the airport used 323,690 passengers (69.3% less than in December 2019). Stastic of passanger flow you can see on the Fig. 2.1.

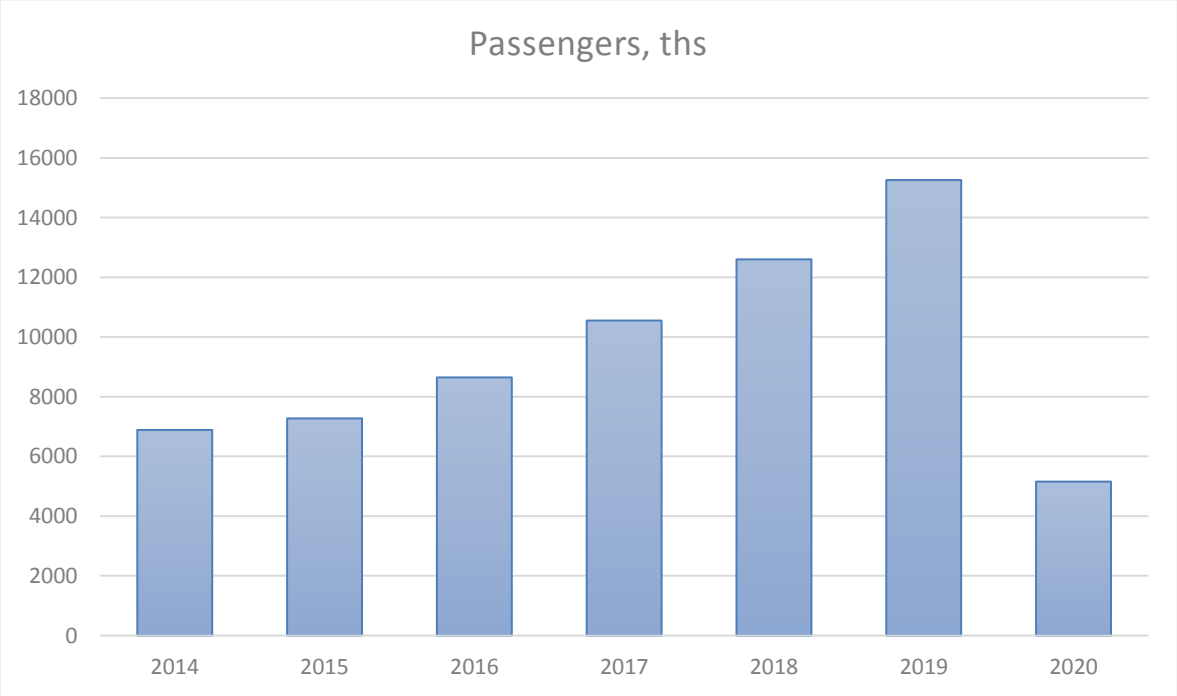

Fig. 2.1. Passenger Flow Decrease of Airport Boryspil [16]

In 12 months, 3.1 million passengers were transported to / from Boryspil by regular flights (-73%), 1.98 million – by non-scheduled flights (-46%). In December, the number of passengers on scheduled flights amounted to 209,572 (-74.2%), charter - 114,118 (-52.9%).

For today Boryspil International Airport serves this list of International Airlanes which is given in appendix A.

2.2. The analyses of financial indicators of the State Enterprise "Boryspil International Airport"

Economic analysis is necessary at all stages of entrepreneurial activity: from the conception and formation of the enterprise to the implementation of each stage of its operation, following the principles of each stage of analysis itself. To study objectively applicable economic principles with the purpose of consciously using them in practical activity, to determine the most rational ways of development, optimal rates and proportions, maximizing the efficiency of logistics process management – economic analysis of the SE IA «Boryspil» Balance Sheet was performed on the basis of financial reporting data that is given in Tables 2.3-2.4.

Table 2.2.

Assets of SE IA «Boryspil» in 2018-2020

№	Assets, ths. UAH	2018	2019	2020	Absol. deviation, ths. UAH		Growth rate, %	
					2020/2018	2020/2019	2020/2018	2020/2019
1	Current Assets	1593	1659	2114	521	455	132.72	127.39
2	Non-current Assets	8813	6390	14293	5480	7903	162.17	223.66
3	Balance	10406	8050	16407	6001	8357	157.66	203.81

Source: Calculated by the author based on SE IA «Boryspil» financial statements

Information presented in this table represents us the changes of assets conditions for the last 3 years. In first row are shown the growth and growth rate of current assets. We see that here is a little growth pace decrese of current assets between 2020/2018 and 2020/2019 report periods. It can have place due to obstacles that was caused by pandemia, and we remember that aviation industry was in one of the most damaged sectors.

Assets indicators of SE IA «Boryspil» are are represented in Fig. 2.2.

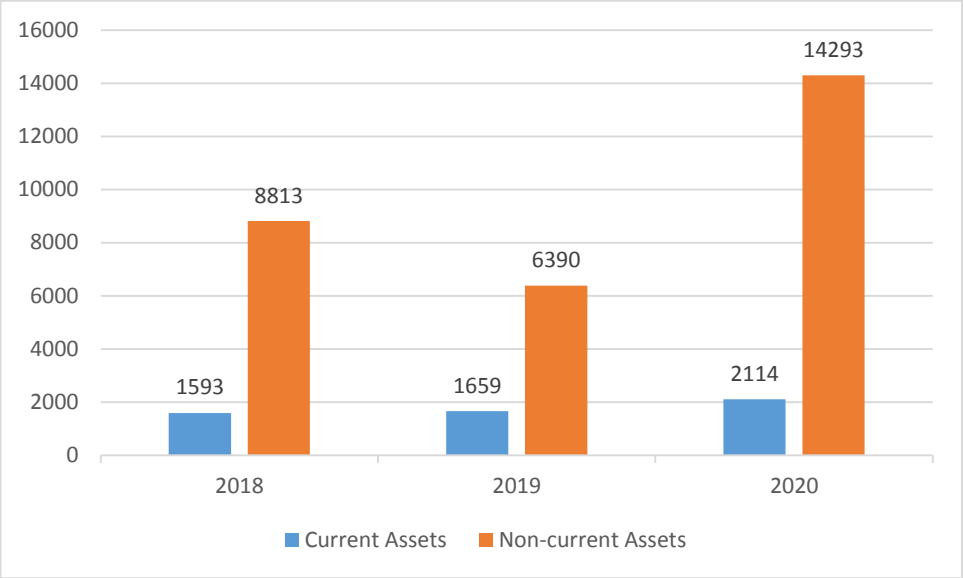

Fig. 2.2. Dynamics of Balance Assets of SE IA «Boryspil» in 2017-2019**,** ths. UAH

Source: Developed by the author based on SE IA «Boryspil» financial statements

The Fig. 2.2. contains information about an annual growth of non-current and current assets of the enterprise.

Second step is to perform economic analysis of the liabilities elements in the balance.

Table 2.3.

Liabilities Balance of the SE IA «Boryspil» in 2018-2020

№	Liabilities, ths. UAH	2018	2019	2020	Absol. deviation, ths. UAH		Growth rate, %	
					2020/2018	2020/2019	2019/2018	2019/2019
1	Equity	7 255	5 516	12 349	5094	6833	170.21	223.87
2	Long-term liabilities and collateral	2 376	1 706	3 989	1613	2283	167.88	233.82
3	Current liabilities and security	1 073	827	1 248	175	421	116.3	150.9
4	Balance	10704	8049	17586	6882	9537	164.29	218.48

Source: Calculated by the author based on SE IA «Boryspil» financial statements

It can be observed an increase in equity compared with 2018 by 70% and a significant increase 123,5% in 2019, an increase in long-term liabilities and provisions: from 2018 by 67.8%, and in 2019 by 133%, and increase of current liabilities and provisions from 2018 by 16% and in 2018 by 50%. In general the liabilities dynamics of the balance sheet of SE IA «Boryspil» is very positive referring on the data given in Table 2.4. And it is clear that long-term liabilities and provisions grew most compared to other liabilities of the balance sheet, indicating the widespread use of long-term financing sources by the company.

Dynamics of indicators represented in Table 2.4 are illustrated in Fig. 2.4 and it can be seen the gradual annual growth of the elements of the liabilities of the balance of the enterprise.

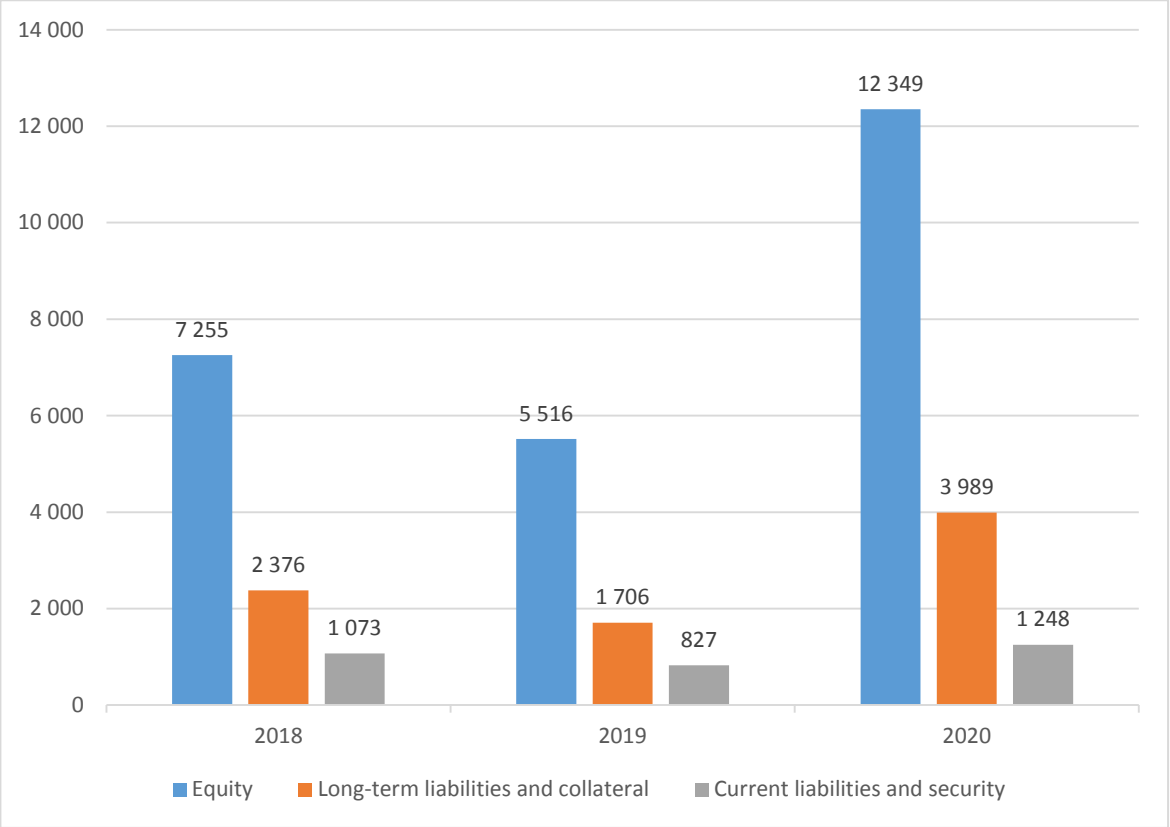

Fig. 2.3. Dynamics of liabilities of SE IA «Boryspil» in 2018-2020

Source: developed by the author based on SE IA «Boryspil» financial statements

Table 2.3. represents the absolute liquidity ratio of SE IA «Boryspil», which is calculated as the ratio of the most liquid assets, that is, cash, to current liabilities; the

rate of rapid liquidity, calculated by dividing working assets minus inventories to current liabilities; the coverage ratio is calculated by dividing the amount of current assets into current liabilities.

Table 2.3.

Liquidity Indicators of SE IA «Boryspil» in 2018-2020

№	Indexes	2018	2019	2020	Absolute deviation	
					2019/2017	2019/2018
1	Absolute liquidity ratio	0,42	0,47	0,19	-0.23	-0.28
2	Quick liquidity ratio	1,58	3,08	1,83	0.25	-1.25

* Calculated by the author based on SE IA «Boryspil» financial statements

According to the above given indicators the absolute liquidity ratio characterizes an entity's ability to repay its short-term debt immediately. At SE IA «Boryspil», this coefficient ranges from 0.2-0.5. The little increase in the absolute liquidity ratio from 0.42 in 2018 to 0.47 in 2019 and an decrease significant decrease to 0.19 in 2020 is shows us a negative trend. This indicator is near the down point of the sufficient value of this indicator which is need to be higher than 0.2-0.5, that means, 20-50% of its short-term debts may be repaid by the enterprise at the same time. Now SE IA «Boryspil» holds the optimal situation which is considered when the absolute liquidity ratio is at 0.2. But company should pay more attention for the question of repaiment its short-term debts.

The quick liquidity ratio gives an idea of the expected solvency of the enterprise in the short-term period, namely in the period equal to the average duration of one turnover of receivables, provided that it is timely repayable. The quick liquidity ratio of SE IA «Boryspil» in the last years is unsustainable, and had a significant decrease from 3.08 in 2019 to 1.83 in 2020. That is, it is an indication that in the short-term period SE IA «Boryspil» may have some problems with the repaiments in future thus company needs to pay more attention to optimize its indicators.

On the basis of the analysis, it can be concluded that SE IA «Boryspil» financial position has decreased and it is understandable due to global market issues.

According to the results of the research, the company does not violate the rules of financing, it is not threatened with insolvency. The financial activity of SE IA «Boryspil» should be aimed at ensuring the systematic receipt and effective use of financial resources, compliance with the accounting and credit discipline. After all, the financial condition is one of the most important characteristics of the activity of each enterprise.

Indicators of financial results (profit) of SE IA «Boryspil» characterizes the absolute efficiency of management of the company in all areas of its activities: production, marketing, supply, financial and investment. They form the basis of the economic development of the enterprise and strengthen its financial relations with all participants in commercial business. The results of analysis of the dynamics of financial indicators of SE IA «Boryspil» Tab 2.4.

Table 2.4.

Financial Results of SE IA «Boryspil» in 2018-2020

№	Article	2018	2019	2020	Absolute deviation, ths. UAH		Growth rate, %	
					2020/ 2018	2020/ 2019	2020/ 2018	2020/ 2019
1	Net income from sales of goods (goods, works, services)	4151	4300	4476	325	176	107.82	104.09
2	Cost of the sold products (goods, works, services)	-1749	-1743	-2209	-460	-466	126.3	126.73
3	Gross profit	2402	2558	2267	-135	-291	94.7	88.62
4	Other operating income	142	53	79	-63	26	55.63	149.05
5	Administrative expenses	-146	-136	-185	-39	-49	126.7	136.02
6	Selling expenses	-10	-9	-12	-2	-3	120	133.3
7	Other operating expenses	-90	-62	-83	7	-21	92.22	131.7
8	Financial result of the operational activities: profit	2298	2403	2063	-235	-340	89.7	85.85
9	Revenues in capital	0	0	0	0	0	0.00	0.00
10	Other financial income	15	97	154	139	57	1026.66	158.76
11	Other income	66	4	36	-30	32	54.55	900
12	Financial expenses	-289	-250	-283	6	33	97.92	113.2
13	Loss in the capital	0	0	0	0	0	0.00	0.00
14	Other expenses	-210	-24	-122	88	-98	58.09	508.33
15	Financial result before tax: profit	2039	2229	1896	-333	-16123	92.99	85.06
16	Net financial result: profit	1668	1808	1533	-135	-275	91.91	84.79

Source: calculated by the author based on SE IA «Boryspil» financial statements

Please note that the amount of net profit in 2020 compared with 2018 decreased by 8%, and compared to 2019, it decreased by 18%. At the same time, Net income from sales of goods increased by 8% and 4% respectively. Gross profit of the company in 2020 decreased by 6% compared with 2018 and increased by 11% compared with 2019. Financial result of operating activities: profit for 2020 by 2018 decreased by 235 thousand UAH and by 2019 decreased by 340 thousand UAH.

In turn, the financial result of SE IA «Boryspil» before tax: profit decreased by 7% in 2020 compared to 2019 and by 15% compared with 2019.

Negative factor of activity of SE IA «Boryspil» is that the cost of sold products in 2020 increased by 26.5% compared with 2019 and 2018.

In general there is little decline in almost all financial indicators.

The economic analysis of profitability of IA «Boryspil» was conducted Tab. 2.5.

Financial ratios are created with the use of numerical values taken from financial statements to gain meaningful information about a company. The numbers found on a company's financial statements – balance sheet, income statement, and cash flow statement – are used to perform quantitative analysis and assess a company's liquidity, leverage, growth, margins, profitability, rates of return, valuation, and more.

Table 2.5.

Financial Ratios of SE IA «Boryspil»

Ratio	2018	2019	2020	2020/2018	2019/2018	2019/2018	2020/2019
Financial independence (autonomy) ratio	0,724	0,752	0,711	0,028	-0,041	104%	95%
Financial dependency ratio	1,381	1,328	1,405	-0,053	0,077	96%	106%
Equity maneuverability ratio	0,084	0,091	0,057	0,007	-0,034	108%	63%
Debt capital concentration ratio	0,276	0,247	0,289	-0,029	0,042	89%	117%
Financial stability ratio	0,303	0,368	0,197	0,065	-0,171	121%	54%
Total financial stability ratio	0,891	0,962	0,95	0,071	-0,012	108%	99%

Source: calculated by the author based on SE IA «Boryspil» financial statements

Here we can observe negative trend in all ratios and it is due to negative financial results compared with previous years. Changes are not crucial, and for my opinion, now company adapts to new game rules and in 2020 year we can observe positive dynamics

Turnover and return ratios refers to the set of financial ratios that indicate how efficiently a company is leveraging its assets and managing its liabilities.

Table 2.6.

Turnover and Return ratios

Ratio	2018	2019	2020	2020/2018	2019/2018	2019/2018	2020/2019
Asset turnover ratio	0,454	0,365	0,13	-0,089	-0,235	80%	36%
Capital productivity	0,788	0,436	0,149	-0,352	-0,287	55%	34%
Working capital turnover ratio	2,602	2,373	1,104	-0,229	-1,269	91%	47%
Working capital turnover period	138,355	151,707	326,087	13,352	174,38	110%	215%
Equity turnover ratio (turnover)	0,639	0,501	0,177	-0,138	-0,324	78%	35%
Return on assets	0,187	0,19	-0,09	0,003	-0,28	102%	-47%
Return on equity	0,259	0,277	-0,14	0,018	-0,417	107%	-51%
Return on sales	0,434	0,341	-0,71	-0,093	-1,051	79%	-208%

Source: calculated by the author based on SE IA «Boryspil» financial statements

After analisis of this ratios can be concluded that company significantly lost its positions of the last years. And I think it all connected with pandemic and problems which it brings as to global economy and as to most intense sectors such as aviation.

In my opinnion financial sitution at SE IA «Boryspil» had rather good financial state if not including negative trends that certainly related with COVID-19. It needs some time to adapt to new market rules and new conditions. Airport did not lose its positons not in domestic nor in international. “Boryspil” is the main airport of Ukraine and it stills to be, so to change situation with negative financial results it should be done diligent analysis and find ways how to operate more effectively in new world with coronovirus.

2.3. The specifics of risk management system of the State Enterprise “Boryspil International Airport”

The central place in the assessment of entrepreneurial risk is occupied by the analysis and forecasting of possible losses of resources in the course of entrepreneurial activity. The company operates in Ukraine. The political and economic situation in the country in 2020 was characterized by instability, which led to the deterioration of public finances, volatility of financial markets, illiquidity of capital markets, instability of the national currency against major foreign currencies[8].

This negatively affects the regulatory, socio-political, financial and market, which affect the activities of the company. The company also operates in the context of technical and operational risks, environmental risks, and other risks (cyber threats, public disorder, terrorism, etc.). The airport identifies risks and manages them for continuous operation and fulfillment of statutory tasks (profit from economic activities, timely satisfaction of economic demand and social needs in the provision of services for air transportation, security) to ensure its majority of identified risks, a qualitative assessment is provided, based on an expert analysis of the probability of occurrence and impact on the company's activities. For each identified risk, a formalized or informal policy of the company is developed to reduce the potential negative effect. The main provisions of some risk management policies are disclosed

(for example, financial risk management policies – in financial statements, environmental risks – in relevant reports, etc.), but some policies (operational, prevention of cyber threats, prevention of public order, counter-terrorism, etc.) cannot be made public together with the report of the independent auditor, management. However, the company systematically publishes the results of the risk management system – production, commercial, financial, environmental, social, safety reports, etc.

The management believes that it is taking the measures necessary to maintain the stable operation and development of the airport, as a result of which the technical and operational risks, financial risks, environmental risks are significantly reduced and eliminated.

The greatest threat to the company is posed by functional risks related to the external environment, namely: regulatory risks (deviations from planned indicators due to changes in laws or regulations), socio-political risks (deviations from planned indicators due to destabilization of the social and political situation), economic risks (deviations from planned indicators due to changes in the economic situation), force majeure (deviations from planned indicators due to natural disasters, pandemics, etc.). And of course here should be noted risks connected with COVID-19 pandemic. The COVID-19 pandemic has significantly affected aviation - since February 2020, and especially in the spring, airlines have significantly reduced the number of flights or stopped flights altogether. Due to the decision of governments to impose quarantine, close flights and ban or restrict entry [17], the crisis caused by the pandemic became the deepest for aviation since the Second World War [22]. In April 2020, the number of flights (compared to April 2019) in the world fell by 80% [5], and in Europe - by 90% [30].

In mid-April, the International Air Transport Association (IATA) published a forecast of total airline losses of $ 314 billion, ie a 55% drop in turnover compared to 2019 [59], 25 million workers may be at risk of redundancy [34].

The International Council of Airports (ACI) estimates that the annual passenger traffic at airports in the world in 2020 will decrease by 38.1% (3.6 billion passengers), and in 2019 the industry will reach no earlier than the end of 2021 [28].

The COVID-19 pandemic has intensified the struggle for customers and forced airlines to become more flexible - they allow free booking or offer vouchers and discounts [60] [44]. Some airlines make it possible to postpone the flight even to 2022 [95].

After the beginning of the pandemic on the planes before and from the directions of the greatest spread of the virus, the crew began to wear masks, at airports and on board planes passengers are measured temperature, passengers are given antibacterial wipes, and before / after flights aircraft cabins are additionally disinfected.

Airlines that continue to operate during quarantine have begun to block medium seats so that there is at least one empty seat between passengers.

Fearing that the virus would spread through food, some carriers stopped cooking hot meals on board. Passengers are offered pre-packaged sandwiches and snacks.

The European branch of the International Airport Council has estimated that the consequences of the coronavirus pandemic are 14 times greater than those of the global financial crisis of 2008-2009 [65].

Eurocontrol reported that during the second half of March and the first half of April, the number of flights decreased until it reached a minimum on April 13-16 - 10-11% compared to the same period last year. As a result, the number of flights gradually increases [43].

In order to competently manage all possible risks in such a large organization, it is necessary to detect them as accurately and in a timely manner as possible. SE IA «Boryspil» is still able to adequately deal with risks.

The possibility of risk manifestation at one time or another directly depends on the internal organization of the enterprise, therefore it is difficult to come up with a universal algorithm for a qualitative analysis of the possibility of risk occurrence.

To better understanding of analysis of risks environment it was decided to analyse of foreign airports. In example will be presented risks analysis of Munich airport.

Risks that could have a material influence on the business activity or on the net assets, financial position, and results of operations, as well as the reputation of Munich Airport, are indicated in Figure 2.4.

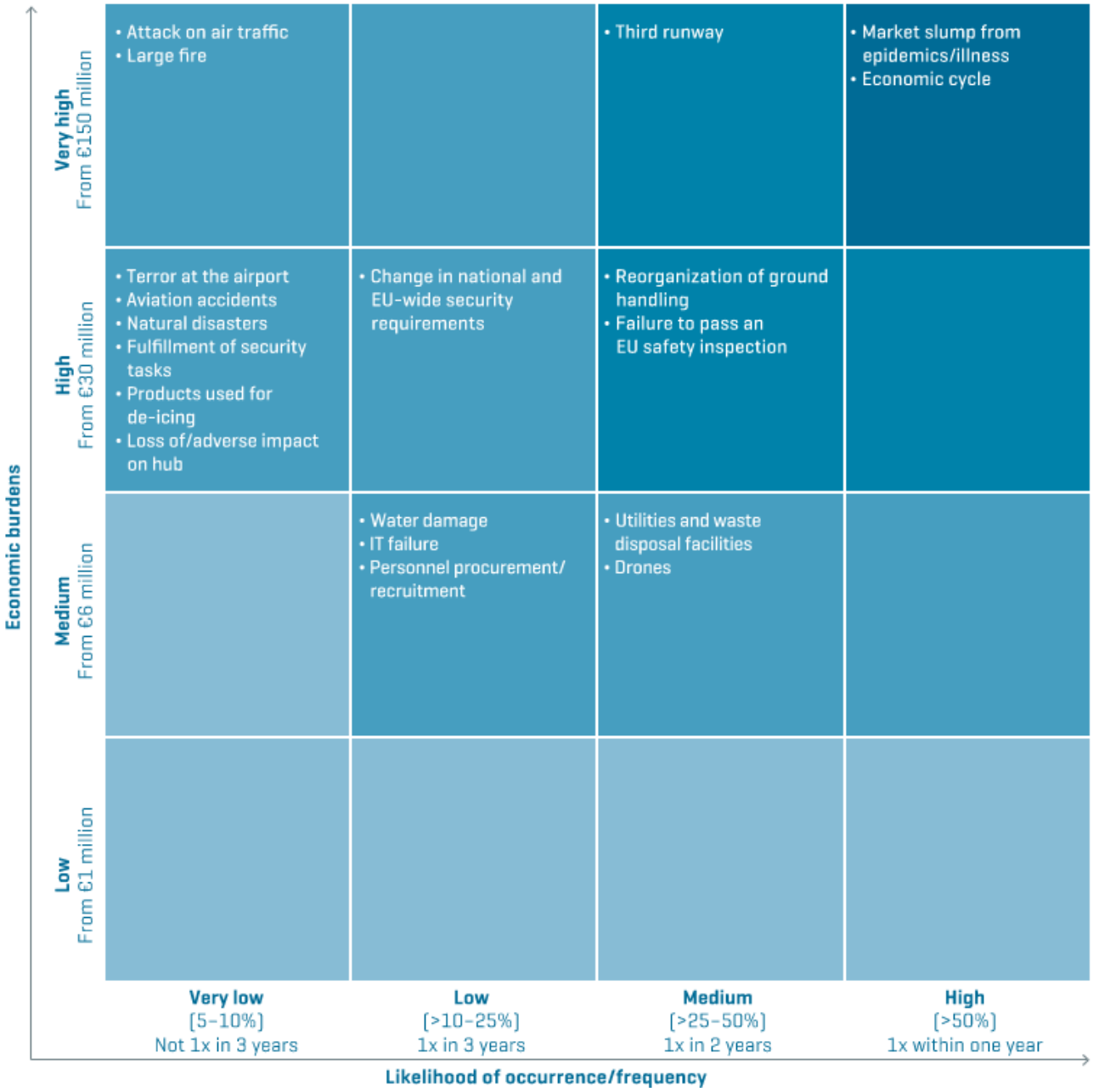

Fig. 2.4. Risks Overview of Munich Airport [65]

Source: developed by author on the basis

Munich Airport has depicted the economic consequences of the spread of the coronavirus in the «Economic cycle» and «Market slump from epidemic/illness» risk categories and thus rated both risks following December 31, 2019 as «very high».

The risk assessment relates to the economic impact in the assessment period quoted. As at December 31.

To understand the situation of the airport “Boryspil” more accurate let’s made SWOT analysis. Compiling a SWOT analysis consists of listing all significant aspects of business activities. For example, “cost advantage over competitors” is an important aspect that must be specified in a SWOT analysis. However, “regular team building events” does not directly affect business development, so it should not be added to the list.

SWOT analysis is a strategic planning tool that allows you to describe the realistic state of affairs of any company. The abbreviation "SWOT" is formed from four English words: "strengths, weaknesses, opportunities, threats". They are translated accordingly as “strengths, weaknesses, opportunities, threats”. The advantage of a SWOT analysis is a comprehensive study of the company, competitors and the industry as a whole.

The strengths and weaknesses categories belong to the factors determined by the internal state of affairs in the company. Opportunity and threat categories are external factors that need to be considered when developing the next business plan. Strengths and opportunities reflect the positive aspects at this stage of the company's development. These are the elements that contribute to the achievement of the set business goals. Weaknesses and threats are negative aspects that hinder the development of a company.

Collecting all the data together makes it possible to understand how to minimize the damage from negative aspects. Ideally, after conducting a SWOT analysis, management should modernize the business strategy to turn negative factors into new growth points.

Sources of information for SWOT-analysis is data on the strengths and weaknesses of the enterprise. All we need to do is gather all these disparate facts

(take the reports of the accounting department, production and sales departments, talk to the employees who have the necessary information) and put them in order. It would be better to involve several key employees in the collection and analysis of this information, as it is easy to miss any important detail alone.

Boryspil Airport is the main air gate of Ukraine, which holds a leading position in the domestic market. Today Boryspil International Airport serves about 8 million passengers a year, which is 70% of all Ukrainian air traffic [66].

Terminal D is the largest and most powerful terminal in Ukraine. Its area is 107,000 square meters, capacity - 10 million passengers per year. It is equipped with 11 stationary air bridges with an automated docking system that can accommodate 6 large ("Boeing 747") and 5 small ("Boeing 737") aircraft. Aircraft maintenance and parking is carried out on the new platform, which can accommodate up to 25 aircraft. The platform is equipped with a system of centralized refueling of aircraft directly in the parking lot.

From the beginning of summer navigation, which begins with the seasonal shift of the clock, Terminal D serves all international airlines, including Lufthansa, Austrian Airlines, British Airways, KLM, Air France, Turkish Airlines, S7 Airlines. Some of them have been served there since August 2012. UIA flights, SkyUP Airline. It was planned that by 2018, Terminal D will be 100% loaded.

There is a lack of shops, pharmacies, bars and cafes at the airport. However, according to the current legislation, lease agreements for commercial areas of the airport are concluded by the State Property Fund through an open tender. Having carefully studied the best experience of Western European airports, the airport management has prepared detailed wishes for the qualification conditions for each type of activity. These include duty-free shops, drugstores, restaurants, vending machines with fresh juices and groceries, cafes, bars of elite gastronomy, fashion clothing, haberdashery. It is planned to place car rental points and travel agency offices. So, let's fill in the table 2.7. as follows: in the first column we write the parameter of evaluation, and in the second and third – the strengths and weaknesses of the enterprise that exist in this area.

Table 2.7.

Strengths and Weakness of the Airport “Borspyl”

Evaluation parameters	Strengths	Weakness
Organization	Employee interest in enterprise development	Low level of qualification of employees Corrupt leadership Low level of interaction between departments of the enterprise Staff turnover
Production	High bandwidth of passenger terminals The largest and most powerful terminal in Ukraine ("D") Leading position in the air transportation market Well-known and well-established partners	Location of the airport High cost of services Opportunities for growth are limited by antitrust law
Finances	State funding	Financial problems Lack of own funds for investment High interest rates on loans Lack of mortgaged property - everything is managed by the State Property Fund of Ukraine
Innovation	Equipped with modern equipment Introduction of new services Unique for Ukraine motivation system for air carriers	Lack of own funds for innovation
Marketing	Availability of regular customers Sufficient advertising effectiveness Prominence	Low quality of service Interruptions in the work of the airport Insufficient range of non-aviation services High price level Negative corporate reputation Low level of qualification of service personnel

Source: developed by author

After that, from the whole list of strengths and weaknesses of the enterprise, select the most important (strengths and weaknesses) and write them in the appropriate places in the matrix of SWOT-analysis (Table 2). Let's limit ourselves to 5-10 strengths and the same number of weaknesses, so as not to have problems with further analysis.

Strength:

- reputation;
- well-known and well-established partners;
- regular solvent clients;
- high capacity of passenger terminals;
- equipped with modern equipment;
- high level of security;
- unique for Ukraine motivation system for air carriers.

Weakness:

- placing;
- high interest rates on loans and lack of collateral;
- incompetent and inexperienced staff;
- low quality of service;
- high prices;
- insufficient range of non-aviation services;
- negative corporate reputation;
- corrupt leadership.

As in the first case, fill in Table 2.8. in the first column we write the evaluation parameter, and in the second and third – the existing opportunities and threats associated with this parameter.

Table 2.8.

Opportunities and Threats of Airport “Boryspil”

Evaluation parameters	Opportunities	Threats
Demand	Growing demand amid improved service	Falling living standards; Reduction of effective demand; Growing consumer demands for service quality;
Competition	High barriers to entry	Entering the market of a large foreign competitor
Marketing	Expanding the range of services	Intensification of competition
Economics	Temporary improving the economic situation in the country through the provision of loans to Ukraine by international organizations with further control of the outcome of expenditures	Deterioration of the economic situation in the country
		The closure of enterprises that exported their goods to Russia Rising inflation Rising unemployment
Politics		Deteriorating political situation in the country War with Russia
Science and technology	Introduction of the latest aviation technologies	Lack of funding for innovation
Nature and ecology	Improving the network of air routes to the airport	COVID-19 pandemic Temporary deterioration of weather conditions; General increase in temperature on the planet
Society	Growth of household income due to going abroad to earn money; Population growth as a result of state support for the birth rate	Low life level
International relations	Facilitating obtaining visas to a number of cranes	Terrorist acts are possible

Source: developed by author

The SWOT-analysis matrix is used to compare the company's capabilities to market conditions (Table 4).

Filling in this matrix we find that:

1. Identified the main directions of enterprise development, which shows how we can take advantage of the opportunities.
2. Formulated the main problems of the enterprise that need to be resolved quickly for successful business development.

Table 2.9.

SWOT Matrix of Airport “Boryspil”

	Opportunities	Threats
Strengths	Expanding the range, quality and prices of services, state support will improve performance, increase revenues; Sufficient popularity, expansion of the network of air routes to the airport will increase the number of customers; Increase of staff qualification, improvement of technological processes, introduction of advanced airport technologies will give an opportunity to keep up with the growth of the market	Increased competition, government policy, inflation and tax growth, changing consumer tastes will affect the implementation of the strategy; The emergence of competitors or intensification of competition will cause additional costs of financial resources; Popularity, the presence of regular solvent customers, high bandwidth of passenger terminals and a high level of security will protect against increased competition
Weakness	Low level of staff participation in decision-making, insufficient control over the implementation of works can lead to sabotage; Lower prices for services, lower taxes will allow you to get extra income	The emergence of new competitors, low level of service and high prices will worsen the competitive position; Unfavorable state policy, insufficient range of non-aviation services, dependence on base airlines, corrupt leadership with rising inflation and exchange rate fluctuations can provoke unprofitable enterprises

Source: developed by author

If the management of the researched enterprise improves technological processes, increases the competence and experience of staff, it will allow (better than competitors) to take advantage of the planned growth of services (opportunity), and ensure greater competitiveness in light of growing customer demand (threat).

The airport development strategy according to the matrix in Table 2.9 provides a hub model of activity (large hub airport), for the implementation of which the airport management must work on building an infrastructure capable of serving transfer passenger flows.

The airline hub is a large international airport that acts as a transportation hub for passengers and goods. The main element of the air transport network, which connects airports that do not have a direct connection.

When it comes to the prospect of 15-20 years, Boryspil is seen as the main air gate of Ukraine, a strong hub, an airport that will serve well-known airlines and provide a European level of comfort for both passengers and airlines. It is planned to take a worthy place among the powerful airports of Eastern Europe. This has the necessary potential, which must be used to the full [74].

One of the easiest ways to use SWOT-analysis is to identify areas for improvement. Of course, it will be better if you eliminate all the weaknesses and further strengthen the strengths. Only in conditions of limited resources it is always unrealistic. SWOT-analysis allows to identify the most significant (in terms of development of opportunities and protection against threats) factors that require change. They are:

- financial problems;
- low quality of service;
- unqualified and inexperienced staff;
- interruptions in the work of the airport;
- insufficient range of non-aviation services;
- high prices;
- corrupt leadership.

Once the strengths and weaknesses of the airport have been explored, it is time to examine the main risks facing the airport. In fact, there are a lot of risks, therefore, in order to simplify this task, it was decided to single out the main groups of risks by their origin.

List of main risk groups at Boryspil airport:

1. Production risks (delays in the production/service circle due to mistakes in airport service system or personnel).
2. Flight safety risks (aircraft collisions, accidents, damage of buildings, failure of the air navigation system).
3. Reputation risks (reducing loyalty, trust of customers, reputation of airport);
4. Competition risks (strengthening the positions of competitors).
5. Financial risks (banks unreliability, delays in bank operations, mistakes in financial reports).
6. Regulatory risks (changes in international law, changes in government policy regarding air transportation industry).
7. Economic risks (deceleration of economy development, global crisis, other negative market fluctuations).
8. Socio-political risks (unstable political situation in the country or at international market).
9. Commercial risks (demand doesn't match with supply, decrease in the demand on air transportation or tourism, offers are too expensive or unnecessary for consumers or other reasons that affect on commercial activity).
10. Environmental risks (technological accidents, global catastrophes, tsunami, fire, explosions, pandemic and other).
11. Security risks (terror attacks, steal of confidential information, threat to the life of passengers).
12. Quality risks (reduction of service quality, rudeness on the part of personnel, growth of the inconvenience of service provided).

13. Management risks (mistakes in authority decision-making, insufficient management strategies, directions, etc.).
14. Unforseen(war, civil coup, unpredictable negative circumstances).

Now we have 14 risk groups. Each group has its own characteristics, which will be described below. We will start with the first group, these are production risks. Production risks are associated with the production of products, goods and services, the implementation of any types of production activities, in the process of which entrepreneurs are faced with the problems of inadequate use of raw materials, cost growth, increased losses of working time, and the use of new production methods[55].

Flight safety risks are partially production risks, but brought into a separate group as they have their own specifics and require an intelligible approach to exclude them, since flight safety directly depends on this. Despite the fact that today almost all processes associated with aircraft flights are fully automated, this does not exclude the fact that such systems can disfunction, and errors in the organization and control of flights can cost hundreds of lives[56].

Reputational risks of an organization are possible losses due to the negative attitude of clients, partners and investors towards the company. This is caused by the rudeness of employees and management at work or in the public field, failure to meet deadlines, leakage of data about customers and partners due to a failure in the technical support of the organization. The company's image can also be influenced by the quality and level of service, pricing policy, customer reviews, audit, history of relations with government agencies (prosecutor's office, tax inspection, court). An entrepreneur and his team need to think through reputational risks, understand their causes and calculate possible losses. The more risks a company can predict and work through them in more detail, the easier it will be to maintain a positive image[70].

Competition risks refer to the potential loss that your company or organization could incur due to the competitive forces of other companies in your line of business [53]. There are a number of factors that can influence competitive risk, such as a competitor's innovation, prices, available resources, advantageous location, effective

distribution, effective promotion, etc. Often times, especially if your business operates in a strong competitive market, competitive risks can actually lead to numerous improvements, such as:

- improving quality control;
- cost reduction;
- improving product quality and so on.

Financial risks refers to the likelihood of a negative event affecting a decrease in income or capital arising from the uncertainty of the conditions of the financial and economic activity of the enterprise in case of inability to fulfill the financial obligations of the enterprise to partners as a result of instability in the purchasing power of money, the formation of an optimal capital structure [98].

Financial risks are divided into risks associated with the purchasing power of money, risks associated with investing capital (investment), and risks of loss of profits.

Risks associated with the purchasing power of money:

- inflationary risks;
- currency risks;
- liquidity (insolvency) risks.

Investment risks are expressed in the loss of the planned profit during the implementation of investment projects[74]. There are real investments and portfolio (financial) investments. Accordingly, the types of investment risk differ:

- real investment risk (investment in production);
- the risk of financial (portfolio) investments (purchase of securities).
- loss of profit risk - the risk of financial loss (or loss of profit) due to non-execution of any transaction or business interruption.

Regulatory risks associated with the presence and identification of special legal requirements, as well as special legal regulation and interaction with the regulator. The regulator here is the relevant legislative body. Regulatory requirements can be related to violation of competition, corruption, tax optimization, etc [25].

Economic risks are risks caused by unfavorable changes in the economy of an enterprise or in the economy of a country. The most common type of economic risk, in which private risks are concentrated, are changes in market conditions, unbalanced liquidity (inability to fulfill payment obligations in a timely manner), changes in the level of management, etc[71].

Socio-political risks these are risks that permeate all social strata, groups, some of which are subjects, while others are objects of risk. They can be managed on the basis of joint, mutually beneficial participation and consistency of interests of the participants and also the possibility of losses or reduction in the size of profits, which are a consequence of public policy [42].

According to many researchers, commercial risks are the most unpredictable and most dangerous, especially when it comes to the production of innovative products[52]. This is due to the unpredictability of consumer demand for manufactured and sold products, its dependence on many factors that are very dynamic. In this case, the probability of commercial success of new products is usually much lower than the probability of their technical success. The need to generate demand for new products requires significant costs, which are not always recoverable, and the actual cost of innovation is usually much higher than planned.

Environmental risks refers to the likelihood of negative changes in the environment, or long-term adverse effects of these changes that occur due to negative environmental impacts [36]. Environmental risk can be caused by emergencies of natural, anthropogenic and man-made nature.

Security risks complies a category of threats to the safety of people and information [40].

Quality risk is the potential for losses due to quality that fails to meet your quality goals [41]. Quality defines the value of your products and services and can include a wide range of factors. For example at the airport it is smooth and proper service to the passenger without delays.

Management risks are risks — financial, ethical, or otherwise — associated with ineffective, destructive, or underperforming management. Management risk can

be a factor for investors holding stock in a company. Management risk can also refer to the risks associated with the management of an investment fund [81].

And the last one force majeure risks this group characterize by unpredictable negative circumstances such as wars, civil coups, global catastrophes and others.

As we can see, the airport has a huge number of risks. Some are less critical than others, but all of them in one way or another affect the profitability of the enterprise. But in the future, for the development of recommendations for their optimization, it is worth choosing only a few of the most significant and important ones. For this, it was proposed to select the 3 most dangerous risks from each group, and then to assess and rank them using the method of expert assessments.

So the first group is production factors. According to a survey of experts, the most dangerous risks of this group are delays due to passenger check-in, flight delays due technical reasons and it service failures, they also can be seen in Table 2.10

Table 2.10.

Expert Estimation of Main Production Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Production					
Delays due to passenger check-in	3	5	5	4	4,25
Flight delay due to technical reasons	2	5	4	4	3,75
Failures in IT service systems	3	3	3	3	3

Source: developed by author

As we know, self-check-in counters are one of the sore spots in Boryspil, and in general, the procedure for passing through customs control delays the passenger on the way to the aircraft. Also, during the pandemic, the check of civil and vaccination passports was added, which in turn further complicated the process of passing registration and identification of a passenger at the airport.

Another crutch in the production cycle of Boryspil is flight delays due to technical reasons. This is a fairly common problem not only for Boryspil, but also for many other airports, and it is also very negative about the passengers themselves. To ensure smooth operation, it is necessary to constantly monitor all systems of the production process of the airport itself, as well as high requirements for the efficiency and maintenance of their aircraft by the airlines themselves or other partners.

The last of the common risks is IT service failures. Various failures in the accounting of passengers or baggage are quite common problems at the airport. This risk is also slightly related to the previous two, only it rather refers to the correct operation of only the operating systems of the airport itself rather than to external ones.

Next, let's talk about the flight safety risks and first risks associated with runways. These can be problems with integrity and reliability, failure or malfunction of beacons located along the runway, foreign objects and other obstacles for a safe landing or takeoff.

It is also worth considering that the climatic zone in which Ukraine is located has many variations of unfavorable weather conditions for flights. For example, in summer, there is often heat, showers, thunderstorms, and in the cold season in winter there are large frosts or heavy snowfalls. All this, of course, greatly affects flight safety, and the difficulty is that you need to be prepared for different weather conditions.

And the last risks in this group are the risks of failure in air navigation systems. Today, aircraft flights are extremely automated and do not require human intervention, with the exception of control in order to prevent errors and failures in the system.

Flight safety has always been a key component of civil aviation. This is unequivocally reflected in Article 44 of the Chicago Convention, which explicitly defines ICAO's responsibility "for the safe and orderly development of international civil aviation throughout the world."

At present, security is largely seen not as an ex post facto phenomenon with which prevention measures are agreed and developed, but as an event that is continuously related to the control of risk factors. Hence the need to change the previously accepted concept of security.

Table 2.11.

Expert Estimation of Flight safety

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Flight safety					
runway malfunction	4	2	1	3	2,5
weather conditions	5	4	4	3	4
malfunction of airport air navigation systems	2	3	2	3	2,5

Source: developed by author

Next, we will focus on the company's reputational risks.

Table 2.12.

Expert Estimation of Reputational Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Reputation					
corruption schemes	4	5	5	5	4,75
impact of yellow press	1	3	2	2	2
sponsored articles of competitors	2	2	3	3	2,5

Source: developed by author

In general, Boryspil has a pretty good reputation as it is the leader in the Ukrainian market. But this group also has its own risks, and the first is the risk of uncovering corruption schemes. As we could see earlier, Boryspil sometimes gets into corruption scandals, which are mainly related to customs, all of this, of course, affects the company's image.

It is also worth considering the influence of the yellow press, which spoils the reputation of not only famous people, but also large enterprises collect information about failures or simply weaknesses. The goals of such articles may be different, but the effect is always negative.

Also in this group there are risks associated with customized articles from competitors. Competitors do not always choose honest methods of struggle; sometimes you have to drown the reputation of others in order to appear better against their background.

The following risks are associated with competition.

Table 2.13.

Expert Estimation of Main Competion Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Competition					
expensive or exclusively available innnovations	3	5	2	3	3,25
improving the quality of competitors' services	4	3	2	3	3
unique offer of competitor	4	4	3	4	3,75

Source: developed by author

And the first in this group are the risks associated with expensive and exclusive innovations. In the case of competition of Boryspil in the home market, this is not expressed in any way, since the airport is already advanced in this regard, but if we

are talking about European airports, things are not so good here. The question is not only about the difference in funding for Boryspil and European airports, but also the development of these innovations. They are usually developed by foreign experts and scientists, so it is good for Boryspil to try to break through on the international arena.

There is also an improvement in the quality of service to competitors. Boryspil is not famous for the highest level of customer service anyway. Against the background of Ukrainian companies, this is certainly not so noticeable, but if the airport wants to consolidate its status in the European market, then it needs to be done so as to meet Western standards.

The last group in this section is called the unique offer of competitors. It is characterized by the fact that competitors will be able to offer a unique service for their passengers, which our airport cannot provide.

Another one group is financial risks.

Table 2.14.

Expert Estimation of Main Financial Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Financial					
inflation risk	4	5	5	5	4,75
investment risk	2	2	3	3	2,5
liquidity	3	1	4	3	2,75

Source: developed by author

And the main risks in this category are related to inflation in the country, that is, the loss of purchasing opportunities for both the company and its consumers. Risks of unsuccessful investment in projects. A company can lose the lion's share of its funds simply by investing its funds in weak projects. As well as liquidity risks, that is, the ability to pay bills.

A group of regulatory risks is considered. The main risks of this group are changes in both international legislation and government regulation of the aviation sector. Also, the antimonopoly policy with regards to the airport itself, since Boryspil already has large capacities.

Table 2.15.

Expert Estimation of Main Regulatory Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Regulatory					
changes in international legislation	3	1	2	3	2,25
changes in domestic legislation	3	4	3	4	3,5
antimonopoly activity	3	3	2	5	3,25

Source: developed by author

Among the economic factors we have the depression of the world economy as a whole, which affects not only the aviation industry but also the economy as a whole. It is also the volatility of world markets, their instability, which is generally interconnected with the previous risk, but also characterized by the fact that the airport will not be able to catch the right wave in order to emerge victorious in these conditions. And the last thing is the instability of the Ukrainian economy, which, against the background of all the above risks, is not in the best position anyway.

Table 2.16.

Expert Estimation of Main Economic Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Economic					
economic degradation	4	3	2	4	3,25
fluctuations in world economy	2	1	4	5	3
unstable economic situation in Ukraine	4	4	4	4	4

Source: developed by author

In socio-political terms, the development of fear in people of flights and travel, which is associated with the covid pandemic, is recognized as the most dangerous. And also the unstable political situation both in the world and in Ukraine.

Table 2.17.

Expert Estimation of Main Socio-Political Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Socio-political					
unstable political situation in Ukraine	5	5	4	5	4,75
people's fear of flight and traveling	4	5	5	2	4
unstable political situation in the world	2	3	3	3	2,75

Source: developed by author

In the group of commercial risks, it is worth highlighting the risk of a drop in demand for passenger air travel, which was caused by the covid pandemic. Ineffective advertising methods as the marketing mix is now undergoing a lot of changes and the old methods of banner advertising or TV advertising no longer work.

Table 2.18.

Expert Estimation of Environmental Safety Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Commercial					
falling demand on passanger air transportation	2	3	5	4	3,5
uneffective marketing	3	1	4	5	3,25
absence of unique supply	4	2	1	4	2,75

Source: developed by author

Among the environmental risks, the most dangerous is the risk of a pandemic, it has brought many problems not only to aviation, but also to the world as a whole. Of course, various vaccines have been invented, but there is always a risk that the coronavirus will mutate and there will be another blow.

Also, the risks of natural disasters such as hurricanes and others can be attributed to environmental risks.

Table 2.19.

Expert Estimation of Environmental Safety Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Environmental					
pandemic	5	5	5	5	5
storm, hurricane, heavy snowfall, smother	4	5	3	5	4,25
air pollution	4	2	5	3	3,5

Source: developed by author

The main risks of the security group are threats of terrorist attacks, since airports are a favorite place for terrorists. It should also include the risks associated with injury to passengers, for example, non-compliance with safety rules or violation of public order. The last important risks are the risks of failure of security systems, cameras, automatic locks, check gates, etc.

Security control is very important because it is imposed to ensure the safety of civil aviation on domestic and international flights. All the passengers (including transit and transfer), their carry-on baggage and luggage is required to pass through pre-flight security control.

Table 2.20.

Expert Estimation of Security Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Security					
terror attack	2	1	1	3	1,75
injury to passengers	1	1	2	1	1,25
failures in security systems	2	1	3	1	1,75

Source: developed by author

Among the quality risks, the main ones are rudeness on the part of employees. This is something that happens very often, this is evidenced by the information that was obtained as a result of studying reviews on the Internet, as well as a survey among friends. Also, the discomfort of passengers during their stay at the airport was revealed, as well as the infrastructure issue is still acutely raised, because the Borispol Express does not cover all the needs of passengers, they complain about uncomfortable conditions.

Table 2.21.

Expert Estimation of Quality Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Quality					
rudeness of service staff	5	5	4	4	4,5
risk of inconvinience for passangers in airport	5	4	4	5	4,5
risk of passangers negative experience when getting to the airport	4	5	5	5	4,75

Source: developed by author

One of the latter groups is management itself. From the main here, these are management mistakes when making important decisions, development strategies or corruption schemes that also hit the reputation of the enterprise, as mentioned above.

Table 2.22.

Expert Estimation of Management Safety Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Management					
fails in authority decision-making	1	4	2	3	2,5
corruption schemes	5	5	5	5	5
fails in development strategies	2	1	1	1	1,25

Source: developed by author

And the last group is the group of unforeseen risks. Of the main and most important here is the threat of a full-scale war with the Russian Federation. Civil

coup, so many people are not happy with the current government, or it could be global man-made disasters.

Table 2.23.

Expert Estimation of Unforeseen Circumstances Risks

Main risks	Estimation				
	Expert 1	Expert 2	Expert 3	Expert 4	Total average
Unforeseen circumstances					
war	2	3	4	1	2,5
civil coup	1	1	2	1	1,25
global technological catastrophes	1	1	1	1	1

Source: developed by author

After a complete analysis of the main risks in each of the groups, we can draw a conclusion and highlight one of the most important risks from each group in order to understand which risks really require attention. As a result, we get a list like this:

1. Delays due to passenger check-in;
2. Malfunction of runways and air navigation systems;
3. Disclosed corruption schemes;
4. Unique offer of competitor;
5. Inflation risk;
6. Antitrust activity;
7. Instability of Ukrainian economy;
8. Instability of Ukrainian political environment;
9. Falling demand on air passenger transportation;
10. Pandemic;
11. Failures in security system;
12. Risk of negative passenger experience when getting to the airport
13. Corruption schemes that harms to the airport itself;

14.Full-scale war with Russian Federation;

Now that we have a ready-made list of the most important risks of the enterprise. We must arrange them according to their importance and the possibility of influencing them. Risks such as an unstable political and economic situation are less susceptible to management and optimization than internal airport risks, such as delayed check-in of passengers, failures in security systems, risks of COVID infection and other risks within the enterprise itself. The expert group found that the most important risks that require optimization are:

- Intensification of pandemic;
- Negative passenger experience due to inconveniences caused by airport;

It should be noted that these risks are closely interrelated with each other. Their occurrence, to one degree or another, affects the attractiveness of the airport for the end user (passenger). The intensification of the pandemic threatens to turn into a global lockdown again, which will hit the aviation industry with monstrous force and entail a chain of occurrence of other risks, such as a drop in demand for passenger air transportation, or a decrease in the ability to provide truly high-quality service for consumers. Nobody knows where is the end of pandemic and when we should wait for new stamps of coronavirus or other diseases. Also it should be admitted that this factor has huge influence on possibility of other factors, thus it can be concluded that pandemic is dangerous itself, but it becomes more dangerous because has impact and make more strong other factors from the list. Also unstable political situation in the country and at international market. Ukraine has unstable political environment since its independence and in last years it getting worse due to the war on East and a number of decisions of current authorities. The relationship between countries can change rapidly and drastically thus popular routes in the sphere of air transportation may be closed. The recent events show unpreparedness of countries to the radical changes of the world order, this group has more indirect impact on the air transportation industry and influence more on the economy in general and feed up the depression of economy.

CONCLUSION OF PART 2

The studied enterprise is Boryspil International Airport is the main and largest international passenger airport in Ukraine and its capital, serving Kyiv, the Kyiv agglomeration and other regions of Ukraine, providing almost 2/3 of the country's air traffic. Boryspil is the only airport in Ukraine that carry passengers to transcontinental directions. It serves more than 15 million domestic and foreign passengers per year.

Boryspil International Airport took the fourth place in the rating of airports with passenger traffic from 10 to 25 million passengers. This is stated in a report for July 2021, which was published by Airports Council International.

Boryspil was included in The World's Best Airports in 2021 rating by the British consulting company Skytrax, taking fifth place among the best airports in Eastern Europe.

Company significantly lost its financial positions of the last years. Such a fall related with pandemic and problems which it brings as to global economy and as to one of most intense sectors such – aviation.

The greatest threat to the company is posed by functional risks related to the external environment, namely: regulatory risks (deviations from planned indicators due to changes in laws or regulations), socio-political risks (deviations from planned indicators due to destabilization of the social and political situation), economic risks (deviations from planned indicators due to changes in the economic situation), force majeure (deviations from planned indicators due to natural disasters, pandemics, etc.).

SWOT analysis helps us to understand that if the management of the researched enterprise improves technological processes, increases the competence and experience of staff, it will allow (better than competitors) to take advantage of the planned growth of services (opportunity), and ensure greater competitiveness in light of growing customer demand (threat).

The airport development strategy according to the matrix in provides a hub model of activity (large hub airport), for the implementation of which the airport management must work on building an infrastructure capable of serving transfer passenger flows.

In the prospect of 15-20 years, Boryspil is seen as the main air gate of Ukraine, a strong hub, an airport that will serve well-known airlines and provide a European level of comfort for both passengers and airlines.

SWOT-analysis allows to identify the most significant factors that require change. They are: financial problems, low quality of service, unqualified and inexperienced staff, interruptions in the work of the airport, insufficient range of non-aviation services, high prices, corrupt leadership.

Experts examination of main risks and its groups help us to understand that the main risks of enterprise are threat of pandemic intensification, and negative experience of passenger experience due to inconveniences caused by airport.

PART 3. OPTIMIZATION OF RISK MANAGEMENT OF THE STATE ENTERPRISE "BORYSPIL INTERNATIONAL AIRPORT" IN THE INTERNATIONAL MARKET OF TRANSPORT SERVICES

3.1. Directions for improving the ways to manage risks of the airport

The strategy of Boryspil Airport is aimed at providing a high level of service, a safe and comfortable stay on the territory of Boryspil Airport and optimal management of airport resources.

As it was established in the process of research, the investigated enterprise Boryspil airport has quite a lot of different groups of risks that, to varying degrees, affect its activities. At the moment, in the context of a pandemic, enterprises in the aviation services sector need to constantly improve, develop their own capabilities and increase the level of safety for passengers. For this, special approaches are used in activities and innovative programs for the development of enterprises in the field of aviation services, including airports, are being developed.

Of course, the main goal of the entire field of aviation services is to combat the pandemic. The main problem of the pandemic is that it slows down or completely stops passenger traffic. It is also worth considering the fact that people have a fear of appearing in public places, or traveling. People do not feel safe, so the main task of the airport is to ensure safety in any conditions of the development of a pandemic. In order to adequately meet any challenges of the pandemic, experts and people who are versed in this matter will be needed, as well as additional means of countering the coronavirus will be needed. At the moment, the airport has generally accepted safety rules in public places, and also has:

- PCR and express testing for coronavirus point;
- vaccination point;
- first-aid post;
- pharmacy;

At Boryspil International Airport in the public area, on the 2nd floor of Terminal D, there is a biomaterial collection point for PCR and express testing for COVID-19.

The sampling of biomaterial is carried out by the staff of the medical center of the Boryspil International Airport, and the results are processed by the medical laboratories “ADONIS”, “Eskulab”, “MEDLAB”, “IMMD”, “Healthy Lab”, “UNIVERSUM.CLINIC”, “Unimed”, “Rumed- T”, “Nikolab”.

The cost of services is determined by each laboratory independently:

- PCR test - from 800 to 950 hrn;
- rapid test to determine the SARS-CoV-2 antigen - from 580 to 650 hrn.

Certificates are issued in Ukrainian and English.

Absolutely everyone can pass the PCR and express test for COVID-19. The service is useful for passengers who arrive and do not want to be in self-isolation, and for those who are planning a trip in the near future.

The results of the PCR study can be ready within 6-12 hours, the results of the express test for determining the SARS-CoV-2 antigen - from 10 to 20 minutes, depending on the conditions set by the laboratory. To clarify the information you should visit the laboratory's website.

On the first level of Terminal D of Boryspil Airport, a hospital medical center operates around the clock. The medical center provides emergency medical assistance.

Automatic defibrillators are located in the terminal rooms, which allows, if necessary, to carry out resuscitation actions.

It should be noted that the medical staff of the Boryspil airport can not provide medical certificates and other permits for use in air transport. If necessary, the passenger must obtain such documents at any medical institution of the last place of stay. And also here is a little pharmacy at the Boryspil airport, which is located on the ground floor of Terminal D.

As we can see, the airport already has first aid stations, but their capabilities are quite limited. I believe that Boryspil Airport has something to work on. Especially in

a pandemic, the airport must ensure the unquestionable provision of medical care at the highest level to all comers, including passengers and airport staff, airlines, and others. Health is the priority identified by the pandemic and the trend that must be followed by all who want to work successfully.

Therefore, in order to optimize the risk associated with the pandemic, it was proposed to create a modern medical center at the airport, which will provide modern quality medical care to all comers. The model of the leading international airport Dubai is taken as an example and basis.

Dubai International Airport Medical Center aims to ensure effective curative, preventive and quality care and at promoting health care for all airline passengers and crews as well as all airport staff. And also conducts medical checks on the fitness of staff for work, ensures compliance with international health control regulations, and in cooperation with the Ministry of Health develops training programs, training for staff on health care, as well as conducts research.

Customers are sorted according to a 5-tier sorting system, which ensures that customers are evaluated and sorted according to the severity of the health threat. Clients of all medical categories, as well as victims of injuries, are provided with emergency care and, if necessary, referred to the appropriate health care facility.

The unit is able to provide rapid resuscitation, stabilization and relocation of critically ill patients and provide a response team in the event of unforeseen events at the airport (eg, plane crashes). The center is always ready to respond to any request for emergency assistance within the airport, if necessary.

Also at the airport there are 2 equipped ambulances around the clock are on standby to provide emergency care on the spot, as well as for further transfer of critically ill patients to hospitals.

The airport's medical center has experienced and certified medical and nursing staff who can provide travelers with emergency care, health and safety services and travel medicine if needed. AMC staff can deal with unexpected illnesses and unforeseen accidents.

The Airport Medical Center also promotes preventive aspects of medical care through the airport rehabilitation program and information and education staff for all travelers, as well as for the entire airport.

And now I wanted to consider ways to optimize the risk associated with the emergence of negative experiences of passengers associated with the airport.

As we know from surveys of acquaintances, and conducting research on the Internet, in the service of Borispol, the biggest problems in people's opinion are:

- entrance to the airport;
- lack of supermarket;
- rudeness of personnel;
- coordination at the airport, and problems with check-in (especially for inexperienced travelers) for a flight at the airport;

Boryspil has difficulties with the access road to the Kiev-Boryspil airport. At the moment, there is a very high probability of getting stuck in a traffic jam on the way to your flight, especially since the beginning of winter this probability increases due to accidents on the roads, which naturally complicates the life of passengers.

It is also worth saying a few words about Kiev Borispol Express

Kiev Borispol Express has become a cheaper and faster alternative to Skybus buses. In just 40 minutes and 80 UAH, it allows you to get from the main railway station of the capital "Kiev-Passenger" to the platform next to terminal D at Boryspil airport. The train makes stops at the stations "Vydubychi" and "Darnitsa" and in a situation when the highway to Boryspil is being repaired, it is the only option to get to the airport at a more or less predicted time.

The key disadvantage of express trains is that the line uses old PESA 620M rail buses, which have poor air conditioning in hot weather, the seats are very tight and there is little room for luggage.

All this makes this type of transport not very convenient and somewhat similar to a trip on a packed tram. Moreover, due to the increasing popularity of express trains due to the increase in airport traffic and highway repairs, getting on the train at intermediate stops can be problematic, and when boarding, even at the end,

passengers are not guaranteed a seat. As a result, you will have to stand for 40 minutes.

"Ukrzaliznytsia" in order to somehow solve this problem, began to send double rail buses on routes during rush hour. More spacious 3-car diesel trains of the Kryukov Carriage Works could completely remove the problem. One of these trains even carried passengers to Boryspil in early 2020, but then it was relocated to the Cherkasy region, and then to the west of Ukraine.

Since 2014, Boryspil Airport has installed frames and X-ray machines at the entrances to the terminal in order to check all people and their belongings. With the onset of a pandemic, passports and boarding passes are additionally checked at the entrances.

All this led to the formation of large queues at the entrance. To make matters worse, the airport has reduced the number of off-peak entrances and exits open to one on each floor to save money. As a result, even if there are few flights departing from Boryspil, you can stand an extra 15-20 minutes just to enter the terminal.

Let's summarize. Two of the problems described above do not relate directly to the Boryspil airport and are in the sphere of activities of other state-owned companies - Ukravtodor and Ukrzaliznytsia.

With regard to the road, so far the only solution to the issue is to properly maintain the highway and regulate traffic on it.

In the case of trains, the airport should work closely with Ukrzaliznytsya to improve the quality of the product offered by this state-owned company, because the necessary infrastructure for this is in place or will appear in the near future.

As for the queues at the entrance to the terminal, this is completely within the competence of Boryspil. He should either make all entrances work around the clock and increase the number of employees who are involved in checking, or he should abandon the framework at the entrance. This practice is not used in Europe, and in Ukraine, such checks are only in Boryspil and Kharkov, and at other airports, only passengers pass through metal detectors before departure.

An empty refrigerator is the worst thing to come home after a relaxing break or a flight across multiple time zones.

But for those who do not have the strength or time to go to the supermarket with their luggage in tow, a new service appears at the airports.

Targeting a small but emerging market, retailers are taking advantage of the busy schedule of weary travelers by launching push-to-pick services that allow travelers to order food from overseas and pick it up when they land at the airport.

Airport food pick-up points are a growing trend in Europe, and Waitrose has announced plans to install its own refrigerated lockers in long-stay parking lots at London Gatwick Airport.

The convenient system is incredibly easy to use – vacationers place an order on their smartphone or other device before flying home and, using the code sent to their mobile phone after payment, receive the delivered goods without being distracted by the store.

After identifying the possible risks that an enterprise may face in the process of doing business and assessing them, the entrepreneurial structure needs to develop a program to minimize risks.

3.2. Main perspectives of optimizing the risk management system of the State Enterprise "Boryspil International Airport"

As a result of the above material, it was decided to focus on the risk of exacerbation of the coronavirus pandemic. At the moment, the medical healthcare facilities of the airport do not fully meet the demand for them. The fact of this for example is the queues at vaccination or testing points. As practice shows, when the state imposes strict methods of resolving the epidemiological situation, people have difficulty accessing public places, including the airport, as exemplified by the situation related to lockdown and restrictions for unvaccinated people in early November 2021. There is also a threat of new coronavirus mutations such as

Omicron. At the moment, Ukraine is strengthening its protection against the coronavirus of the Omicron strain, which is spreading around the world. So far, a new variant of the virus has been found in a number of countries, including Hong Kong, Israel, Germany, the United Kingdom, Canada and the Netherlands. Authorities in the latter have reported at least 13 confirmed cases of people arriving in Amsterdam from South Africa. As of November 29, a new version of the coronavirus "Omicron" has not been detected in Ukraine, according to the Ministry of Health. However, the agency emphasizes that "all samples that will not be identified as" Delta-strain "will be subject to mandatory decryption of the virus. As mentioned earlier, in order for the airport to be able to successfully withstand the new challenges of the pandemic, it is necessary to create a modern medical center on the basis of the airport itself. In my opinion, there is an interest not only in the airport but also in the Ministry of Health, as well as the possible participation of medical companies that have experience, methods and equipment to combat the pandemic.

The medical center of Dubai International Airport can be taken as a model for the future medical center at the Boryspyl airport. The main areas of responsibility of this center have been mentioned before, but now I would like to provide a clear list:

- Provision of free emergency medical care and treatment of injuries by qualified medical personnel in accordance with international standards
- Provide emergency medical care in case of heart attack or cardiac arrest
- Consultation with health regulations at the airport to all visitors through audio, video or personal consultations
- Development of infection control programs in cooperation with the Ministry of Health
- Analysis of the epidemiological situation at the airport, and development of programs to control coronavirus at the airport
- Conducting rapid PLR and rapid testing
- Medical fitness exams for airport staff (renewal only).
- Provides all types of vaccination services to passengers and airport staff

- Provides assistance for stretcher case or other passengers with disabilities during embarkation and disembarkation.
- Creating health and safety awareness programs for airport staff.
- Providing passengers with all necessary medical permissions or certificates for flights
- Training airport staff on first aid
- Emergency transportation of patients to private or public hospitals for further treatment
- Quick response in case of emergencies such as aircraft crash
- Pharmacy services (sale of tablets and medicines)

The medical center will be ready to provide its services to the following categories of people:

- Passengers (including transit passengers)
- Airlines staff
- Airport staff
- Stretcher case, wheelchair case and passengers with other disabilities

Once we have decided on the range of services that will be provided by AMC and its end customer, we need to consider the possibility of creating it at the airport. To begin with, it should be understood that the project is quite serious and expensive and requires serious experience in the medical field.

The first option is to open such a center independently and exclusively on the basis of the airport without outside funding and assistance.

Advantages of this option:

- independence from funding and partner decisions
- better accountability and control of the center itself
- more rapid and flexible management
- net income from paid services

Among disadvantges can be listed:

- high project costs
- high demand for medical experience

- high risks
- insuffieciency of the AMC due to the lack of experienced support

Consideration of advantages and disadvantages shows us that the opening of AMC independently, without the involvement of external partners has in the long run ease of management and profitability of this project, but among the main disadvantages we have that the medical field is not the main one for the airport. makes it impossible to successfully launch such a center. Also regarding the cost of such a project, if as a result we want to get a truly effective medical center, we will need qualified specialists and expensive laboratory and medical equipment, the estimated cost of such a center can reach 100 000-300 000 dollars and it is to expensive for the enterprise.

As the first option has quite significant shortcomings, another solution was proposed, the opening of the airport in cooperation with the Ministry of Health and another private medical company.

The main advantages of this solution are the following:

- attracting professional experience
- lower startup cost
- higher efficiency of AMC
- development perspectives

The main disadvantages:

- dependence on partners
- limited freedom of management decisions
- shared income

As you can see, this option has quite significant advantages, namely the experience in the field of health care in order to attract partners you need to make arrangements in the right direction.

The Ministry of Health may have the following interests in this project:

- safety of life of citizens
- tourist attraction of the country
- uninterrupted operation of the airport and customs

- pandemic control

With regard to a private medical company, their main interests will be as follows:

- exclusive cooperation
- unique experience
- reputation growth
- income from paid services

At the moment, we understand the first partner is the Ministry of Health. Regarding the choice of a private partner company, the airport must hold a tender as it is a state-owned enterprise. Tender is a mandatory component of public procurement in the public sector. According to the current legislation, the overwhelming majority of state-owned enterprises must conduct tenders for the purchase of services and goods necessary to perform their functions. This opens up broad prospects for executing companies wishing to participate in government orders. But for this participation to be effective, it is important to know the rules for holding tenders in Ukraine and follow them at every stage of the bidding.

State tenders in Ukraine are classified according to two criteria:

1) By item type - for purchase:
   - goods;
   - services;
   - work.
2) By cost level:
   - subthreshold - goods / services are purchased for a total amount of less than UAH 200 thousand. and works for the amount of not more than UAH 1.5 million; the price of goods / services is no more than UAH 1 million, and for works - UAH 5 million;
   - above-threshold - goods / services are purchased for a total amount of more than UAH 200 thousand. and works worth at least UAH 1.5 million; the price of goods / services is more than UAH 1 million, and for works - UAH 5 million.

Most of the state tenders in Ukraine are above-threshold - the procedure for holding tenders of this format is regulated by Law No. 922 "On Public Procurement".

The first stage of the tender by the customer is the announcement of the state auction. It is published on electronic platforms authorized by the ProZorro system. The announcement contains the conditions for participation in the tender and a list of documents requested from potential bidders. Mandatory ad components:

- requirements for purchased goods / services / works (technical, qualitative and quantitative characteristics);
- requirements for the qualifications of participants;
- criteria and methodology for evaluating proposals.

For an enterprise that plans to take part in public procurement, the first step is to register on the electronic platform, followed by a search for tenders. When a suitable tender is found, it is necessary to study the rules for participation in the tender, collect the requested documentation and submit your proposal electronically through an authorized platform within the specified time frame.

During the period of submission of applications for the tender, participants can ask the customer clarifying questions regarding the content of the documentation. This option is available if there are at least 10 days left until the end of the publication of proposals. The customer has 3 days to respond. In the course of communication, he may change some of the conditions prescribed in the documentation - in this situation, the term for filing applications is automatically extended by 7 or more days. Every tenderer is notified of changes to the terms of the tender, so they have time to review the amendments. Further, participants have the right to either update the proposal, or withdraw the application.

For the procurement, the minimum number of bidders must be provided: for pre-threshold bidding - at least 1 bidder, for above-threshold bidders - at least 2 bidders. If the criteria are not met, the purchase will be canceled. If a sufficient number of bidders are submitted to the above-threshold bidding, an auction is announced.

At the time of the announcement of the auction, the electronic system reveals the prices offered by the participants and sorts them in decreasing order. Bidding takes place in three stages - at each of them the participants reduce the price of their offer in a predetermined order. The new stage starts from the last price of the previous one.

Members have no strict price reduction restrictions. The main thing is to adhere to the basic rule: the step of each reduction must exceed the minimum step of the auction specified in the terms of the auction. At each stage, participants can follow the progress of the tender - how price offers change and which of the competitors continues to participate in the auction.

After the third stage of betting, the system makes all offers public for participants. Prices, conditions for the provision of the subject of procurement, as well as documents that confirm the qualifications of potential contractors are disclosed. Based on this data, the customer will evaluate the proposals.

The main criterion for evaluating according to the rules of the tender is economic benefit. Therefore, the order with the lowest price is considered first. After determining the advantageous offer, the customer is given 5 days to study it. In some cases, this period can be extended up to 20 days. If the documentation of the first candidate meets the conditions of the tender, the customer has the right to declare him the winner without considering the rest of the applications - this is the end of the tender procedure.

If the first proposal does not satisfy the customer's requirements, he continues to evaluate the applications. At this stage, not only the price and documentation of the participants are analyzed, but also additional factors:

- acceptable forms of payment;
- terms of warranty service;
- operating costs;
- the proposed terms for the implementation of the contract.

The tender continues either until the final winner is determined, or until all bids are rejected. In the second case, the auction is considered canceled.

After determining the participant, the winner of the tender, an official message about the customer's intention to conclude an agreement is published on the electronic platform. In parallel with this, the ProZorro system informs all participants about the results of the trades. Each of them has the right to contact the customer to explain the competitive advantages of the winner's proposal. Also, participants can submit a complaint to the Authorized Committee if, in their opinion, the tender was held in violation of the current legislation.

In the absence of complaints, the customer and the contractor sign a contract. The procedure is carried out no later than 20 days after the official statement on the conclusion of the contract. This closes the auction. All decisions that were made during the tender in Ukraine are drawn up in the form of a protocol of the Authorized Body or the tender committee.

It should be noted that in the event of the creation of an AMC, not only a tender will be held for a medical company (future partner), but also for a construction company that can build a room for a center in the terminal.

The airport will hold two above-threshold tenders for the procurement of medical services and construction works.

The partner medical company must comply with all legal standards, have a license to provide medical services, qualified and experienced personnel, and also be able to provide all the above-described medical services that are required by the airport.

As for the requirements for a construction company, it must also comply with all legal regulations and have experience in building clinics, medical centers or other medical institutions.

Once the partner medical company will be selected, the areas of responsibility of all parties will need to be identified and their cooperation legalized. In the future, a clear project plan will be concluded, deadlines for work and launch of the medical center will be set.

3.3. Effectiveness evaluation of proposed measures

Once the main measures and aspects of establishing an airport-based medical center have been clarified, it is necessary to evaluate the proposed recommendation. As practice shows, the estimated cost of such projects in Ukraine is about 3-4 million UAH.

This is a significant amount for the airport, whose net profit in 2020 amounted to about 1.6 million UAH. Therefore, in this case, the main source of project funding will be state funding through the Ministry of Health.

On September 15, the Ministry of Finance presented the draft state budget of Ukraine. The priority of 2022 is the healthcare sector. The draft state budget for health care provides about 194 billion UAH. This is almost UAH 35 billion more than in 2021. As we see, the state as a whole is interested in projects related to the fight against COVID-19 so it will be easy to get such funding.

The costs may be allocated as follows:

- half of this amount (from 45-50%) will be spent on the purchase of medical equipment;
- construction of the AMC inside Terminal D – 10-12%;
- center maintenance costs – 7-8%;
- the remaining 25-30% is needed for salaries, payments to partners, advertising and marketing costs.

Ideally, provide for the possibility of ultrasound and X-ray, but it is cheaper to outsource laboratory diagnostics to specialized organizations.

From the idea to the launch of the project, it will take about 6-8 months, which are needed to obtain permits, equip the center and select doctors and other personnel.

It is important to choose the right room that will be convenient to use as a medical center. A good ventilation system, sufficient ceiling heights to ensure air exchange, and a large number of separated rooms are essential. In order to accommodate those doctors who were indicated above and comply with all the norms, you need about 130-150 sq. m.

The passenger turnover of the airport at the moment is about 15-20 thousand passengers, as statistics show, about 5% apply to the medical center. Assessing the scale and the project, it can be noted that the IA “Boryspil” Medical Center will be ready to serve up to 1000 passengers per day.

One of the most important factors affecting the assessment of the effectiveness of the project is the calculation of costs. In order to understand what costs will be, you need to divide them into categories.

The initial costs will be associated with the construction of the medical center. As the research shows, the estimated cost of construction work will be about UAH 150 thousand. This cost includes the cost of building materials and labor costs.

The next step will be to purchase furniture and equipment for work and the organization of workplaces for staff. Approximately 1 workplace will cost 30 thousand UAH. This includes the purchase of furniture (tables, chairs, wardrobes, stationery, office supplies, computer equipment, and other decorative and interior elements). 30 workplaces will cost about 90 000 UAH.

Next come the highest costs - the cost of purchasing the necessary medical equipment. We must understand that we do not need equipment for treating patients, but rather that which is intended for first aid, as well as defibrillators, means of transportation, medical bags, stretchers, ultrasound devices for ambulance, equipment for monitoring and diagnosing the patient's condition, operating tables and other medical furniture. For a more detailed list, it is necessary to negotiate this part of the cost with competent specialists who are well versed in the necessary medical equipment. According to initial expert estimates, these costs are expected to amount to about UAH 2 million.

It is also worth adding that the cost of consumables such as tests, syringes, vaccines, test tubes, etc. per month will be about 150-200 thousand UAH.

Another equally important and significant part of the costs will be the remuneration of labor for the personnel of this center.

According to experts, it is optimal for the medical center to have such doctors: therapist, allergologo-immunologist, ambulance doctors, infectious disease specialist,

cardiologist, nurses, neurologist, otolaryngologist, pediatrician, psychologist, toxicologist, traumatologist, pharmacist, surgeon, epidemiologist.

It is expected that the number of staff will not exceed 30 people. The average salary of a doctor in Ukraine is slightly lower than the average salary in the country and amounts to UAH 17468. according to statistics, given that 10 out of 30 people will be junior medical personnel, whose salary is approximately UAH 10 ths, we can calculate that the approximate labor costs will amount to UAH 440 000.

Another part of the costs will be medicines, it should be borne in mind that they will be purchased both for the center itself and the pharmacy, which will also be a part of it, these costs will amount to 250 000 UAH based on statistical data.

And the smallest group of costs will be associated with utilities and services for the maintenance of the center, it is approximately 2000-4000 UAH.

So after calculating the costs, we can summarize in the form of a Table 3.1. of costs which is presented below.

Table 3.1.

Costs for Creation of AMC at SE IA “Boryspil”

Category	Costs, UAH
Construction of the center	150 000
Furniture and workplaces	90 000
Medical equipment	2 000 000
Consumables	200 000
Salaries	440 000
Medicines	250 000
Utilities	3 000
Total:	3 133 000

Source: developed by author

As we see, the total cost of launching the project amounted to UAH 3 133 000.

Below in the Figure 3.1. you can also see the share of each of the project costs categories for a clearer understanding.

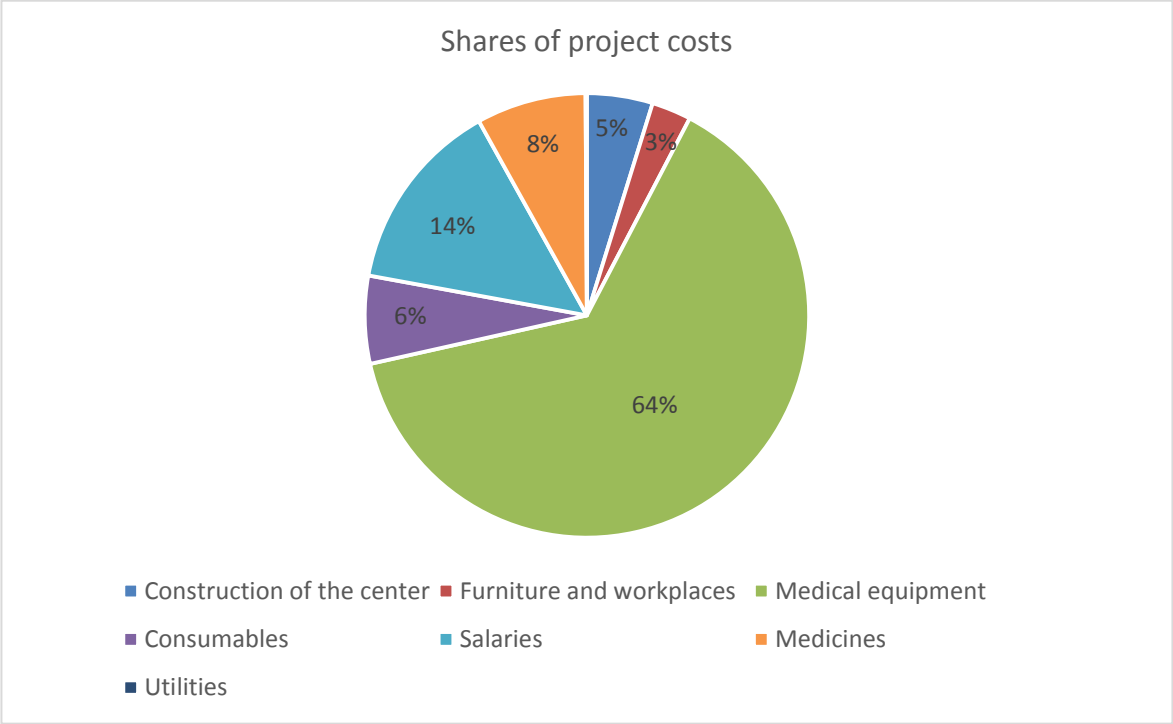

Figure 3.1. Shares of Project Costs

Source: developed by author

As can be seen in the figure and as expected, the largest costs are the purchase of medical equipment, their share was 64%, which is more than half of all other costs. Next are the costs associated with staff salaries, their share is 14% of total costs. Human resources are very important so people need to get good financial motivation. The costs associated with the monthly purchase of drugs and medicines for the pharmacy account for 8% of all total costs. High-quality medicines significantly affect the level of treatment of patients, so their cost justifies itself, and it should be borne in mind that the pharmacy is one of the sources of income. 6% are the costs associated with consumables, the main costs will go to PCR and express tests, as well as materials intended for vaccination.

The lowest costs will be associated with the construction of the premises and its furniture, the share of costs of these categories will be 5% and 3% respectively.

Concerning share of utilies for the first mounth we can’t see it in chart cause its share too small only 0.1% of all costs.

When we talk about the effectiveness and benefits of the proposed project, we must understand that the medical center is not a project that can significantly and in a short time increase the profit of the Boryspil airport. It is worth remembering that its creation is aimed at optimizing the risk of an intensification of the pandemic. Often, when it comes to optimizing risk, it is not an increase in the profitability of an enterprise, but rather a decrease in the likelihood of its fall. Evaluation of the effectiveness of optimization in this case will be more qualitative than quantitative.

At a time when the world is suffering from the complications caused by the pandemic, every enterprise must be ready to work in the new conditions. It is very important to pay due attention to the medical field and the protection of the health of both our clients and employees, especially if we are talking about the service sector.

Boryspil airport is rightfully considered the air gateway of Ukraine. During the first quarter of 2021, the airport served 1.2 million passengers (including 633 thousand passengers on regular flights, 573 thousand on non-scheduled flights). This is 50.5% less than the same period in 2020, but still these are impressive figures. There is always a risk that among such a large number of people there may be a similarly large number of infected. Since at the moment every state in the world is now interested in the development of the health sector, it must fight the migration of the virus, which is mainly imported from other countries by tourists. Therefore, it is so important to conduct a thorough inspection of all passengers who fly out and arrive at the airport.

If we consider the level at which the airport's medical services are located, then it should be said that it is an order of magnitude lower than European airports and significantly lower when it comes to the world's leading airports.

The core goal of creating an airport-based medical center is to optimize the risk of the pandemic's impact on airport operations. In most cases, this will allow the enterprise to carry out uninterrupted work, as health conditions will allow it to be done. In order to evaluate the benefits of the proposed, a qualitative expert evaluation will be used first. Next, it can be listed the main perspectives that gives medical center and which are not currently available in Boryspil.

1. Independence from national and readiness to operate in global lockdowns.
2. Analysis and monitoring of the epidemiological situation at the airport.
3. Development of infection control programs.
4. Rapid PLR and express testing without queues and intermediaries.
5. Provision of all necessary medical permissions or certificates for flight in accordance with international standards.
6. Provision of all needed vaccination services.
7. Provision of highly professional assistance for people with disabilities.
8. Creation of health care and safety awareness programs.
9. Wide range of high-grade medecines and drugs.
10. Total readiness for emergency situation.

By protecting itself and passengers, the airport not only positively affects the level of sickness rate in the country, but also will help prevent the falling demand for passenger air travel, and will be able to inspire confidence in people that even in a pandemic, it is possible to fly and travel safely.

In the future, we can talk about increasing the reputation and attractiveness of the airport not only in the eyes of passengers, but also it can open up new opportunities for international cooperation with other airports or airlines that are also working to improve the health care of their passengers.

The passenger traffic of Boryspil airport in March 2021 increased by more than 10% compared to March 2020, in general last year it decreased by 66%. The passenger traffic of Boryspil airport in March 2021 increased by more than 10% compared to March 2020, in general last year it decreased by 66%. Since the beginning of the year, the airport has served more than 534 thousand passengers, of which 260 thousand are from regular flights, 275 thousand are from non-scheduled flights. Passenger traffic on domestic flights increased by 18.6% (40.1 thousand passengers) compared to March 2020. International passenger traffic is also showing growth - the number of passengers increased by 9.2% (494.3 thousand passengers).

In the first nine months of 2021, almost 7 million passengers used the services of Boryspil Airport, including 4 million regular passengers and 2.8 million non-scheduled passengers. Compared to the same period in 2020, the total number of passengers increased by 72%.

Based on today's statistics and trends, experts made quantitive estimation considering two possible scenarios, taking into account the existing project in case the pandemic intensification again.

The first option is pessimistic, in this case, with the intensification of the pandemic and the introduction of restrictions, the airport will lose about 20% of the current monthly passenger traffic during one quarter (at the moment, the monthly passenger traffic is about 752 670 passengers), as a result, we will receive 602 160 passengers, the losses in monetary terms will be approximately UAH 3 311 220

The second option is optimistic, it is designed so that the project will cope with the tasks set and successfully neutralize the impact of the pandemic and will produce a possible stable increase in passenger traffic during the quarter by 35%, as a result of which 1 016 105 passengers, an increase in profitability in the amount of 5 795 570 UAH. These results can be found in the Table 3.2. and Figure 3.2.

Table 3.2.

Estimation of Risk Scenarios Taking into Account Optimization Measure

Indicator	Pessimistic scenario (losses)	Actual	Optimistic scenario (increases)
Passenger traffic	20% (150 510 passengers) Result: 602 160 passengers	Result: 752 670 passengers	35% (263 435 passengers) Result: 1 016 105 passengers
Income	3 311 220 UAH Result: 1 3247 520 UAH	Result: 16 558 740 UAH	5 795 570 UAH Result: 22 354 310 UAH

Source: developed by author

Lower we can see the chart that shows us the decrease or increase of passenger flow during the first half year of launching the project. Pessimitstic scenario it is pandemic intensification which can’t be mitigated by AMC. Optimistic scenario for

us means that even if risk happens we can mitigate it and after shows about 35% increase of passenger flow.

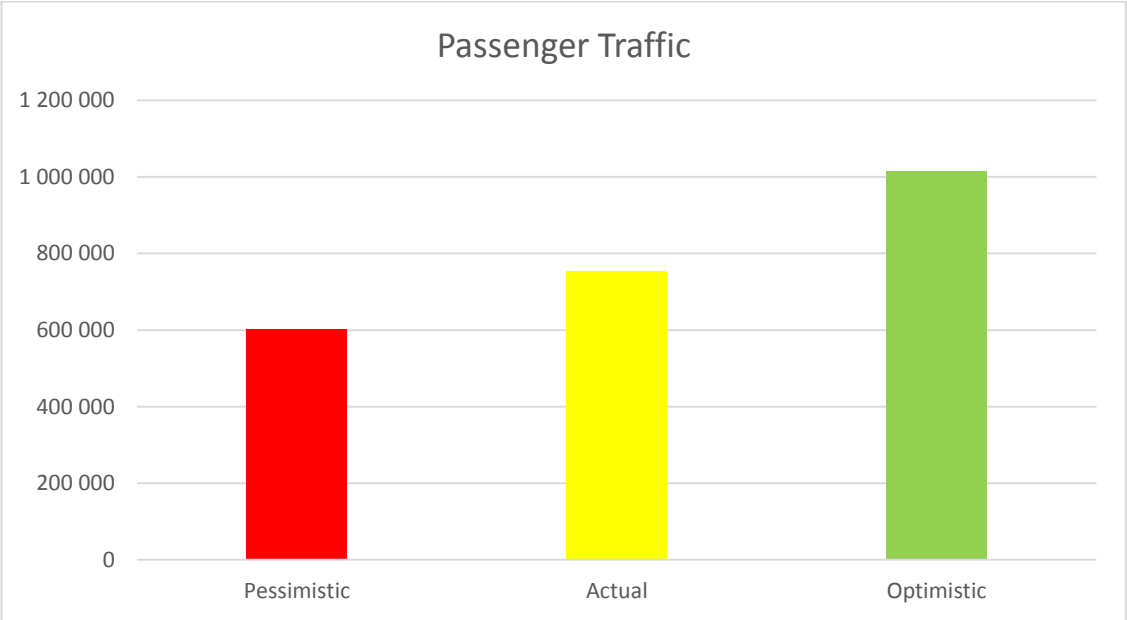

Figure 3.2. Passenger Traffic Comparison in Pessimisitic, Actual and Optimistic Conditions

Source: developed by author

In conclusion, I would like to say that it is quite difficult to accurately predict the effect of the launch of this project, since its success depends on many factors, one of which may be the professionalism of specialists. One thing is clear that at the moment we must deal with the risks that the pandemic brings to our lives, only through trial and error in the end it is possible to get a satisfactory effect. Improving health care at the airport is clearly a necessary and necessary measure. The pandemic can only be defeated if we constantly monitor, analyze, study the coronavirus and introduce corrective measures in time.

CONCLUSION OF PART 3

Risk of pandemic intensification stills relevant for airport due to its unreadiness and medical facilities of the airport All facilities that it has now are: PCR and express testing for coronavirus point, vaccination point, first-aid post, pharmacy;

It is not enough in current conditions to resist pandemic, airport should to all pandemica scenarios.

Also it should be noted that also there is a risk of passengers dissatisfaction of airports service and it come out in different ways among main are: entrance to the airport, lack of supermarket, rudeness of personnel, coordination at the airport, and problems with check-in (especially for inexperienced travelers) for a flight at the airport;

As a result of the of main risks study, it was decided to focus on the risk of intensification of the coronavirus pandemic. At the moment, the medical healthcare facilities of the airport do not fully meet the demand for them thus it can be the most dangerous and unpredictable risk.

To be ready to meet new challenges of COVID-19 it was decided to create Airport Medical Center on the territory of state enterprise “Boryspil”. Main aim of AMC is to help overcome pandemic intensification risk and improve health care facilities at the airport. To increase success of the project it was decided to attract such partners as Ministry of Health and private medical company. Such combination helps to attract bigger funds and professional expirience to the project.

After calculation it was found that approximate cost of project will comply about 3 133 000 UAH and main source of funds will be state budgeting.

AMC creation is not that kind of project that aimed at huge economic effect in short period of time. It is usefulness are prespectives that opens AMC in current pandemic conditions. To estimate the effectiveness of project was chosen qualitative and quantitative expert assement.

The core goal of creating an airport-based medical center is to optimize the risk of the pandemic's impact on airport operations.

The main perspectives that gives medical center and which are not currently available in Boryspil are: independence from national and readiness to operate in global lockdowns; analysis and monitoring of the epidemiological situation at the airport, development of infection control programs, rapid PLR and express testing without queues and intermediaries, provision of all necessary medical permissions or certificates for flight in accordance with international standards, provision of all needed vaccination services, provision of highly professional assistance for people with disabilities, creation of health care and safety awareness programs, wide range of high-grade medecines and drugs, total readiness for emergency situation.

By protecting itself and passengers, the airport not only positively affects the level of sickness rate in the country, but also will help prevent the falling demand for passenger air travel, and will be able to inspire confidence in people that even in a pandemic, it is possible to fly and travel safely.

In the future, we can talk about increasing the reputation and attractiveness of the airport not only in the eyes of passengers, but also it can open up new opportunities for international cooperation with other airports or airlines that are also working to improve the health care of their passengers.

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Thus, all mentioned about recommendations shows practical usefulness and help optimize risk of pandemic intensification. It also can be good basis to open new perspectives and develop international relations taking into account current pandemic conditions and develop health care programms for passenger during air transportation.

CONCLUSION

Based on the results of the Qualification study of theoretical and methodological aspects of the formation of an effective risk management process of the enterprise, the following conclusions can be made.

In simple terms, risk is the possibility of something bad happening. Risk involves uncertainty about the effects/implications of an activity with respect to something that humans value (such as health, well-being, wealth, property or the environment), often focusing on negative, undesirable consequences. Many different definitions have been proposed. The international standard definition of risk for common understanding in different applications is “effect of uncertainty on objectives”.

Risk management is an important factor in the effectiveness of the organization, because without it it is almost impossible to define their goals for the future. And if a company sets goals without taking risks into account, there is a high probability that it will suffer losses.

Entrepreneurship without risk does not exist. The greatest profit, as a rule, is brought by market operations with increased risk. The risk must be calculated to the maximum allowable limit. As you know, all market assessments are of a diverse nature. It is important not to be afraid of mistakes in your market activity, since no one is immune from them, and most importantly, not to repeat mistakes, constantly adjust the system of actions from the position of maximum profit.

There are 6 schools of risk management, among them: American, English, Australian, German Swiss and Japanese. The most famous school in the theory of financial risk and risk management since 1955 is the American school.

It was analyzed steps of risk management process. The methodology consisting of the following steps: risk identification, risk assessment, risk mitigation.

The studied enterprise is Boryspil International Airport is the main and largest international passenger airport in Ukraine and its capital, serving Kyiv, the Kyiv agglomeration and other regions of Ukraine, providing almost 2/3 of the country's air

traffic. Boryspil is the only airport in Ukraine that carry passengers to transcontinental directions. It serves more than 15 million domestic and foreign passengers per year.

Boryspil International Airport took the fourth place in the rating of airports with passenger traffic from 10 to 25 million passengers. This is stated in a report for July 2021, which was published by Airports Council International.

Boryspil was included in The World's Best Airports in 2021 rating by the British consulting company Skytrax, taking fifth place among the best airports in Eastern Europe.

Company significantly lost its financial positions of the last years. Such a fall related with pandemic and problems which it brings as to global economy and as to one of most intense sectors such – aviation.

The greatest threat to the company is posed by functional risks related to the external environment, namely: regulatory risks (deviations from planned indicators due to changes in laws or regulations), socio-political risks (deviations from planned indicators due to destabilization of the social and political situation), economic risks (deviations from planned indicators due to changes in the economic situation), force majeure (deviations from planned indicators due to natural disasters, pandemics, etc.).

SWOT analysis helps us to understand that if the management of the researched enterprise improves technological processes, increases the competence and experience of staff, it will allow (better than competitors) to take advantage of the planned growth of services (opportunity), and ensure greater competitiveness in light of growing customer demand (threat).

The airport development strategy according to the matrix in provides a hub model of activity (large hub airport), for the implementation of which the airport management must work on building an infrastructure capable of serving transfer passenger flows.

In the prospect of 15-20 years, Boryspil is seen as the main air gate of Ukraine, a strong hub, an airport that will serve well-known airlines and provide a European level of comfort for both passengers and airlines.

SWOT-analysis allows to identify the most significant factors that require change. They are: financial problems, low quality of service, unqualified and inexperienced staff, interruptions in the work of the airport, insufficient range of non-aviation services, high prices, corrupt leadership.

Experts examination of main risks and its groups help us to understand that the main risks of enterprise are threat of pandemic intensification, and negative experience of passenger experience due to inconveniences caused by airport.

The original points in this methodology are the causes identified associated with each risk by analyzing other studies and the risk probability assessment through to the cumulative probability of the causes identified.

Total probability theorem is the conditional probability assessment $P(E/C_i)$ and was established by analyzing the national database for causes belonging environmental and surface conditions categories and by analyzing the international database for causes belonging aircraft performance characteristics category and hazard severity assessment by analyzing of national database.

The risk management concept is equally important in all aviation sectors and should be implemented in a consistent manner by airline operators, air navigation service providers, certified aerodrome operators, maintenance organisations and training organisations. Its strategies include identifying the risk, assessing the risk, avoiding or mitigation the risk or accepting certain risks.

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APPENDIXES

Appendix A

Aegean Airlines	Seasonally: Athens
Air Arabia	Sharjah
Air Astana	Almaty, Nur-Sultan
Air France	Seasonally: Paris-Charles de Gaulle
Air Malta	Malta
airBaltic	Riga, Vilnius
Austrian Airlines	Vienna
Buta Airways	Baku
Azur Air Ukraine	Charter: Hurghada, Sharm el-Sheikh Seasonal charter: Antalya, Barcelona, Bodrum, Burgas, Dalaman, Dubai Al Maktoum, Enfida, La Romana, Cam Ranh, Punta Cana
Belavia	Minsk

Bulgaria Air	Sofia (from 30April 2021)
Czech Airlines	Prague
Cyprus Airways	Seasonally: Larnaca
El Al	Tel-Aviv
flydubai	Dubai
Georgian Airways	Tbilisi
KLM	Amsterdam
LOT Polish Airlines	Warsaw-Chopin
Lufthansa	Frankfurt, Munich
Pegasus Airlines	Ankara, Bodrum, Izmir
Qatar Airways	Doha
Ryanair	Athens, Barcelona, Berlin, Bologna, Bratislava, Bydgoszcz, Catania, Cologne / Bonn, Dublin,

	Dusseldorf-Weeze, Frankfurt-Hahn, Gdansk, Karlsruhe, Katowice, Krakow, London-Stansted, Madrid, Milan-Bergamo Poznan, Riga, Rome-Fiumicino, Sofia, Treviso (since July 3, 2021) [43], Valencia, Vienna, Vilnius, Warsaw-Modlin, Wroclaw
Scandinavian Airlines	Oslo-Gardermoen, Stockholm-Arlanda
SkyUp	Almaty, Barcelona (since October 2, 2021), Batumi, Paris-Beauvais (since October 2, 2021), Bologna (since October 1, 2021), Dubai, Istanbul, Katowice (since August 24, 2021), Larnaca, Lisbon (since August 23, 2021), Lodz (since July 26, 2021), Naples (since October 3, 2021), Pardubice (since August 23, 2021), Prague (since August 24, 2021), Rome Fiumicino (since October 3, 2021), Tashkent, Tbilisi, Yerevan Seasonally: Bodrum, Burgas, Colombo, Corfu, Helsinki, Dubrovnik, Izmir, Heraklion, Kayseri, Lyon (from October 2, 2021), Marseille (from October 1, 2021), Nice (from October 3, 2021), Odessa, Poprad, Pula, Rhodes, Salzburg, Sofia, Split, Tirana, Tivat, Varna, Zanzibar Charter: Hurghada, Sharm el-Sheikh Seasonal charter: Antalya, Dalaman, Marsa Alam, Hambantota, Monastir, Madeira

Swiss International Air Lines	Zurich
Turkish Airlines	Istanbul
Ukraine International Airlines	Amsterdam, Ankara, Athens, Baku, Barcelona, Milan-Bergamo, Berlin, Brussels, Bucharest, Budapest, Cairo, Chernivtsi, Chisinau, Copenhagen, Delhi, Dnipro, Dubai, Dusseldorf, Frankfurt, Geneva, Helsinki, Istanbul, Istanbul Kharkiv, Kherson, Larnaca, London-Gatwick, London-Heathrow, Lviv, Madrid, Milan-Malpensa, Munich, Naples, New York-JFK, Odessa, Paris-Charles de Gaulle, Prague, Rome-Fiumicino, Sofia, Stockholm -Arlanda, Tbilisi, Tehran-Imam Khomeini, Tel Aviv, Toronto-Pearson, Venice, Vienna, Vilnius, Warsaw-Chopin, Yerevan, Zaporozhye, Zurich Seasonal: Izmir, Nice, Palma de Mallorca, Salzburg Seasonal charter: Antalya, Bodrum, Dalaman, Erzurum, Hurghada, Ioannina (since June 19, 2021), Kayseri, La Romana, Male, Marsa Alam, Mattala, Madeira, Sharm el-Sheikh
Windrose Airlines	Belgrade, Bucharest, Dnipro, Ivano-Frankivsk, Kharkiv,

	Kherson, Ljubljana, Lviv, Mykolaiv, Odessa, Sofia, Zagreb, Zaporizhia, Chernivtsi (since June 1, 2021) Seasonally: Ancona, Barcelona, Bodrum, Burgas, Dubrovnik, Heraklion, Lamezia Terme, Larnaca, Patras, Pula, Rhodes, Split