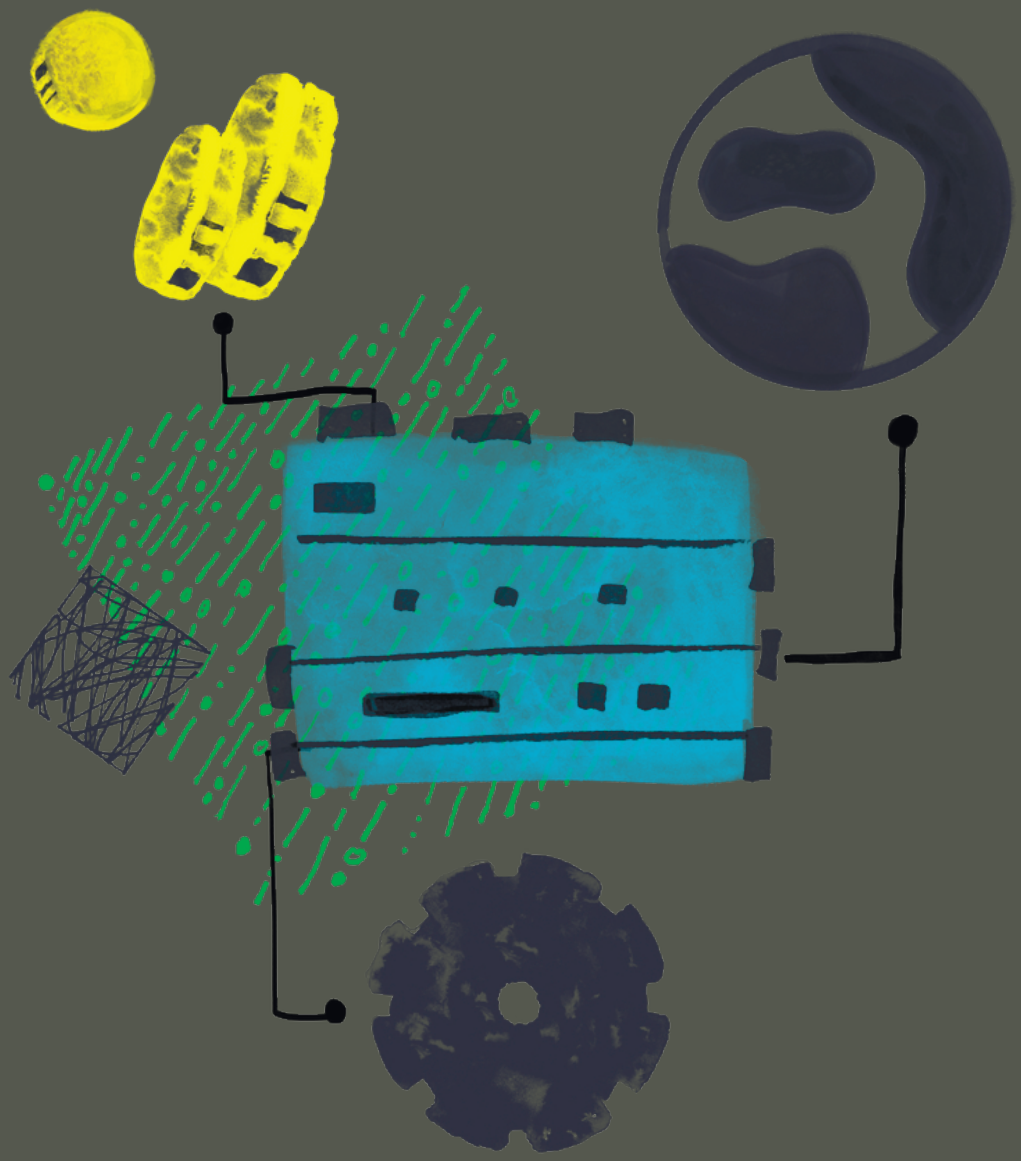
O. O. NESTERENKO, N.S. KOVALEVSKA, I.V. NESTERENKO

AUDIT OF INTEGRATED REPORTING IN CONTEXT OF SUSTAINABLE DEVELOPMENT



TEADMUS
SERVICE FOR SCIENTISTS

2021

State Biotechnology University

O. O. NESTERENKO, N.S. KOVALEVSKA, I.V. NESTERENKO

AUDIT OF INTEGRATED REPORTING IN CONTEXT OF SUSTAINABLE DEVELOPMENT

Tallinn
Teadmus
2021

Reviewers:

Doctor of Ekonomics, Professor Head of the Chair of Managerial accouting and audit, ASUE, Liana Grigoryan

Vise-rektor of science in State Biotechnological University, T. Vlasenko

Nesterenko O. O., Kovalevska N.S., Nesterenko I.V. **Audit of integrated reporting in the context of sustainable development**: monograph, State Biotechnology University. – Tallinn: Teadmus OÜ, 2021, 112 p.

ISBN 978-9916-9704-5-4

This monograph reflects the results of applied research "Integrated reporting as a communication component of sustainable development management of economic entities in conditions of uncertainty" (0119U002175). The monograph presents the author's approach to solving urgent issues of organizing the audit of integrated reporting in the conditions of Ukraine's integration into the EU. The methodological principles of the audit integrated reporting are founded; scientific and practical approaches to assessing risks of the audit integrated reporting in conditions of uncertainty are developed; prospective directions of environmental audit as a tool for international environmental security are defined and specified.

This work is intended for scientists, teachers, managers and specialists of enterprises as well as for students of economic specialties of institutions of higher education.

ISBN 978-9916-9704-5-4

CONTENT

INTRODUCTION

The processes of European integration in Ukraine require appropriate search for new audit organization instruments based on the use of information on the strategic, industrial, social, and managerial activities of a business entity. Modern requirements for the management information base go beyond financial statements and require data on the economic, social and environmental aspects. The adopted Strategy for the IFRS Application in Ukraine has created the basis for further reforming the accounting and auditing system and disseminating information on economic issues in accordance with international standards to ensure openness, transparency and comparability of financial reporting indicators of enterprises. At the same time, the need to develop a system for auditing integrated reporting is increasing in the context of the financial crisis, as the very formation of reporting is a convenient tool for veiling the real financial status of business entities.

The monograph “Audit of integrated reporting in cotext of sustainable development” presents the author's approach to solving theoretical, organizational, methodological and applied issues of systematic support for the integrated reporting audit in the context of sustainable development of business entities.

Methodological provisions for audit integrated reporting, which, in contrast to existing ones, are based on the definition of criteria for compliance with economic, social and environmental requirements of the concept of sustainable development. This makes it possible to create organizational and methodological tools to confirm the environmental, economic and corporate social responsibility of the business entity; to increase investment attractiveness of the enterprise; to create a favorable social and psychological climate; to increase labor productivity and corporate loyalty; to increase the level of interaction with public authorities; to evaluate the effectiveness of spending on social needs; to reduce environmental pollution risks; to increase demand for goods and services on both foreign and domestic markets andto bring the subject of economic activity to the international level in accordance with the world ecology standards.

The developed methodological principles and practical tools of integrated reporting in audit allow forming a scientific basis to assess the effectiveness of accounting and analytical support, internal processes and compliance with corporate ethics, environmental protection and ideals of socially responsible management, contributing to the optimization of key indicators of economic activity. The authors hope that this monograph will be useful for teachers, managers and specialists of enterprises, researchers, graduate students, miners of higher education in the field of accounting, auditing and taxation, as well as readers who are interested in the organization of audit integrated reporting of sustainable development of business entities.

1. ENVIRONMENTAL AUDIT AS A TOOL FOR INTERNATIONAL ENVIRONMENTAL SECURITY

Today, the domestic food industry, aspart of the agro-industrial complex, combines more than 40 sub-branches and manufacturing departments, in which about 15 thousand economic entities are involved. These are powerful modern enterprises that are on par with headline players in the world market, small and medium processors actively increasing the volume of products to fill the domestic market and gradually enter the foreign ones [1].

According to official statistics, the sales of food industry products in Ukraine have been steadily increasing (Table 1, Figure 1).

Table 1

Dynamics of food industry sales in Ukraine, million UAH [2].

Rate (year)	**2014**	**2015**	**2016**	**2016**	**2017**	**2018**	**2019**	**2020**
Value of industrial output (total)	1331886	1400680	1354130	1428839	1776604	2158030	2608027	3045201,9
Manufactu-ring industry	852537,4	871146,6	817734,3	903735,3	1139213,2	1312729,0	1627504,3	1885406,2
Food, beverage and tobacco production	222387,8	254459,9	261783,7	302391,9	398023,2	462418,9	548377,9	589854,5
- in % of total industrial output sold	16,7	18,2	19,3	21,2	22,4	21,4	21,0	19,4
– in % of process industry output sold	26,1	29,2	32,0	33,5	34,9	35,2	33,7	31,3

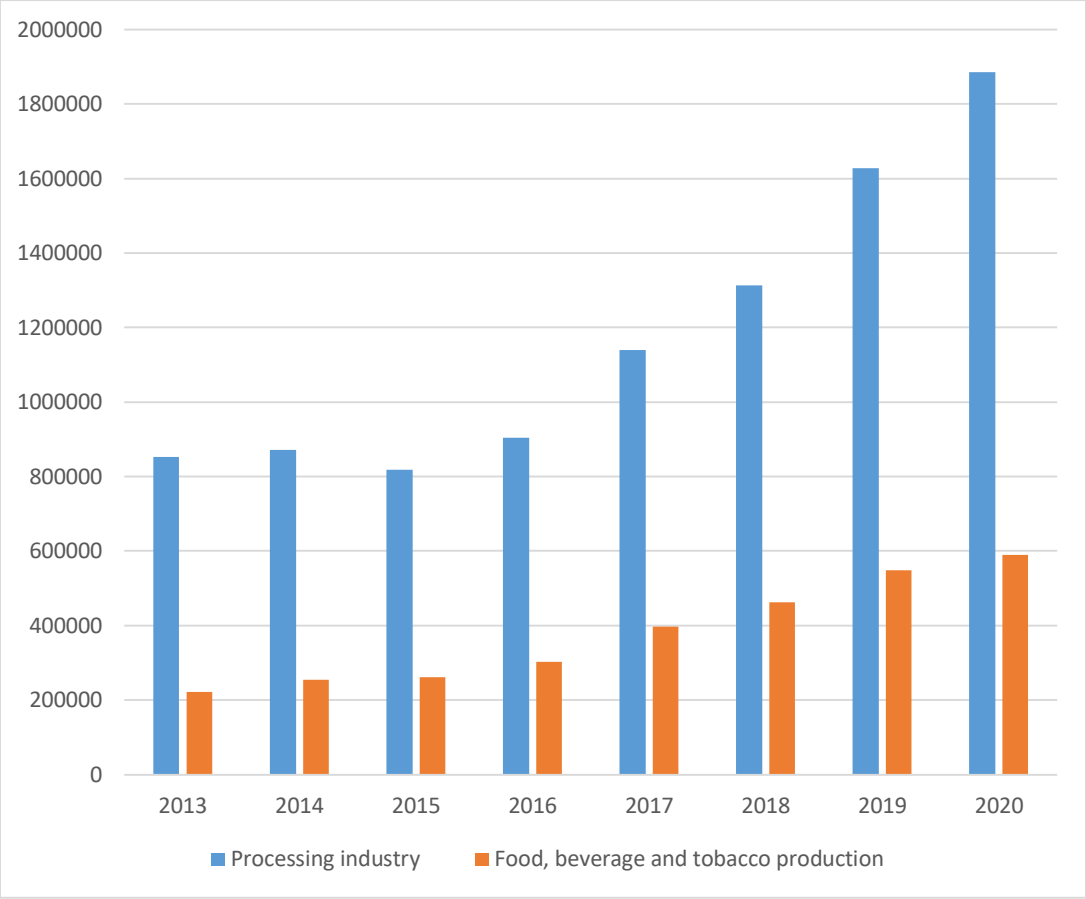


Fig. 1 - Dynamics of food industry sales in Ukraine, million UAH [2].

At the same time, the production of organic products is rapidly gaining popularity. In 2019, the amount of organic food and drinks was sold for 97 billion dollars in U.S. In Europe, the area of land involved in organic production is 14.6 million hectares, 289 thousand hectares of which are located in Ukraine [3].

The food-processing industry has a significant impact on the environmental and economic development of the world, because this sphere of economy, on the one hand, uses natural resources in economic activity, and on the other hand, produces environmentally friendly products directly affecting their health and development of society.

Therefore, the key information resources and development aspects of natural capital management in food-processing industry requires advanced theoretical studies and search for practical solutions.

Food industry enterprises emit polluting substances into atmosphere, dirty sewage discharges into surface impoundment and leave industrial and household solid waste during production. The composition, dynamics and volume of pollutants produced by the food industry depends on many factors: the equipment in service, production technologies, quality of raw materials, the organization of production process as well as storage and sale of manufactured goods, the scale of consumption of raw materials and energy, production and sale of manufactured goods, etc. [4, c. 62]. At the same time, the activity of food industry has a positive impact on a number of socio-economic parameters of the country's development [5, p. 8].

Our state must focus its main efforts to implement effective state regulation of the food industry in Ukraine to develop the production of high-tech environmental products with high added value. This will ensure a general increase in the competitiveness of food products and raise the level of industrial and technological processing [6, p. 83]. At the same time, we must keep in mind that the processing industry is one of the sectors of the economy that significantly affects the consumption of ecosystem services and has a significant impact on the environment and the health of citizens.

Today, the total value of ecosystem services is about $124.8 trillion a year, which is twice the size of the world’s GDP [7]. About a third of the natural resources that humanity loses in a year are not reproducible [7]. Between 1970 and 2018, there was a 60% decline in total population numbers, and the rate of species extinction is now 100-1000 times higher than the reference values before the increase in anthropogenic pressure [8, p. 18]. If no environmental protection measures are taken, humanity will require a natural capital equivalent to two planets of Earth to exist by 2030 [9].

Specialists of the Public Institution "Institute of Environmental Economics and Sustainable Development of the National Academy of Sciences of Ukraine" determined the value of natural wealth of Ukraine to be 1060 billion UAH. At the same time, the structure of natural resources is as follows: water resources - 6.4% of the total value (67.9 billion UAH) land resources - respectively 44.7% (473.9 billion

UAH) forest resources - 7.9% (84.6 billion UAH) mineral resources - 24.8% (263.0 billion UAH). According to the aggregated approach, the ecosystem component of natural wealth equals 16.2% of its total value, namely 170.6 billion UAH (calculated as on 01.01.2018 in accordance with the exchange rate of 8 UAH/USD. USA) [10]

The global stability of the entire biosphere, the survival of humanity in the long term depends on the viability of ecosystems. Degradation of natural resources, their pollution and loss of biodiversity reduce the ability of ecological systems to self-recovery [11, p. 225]. Degradation of nature is one of major global problems. Key issues for drawing up a global strategy to reduce human's harmful impact on the environment and halt the loss of biodiversity were highlighted in the Living Planet anniversary edition report and the Nature Sustainability (dated Sept. 14, 2018). The representatives from around the world noted that the planet's natural systems are critical to society's existence, and expressed doubts that setting ambitious and clear goals and defining further actions is sufficient to restore the ecosystem to a level that promotes harmonious coexistence between humans and wildlife [8].

It is time to understand that the sustainability of the properties and integrity of the Earth's envelopes (atmosphere, hydrosphere, lithosphere and biosphere) is fundamental for the safe functioning and sustainable development of life in every corner of the Earth. The ecological safety must be ensured from the system to the element. In other words, it makes sense to talk of the ecosystem component safety only when the state of the whole system is safe [12, p. 26]. Manufacturing progress should be achieved by increasing the efficiency of use and conservation of raw materials, that is, not zero economic growth was advocated, but zero increase in the environmental consumption [13, p. 15]. Humanity can only find ways of planet sustainable development to avoid a possible premature disappearance from the face of the Earth because of self-destruction under the influence of our own barbaric actions towards the surrounding reality. [14] Awareness of ecosystem problems at the world level has led to a number of international initiatives to find ways of improving the situation, which can be united under the banner of achieving sustainable development goals. A chronological interpretation of key international events aimed

at addressing environmental issues is presented at Figure 2.

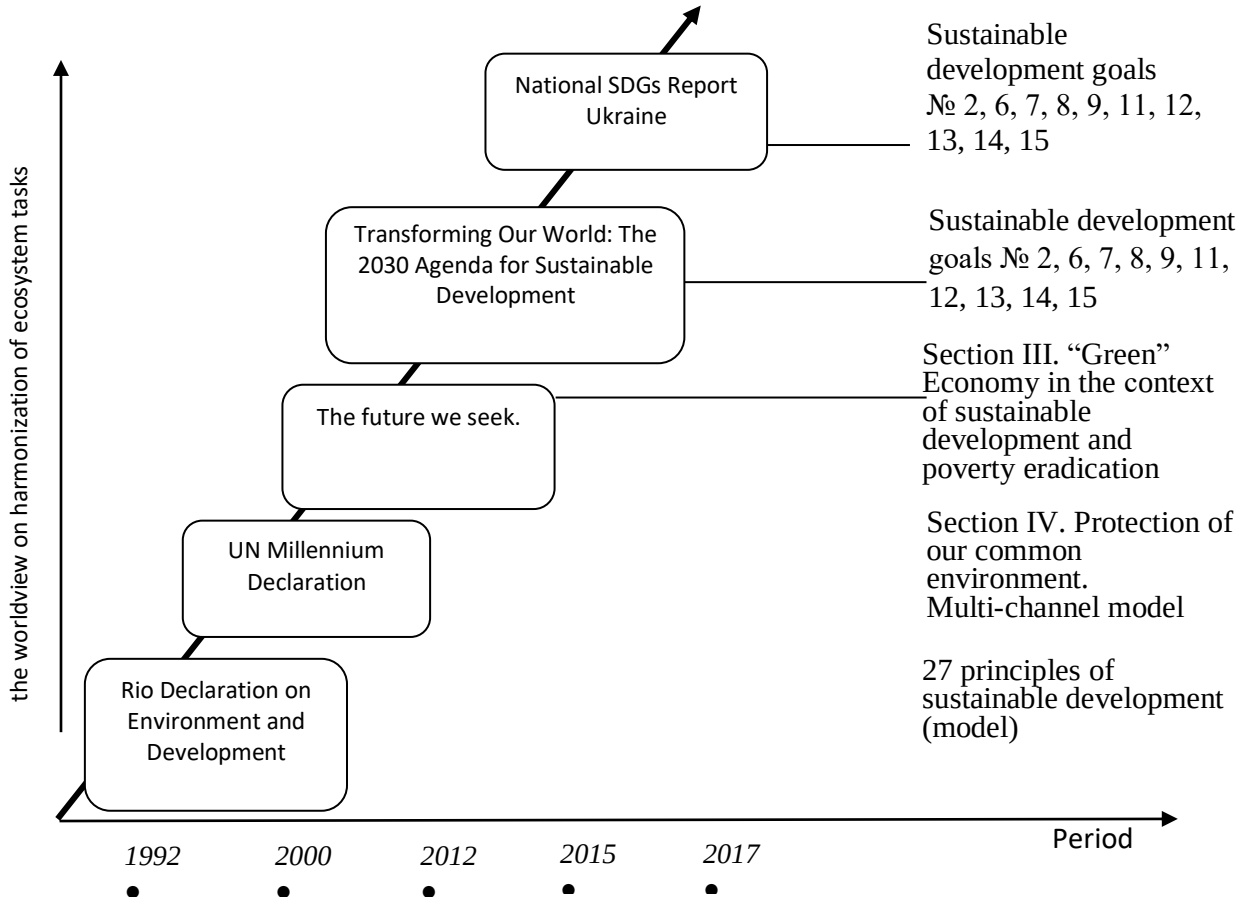


Fig. 2 - Formation stages of international initiatives for the protection of natural capital

As we can see, the process of development and adoption of effective environmental legislation by the countries of the world was initiated on June 14, 1992 by the Rio Declaration on Environment and Development. This declaration became the final document, which summarized the achievements of the world community that became the basis for the Global Agenda 21.

OnSeptember 25, 2015 humanity's focus vectors took on a modern form in the program document "Transforming Our World: Agenda 2030," which established 17 sustainable development goals (poverty, hunger and food security, health, education, gender equality, water and sanitation, energy, economic growth, infrastructure and industrialization, inequality, cities, sustainable consumption and production, climate change, oceans, biodiversity, peace and justice, partnership. They are divided into 169 goals. The environmental sphere covers selected indicators of the 10 SDGs goals from the existing 17 ones. (Table 2, Annex A).

Table 2

Sustainable development goals related to environmental auditing

Global task	National task
1	2
Goal 2. Overcome hunger, achieve food security, improve nutrition, and promote sustainable agriculture (global definition)	
2.4 Implement sustainable food production systems and agricultural practices that improve resilience and productivity and increase output rates, contribute to ecosystem conservation, strengthen adaptive capacity to climate change, extreme weather events, droughts, floods and other disasters, and progressively improve land and soil qualityup to 2030.	2.3 Ensure the establishment of sustainablefoodproduction systems that preserve ecosystems and gradually improve land and soil quality, primarily through the use of innovative technologies.
Goal 6. Ensure availability and sustainable management of water resources and sanitation	
6.3 Improve water quality by reducing pollution, eliminating waste discharges and minimizing releases of hazardous chemicals and materials, halving the proportion of untreated wastewater and significantly increasing recycling and safe sewagereuse worldwideup to 2030.	6.3 Reduce the volume of untreated wastewater discharges, especially through the use of innovative wastewater treatment technologies at the national and individual levels
Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy sources for everyone	
7.2 Significantly increase the share of energy from renewable sources in the global energy mix up to 2030.	7.3 Increase the share of energy from renewable sources in the national energy mix, in particular through the introduction of additional capacities of facilities producing energy from renewable sources
7.a. Enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency, as well as advanced and clean fossil fuel technologies, to encourage investment in energy infrastructure and clean energy technologies up to 2030.	-
Goal 8. Promote progressive, integrated and sustainable economic growth, full and productive employment and decent work for everyone (global definition)	
8.4 Throughout the entire period until the end of 2030, gradually improve the global efficiency of resource use in consumption and production systems and seek to ensure the economic growth to be environmentally sustainable, as set out in the 10-Year Framework of Programmes for Sustainable Consumption and Production. Moreover, the developed countries should be the first to deal with this issue.	8.2 Improve the industrial efficiency based on the principles of sustainable development and the development of high-tech competitive industries.

Extended tables 2

1	2
Goal 9. Material intensity of GDP (ratio of the volume of intermediate costs from input-output tables of activities that produce tangible products to total GDP)	
9.4 Modernize infrastructure and retrofit industrial enterprises, making them sustainable through increased resource efficiency, widespread use of clean and environmentally sound technologies and industrial processes, involving all countries according to their individual capabilities up to 2030.	-
Goal 11. Ensure openness, safety, resilience and environmental sustainability of cities and human settlements	
11.3 Expand inclusive and sustainable urbanization and opportunities for integrated and sustainable participatory human settlements planning and management in all countriesup to 2030.	11.2 Ensure the development of settlements and territories solely on the basis of integrated planning and management with public participation.
11.4 Increase efforts to protect and preserve the world's cultural and natural heritage.	11.3 Ensure the preservation of cultural and natural heritage with the involvement of the private sector.
11.6 Reduce the negative environmental impact of citiesper capita, in particular through focusing on air quality, urban and other waste management up to 2030.	11.5 Reduce the negative impact of pollutants, including the city environment, in particular through the use of innovative technologies.
11.a. Maintain positive economic, social, and environmental linkages between urban, suburban and rural areas through improved national and regional development planning.	-
Goal 12. Ensure the transition to sustainable consumption and production patterns	
12.2 Achieve sustainable development and efficient use of natural resourcesup to 2030.	12.1 Reduce the resource intensity of the economy.
12.4. Achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with internationally agreed principles, significantly reduce their release into the air, water and soil to minimize their negative impact on human health and the environmentup to 2030.	12.3 Ensure the sustainable use of chemicals based on innovative technologies and industries.
12.5 Substantially reduce waste through prevention, reduction, recycling and reuse up to 2030.	12.4 Reduce waste generation and increase recycling and reuse through innovative technologies and industries.
12.6 Encourage companies, especially large and transnational ones, to adopt sustainable industrial practices and to display information about sustainable resource use in their reports.	-
12.8 Ensure that people around the world have relevant information and knowledge about sustainable development and a way of life in harmony with nature up to 2030.	-

Extended tables 2

1	2
Goal 13. Implementation of urgent measures to combat climate change and its impacts.	
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	13.1 Limit greenhouse gas emissions in the economy.
13.3 Improve education, information dissemination and the ability of people and institutions to mitigate and reduce the impacts of climate change, adaptation to them and early prevention.	-
Goal 14. Conservation and sustainable use of the oceans, seas and marine resources for sustainable development	
14.1 Implement prevention and significant reduction of any pollution of the marine environment, the results of land-based activities, including marine debris and nutrient contamination up to 2025.	14.1 Reduce marine pollution
14.2 Ensure the sustainable use and protection of marine and coastal ecosystems to prevent significant harmful impacts through increasing the resilience of these ecosystems, and take measures to restore them to ensure proper ecological status and productivity of the oceans up to 2020.	14.2 Ensure the sustainable use and protection of marine and coastal ecosystems and enhance their resilience and recovery using innovative technologies.
14.4 Ensure effective regulation of fishing, to end overfishing, illegal, unregistered and unregulated fishing and destructive fishing practices; to implement science-based management plans to restore fish stocks as soon as possible to achieve levels that maximise sustainable yields based on the biological characteristics of these stocks by 2020.	14.3 Establish effective regulation of marine bio-resource extraction.
14.5 Cover at least 10% of coastal and marine areas with environmental measures in accordance with national and international law and on the basis of the best available scientific information up to 2020.	-
Goal 15. Protection and restoration of terrestrial ecosystems as well as promotion of their sustainable use, sustainable forest management, combating desertification, halting and reversing land degradation and stopping the loss of biodiversity	
15.1.Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, including forests, wetlands, mountains and drylands, in line with obligations under international agreements up to 2020.	15.1. Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems.
15.2. Promote sustainable management of all types of forests, stop deforestation, restore degraded forests, considerably enhance forest planting and reforestation worldwide up to 2020.	15.2. Promote sustainable forest management.
15.3. Combat desertification, restore degraded lands and soils, including those affected by desertification, drought and floods; strive to avoid land degradation worldwide up to 2030.	15.3 Restore degraded lands and soils using innovative technologies.

End tables 2

1	2
15.4 Ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their ability to provide the benefits necessary for sustainable development up to 2030.	15.4 Ensure the conservation of mountain ecosystems.
15.5 Take immediate and meaningful measures to stop the degradation of natural habitats, to halt the loss of biodiversity, to conserve and prevent the extinction of endangered species up to 2020.	
15.6 Promote the equitable sharing of benefits arising from the utilization of genetic resources and help to ensure appropriate access to such resources under internationally agreed conditions.	
15.7 Take immediate measures to end poaching and smuggling of protected species of flora and fauna, and address both the demand and supply of illicit wildlife products.	
15.8. Take measures to prevent invasive alien species from entering the aquatic and terrestrial ecosystems, and to prevent limitation or elimination of priority species up to 2020.	
15.9. Ensure that ecosystem and biodiversity values are integrated into national and local development planning and processes, as well as into poverty reduction strategies and plans up to 2020.	
15.a. Mobilize and significantly increase financial resources from all sources for the conservation and sustainable use of biodiversity and ecosystems.	
15.b. Mobilize significant resources from all sources and at all levels to fund sustainable forest management, and provide developing countries with adequate incentives for such management in order to preserve and restore forests.	
15.C. Intensify global efforts to combat poaching and smuggling of protected species by improving local livelihood opportunities in an environmentally sustainable manner.	

To date, Ukraine has already made significant efforts to the process of formation of national institutional model to ensure the achievement of the SDGs. Ukraine has developed a regulatory framework for achieving the SDGs, in particular regarding environmental safety. In recent years, a number of Ukrainian laws

regulating production and environmental activities of economic entities, territorial communities and society as a whole have been adopted.

They include the Law of Ukraine "On Environmental Protection", the Law of Ukraine "On Air Protection", the Law of Ukraine "On Environmental Expertise", the Law of Ukraine "On Waste", the Law of Ukraine "On Environmental Audit".

At the same time, the ecological situation in our country still cannot be assessed positively. According to the Global Alliance on Health and Pollution (GAHP), Ukraine in 2019 entered the top five countries with high mortality due to the environment and took the fourth place among European countries by the number of deaths caused by pollution. About 60,000 people die annually in Ukraine because of environmental pollution [15]. According to the Yale Center for Environmental Law and Policy, Ukraine ranked 109th among 180 countries of the world on the Environmental Performance Index.

It allows to measure the achievements of the country in terms of environmental conditions and management of natural resources on the basis of 22 indicators in 10 categories, reflecting various aspects of the state of the environment and the viability of its ecological systems, conservation of biodiversity, combating climate change, public health, economic activity practices and the degree of its pressure on the environment.

According to this indicator in 2016, Ukraine ranked 44th, that is, for 2 years we have lost 65 points in the ranking of environmental effectiveness (79.69 in 2016 compared to 52.87 in 2018).

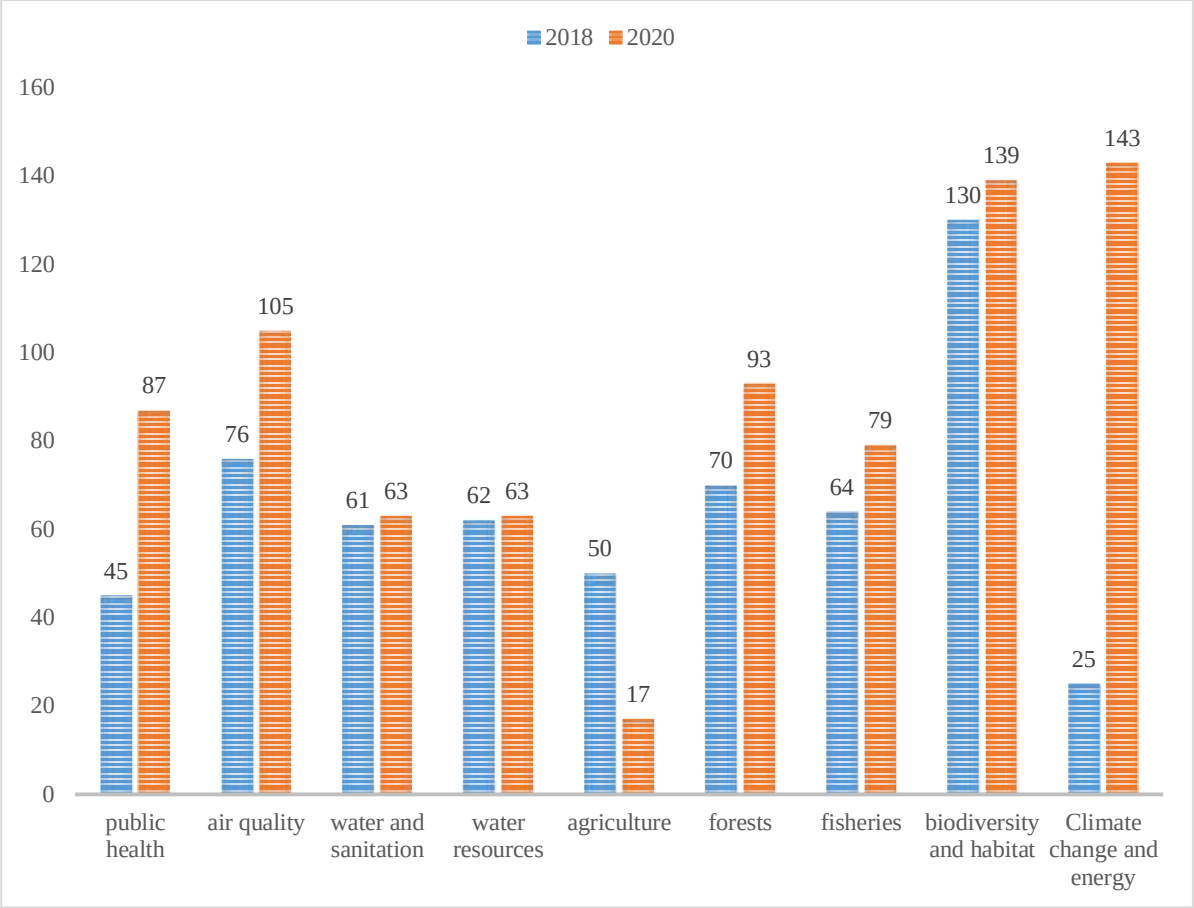


Fig. 3 - Evaluation of environmental effectiveness indicators of Ukraine

Compiled from [16]

Ukraine is ranked 63rd on the food security index, which measures the policies of states and the effectiveness of their institutions in the area of food security. For the analysis, three main Food Security Indicators Groups of the countries of the world are examined - the level of food availability and consumption, food availability and sufficiency and the level of food quality and safety. These categories include 28 different indicators measured over a two-year period. The calculation uses data from international organizations and national institutions. The final Global Food Security Index ranking can be identified on the basis of the indicators.

A high position in the ranking means that the country's food security is at a high level. However, according to this indicator, Ukraine, unfortunately, is behind such post-Soviet countries as the Czech Republic, Poland, Hungary, Estonia, Romania, Russia, Belarus, Bulgaria, Serbia, Azerbaijan and Kazakhstan (Table 3).

Table 3

Global Food Security Ranking

Ranking	Country	Price availability	Availability and sufficiency	Quality level	Index
1	Singapore	94.3	81.0	78.1	85.9
2	Ireland	87.8	83.6	84.8	85.5
3	Great Britain	82.6	88.8	80.4	85.0
4	USA	86.8	83.2	85.4	85.0
11	Germany	82.9	83.6	79.7	82.7
21	Spain	79.2	74.9	83.6	78.0
24	Czech Republic	77.9	75.4	73.7	76.1
26	Poland	76.4	75.0	74.1	75.4
30	Hungary	75.6	70.5	72.0	72.8
35	Estonia	73.6	69.4	64.6	70.3
38	Rumania	67.5	68.8	72.6	68.9
42	Russia	70.5	61.0	75.2	67.0
44	Belorus	67.6	63.4	67.1	65.7
47	Bulgaria	70.1	60.0	63.2	64.5
53	Serbia	63.2	57.4	57.8	59.8
56	Azerbaijan	61.0	61.0	43.4	58.2
57	Kazakhstan	65.5	50.5	58.3	57.7
63	Ukraine	54.1	53.8	65.2	55.7

Compiled from [16]

The signing of the Decree of the President of Ukraine № 722 / 2019 "On the Sustainable Development Goals of Ukraine for the period until 2030" became a significant step towards the formation of effective institutional mechanisms for implementation of the environmental component of Ukraine's sustainable development goals. According to it, the Cabinet of ministers of Ukraine must ensure:

1) Analysis of forecast and program documents within two months, taking into account the Sustainable Development Goals of Ukraine with the involvement of scientists, experts, representatives of public associations for the period up to 2030. According to the results of such analysis, to take measures to improve them, if necessary.

2) Introduction of an effective system of monitoring the implementation of the Sustainable Development Goals of Ukraine for the period up to 2030 and promulgation of its results annually by March 1 of the year following the reporting period [17].

Disclosure of non-financial information is vital for managing changes on the path to building a sustainable global economy by combining long-term returns on social justice and environmental protection [9]. The need to develop a set of relevant indicators that will allow to measure and evaluate the progress in achieving the goals of sustainable development in general and their environmental component in particular is noted in the report "Wildlife" [8].

The importance of business participation in achieving the Sustainable Development Goals (SDGs) was noted the next day after their approval. At the United Nations (UN) Private Sector Forum on September 26, 2015, UN Secretary-General Ban Ki-moon (2007-2016) expressed the hope that private business would accelerate success in achieving the SDGs, noting that "now is the time to mobilize the global business community. The case is clear. The achievement of the SDGs will improve the business and market environment. Trillions of dollars in public and private funds should be redirected to the achievement of the SDGs, creating enormous opportunities for responsible companies to generate solutions."[18] From this event the international community started searching for ways to integrate the corporate sector's contribution to the SDGs achievements, in particular those related to the environmental sphere.

The Global Reporting Initiative (GRI) [19] regulates the disclosure of certain indicators characterizing the state of natural capital of business entities. The Global Standard has become one of the most widespread formats of reports on sustainable development, and also de facto, is the standard for determining the framework conditions for the preparation and disclosure of indicators of non-financial reporting on the results of economic entities to achieve sustainable development. The GRI system is intended for use by enterprises of any type, size, organizational-legal form and location. It is constantly being improved and expanded in the light of reporting

experience and changes in the information needs of key stakeholders. According to the GRI standard, enterprises reporting on the achievement of sustainable development goals must submit information on the following indicators in their reports: 301 Materials, 303: Water, 305: Emissions, 306: Sewage and Waste, 308: Supplier Environmental Assessment.

A significant step in organizing the collection of information regarding the contribution of business entities in different countries to achieving the Sustainable Development Goals, which relate to environmental conservation, was the adoption of UN General Assembly resolution 70/1 in 2016. It stated that the SDGs would be implemented and reviewed through a set of global indicators focused on measurable results. A dedicated UN International Expert Group on the SDGs was tasked with developing a global framework of indicators to monitor and measure key aspects of the 2030 Agenda implementation. So far, member states, including Ukraine, are in the process of developing their national indicators in line with the 2030 Agenda, taking into account national specificities [20]. Thus, a set of key indicators (Core Indicators) of the UN to achieve the SDGs by corporate sector entities was established. It contains 33 indicators on the economic, social, environmental and institutional spheres [199]. In particular, the indicators of the environmental sphere, the measurement of which is regulated by the Core Indicators, include: indicators of responsible water use of group B.1 (B.1.1. Water recycling and reuse, B.1.2. Water use efficiency, B.1.3. .3. Water scarcity); indicators of waste management efficiency of B.2 group (B.2.1. Waste Generation Reduction, B.2.2. Waste Recycled and Reused B.2.3. Hazardous Waste); indicators of greenhouse gas emissions of B.3. (B.3.1. Greenhouse gas emissions (scope 1), B.3.2. Greenhouse gas emissions (scope 2)) indicators of pollution by ozone-depleting substances and chemicals of B.4. (B.4.1. Ozone-depleting substances and chemicals); energy consumption indicators of group B.5. (B.5.1. Renewable energy, B.5.2. Energy efficiency).

The goal of the Guideline for defining corporate contribution to SDGs implementation was to provide practical information on how these indicators could be measured consistently and in accordance with countries' national needs to monitor

compliance with the SDGs agenda. In addition, the guide should serve as a tool for developing national-level reporting that would enable countries to report internationally on indicator 12.6.1, "Number of enterprises that publish sustainability reports.

To date, neither forms of such reporting nor lists of indicators exist. Therefore, we propose to use a set of indicators to characterize its environmental component in the areas of water use, energy consumption, waste management, and greenhouse gas emissions, ozone-depleting and chemical substances (Table 4).

Table 4

Methodology for determining indicators of the environmental sphere of sustainability reporting

Name of the indicator in the report	**Name of the indicator forUNCTAD ISAR Core Indicators**	**Methodology for determining the indicator**	**Unit of measure**	**Compliance with the SDGs**
1	2	3	4	5
B 1. Sustainable use of water				
Water recycling and reuse	B.1.1. Water recycling and reuse	Total volume of water, the business entity reports, recycles and/or reuses during the reporting period	m3 and %	Indicator 6.3.1, developed by the World Health Organization (WHO) and the United Nations Human Settlements Program, refers to the generation of wastewater from both households and productive activities. This indicator requires reporting on the percentage of treated wastewater that is safely treated before disposal or reuse, as a percentage of total wastewater.
Water use efficiency	B.1.2. Water use efficiency	The ratio of the volume of water used in the net value added of the reporting period	m3, % andUAH.	According to the Food and Agriculture Organization of the United Nations (FAO), metadata for this indicator is expected to be consistent with target 6.4.1 and takes into account the production of the current sector (gross value added) per unit of water used for household purposes (water is withdrawn and expressed in $ per m3.

Extended tables 4

1	2	3	4	5
Water stress	B.1.3. Water stress	the amount of all water that enters the organization from all sources for any use during the reporting period. Sources of water intake can be fresh surface water + groundwater + seawater / brackish water + produced / process water. This should be reported by the following sources	m3	corresponds to SDG indicator 6.4.2, water scarcity level: freshwater withdrawal as a share of available freshwater resources. The indicator is calculated as water withdrawn divided by the difference between available renewable freshwater sources and ecological water demands, multiplied by 100 and expressed in cubic kilometers per year.
B.2. Waste management				
Reduction of waste generation	B.2.1. Reduction of waste generation	The sum or quantity of all mineral, non-mineral and/or hazardous waste processed with any technology.	kg, t, litres, m3, in financial equivalent	indicator is relevant to Goal 12.5 - significantly reduce waste generation through prevention, reduction, recycling and reuse up to 2030. The United Nations Statistics Division (UNSD) and the United Nations Environment Program, in their methodological guidelines for Indicator 12.5.1, National Recycling Standard, have prepared a recycling and waste questionnaire that requires, among other things, data on materials that are not primary products, that the generator no longer uses for its own production, conversion or consumption purposes, and that he or she disposes or intends or needs to dispose.

Extended tables 4

1	2	3	4	5
Waste reused, re-manufactured and recycled	B.2.2. Waste reused, re-manufactured and recycled	defined in quantitative measures in the period in which the waste was processed with the separation of single recycled, reused	kg, t, litres, m3	is relevant to Indicator SDG 12.5.1, the national recycling rates, tones of material. In Indicator 12.5.1, recycling data from the UN Environment Program is collected by UNSD using the municipal recycling rate as the basis for comparison
Hazardous waste	B.2.3. Hazardous waste	Total amount of hazardous waste, in absolute terms, according to the share of manufactured hazardous waste, considering the total amount of waste reported by the business entity.		is relevant to Indicator SDG 12.5.1 - hazardous waste generated per capita and shares of manufactured hazardous waste by type of processing. UNSD and the UN Environment Program in their work plan for Indicator 12.4.2 note that States Parties of the Basel Convention must report annually on the amount of hazardous waste generated and the amount of hazardous waste imported and exported and other waste destined for reuse, recycling or disposal
B.3. Greenhouse gas emissions				
Greenhouse gas emissions	B.3.1. Greenhouse gas emissions (scope 1)	the amount of direct greenhouse gas emissions (which arise internally)per unit of net value added	tones of CO2 per unit of money equivalent (UAH) of net value added	Corresponds to the indicator SDG 9.4.1, CO2 emissions per unit of new value added. UNIDO and IEA metadata for indicator 9.4.1 cover all types and sources of CO2 emissions. The latter are expressed in kg per constant amount of U.S. dollars per unit of value added production in 2010.
	B.3.2. Greenhouse gas emissions (scope 2)	is determined by multiplying activity data (MWhof electricity consumption) by emission factors to achieve the total impact of greenhouse gas emissions from electricity use.		

End tables 4

1	2	3	4	5
B.4. Ozone-depleting substances and chemicals				
Ozone-depleting substances and chemicals	B.4.1. Ozone-depleting substances and chemicals	the enterprise's dependence on ozone-depleting substances and chemicals is assessed	kg per unit of financial equivalent (UAH) of net value added	similar to the indicator "Hazardous Waste" is related to Indicator SDG 12.4.2, hazardous waste generated per capita, and shares of manufactured hazardous waste by type of processing.
B.5. Energy consumption				
Renewable energy	B.5.1. Renewable energy	The renewable energy consumption of an enterprise to its total energy consumption during the reporting period. Types of renewable energy include, for example, solar energy, biomass, hydropower, geothermal energy, and ocean energy. Calculated using the formula: can be calculated as follows: non-renewable fuel consumed + renewable fuel consumed + electricity, heating, cooling and steam purchased for consumption + electricity generated, heating, cooling and steam not consumed - electricity, heating, cooling and steam sold.	joules per unit of financial equivalent (UAH) of net value added	This indicator corresponds to SDG indicator 7.2.1, the share of renewable energy in total final energy consumption. The IEA, UNSD and the International Renewable Energy Agency use indicator 7.2.1 to count the share of renewable resources in final energy consumption at the national level.
Energy efficiency	B 5.2. Energy efficiency	the ratio of the enterprise's energy consumption to the net value added		

Table 4 presents the methodology for determining each indicator, its unit of measurement and investigates the correspondence of metadata for each indicator of the environmental sphere, the indicator within a specific goal of sustainable development. The preparation by domestic enterprises of the food industry of voluntary reports on the above indicators will allow the environmental sphere to include the enterprise in the calculation of indicator 12.6.1 "Number of enterprises that publish reports on sustainable development", which will bring Ukraine closer to the achievement of the SDGs and the preparation of high-quality voluntary national reviews.

Humanity has created an industrial civilization of enormous proportions, which leads to the depletion of natural resources. Today, the ecological situation in the world is becoming extremely acute. Therefore, the issue of the balance of nature, environmentally sustainable development in society, harmony between human and nature, saving life on Earth has become acute on the agenda [21, p. 9]. Deployment of the post-industrial society and ecocentric reorientation of world outlook bases of development of a modern civilization have determined essential shifts in requirements of all groups of users to the economic information that is formed by information systems of ecological audit and accounting of subjects managing at a microlevel.

"Digital" technologies are essential for the growth of efficiency in the Ukrainian industry. In the food industry, they are becoming the basis of product and manufacturing strategies. Their transformative power is changing traditional business models, production chains and resulting the emergence of new products and innovations. Digitalization for Ukraine has a positive social character, because it focuses on improving the quality of social infrastructuresecurity, the quality of social services, the organization of transparency and targeting of social assistance, as well as cost reduction [22].

The era of computerized accounting began with the appearance of the first computers, in particular the IBM 702, which became available for use in accounting in 1953 [23]. In those days, only tightly structured and algorithmized financial

decisions, such as payroll calculations, were a subject to computer processing [24]. The major global financial scandals of recent years have forced the business community and society to increase their scrutiny of the quality of accounting and the effectiveness of public interest of enterprises' internal control systems. At the same time, the rapid development of information and network technology has changed the business environment and expanded the scope and content of business management [25].

Automation processes are being actively introduced both in the distribution of food products and directly in their production. It is worth noting that there is a growing supply of such innovative technologies that are available not only to large, small and medium-sized agricultural holdings and food industry enterprises [26, p. 16]. At the same time, the process of digitalization is not limited to the transfer of information flows and data storages into digital format. Information and communication technologies first digitize individual business processes in business organizations, and gradually form a virtual (digital) business model, "transferring" the business to the "digital world" [27].

Today, the accounting information system (AIS) is a computer-based accounting method combined with information technology resources [28]. Information software systems have become a major component of the accounting process and audit system at the enterprise, without which it is impossible to imagine a modern accounting. Information and software support is as important for enterprise accounting as the organization of the accounting process, the availability of highly qualified employees, the system of document management, etc. [29, p. 291].

The accounting information system (AIS) is responsible for collecting, storing and processing of accounting and economic data that are used to make internal management decisions, including non-financial operations that directly affect the processing of financial transactions. In order the environmental audit and accounting system to cover all relevant transaction-based information, an organization needs to link resources to input information, send the information to the correct recipient (another computer or person) for processing, and finally to the party that requires the

processed data for management decisions, reporting or control (including auditing) [30].

Typically, the AIS consists of three main subsystems: (1) the Transaction Processing System (TPS), which supports daily business operations; (2) the General Ledger System (GLS/ FRS - Financial Reporting System) and (3) the Management Reporting System (MRS) [31, p. 537]. The transaction processing system is responsible for maintaining daily business transactions, which can be grouped into three cycles: revenue cycle, cost cycle and transformation cycle. The second block - environmental audit, general accounting system and financial reporting system, in our opinion, should be considered as two closely linked systems. The firstis devoted to the generalization of transactions of the transaction cycle, while the second one is focused on their measurement and disclosure in reporting on the state of financial resources, usually in the form of financial or tax reporting, which is intended mainly for external users. The management reporting system, as a rule, offers the formation of information resources to manage with special target functions and information necessary to make operational management decisions, such as procurement, budget planning, loyalty programs, etc.

The study of literature sources shows that modern economic science is moving away from this well-established view usinga more modular approach, considering the AIS as a domain where new technologies such as systems (Business Intelligence BI) or the balanced scorecard (BSC) play an increasingly important role [32]. In order to provide useful information to make the right decisions and improve the efficiency of the accounting information system (especially computerized one), it should be marked by the following features: high level of accuracy and timeliness of financial data, relevant and synchronized information with decision-making positions, simplified and understandable information, sufficient flexibility for change and development [33]. At the same time, the traditional architecture of the accounting information system still lacks a block that will be responsible for the formation of information about the enterprise's contribution to the achievement of sustainable development goals, in particular the environmental sphere. Therefore, the hypothesis

of this work is based on the assumption that there is a huge set of new technologies that can complement or integrate the modern AIS and provide information response of the AIS domain of any enterprise to the new challenges faced by the company management and society as a whole. Under such conditions, it becomes an important task to find the optimal balance between modern information technology and business processes of economic entities. The complexity and importance of ensuring sustainable development requires the search for new perspectives of its solution in terms of identifying the most important modern trends and problems of accounting and finance, respectively, related to technological approaches, which should provide adequate responses to the globalization challenges of environmental and economic stability of the state (Fig. 4).

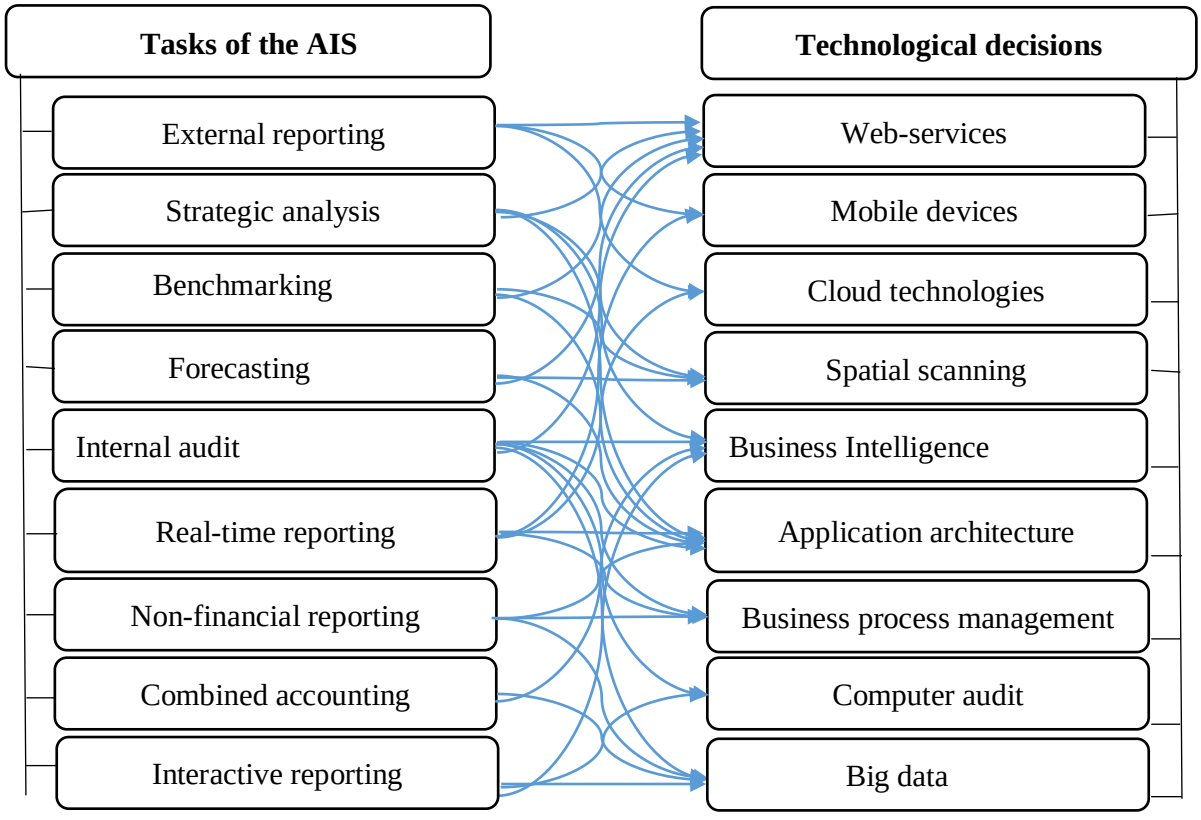


Fig. 4 - The impact of information technology on environmental audit

Globalization, as a civilizational process fundamentally changes the picture of the modern world, the structure of the world economy and the world community, as well as political, economic and cultural relations between peoples and countries. The world social, economic, environmental and cultural space, which for thousands of

years has been a conglomerate of various national states, is now turning into a space without borders. In this context, the formation of global economic ties, environmental, demographic challenges cannot be solved by local efforts and means alone. These problems can only be solved by uniting the efforts of the entire world community [21, p. 136]. Therefore, the starting point in the choice of priorities for the strategic development of food industry enterprises is the fact that during the years of stagnation of national economy, enterprises engaged in the processing of agricultural raw materials and food production have fallen further behind the economic entities of highly developed countries in technical and technological development [34, p. 43]. This fully applies to the use of modern information technology in the management of industrial enterprises.

Under application of these technologies, the formation of information support for environmental and economic management decisions should be carried out in a sequence that characterizes the stages of the accounting process on the elements of natural capital and takes into account the specifics of business processes of food industry enterprises.

As a result of mass introduction of modern information and communication technologies into management practice, the issue of automation of accounting applies more widely. Absolutely impartial question arose not only in the automation of individual control subsystems, but rather in the comprehensive automation of all enterprise management processes. Through this approach, it has become necessary to create systems that integrate the functions of accounting, operational and technical, as well as statistical accounting on the basis of a single data bank [35, p. 18]. Therefore, to improve the efficiency of collecting, processing, systematizing and summarizing information about the natural capital of food industry enterprises, we propose to build the accounting automation process according to the model shown in figure 5.

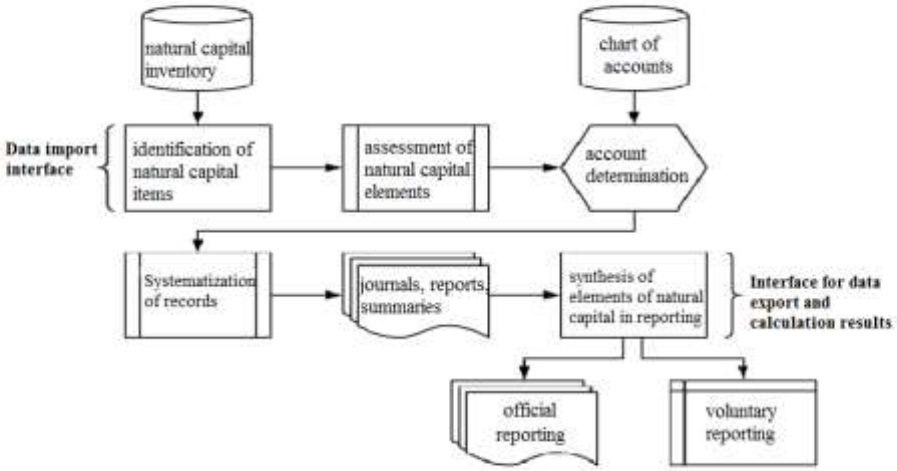


Fig. 5 - Model of automation of environmental audit

Such an information system includes interfaces for data import and export, provides automation of all stages of the accounting process, supports the maintenance of directories of elements of natural capital, business accounts, constants, forms of accounting registers and reporting. In addition, it should be taken to consideration that raising the eco-consciousness of citizens and business educations requires food industry enterprises promulgate not only indicators that characterize their economic activity, but also information about the existing and potential impact of economic activity on the environment and the biodiversity of our planet. Such information can only be provided by reports that characterize the enterprise's contribution to the achievement of sustainable developmentgoals.

Therefore, the proposed sequence of implementation of information and communication technologies in the management process of the food industry enterprises stipulates:

- defining the contours of the unified information space of the food industry enterprise and the choice of methodology for forming sustainable development reporting based on the analysis of the requirements of the accounting and reporting information users;

- adjusting the accounting policy of the enterprise in accordance with the natural capital accounting imperatives;

- development of methods for reflecting the movement of natural capital elements in the business accounts(Fig. 6).

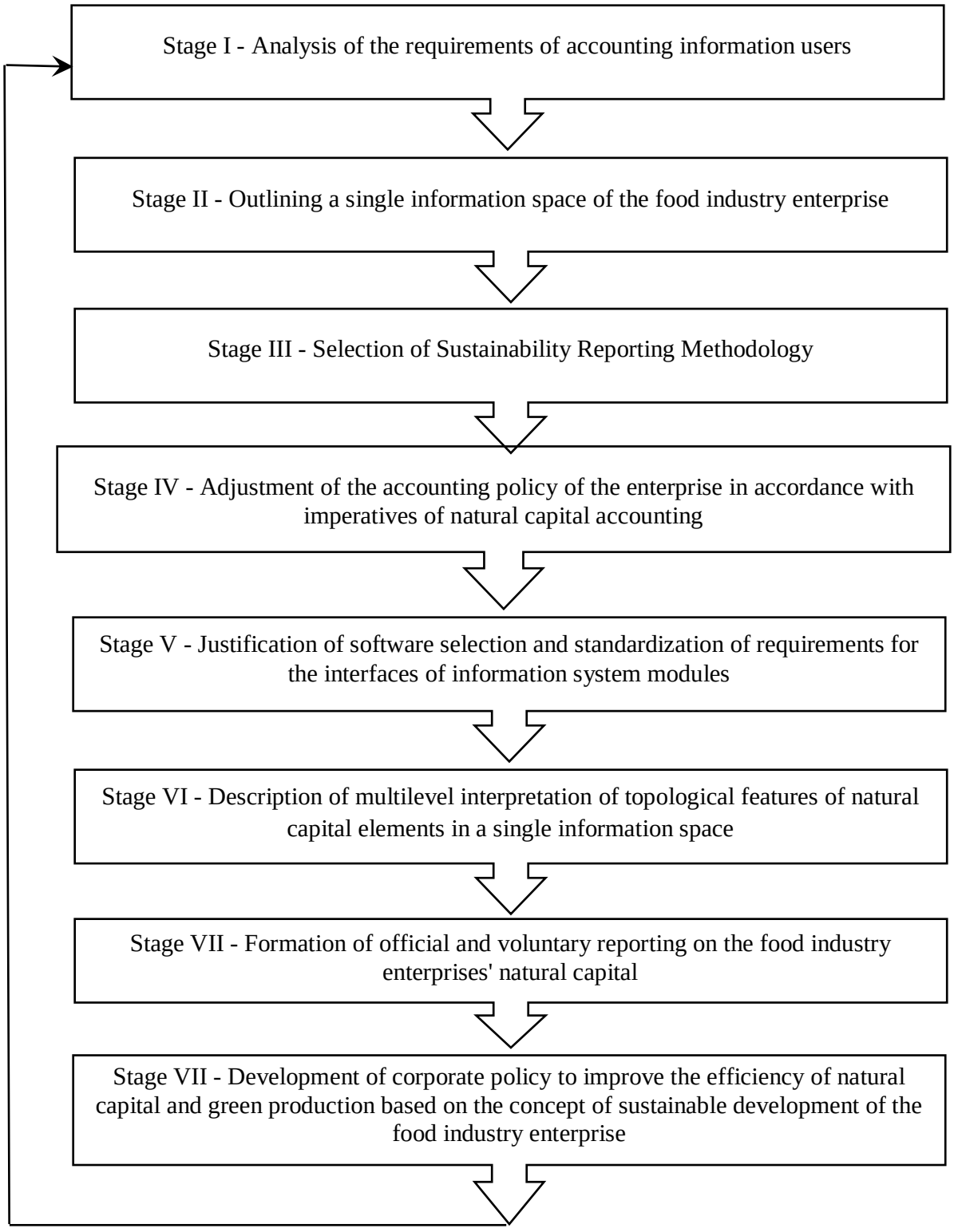


Fig. 6 - Sequence of implementation of information and communication technologies in the management process

Most of the work of the accounting and technical staff in setting up the accounting information system with the requirements of the organization of natural capital accounting consists of creating and synchronizing the reference books of natural capital elements, the chart of accounts and accounting registers. To create a directory of natural capital elements, we propose to use the developed facet classification of natural capital of food industry enterprises, within which the following facets are highlighted: non-current assets, current assets, capital, long-term liabilities, current liabilities, UNCTAD ISAR Core Indicators, Methodology for SDG indicator 12.6.1, environmental (eco-)tax, management report. According to each facet, the proper accounts are selected. They display the data necessary for formatting both the official financial, statistical and tax reporting and voluntary sustainability reporting in the information system of the food industry enterprise. The important issue of modern automation of accounting is the issue of reliable data storage, since information is becoming one of the organization's strategic resources increasingly important in its activities [36, p. 901]. In addition, the resolution of global environmental problems is impossible without the systematic exchange of information within the framework of international environmental monitoring. It is impossible to move to the planetary management of eco-development, which makes the survival of human race real without creation of databases and environmental knowledge as well as without full development of environmental publicity as free movement of the mentioned information. The transition to a predominantly informational strategy of interaction between humanity and nature is also planned in the nearest future [21, p. 110]. Therefore, the description of multilevel interpretation of topological features of natural capital elements are implemented in a unified information space of the food industry enterprise (Fig. 7).

According to modern economists, an effective means of stopping the growing degradation of natural capital is to spread the range of improvements in accounting practices, including the multidimensional evaluation of elements of natural capital and the disclosure of a network of additional accounts, which will increase inclusiveness among interested stakeholders [38, p. 339].

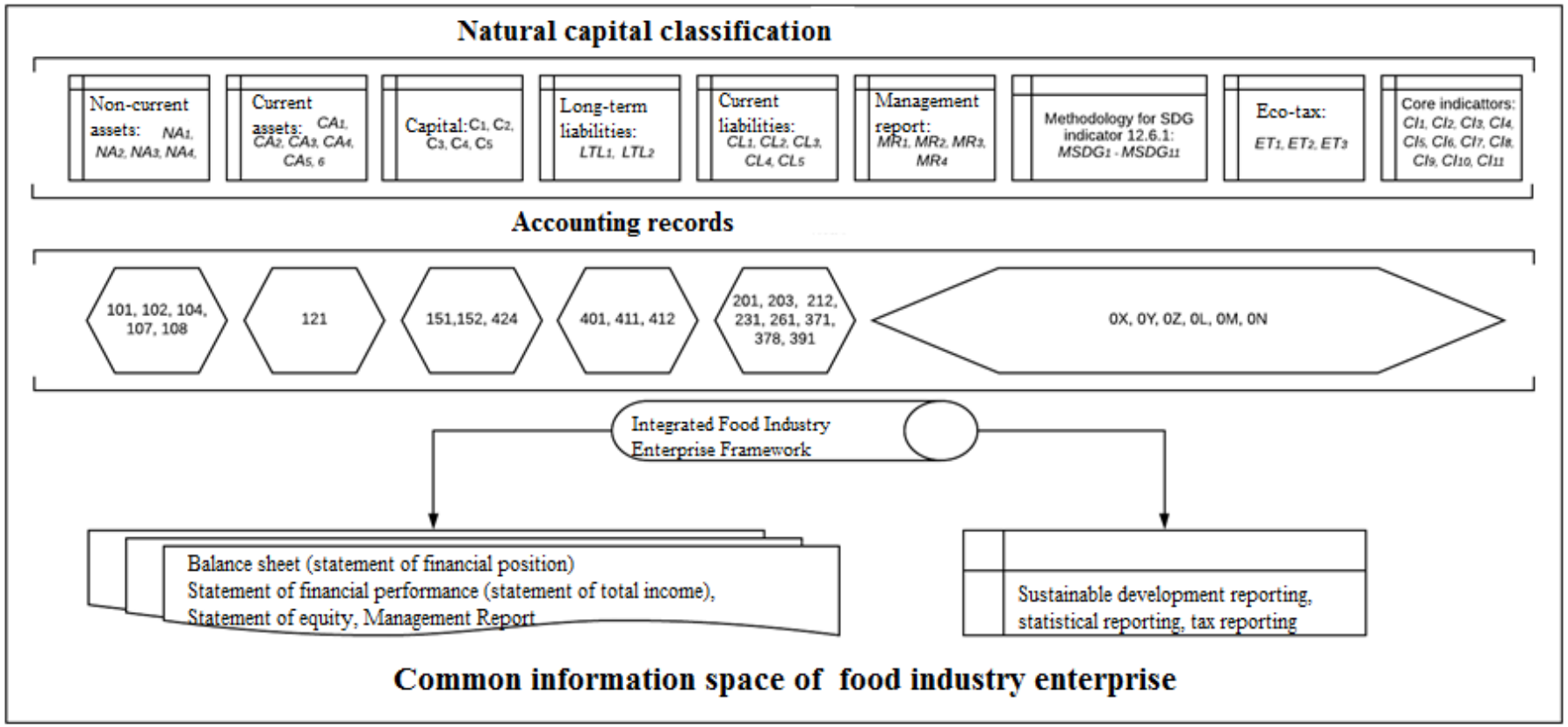


Fig. 7 - Description of multilevel interpretation of topological features of natural capital elements in a common information space

Therefore, the proposed methodology of accounting and disclosure of natural capital elements of food industry enterprises is based on the allocation of special both balance sheet and off-balance sheet accounts.

By storing the entire array of information in a single enterprise database, balance sheet account data will be used to generate financial statements for a food processing company, while off-balance sheet account data will help to generate statistical reporting and sustainability reporting for the company according to the chosen methodology.

According to SAP research, which specializes in digital solutions, including management automation, 96% of LEADER companies believe that digital transformation is the main goal of business, but only 3% of them complete projects for transition to the digital environment [39]. Despite significant achievements, the problem of automation of accounting in the enterprises of Ukraine remains one of the urgent and difficult ones. This, in turn, calls for considerable input of software and the availability of qualified personnel, fluent in computer technology, as well as the accounting process [36, C. 901].

The main problem of implementation of public policy in Ukraine to promote the development of ICT (digitalization) is still fragmentation, lack of consistency, consistency, coherence between the adoption of legal and regulatory instruments and the subsequent development of mechanisms for their implementation.

The set of legislative and regulatory documents in the ICT field has many uncertainties and contradictions. There are many regulatory norms and institutions, administrative and tax pressures on stakeholders. Therefore, the state's ability to deal effectively with the assumed powers is low. At the same time, the current situation requires transition to a higher level of ICT use, and improvement of the state management of this process. Solving these and other problems, considering current state and potential development of the ICT sector in Ukraine requires coordination of the main strategic objectives, mechanisms and regulatory support for the development of information society in Ukraine in the near future through the creation of a unified information and communication technology platform [40, p. 130].

That should be the direction of further scientific search for ways to improve the accounting of natural capital of food industry enterprises.

Thus, in order to move to a system of comprehensive state monitoring of the environment and improve the system of information support for management decision-making, the need to form a variety of reports, which should provide information on the use of natural capital is proved. The entire system of environmental reporting is divided by subjects of formation of reporting (state and business entities) with the mandatory formation of reports (mandatory and non-mandatory).

The peculiarities of presentation and characteristics of statistical, financial, tax reporting and management report in terms of disclosure of information on natural capital are analyzed in detail. Users of official financial reporting information and voluntary sustainable development reporting were grouped according to the level of financial interest.

The guide made a comparative analysis from the key indicators for reporting of business entities on the contribution to the achievement of the SDGs and the UN proposals on the Methodology of indicator 12.6.1 assessment regarding the disclosure of information on natural capital in the voluntary reporting.This allowed to conclude that further steps to form in Ukraine an effective mechanism of coordination of information exchange and achieving consistency of strategic documents at the global and national level should take place in the direction of improving the substantive content of the Management Report, which contains the largest number of indicators assessing the use of the natural capital elements.

In order to improve the system of environmental audit and accounting in terms of forming the information base for environmental management and the development of a mechanism for transferring information from financial statements to voluntary ones, the recommendations for filling the financial statements with indicators of natural capital,considering the proposed facet classification of natural capital and the developed working plan of accounts,are made.

Changes to financial reporting form № 1 "Balance sheet (Report on financial status)" are introduced and schemes of information transfer from accounting registers of its articles are given. The analysis of the proposed form allows to determine changes in the amount of environmental assets and sources of their formation, which will attract the attention of specialists involved in environmental activities to determine the reasons that caused these changes. For definition of financial result of the operations connected with nature protection activity it is offered to make changes in the form №2 "Report on financial results", the schemes of information transfer to its items are given. The conducted analysis of practical activity of food industry enterprises and stakeholders' requests concerning ecological information allowed to develop the form of information disclosure on natural capital in the report on management of food industry enterprises by sections: rational use of water; waste management; greenhouse gas emissions; energy consumption and ecological management.

For the formation of voluntary reporting, the food industry enterprises are recommended to use a set of indicators that will characterize their environmental component in the areas of water use, energy consumption, waste management, greenhouse gas emissions, ozone-depleting and chemical substances. The methodology of definition of each indicator and its unit of measurement is presented. Besides, the correspondence of metadata on each indicator of the environmental sphere of the indicator within the framework of the specific goal of sustainable development is investigated. The preparation by domestic food enterprises of voluntary reports on the given indicators will allow the environmental sphere to include the enterprise into the calculation of indicator 12.6.1 "Number of enterprises that publish reports on sustainable development", which will bring Ukraine closer to achieving the SDGs as well as the preparation of high-quality voluntary national reviews.

It is proved that the complexity and importance of sustainable development requires the search for new perspectives of its solution in terms of identifying the most important modern trends and problems of accounting and finance, respectively,

related to technological approaches, which should provide adequate responses to the globalization challenges of environmental and economic stability of the state. As part of application of the above-mentioned technologies, the formation of information support for environmental and economic management decisions is proposed to carry out with a sequence that characterizes the stages of the accounting process in relation to the elements of natural capital and takes into account the specifics of business processes of food industry enterprises.

The influence of information technologies on the environmental audit and accounting process of food industry enterprises is studied. To improve the efficiency of collecting, processing, systematization and summarization of information on natural capital of food industry enterprises, a model of the process of automation of natural capital accounting is suggested. It includes interfaces for data import and export, provides automation of all stages of the accounting processand supports the maintenance of directories of natural capital elements, business accounts, constants, forms of accounting registers and financial statements.

The sequence of information and communication technologies implementation into the food enterprise management process is offered. It includes: determination of contours of unified information space of food enterprise and choice of methodology of forming the reports on the basis of analysis of users requirements of accounting and reporting information; correction of enterprise accounting policy in accordance with the natural capital accounting; development of method of reflection of natural capital elements movement.

For the purposes of reflection in accounting and disclosure in reporting, the term natural capital is used. It means the totality of natural resources and environmental assets attracted by the enterprise in the production cycle to implement the business model and support biodiversity in the process of economic activity. It is proved that this definition reflects the need for disclosure of information on the natural capital elements in the Ukrainian enterprise reportings and should be the basis for accounting and analytical classification of natural capital elements of the food

industry and become the basis for the study of the regulatory and legal field of natural capital accounting in Ukraine.

Accounting policy of food industry enterprises is divided into four sections - organizational, technological, methodical and analytical one. The following mandatory elements as: regulatory support, internal regulations that determine the content of the accounting policy, components of the methodical section, indicators of the analytical section should be highlighted in the structure of these sections. It has been proved that for rational organization of natural capital accounting at food industry enterprises while determining procedural issues of accounting policy it is necessary to develop a working plan of natural capital accounting assets and forms of relevant primary documents; to include aspects concerning natural capital accounting in the order "On Accounting Policy"; to form schedules of document flow of accounting operations for environmental aspects of business; to describe the order of organization of material responsibility for violation of environmental regulations; to determine the order of accounting management and the formation of environmental reporting. The recommendations on the construction of the accounts working plan for the food industry enterprises are based on the developed facet classification of the environmental aspects of activity.

Information resources for determining the indicators of voluntary reporting on the achievement of sustainable development goals of the environmental sphere of the food industry enterprises are proposed to form in the accounting system by accounting data display on off-balance sheet accounts.

The analysis of literary sources and normative-legal acts allowed drawing a conclusion that the accounting assessment has the purpose to measure the object of accounting in the monetary indicator for putting it on the balance sheet. The method of accounting evaluation of elements of natural capital has been determined. The recommendations on the application of the following methods of evaluation to the objects defined in the established facet classification of natural capital elements of food enterprises are developed. Depending on the type of natural capital object, the method of its receipt and the period of its use in economic turnover, such methods of

assessment as: historical cost, fair value, residual value, net realizable value, present value of future cash receipts, liquidation value, actual cost and historical cost value are used.

The organization of accounting of natural capital is proposed for consideration from the perspective of streamlining all the components of the accounting system with the formation of appropriate documentation. The form of an analytical accounting card of natural capital components for each type of organic production, the direction of environmental protection measures, perspective environmentally oriented economic operations were developed for establishing an effective documenting system. The system of internal regulations of the natural capital accounting organization implies allocationof four blocks of documents, which are grouped into two classes: regulation of the organization and accounting of environmental protection (block 1. Documents in the field of organization of environmental services and block 2. Documents in the field of atmospheric air protection), and regulation of the organization and accounting of environmental management (block 3. Documents in the field of water managementand block 4. Documents in the field of waste management).

It is proved that the transition to a system of integrated state monitoring of the environment and the improvement of an information support system for management decision-making is possible through the formation of various reports, which should provide information on the use of natural capital. The system of environmental reporting is divided by subjects of reporting (state and economic entities) and by mandatory reporting (mandatory and voluntary reporting).

The range of sustainable reporting users is wider, if such reporting is popular in the society and directly depends on the maturity of society about the need to achieve sustainable development goals. In terms of environmental audit indicators of integrated reporting in the context of sustainable development, the financial interest of users is inversely proportional compared to the users of official financial and tax reporting.

It is proved, that in order to improve the system of environmental audit and accounting in terms of formation of the information base for environmental management and to develop a mechanism for information transfer from the financial reporting to voluntary one, it is advisable to fill the financial reporting articles with natural capital indicators. Taking into account the offered facet classification of natural capital and developed working chart of accounts, it is suggested to make changes in the form № 1 "Balance sheet (Report on financial status)", the form №2 "Report on financial results". The form of "Management report" is also developed. That will allow to disclose information about natural capital. In voluntary reporting, it is proposed to use a set of indicators that would allow characterizing the environmental component of the activities of food industry enterprises in the areas of water use, energy consumption, waste management, greenhouse gas emissions, ozone-depleting and chemical substances. The methodology of definition of each indicator and its unit of measurement is presented. Besides, the correspondence of metadata on each indicator of the environmental sphere of the indicator within the framework of the specific goal of sustainable development is investigated.

The analysis of the current environmental and economic situation shows that increasing the environmental awareness of citizens and business entities requires food industry enterprises disclosing not only indicators that characterize the economic component of their activities, but also the information about the existing and potential impact of economic activities on the environment and biodiversity of the planet. Therefore, the proposed sequence of implementation of information and communication technologies in the management process of the food industry enterprises includes: determining the contours of the unified information space of the food industry enterprise and the choice of methodology of forming sustainable development reporting based on the analysis of the requirements of users of accounting and reporting information; adjustments to the accounting policy of the enterprise in accordance with the imperatives of natural capital accounting; and development of methods to reflect the movement of elements, as well. To increase the efficiency of gathering, processing, systematization and generalization of the

information about natural capital of the food industry enterprises, it is recommended to build the automation accounting process on a model, which includes interfaces for data import and export, provides automation of all stages of the accounting process; supports keeping of directories of natural capital elements, bookkeeping accounts, constants, forms of accounting registers and reporting.

2. AUDITING DESIGN SYSTEM FOR INTEGRATED REPORTING OF BUSINESS ENTITY

In modern conditions of economic management, the audit is recognized as an effective tool of control and management of economic security of the enterprise. Development of audit in Ukraine is associated with evolutionary changes in the economy, society and the political system. A necessity of audit doesn't arise spontaneously. Various users of information, which directly and indirectly regulate the activities of the enterprise are interested in its results.

The implementation of the integrated reporting audit into the control practice in Ukraine is just beginning. There is a lack of both scientific developments on this issue and a general lack of understanding of internal audit by senior management and owners [41, p. 447].

Audit of integrated reporting as one of the most important elements of market infrastructure and a form of independent financial control is in a state of evolutionary changes under the influence of economic globalization. The process of formation and development of environmental audit at the enterprises of Ukraine is at the stage of transition from confirmatory audit to system-oriented and in fact to the practical activities of internal audit subjects, focused on assessment of accounting and internal control systems of enterprises.

Today, the definition of audit as a systematic process of obtaining, research and evaluation of objective data on the subject of research in order to find out the level of their compliance with the established criteria and to report the results to interested parties has been widely recognized. [42, p. 153]. The concept of audit is broader than the concept of supervision and control, as it includes not only checking the reliability of financial indicators, but also the development of applications to improve economic activity in order to rationalize costs and optimize profits on a legal basis [43, p. 8 - 9]. This is even more valid for the system of internal audit which, besides tasks typical for audit, is called to provide services on expert planning and consulting for the purpose of prevention of irrational expenses occurrence.

In the economic literature, there are different approaches to the definition of concepts and classification of types of audit, which, in our opinion, don't take into account the current state of development of this type of control and are limited only to confirming the reliability of financial information. But nowadays the needs of information users are much broader. This is confirmed by the ratification of the regulations of the International Auditing Practice Group 1000 - 100 and the widespread introduction and use of computer technologies. Among others, the functions of the internal audit service include verification, evaluation and monitoring of the adequacy and effectiveness of accounting systems and internal controls [44, p. 42]. Therefore, we developed our own classification of audit types, which corresponds to business requirements and has the following form (tab. 5).

Table 5

Classification of Integrated Reporting Audit

№	Classification groups	Types of Audit
1	1 According to the stages of audit	1. Preliminary 2. Current 3. Further
2	2 In relation to the business entity	1. External 2. Internal 3. IT-audit
3	By sources	1. Actual 2. Documentary
4	Regarding legal requirements	1. mandatory 2. Initiative 3. Pre-investment
5	By purpose	1. Audit of financial statements 2. Tax 3. Compliance audit 4. Price 5. Managerial (production) audit 6. Audit of Economic Activities 7. Special audits (environmental, operational, etc.). 8. Express audit
6	According to audit methods	1. Manual 2. Computer-based

In modern conditions, due to influence of a number of factors, the interest of hotel enterprises in obtaining a professional internal auditor's opinion on the reliability of accounting information and compliance of financial statements with the requirements of SSAP and IFRS has increased significantly (Fig. 8).

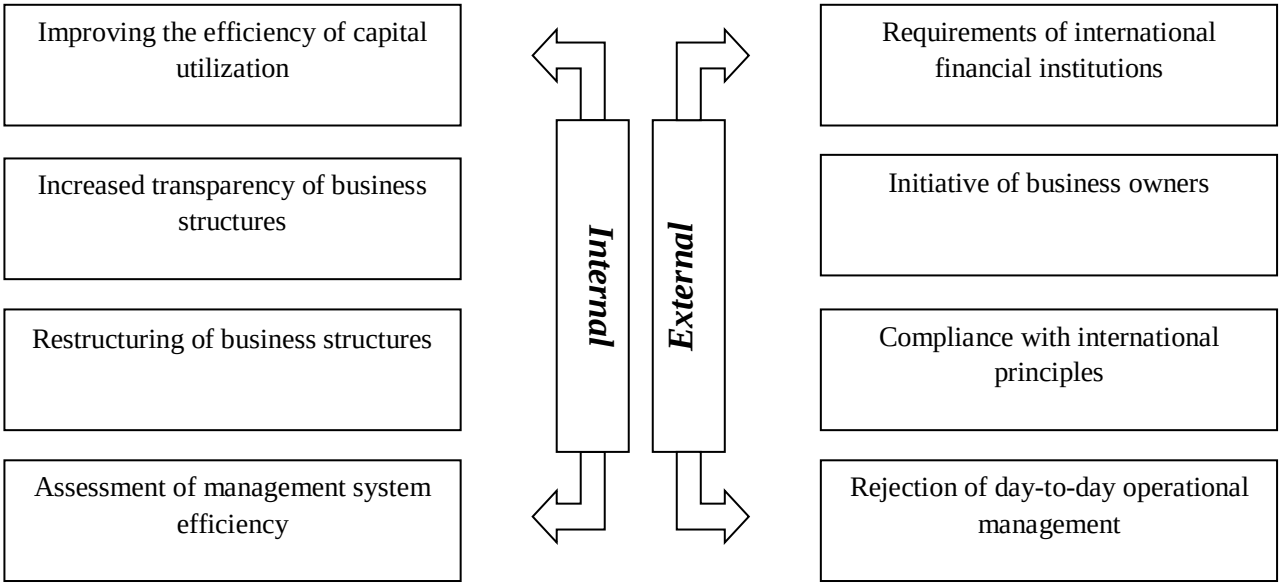


Fig. 8 - The main demand factors for integrated accounting audit services

The accounting provides completeness, reliability and timeliness of information obtained, which is used by the management system. It produces information necessary for management about the state of objects, which are used in the process of planning, control and analysis.

The main advantage of accounting information is the presence of three components: temporal, qualitative and quantitative, which allow to form information support for internal audit and ensure the formation of an informed management decision (Fig. 9).

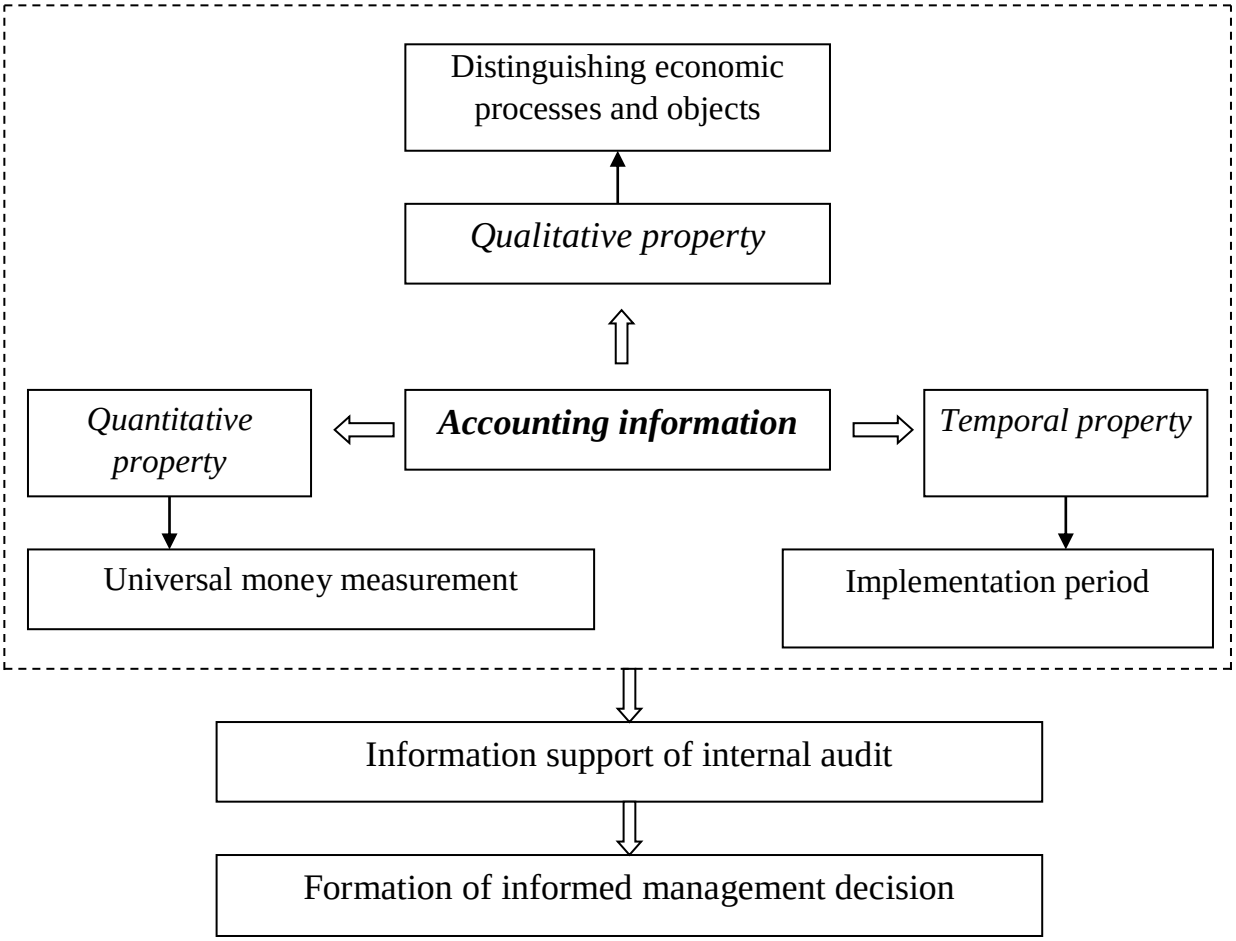


Fig. 9 - Information support for internal audit of integrated reporting

Other important components of information support of the audit quality, creating the ground for its effective implementation, are the characteristics of accounting information - timeliness and relevancy. Each of them is estimated subjectively by the users of information, because the information can be presented in different variants, it doesn't decrease the level of reliability and necessity for the needs of internal audit (Fig.10).

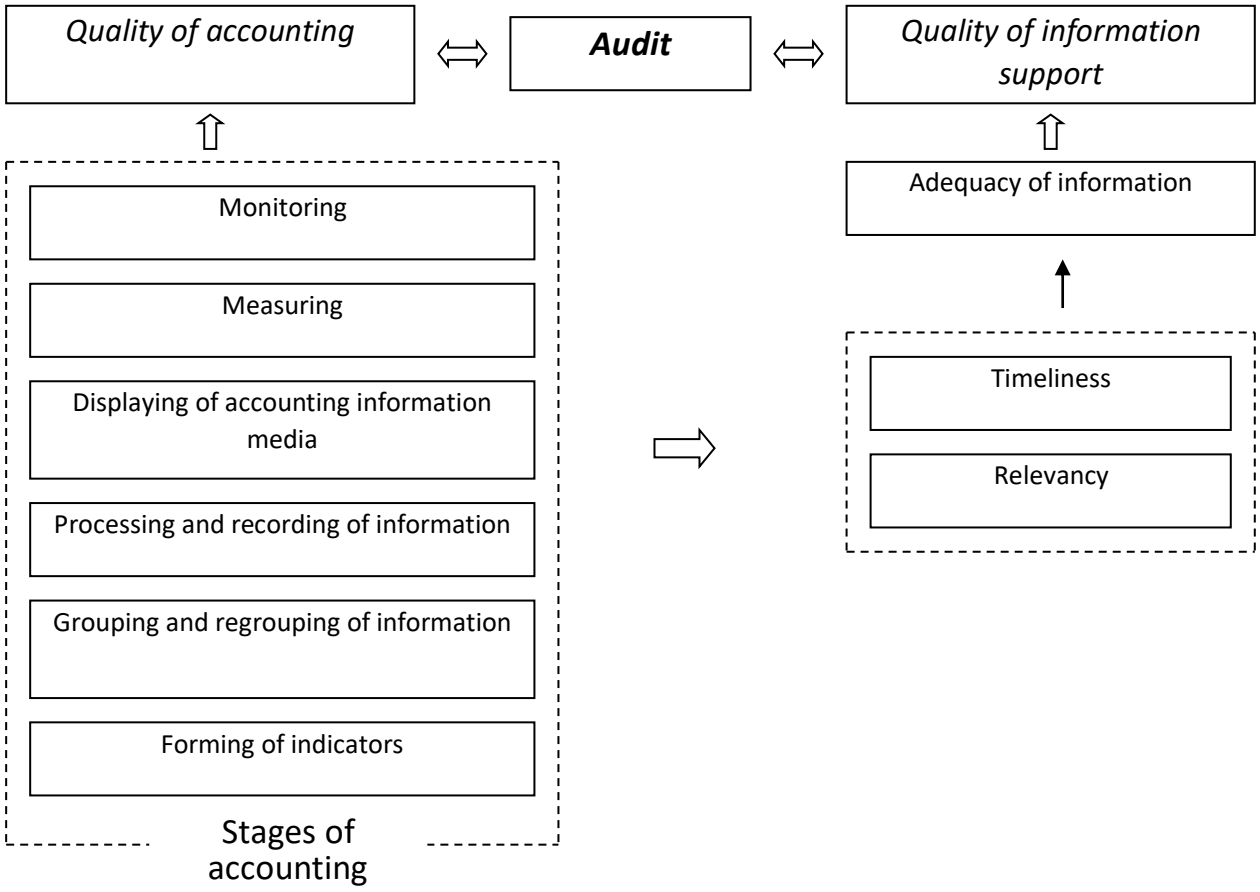


Fig. 10 - Information support for audit of integrated reporting

The basis of quality assurance of audit information includes the stages of accounting (preparation, keeping, summarizing of information), which are the basis of determining the quality of accounting in the information support of audit. At each stage, users of information are guaranteed to obtain data, which determine further direction of activity of the enterprise by means of evaluation of the existing condition, control and formation of tactical and strategic management decisions. In this process, accounting provides not only informational, control and analytical functions, but also performs a communication function, i.e. transfer of information to management authorities for making management decisions.The accounting system must generate information that satisfies the needs of a wide range of interested users. The quality of accounting depends on the quality of all stages of accounting. Each stage should provide the formation of such information data, apart from the actual include planned, normative, estimated indicators. Entities to assess the quality of the accounting process in the context of its stages are shown in Table 6.

Table 6

Entities to assess the quality of the accounting process asorganizational unit

Stage of the accounting process	Characteristics	Entities to assess the quality of the accounting process
Initial	Initial observation (assistance in the fact of economic activity); measuring in natural and in value terms; display on recording media - primary documents.	1.Data, information on facts of economic activity 2. Primary documents 3. Movement of initial information carriers.
Current	Processing and registration of information in accounting registers, as well as its grouping and regrouping in order to form useful information, that is such information that can satisfy the needs of users.	1. Data, information, indicators of current accounting 2. Accounting registers, documents compiled at this stage 3. Movement of current information carriers to form information resources about the needs of users.
Final	A set of operations for the formation of indicators, reflecting information about the results of production, financial and economic activities for a certain period (month, quarter, half-year, year)	1. Data, information, indicators of final accounting (planning, rationing, finance data, etc.) 2. Reporting forms 3. Movement of output media to ensure the formation of information data on the results of work and development

M. Heydes formulates the system of internal audit in the field of financial control as the analysis of indicators of financial statements of a business entity in order to express an independent opinion on its reliability in all material aspects and compliance with the criteria set by the users [42, p. 153]. Such position is rather limited. The objectives of internal audit are much broader than the objectives of external audit, provides flexibility to internal auditors to satisfy the needs of the enterprise [44, p. 42].

Enterprises differ in the amount, focus and scope of internal audit research. It gives the basis for internal audit classification, due to the diversity of financial and economic activities of the enterprise.

When designing the organizational and methodological structure of internal audit at the food industry enterprises, it is appropriate to use the following stages of audit development:

1. Confirming audit (represents the verification and confirmation of the compliance of the financial statements with the requirements of SSAP and its reliability).

2. System-based audit (represents analysis of efficiency of the internal control system.

3. Risk-based audit (conducted in relation to audited objects, where audit risk is higher, at the same time shortening the auditing period of areas with acceptable risks). According to ISA 610 "Review of internal audit activity", possibilities and the purpose of internal audit service activity have a very wide spectrum, many directions depending on the size and structure of the enterprise, and requirements of its managerial personnel, as well [45, p. 371].

Therefore, the following influencing factors should be investigated before establishing and function of an internal audit service for integrated reporting in enterprises:

- size and category;
- legal organizational form of economic activity;
- organizational structure of enterprise;
- needs of management personnel;
- level of automation of accounting and control procedures.

The analysis carried out at the enterprises of Kharkiv region showed that the developed organizational and functional structure of internal audit service is inherent in five- and four-star hotel and restaurant complexes (tab. 7).

Table 7

Analysis of internal audit system of hotel enterprises in Kharkiv region

State of internal audit system	Hotel level (number of stars)			
	5	4	3	No stars
Internal audit functions are not performed	–	3	–	5
Creation of an internal audit system is planned	–	5	–	1
Some internal audit functions are performed on management initiative	–	–	–	1
Some internal audit functions are outsourced	–	–	1	–
Internal auditor's position is created within accounting service structure	–	1	–	–
Internal audit system is under control of management	–	–	–	1
Independent internal audit system	2	–	–	–
Total	2	9	1	8

As we can see, most enterprises of the hotel industry in the Kharkiv region do not have internal audit system in their structure. Those,posessing such a system, entrust internal audit services with the task of confirming the reliability of financial statements of the enterprise, leaving unattended its transformation to international standards and other issues to improve the efficiency of accounting work and management in general.

The results of the analysis of tendencies of hotel industry development in Ukraine show that a significant part of enterprises of hotel industry are public and private joint-stock companies, for which the financial reporting on the basis of IFRS since 01.01.2012 is compiled. It is mandatory, or customary according to Article 12 of the updated Law of Ukraine "On Accounting and Reporting in Ukraine" and

paragraph 1 of the Letter of the National Bank of Ukraine, the Ministry of Finance and the State Statistics Service of Ukraine from 07.12.2011. [46].

The study of the management needs of business entities allowed proposing the relationship between the levels of internal audit system and types of enterprises (Fig. 11).

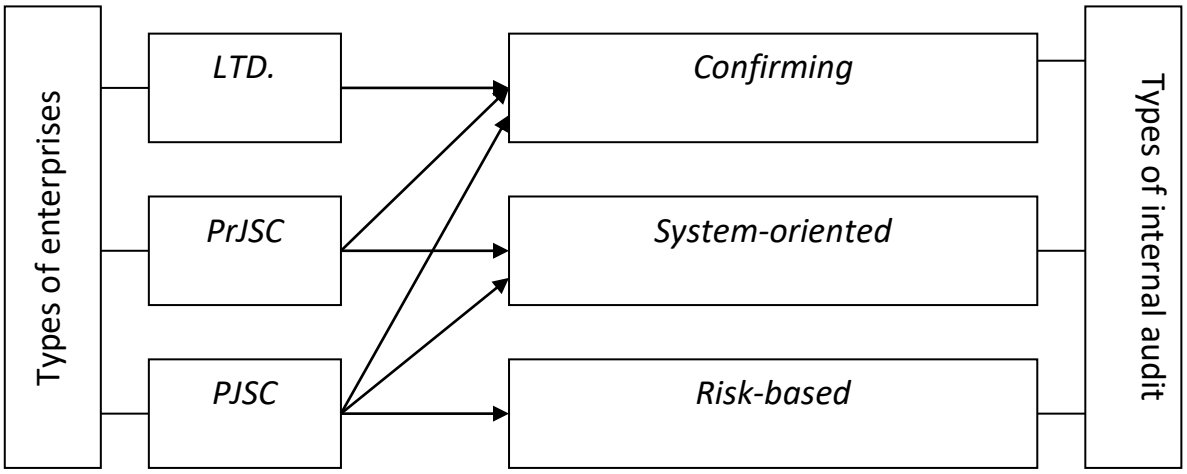


Fig. 11 - Connection between types of enterprises and types of integrated reporting audit

Initially, large enterprises with different types of activities, with a complex branched structure and a large number of territorially remote branches, subsidiaries and affiliates need to form an internal audit department. Work of specialists of internal audit department in this direction consists in unification and standardization of accounting processes for rational formation of financial reporting [49, p. 50].

One of the activities of internal auditors is the formulation of conclusions and development of recommendations, which should help to reduce costs and improve the efficiency of the enterprise. Internal audit cannot be considered as completed until the audit recommendations are implemented and the identified deviations are eliminated.

The company's management staff may accept or deny such a proposal, since the company's accounts are subject to mandatory audit. Table 8 shows the distinguishing features between internal and external audit, which allows evaluating the feasibility of forming an internal audit service [47, p. 48].

Table 8

Distinguishing features between internal and external audit

Characteristic	Internal audit	External audit
Audit objective	To assure managers that assets are used efficiently	To be able to express an opinion that the financial statements are compiled in accordance with the established requirements
Scope of verification	Analysis of all processes	Selective verification
Frequency and rate	Operate in constant contact with the accounting department and other economic services	Operate on a one-time basis, usually at the end of the reporting year
Service user	Aimed at satisfying the interests of management staff	Aimed at satisfying the interests of information users, such as customers, owners of corporate rights
Auditing entity	Enterprise staff	Independent auditing company
Regulation	International internal audit standards, internal company regulations	International internal audit standards, current legislation
Results of their usage	Auditing report and recommendations to improve operational efficiency are used in management	Auditor's report, used to obtain assurance on the reliability of financial statement
Format of the report	Directly determined by the head of internal audit in coordination with the management staff	Depending on the type of services is determined by International Standards on Auditing
Scope of enterprise	Ongoing operational consulting on the management and economic policy of a particular enterprise	Development of general trends, analysis of their impact on production and financial activities of the enterprise

Thus, the need for mandatory external audit does not exclude the need to create an internal audit service. It is necessary to identify internal reserves of the company,

to determine the priority areas of its development, risk assessment and management based on the use of knowledge and experience of its specialists, to ensure the improvement of financial stability and competitiveness of the company. Internal audit unit does not replace external audit, audit group, security service, accounting or financial department, it closely cooperates with them [41, p. 447].

Analysis of the accounting policies content of business entities indicates that the majority of hotels in the Kharkiv region entrust the performance of internal audit and control functions to the chief accountant. This practice does not meet the requirements of the management system of hotel enterprises and does not contribute to the creation of conditions for proper control over the formation of financial results and the preparation of reporting on the segments of the enterprise. The lack of an independent internal audit department in the hotel enterprise leads to distortion of information on the formation of the cost of hotel services, respectively, to the incorrect determination of the financial results of the activities of individual units by the accounting service. This causes an excessively high risk of incorrect distribution of cash flows by the financial department of the enterprise. Therefore, in accordance with the defined priorities of internal audit in the field of hotel services, the components of its conceptual model and the relationship with such elements of information service of enterprises as accounting and financial services were highlighted (fig. 12). In order to provide a more detailed framework for the internal audit system depending on the purpose of the audit, on the content of the studied issues and the composition of information used to analyze revenues and expenses by segments, V. Rudnitsky proposes to distinguish financial and management audit [48 p. 5]. In the proposed model, the functions of management audit of integrated reporting are assigned to accounting personnel, responsible for recording and control of business operations on the ground of their implementation, actually in the segments. The information formed in the management audit system is processed by the financial audit system, provides information support for the tasks of the financial department.

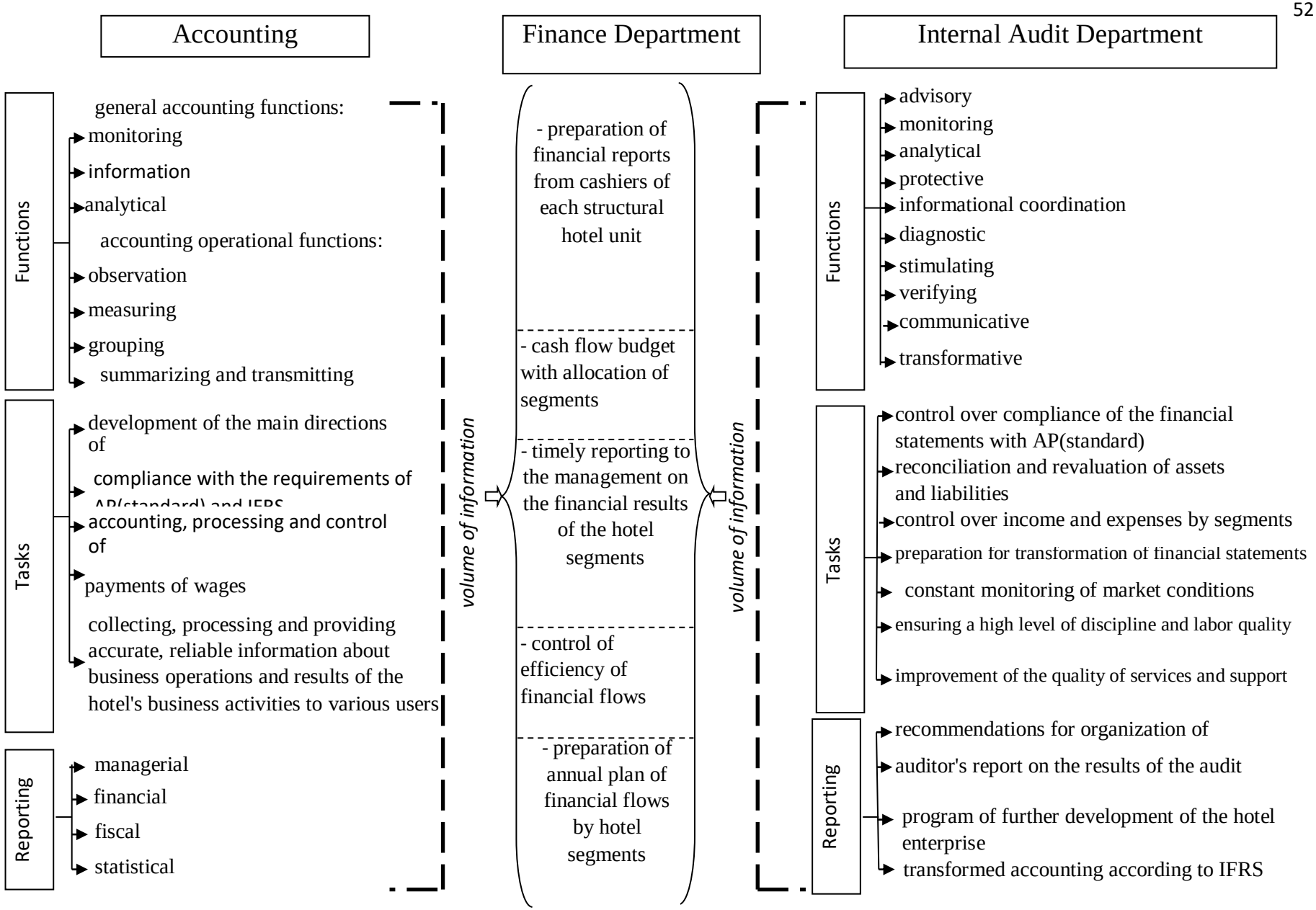


Fig. 12 - Conceptual model of internal audit in the structure of enterprise information service

Following the recommendations and conclusions of the internal audit system of integrated reporting, the financial department makes budget formation of cash flows of enterprise on segments and organizes managing influence in order to improve the service quality.

One of the important issues that arise before the internal auditor is a preliminary determination of the size of the audit risk, the value of which directly affects the number of audit procedures, the size of the audit sample and the labor costs associated with the conduct of the audit. In addition, extensive use of information technology in the organization and accounting of the hotel services significantly affects the size of the audit risk, adding the information risk to its traditional components.

Therefore, while developing a general internal audit strategy, it is advisable to highlight the areas of the company's activities, the implementation of which is associated with a high audit risk and requires more attention in the internal audit system.

3. RISK ASSESSMENT OF AUDIT INTEGRATED REPORTING UNDER CONDITIONS OF UNCERTAINTY

Formation of an internal audit program of integrated reporting provides for profound verification of reliability and quality of accounting information on the basis of assessment of selected elements of typical audit objects inherent in the organization - customer and control of individual issues of activity, specified by the management bodies of the enterprise [49, p. 186]. The internal audit program of integrated reporting is drawn up at the stage of audit planning, the main task of which is to identify and assess the audit risk.

Audit risk is the risk that the auditor will express an inappropriate audit opinion using financial statements, which may contain both significantly distorted and reliable information [50, p. 197].

According to international auditing standards, the audit risk consists of intra-business (inherent) risk, control risk, and non-detection risk [51, p. 367]. In spite of the fact that the internal audit system performs not selective, but total audit of business entities, it has the same groups of risks, but their assessment at the planning stage has its own peculiarities.

First, it should be taken into account that internal audit planning is a permanent process, based on the results of which constant adjustments to the internal audit program are made. A. Red'ko describes internal audit as "the third eye of the management system", emphasizing that the subject of internal audit attention consists of business risks, both external and internal (among the latter, inefficiency of internal control), and the task is to prevent the emergence, identify and eliminate the undesirable consequences of risks for business [41, p. 447]. Therefore, risk assessment should be carried out in the internal audit system continuously, in order to reduce them to an acceptable level. In the risk management system of the business enterprise, we propose to distinguish four groups of risks: intra-business, control, information systems and investment projects. The first three groups are relevant for enterprises of all organizational and legal forms, and the fourth one - for public and

private joint-stock companies. Assessment of control risk is regulated by ISA and does not depend on the specifics of activities in different sectors of the economy. Therefore, let us dwell on the peculiarities of assessment of intra-business, investment and information risk groups.

Intra-business risks of business entities are of fundamental importance for the auditor's assessment. Therefore, to develop an adequate methodology of audit risk assessment it is necessary to investigate the formation of information flows at each stage of hotel services provision (tab. 9).

Table 9

Interrelation of information service stages and internal audit functions

№	Stages of information service rendering hotel services	Internal audit functions	Internal risks
1	2	3	4
1	Documentation of hotel services at the stages of: - reservation - reception, check-in and accommodation - provision of accommodation services - provision of additional services - Final payment and check-out processing	- checking for double bookings - checking of cancelled orders and their prompt reflection in the documents and the IS - reconciliation of discrepancies in reservation status - checking of entered records (forms: Personal card (1-G) registration card (2-G) business card (3-G), account (4-G); register of residents (5-G) register of foreigners staying at the hotel (6-G) register of room reservation requests (7-G) cash report (8-G) list of room availability in the hotel (9-G) register of persons accommodated on the floor (10-G) - balance of accounts	- untimely reflection of requests for room reservations and cancellations - discrepancies between room occupancy and room rates in the floor occupancy register and the report of the reception service - inefficient transfer of documents to the accounting department
2	Forming a database of accounting and analytical information	- verification of the hotel accounting policy (AP) parameters and compliance of accounting for hotel services with the adopted AP - verification of income and expense reporting by divisions of hotel enterprise - checking the degree of completeness of operations for the provision of hotel services; - checking the correct recording of prepayments from customers - checking of cash and cashless transactions with customers of hotel and additional services - checking of analytical accounting for hotel services (by departments: hotel, restaurant, bar, etc.; by client categories: internal (hotel guests),	- inconsistency in the reflection of hotel services in the accounting of the AP - discrepancy between analytical accounting data and synthetic accounting data - errors in processing accounting transactions with clients

End tables9

1	2	3	4
		external (clients of the restaurant, beauty salon, etc.) with the data of synthetic accounting) - checking the reflection in the accounting of discounts provided to customers; - checking and conducting inventories at the hotel enterprise.	- concealment of deficiencies by the materially responsible persons.
3	Reporting - financial - by segments	- financial - by segments - verification of compliance of financial reports with AP (standard) - reclassification and revaluation of assets and liabilities - verification of income and expenses by segments - preparation for transformation of financial statements (for PJSC and PrJSC)	- transformation of IFRS financial reports - inconsistency between financial statements of AP (standard) and IFRS; - irregularities in valuation of hotel assets and liabilities - lack of information on revenues and expenses by segments
4	Formation of a client database	- checking of the client database - segmenting of clients by criteria: net profit, consumption of basic and additional services, age, status, country etc. - formation of the client base by segments of the hotel enterprise; - analysis of the client database and development of loyalty programs - customer significance assessment and development of customer preference models for further improvement of hotel and additional services provision	- lack of a client base of the hotel - damage to and/or disclosure of client information - not using the client database in the hotel's future operation
5	Budgeting, planning, pricing at hotel enterprises	- checking of budgets of income, expenses and cash flows from providing hotel services for the hotel in general and its segments - analysis of external market, competitors and own market position - analysis and approval of hotel budget plans - control over the implementation of the enterprise budgets and their adjustment if necessary - checking of correctness of price determination for basic and supplementary hotel services - checking of the hotel pricing policy; - checking of the hotel accounting policy	- violation of pricing policy by the hotel sales department - ineffective formation of budgets by hotel segments - incorrect determination of the cost of basic and additional hotel services - absence or ineffective accounting hotel policy

Intra-business risks arise at each stage of the information service of hotel enterprises. For the audit assessment, they should be classified into the following

groups: in relation to macro- and micro-environment, the nature of risks, the possibility of insurance and risk management (Fig. 13).

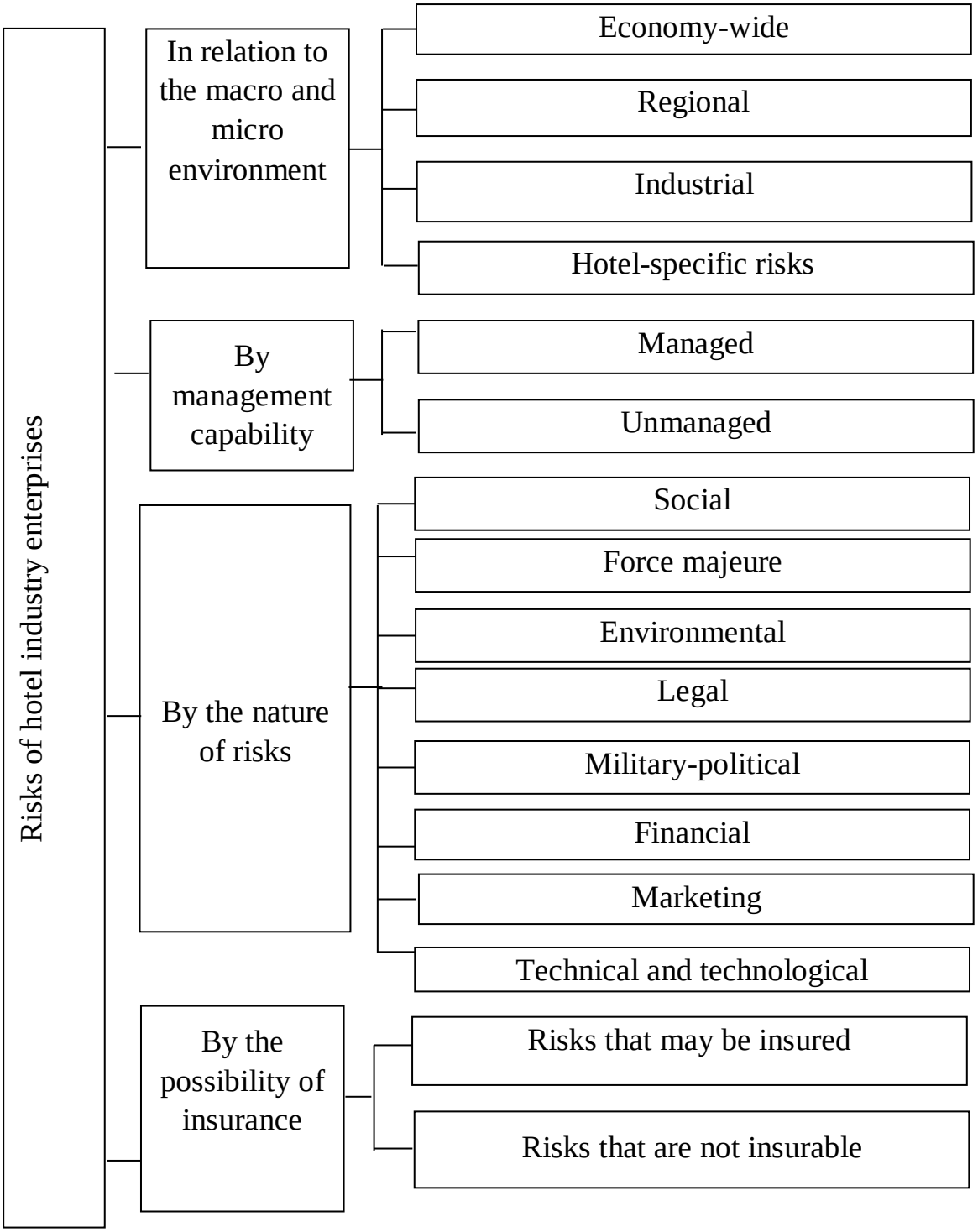


Fig. 13 - Classification of internal economic risks of business entities

In the process of checking the integrated accounts, the internal auditor should check the correctness of determining the cost of services of business entities by segments, which will allow optimizing the pricing policy. As it was proved, it is reasonable to distinguish the hotel and restaurant segment in most hotels in the Kharkiv region. Therefore, it is advisable to check the correctness of determining the cost of services and the calculation of the average price of a conditional room, according to the following scheme (Fig. 14).

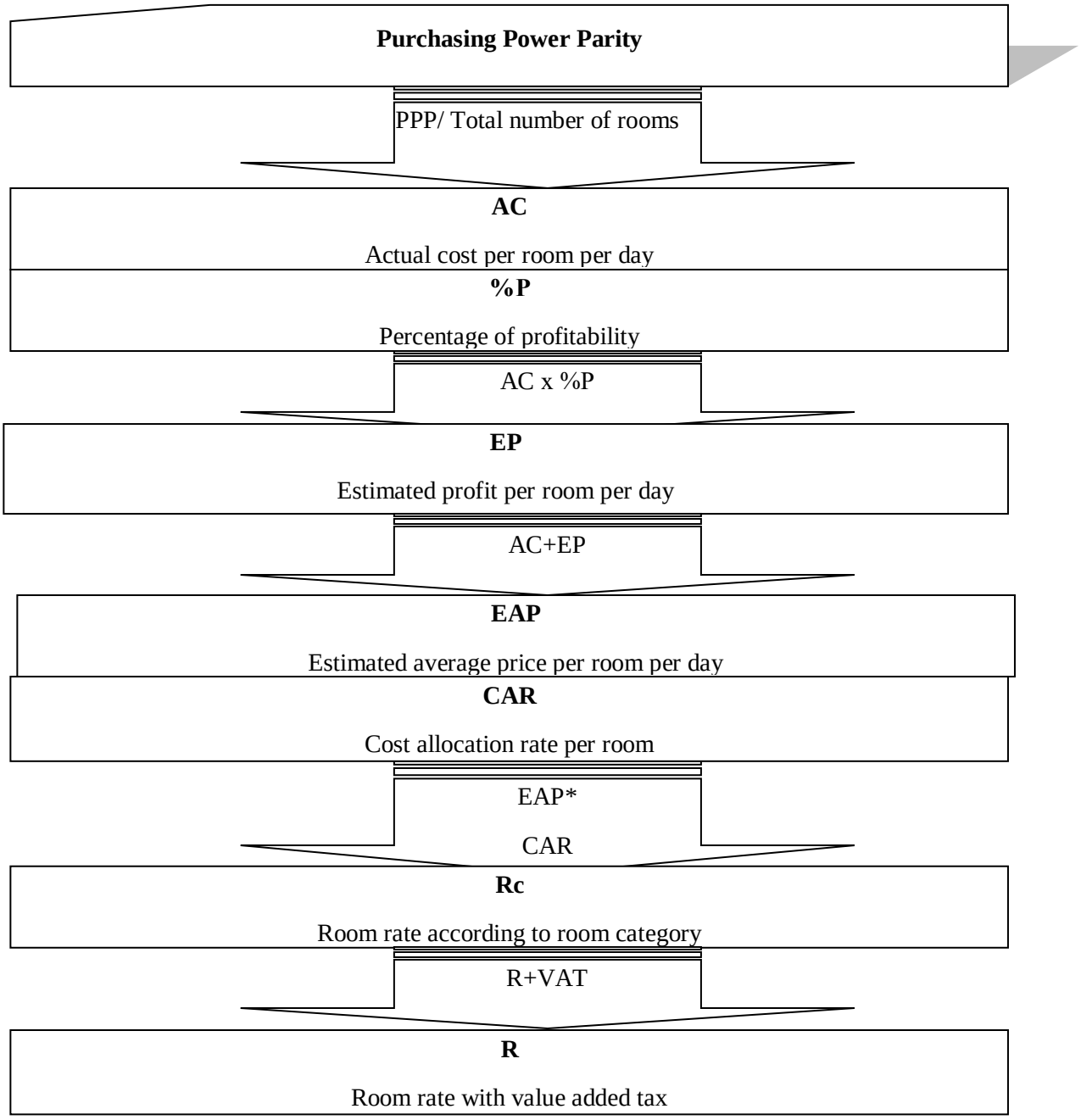


Fig. 14 - Algorithm of auditing the formation of the hotel cost services

Transaction documentation shows the essence and scope of hotel services. It is the basis for determining the revenue from sales and cost of hotel services and accounting of advances received. For each type of hotel service, the type of transaction (cash, price, payments) and its monetary value are recorded.

For the internal audit of integrated reporting, the accounting system must provide additional, independent documentation to verify each transaction. In a manual or semi-automated operation, supporting documents created by any method serve as sources of cross-reference. The auditor, having information on hotel room occupancy and having data on their rates, compares everything to the front desk report. The next component of the internal audit risk of integrated reporting of business entities is investment risk, the assessment of which becomes relevant in the context of increasing share of joint-stock companies. The assessment of investment risks in the system of internal audit of business entities requires the development of their scientifically valid classification (fig. 15).

The main task of internal audit of integrated reporting is to justify the criteria and indicators of investment policy efficiency. The essence of the problem of increasing the effectiveness of investment policy is to achieve the maximum possible increase in economic effect (income, profit) for both the enterprise and the investor for each unit of investment costs. Proceeding from it, the only macroeconomic criterion of investment policy efficiency is the investment climate of the country and specific region, the attractiveness of the industry. Besides, the task of internal auditor is the calculation and analysis of investments for the expansion and opening of new subdivisions of business entities, which becomes particularly important in the conditions of Ukraine's integration into the EU. One of the most important factors shaping the level of service quality of business entities is the provision of a wide range of additional services that can meet the basic needs of customers (both the quality of their provision and the range). The study of the hotel enterprise "Chichikov" showed that the range of additional services provided by the enterprise is not wide enough. Therefore, in our opinion, it is advisable to develop new services

and focus mainly on business people, as they make up a large part of the customers of the hotel "Chichikov".

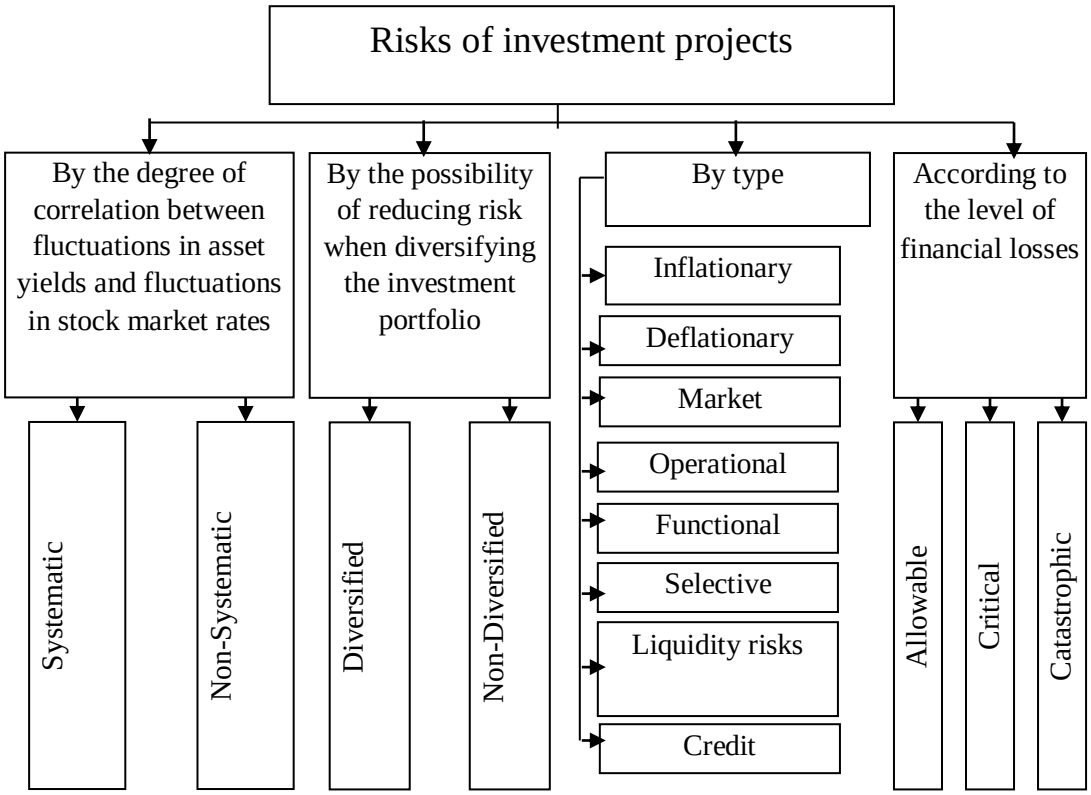


Fig. 15 - Components of investment risk of business entities

A modern conference hall specially equipped for conferences, seminars, symposiums and other business and cultural events of various organizations will contribute to the competitiveness of the hotel enterprise services. Halls for conferences and other business events are quite widespread in many foreign hotels and not common in our country. The need for its creation can be explained by the fact that Kharkiv is a business center and the demand for holding such events is constantly growing here. The Chichikov Hotel also hosts conferences, but the demand is very low. One of the main reasons for this is that the hotel does not have the necessary conditions for holding such events.

The internal auditor needs to determine the amount of investment needed to create a conference hall, and the possible effectiveness of this event for the hotel "Chichikov". The amount of costs for the construction and renovation of the enterprise, the purchase of necessary furniture and equipment is shown in Table 10.

Table 10

Expenditures necessary for organization of conference hall in hotel "Chichikov"

Items of expenditures	Amount of expenditures, thousand UAH
Building and repairing works	40,0
Equipment	135,2
Furniture	53,0
Expenses for delivery and installation of furniture and equipment	9,01
Total expenses:	237,21

In this case, it should be taken into account that the approximate cost of creating a conference room is calculated. It is quite possible that some types of costs will be unaccounted or the calculated cost will be underestimated. Therefore, the internal auditor should also allocate a certain reserve to cover unaccounted costs (for example, for 10% of the total amount). Thus, the total investment needed would be approx:

237,21 + 23,72 = 260,93 thousand UAH.

At the next stage, the internal auditor determines the economic effect that can bring the conference hall of the hotel "Chichikov". The problem of determining the economic efficiency of the projected activities is very important for the enterprise, because it allows to find out over what period the investment will be recouped and whether you should be engaged in the implementation of the project at all.

First, it is necessary to determine the projected annual revenue from the sale of services of the conference hall. The cost of the project includes the use of the conference hall and all the available conference equipment, conference service by hotel staff, as well as the provision of light refreshments and drinks (coffee, tea, soft drinks) during the breaks between meetings to the participants of the conference by the hotel restaurant. The internal auditor calculates the hotel's revenue from conference room services as the product of the cost of the event for one participant (100 UAH) by the average number of participants (80 people) and by the number of weeks in a year (52).

Thus, it is equal to:

100 x 80 x 52 = 416,0 thousand UAH.

In addition, many conferences and seminars are attended by representatives from other cities who stay at the hotel. Therefore, due to holding such events will increase the workload of the hotel "Chichikov". Let's assume that about 20% of visitors from the total number of participants will take part in conferences. Their number for the year is calculated as the product of the average number of participants (80 people.), the number of weeks in the year (52) and 0.20. Thus, the number of participants from other cities of the country for the year will be 832 people. Revenues from the hotel services for accommodation of such clients are calculated as the product of their number for the year and the average tariff for a bed place. Since these customers usually stay in the best rooms, the average rate for them will be 123,84 UAH. per bed place. Thus, the revenue from the sale of hotel services for the accommodation of the participants of the conferences will be:

832 x 123,84 = 103,034 thousand UAH.

For example, by holding conferences in the hotel "Chichikov", revenue from the sale of basic services can be increased by 103.03 thousand UAH.

At the same time, many organizations end such events with banquets at the restaurant. Thus, by holding conferences, the hotel will be able to increase the revenue of the restaurant. Let's assume that at least 50% of the conferences will end with a banquet, the average cost of which for a participant is 180 UAH. Therefore, the annual revenue of the restaurant from serving these feasts will be

80 persons x 52 weeks x 180 grn. x 0,5 = 374,4 thousand UAH.

Thus, holding such events at the hotel will increase the annual revenue of the hotel "Chichikov" restaurant by 374,4 thousand UAH.

At the next stage, the internal auditor calculates the profit and profitability of the hotel "Chichikov" from holding events in the conference hall. Thus, the cost of conference services will approximately amount to 55% of the total revenue from the provision of services of the conference hall:

893.43 x 0.55 = 491.39 thousand UAH.

Conference service costs include utility costs, costs of raw materials and supplies, workers' compensation, deductions for social events and other expenses. Advertising costs - 5 % of total sales revenues

893,43 x 0,05 = 44,67 thousand UAH.

Depreciation charges are calculated as follows:

- for the conference hall premises - 5% of its original cost (2.0 thousand UAH)
- furniture and equipment - 25% of their original cost (47.05 thousand UAH) .

Total amount of depreciation charges will make 49,05 thousand UAH.

Hence the total annual expenses of the hotel "Chichikov" on service of the conference hall is equal to 585,11 thousand UAH. Balance sheet profit of the hotel from granting of the given kind of services:

893,43 - 585,11 = 308,32 thousand UAH.

Profit tax will be equal: 308,32 x 0,25 = 77, 08 thousand UAH. Net profit will be equal to the project 215,82 thousand UAH.

Profitability of revenues of the hotel "Chichikov" for the provision of services to the conference hall is 24.16% (as the ratio of net profit to total revenues). Return on investment is calculated as the ratio of net profit to the amount of investment required to create the conference hall. Rate of return on investment for the project will be 82.71%.Thus, we can conclude that the net profit will cover 82.71% of the amount invested (Table 11).

Table 11

Assessment of project results to provide conference hall services in the hotel "Chichikov"

№ з/п	Indicator	Unit of measure	Size of projected indicator
1	2	3	4
1.	Total revenue from the sale of conference room services, including: - customer participation in conferences - accommodation services - banquet services	thousand, UAH	893,43 416,0 103,03 374,4

End tables 11

1	2	3	4
2.	Conference organization and services	thousand, UAH	491,39
3.	Depreciation charges	thousand, UAH	49,05
4.	Advertising expenses	thousand, UAH	44,67
5.	Other expenses	thousand, UAH	15,42
6.	Balance sheet profit	thousand, UAH	308,32
7.	Income tax expense	thousand, UAH	77,08
9.	Net income	thousand, UAH	215,82
10.	Revenue profitability	%	24,16
11	Project profitability	%	82,71

At the next stage, the internal auditor needs to assess the effectiveness of this project based on the following indicators:

- net present value NPV
- profitability Index PI
- payback period PP
- internal rate of return IRR

The discount coefficient is calculated according to the formula [32, p. 265]

$$K_{\partial} = \frac{1}{(1+r)^n}, \quad (1)$$

n - time period, years
r - discount rate.

Recently, the bank interest for credit has decreased slightly. If, in 2016 it ranged from 50 - 70%, today, for example, UkrSibbank provides loans to legal

entities for up to 2.5 years at 30 - 50% per annum. For the calculation, we will take the average value - 40%. The results of discounting are given in Table 12.

Table 12

Calculation of present value

Periods	Cash flow	Discounted cash flow	Discount multiplier
1 year	215,82	0,714	181,29
2 year	215,82	0,51	151,94
3 year	215,82	0,36	77,7
Total	647,46		410,93

The net present value of the project equals [52]:

NPV = CF – I = 410,93 – 260,93 = 150,0(2)

CF – cash flow (presented);
I – investments.

The Profitability Index equals[52]:

$$PI = \frac{\text{CF}}{\text{I}} = \frac{410,93}{260,93} = 1,6 \quad (3)$$

The term for which the investments will be compensated, is calculated by the formula [52]:

$$PP = P + \frac{C}{F} (4)$$

P - the number of years during which the investment is not paid back(P-period)
C - cash balance, which is necessary for the payback of investments
F - the amount of funds that are allocated in the year of investment recoupment;

For our project the payback period equals:

$$PP = 1 + \frac{106,83}{110,07} = 1,97 \quad \text{(years)}$$

Thus, this project on the calculations should be compensated for about 2 years.

The internal rate of return of the project characterizes the level of profitability and is based on the formula [53, p. 234]

$$\text{IRR} = r1 + \frac{(r1-r2)NPV1}{|NPV1|+|NPV2|} \quad (5)$$

First, the internal auditor should calculate NPV2with the loan percentage equal to 70% (tab. 13).

Table13

Calculation of present value

Periods	Cash flow	Discounted cash flow	Discount multiplier
1 year	215,82	0,59	127,3
2 year	215,82	0,35	75,5
3 year	215,82	0,2	43,2
Total	647,46		246,0

$$\text{NPV2} = 246{,}0 - 260{,}93 = -14{,}89$$

$$\text{IRR} = 0{,}4 + \frac{(0{,}7 - 0{,}4)150{,}0}{150{,}0 + 14{,}89} = 0{,}67 = 67\%$$

The calculations are summarized in Table 14.

Table14

Indicators of project efficiency

Indicator	Value
Net present value (NPV)	150,0
Profitability Index (PI)	1,6
Payback period (PP)	1,97
Internal rate of return (IRR)	67%

The project's internal rate of return is 67%. Therefore, this project will bring the total revenue during three years, excluding the invested funds in the amount of 150 000 UAH. The invested funds will be compensated in 2 years. Thus, the hotel "Chichikov" realizes the chosen competitive strategy to focus its efforts on the selected segment of consumers - businesspersons, which is considered as promising.

In market conditions, entering the market for every producer means entering

competition, as there are a large number of products and services on the market that offer different ways of satisfying the same consumer needs at the same or slightly different price conditions. In such a situation, the competitiveness becomes a leading market category, as it concentrates economic, scientific and technical, production, organizational and managerial and other opportunities not only of an individual enterprise, but also of the economy as a whole. Therefore, the search for ways to improve the competitiveness of hotel services must be continued in the world of new economic realities.

Information environment of internal audit of hotel services is "a set of information and messages used in the process of economic control over the state, formation and efficiency of the use of enterprise resources". [54, c. 196]. Therefore, in the process of assessing the risk of internal audit of hotel enterprises it is advisable to calculate the information risk caused by the use of modern information and communication technologies in management. Such risk is especially relevant for hotel enterprises whose databases contain significant amounts of confidential information (including guests' bank details), which most often becomes the object of information misconduct.

Besides, modern enterprises are characterized by a large amount of paper documentation that is generated at all stages of service provision. The specifics of information service at the enterprises lies in the fact that most of the register information is formed and partially processed by engineering, technical and auxiliary services, which perform operational records at the place of actual service provision, which creates additional threats to the integrity of information arrays. At the stage of documenting the process of service provision of business entities, internal audit should ensure monitoring of the information security situation of an enterprise, the implementation through information risk calculation is proposed.

Information security of business entities in the Kharkiv region was studied using the proposed index of information risk, the components of which are the calculation of the degree of use of information technology in economic activity (Annex B), the degree of information security of the enterprise (Annex C) and the

degree of information threats (Annex D) .

The first step in assessing the information risk of internal audit is the analysis of the IT use, which is proposed to determine on the basis of expert assessments of 16 indicators, according to a developed scale (1 - not used, 2 - at the stage of development, 3 - at the stage of implementation, 4 - used partially, 5 - used to its full extent).

In the proposed model for assessing the information risk of business entities, it is reasonable to calculate the information risk index for enterprises where the calculated rate of information technology usage exceeds 20 points. Therefore, the degree of security and information threats for enterprises with a low index of IT use was not analyzed.

To calculate the level of vulnerability of information service and the state of information security of business entities, the scale suggested by the NBU Board in the normative document of technical protection of information RD TIP 2.5-004-99 "Criteria for evaluating security of information in computer systems against unauthorized access"[55] should be used for the process of auditing the banking sector (Tables 15 and 16).

In the developed model, the risk of information threats directly proportionally affects the overall audit risk of information security, while the coefficient of the state of information security is inversely proportional. The proposed methodology for assessing information security takes into account the peculiarities of the activities of business entities.

To calculate the risk of information threats, we propose to use the following formula:

$$R_{I3} = \sqrt[5]{R_1 \times R_2 \times R_3 \times R_4 \times R_5} \qquad (6)$$

R_{I3} – risk of information threats;
R_1 – software and mathematical risks;
R_2 – physical risks;
R_3 – radioelectronic risks;

R_4 – organizational and legal risks;

R_5 – information risks.

To calculate the degree of information protection we propose to use the following formula (7), according to the criteria of Table 3.12:

$$S_{I3}=\sqrt[4]{S_1\times S_2\times S_3\times S_4}\,, \tag{7}$$

S_{I3} – state of information system protection;

S_1 – state of physical means protection;

S_2 – state of protection against unauthorized access;

S_3 – state of software means protection;

S_4 – state of database protection.

Table15

Scale for assessing vulnerability of information service of business entities

Probability of incident	Frequency	Rate
Insignificant	2-3 times in 5 years	1
Low	Once a year	2
Medium	Once in six months	3
High	Less than once a month	4
Extreme	Once a day	5

Table16

Scale for assessing the state of information security of hotel industry

Level of protection	Rate
High	1
Sufficient	2
Satisfactory	3
Low	4
None	5

We propose to determine the assessment of the general state of information security of business entities using a matrix (Fig. 16).

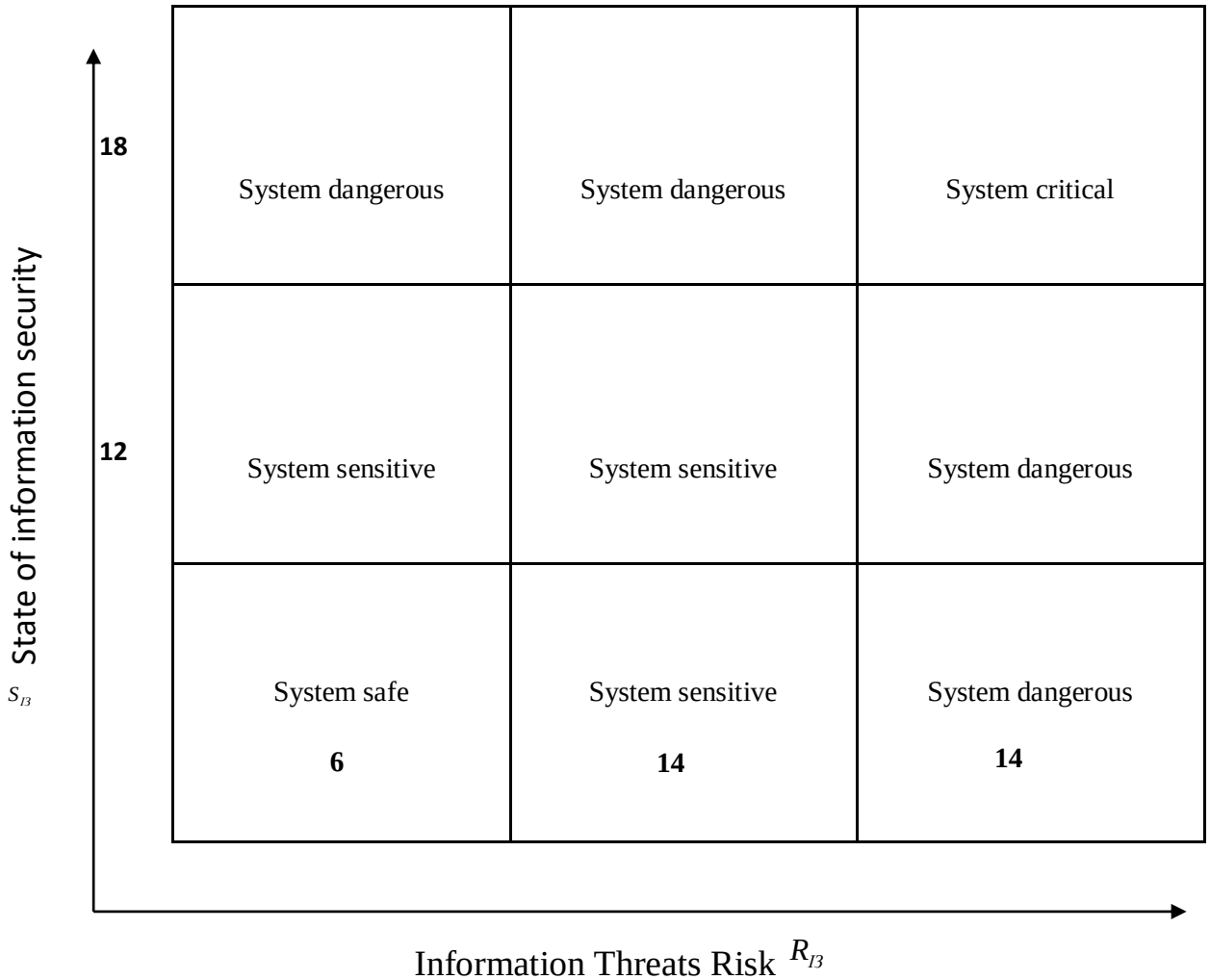


Fig. 16 - Matrix for assessing the state of information security of business entities

The assessment of information security risk of business entities, carried out according to the proposed methodology, allows the internal audit department to develop a set of procedures to verify the state of information service at the enterprise, the methodology of which is discussed below.

4. IMPROVEMENT OF INTERNAL AUDIT ACTIVITIES IN COMPUTER ENVIRONMENT

Enterprise development is connected not only with internal (corporate), but also with external factors. The latest tool to optimize the activities of business entities have become information technologies, the functional purpose of which allowed accelerating and improving the quality of processing of information resources for the adoption of effective management decisions.New conditions of enterprise activity influence auditing activity - a fundamentally new task of internal auditing is not only to check the efficiency of information technologies, but also to justify the economic feasibility of their use and to develop proposals for the modernization of IT infrastructure. The auditor at the modern stage of information technology development should apply computer technology and equipment at all stages of the audit (planning, implementation, documentation, preparation of the report). The application of information technology and computer technology fully meets the objectives of internal audit, having a direct impact on the methodology and technique of audit procedures. It is reasonable to consider the interrelation of the information system of enterprise management and the system of internal audit of integrated reporting from two positions (fig. 17):1) As a provision of internal audit with information and communication technologies, which makes it possible to increase the efficiency and effectiveness of the audit; 2) As a controlling influence of the internal audit system on the information management system of the enterprise to maintain a sufficient level of information security of the enterprise.

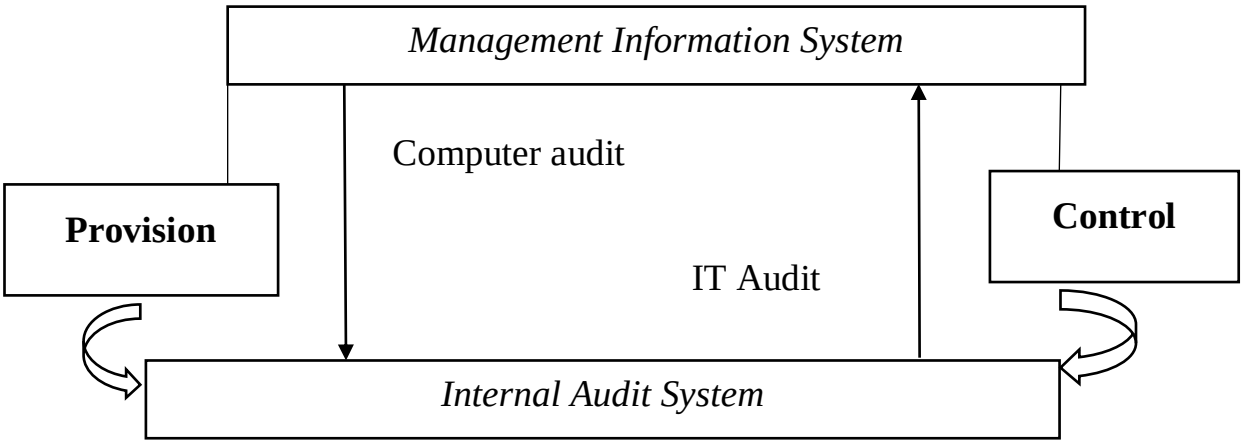


Fig. 17 - Correlation of the information service of business entity components

The first type of relationship should be regarded as a computer audit, while the second one - as an IT audit (information technology audit). The concept of an IT audit is broader than a computer audit. IT audit is a type of audit, which has its own functions, tasks and techniques. Computer audit is a method of audit implementation, which can be applied in the IT audit, as well. Therefore, characterizing the relationship of information and communication technologies and internal audit, it is necessary to investigate the methodology of its implementation.

The issue of audit automation is considered in the works of the native scientists: S. V. Ivakhnenkov, F. F. Butinets, V.O. Shevchuk, N. A. Kantsedal, O. Y. Redka, O. G. Ponomarenko, O. V. Lysa, E. V. Mnikh, T. A. Pysarevska and the foreign scientists: V. I. Podolskiy, V. V. Dick, A. I. Urintsov, P. Friedman, J. Richard, A. N. Romanov, N. P. Baryshnikov, A. D. Sheremet, N. G. Kondratov. However, the issue of automation of audits of business entities is not highlighted enough. Therefore, it is necessary to analyze the information support of audits and develop methodological approaches to the computerization of audits of business entities. Different points of view on the audit classification according to the method of audit procedures exist. There are paper, mechanical and automated types [56; 11]. We believe that in cases where the computer is used by the auditor only as an auxiliary tool (for making reports, calculations, information search, etc.), but not for the purpose of processing accounting information and performing test procedures, then such an audit is manual, regardless of the extent of computer technology use. In this case it is not necessary to distinguish its sub-species (paper and mechanical), since the realities of the present do not imply conducting an audit without the use of computer technologies at all. Therefore, it is necessary to distinguish a new perspective type of audit - the computer audit, in addition to the traditional manual audit. Computer-based audit is regarded as an integrated application of computer equipment and modern information technologies for the organization of auditing activities - audit procedures to assess significant risks, checking financial statements, the preparation of analytical procedures, the formation of the audit report with the provision of additional services [57] , p. 228].

The concept of computer audit was formed under the influence of the evolutionary development of computer technology, accounting and auditing methodology, changes in the role of the audit subject, which in the beginning was defined exclusively as an automated audit, without highlighting the characteristic features [58] , p. 134].

Today, there is no consensus on the concept of computer audit. It is not reasonable to consider computer audit solely as a tool. It is a functional system that ensures the implementation of economic security of the enterprise, forms the statement of probability of information resources. It is the basis of auditor's professional assertions [59, p. 230]. Scientists characterize the computer audit by the grounds shown in Table 17.

Table17

Modern definition of computer audit

Feature	Characteristics
Type of service	Special type of service, which implies risk identification in accordance with the functioning of information systems [60; 56, p. 24-36]
Technical means	Conducting an audit using computer technology [61; 62, pp. 166-170; 63, pp. 198-204]
Organizational means	Application of information technology as an auditor's toolkit [64, p. 12]
Control tool	Controlling the reliability of information, checking the probability of financial statements [65, p. 366-369]

Summarizing the previous iformation, we can conclude that the computer audit covers the use of information technology and software as a method and toolkit of the auditor in the performance of the task based on assessment of reliability and identification of significant risks of the information system of the enterprise.

This type of audit is based on the application of modern computer technologies at all stages: planning, conducting the audit, documenting the audit work and processing the auditor's report. The main objectives of this type of control are the

audit of financial statements with preparation of the audit report and provision of related audit services. The computer can be used in different configurations: as an independent workstation used by one or several users one by one, who can work with one or different programs; as a local network of microcomputers, that is when several microcomputers are united through the use of special programs and communication lines; as a centralized database, that is a workstation united with the central computer.

The overall purpose and scope of the internal audit of integrated reporting in the computer technology environment of business entities does not change. However, the use of computers introduces changes in the processing, storage and transmission of financial information and affects the accounting and internal control system of an enterprise [66, 150].Techniques in which a computer is used as an internal audit tool for integrated reporting are computer-assisted auditing techniques. ISA 401 «Audit in the context of computer information systems» provides recommendations on the use of computer methods in auditing. (Table 18).

Table18

Computer-assisted audit methods

Computer-based audit methods	Software	Content of computer procedures
Audit software consists of computer programs that auditors use as an element of audit procedures	General-purpose software package	Computer programs designed to perform data processing functions, including work with computer files, collecting information, performing calculations, creating data files and making reports in the auditor's prescribed form
	Special purpose programs	Computer programs developed for performing auditing tasks under specific conditions
	Utility programs	Used by the subject to perform general data processing functions (sorting, creating and editing files). Not intended for audit
Testing data - used in auditing procedures by entering data into the subject's computer and comparing the results obtained with predetermined results	Testing of specific controls in computer programs	Data access-control system is being tested
	Selection of checking operations	Checking operations are selected from previously processed business transactions or created by the auditor to test certain characteristics of the processing performed by the entity's computer system
	Built-in test subsystems	Checking operations are used in built-in subsystems with the module through which they run in the normal processing cycle

Computer-based methods of auditing integrated accounts can be used in a variety of audit procedures, including the following:

- detailed tests of transactions and balances (e.g., using audit software to test transactions in a computer file);

- analytical review procedures (e.g., using audit software to identify unusual changes or items)

- compliance testing of general CIS controls (e.g., using test data to test procedures for accessing software databases);

- verification of compliance with applied CIS controls (e.g., using test data to verify the operation of a programmed procedure).

Conducting a computer-based audit of integrated reporting involves the use of appropriate technical means (computers) and information technology. For conducting internal audits in enterprises, it is advisable to use such hardware configurations as multi-user workstations, local computer networks, centralized data storages and virtual workstations (Fig. 18).

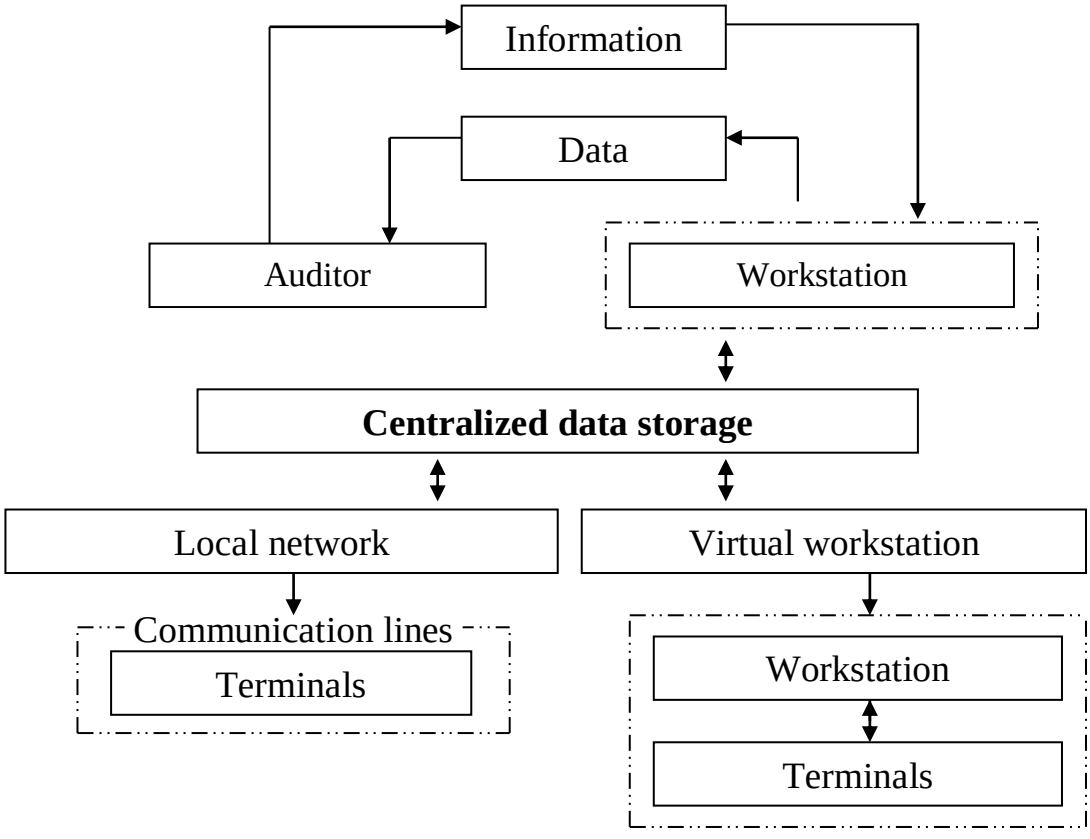


Fig. 18 - Configurations of technical support for the audit of integrated reporting

The selection of the optimal configuration of technical support for internal audit of integrated reporting depends on the size of the enterprise. For hotels with up to 50 rooms, the most acceptable in terms of implementation costs and economic effect would be a standard workstation; from 50 to 100 rooms - a local computer network, and over 100 rooms - a virtual workstation.

The next stage of designing a computer system for internal audit of integrated reporting is the choice of software. In making this choice, the potential user should compare a large number of non-identical characteristics of computer programs and their capabilities. Therefore, the development of formalized techniques for comparing different packages of applied audit software, allowing reducing the subjective factor in conducting an independent audit examination, is of great-applied importance for the design of internal audit system of integrated reporting of business entities.

In this regard, the set of parameters that should be used to assess the software of audit procedures have been aggregated into three interrelated blocks (Fig. 19).

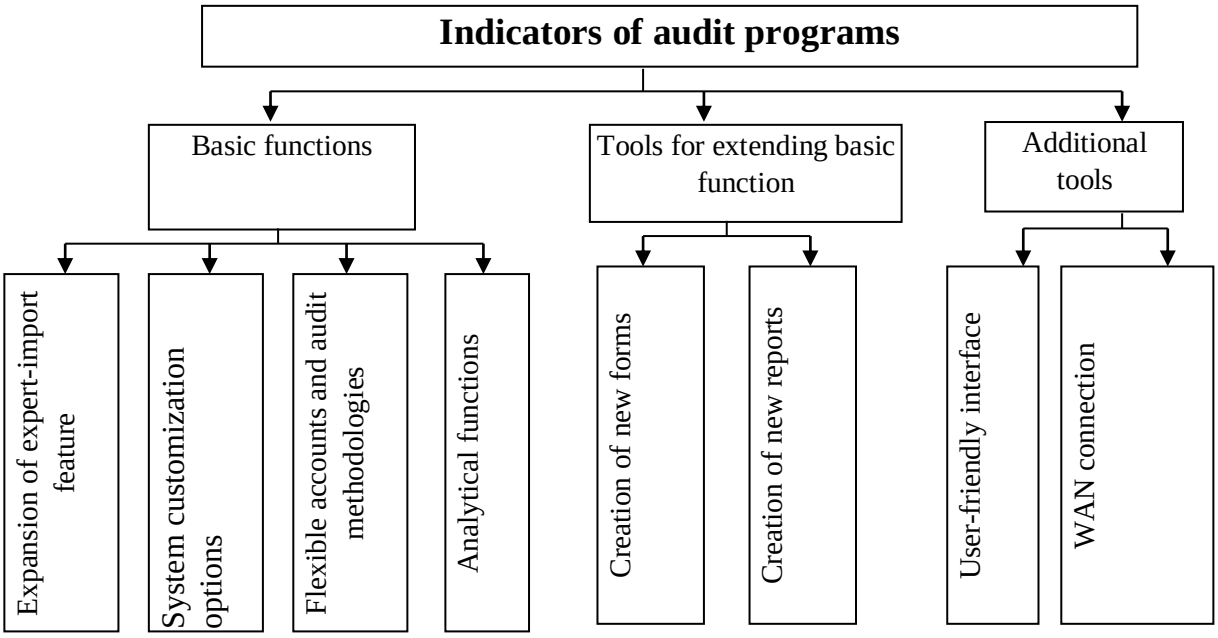


Fig. 19 - Functions of computer-based audit software for integrated reporting

As objects for comparison, we chose three most widespread audit software programs in Ukraine: "INEC: AFSP" (hereinafter - AFSP) of the company

"INEC", "Audit Expert" of the company "Pro-Invest-IT" and "ABFI-Enterprise" (hereinafter - ABFI) of the company "Westona".

The list of their main characteristics is given in Table 19. The presence of a certain characteristic of the corresponding product is defined by a "+" symbol, its absence by a "-" symbol.

Table19

Functionality of automation packages for audit tasks

Functionality	AFSP	Audit Expert	ABFI
1	2	3	4
Basic functionality			
Automatic data maintenance by accounting programs and txt files	+	+	+
Checking the correctness of the input data	-	+	+
Bringing data for different periods of time to a comparable form	+	+	+
Revaluation of balance sheet items in order to restore the data to their real values	-	+	-
Processing of foreign accounts	-	+	-
Existence of regulated auditing methods	-	+	-
Possibility to apply audit techniques	-	+	-
Formation of audit planning	+	+	+
Formation of audit programs	+	+	+
Formation of audit documents	-	+	+
Audit of reporting	+	+	+
Export of audit results to another programs	-	+	+
Tools for extending basic functionality			
Creation of new input data forms	-	+	+
Tools for describing new estimated figures to implement own auditing methods	-	+	+
Possibility to compare the values of financial indicators with the indicators of official accounting statements of the enterprises-leaders in the region	-	+	-
Capability of creating audit reports	-	+	-
Additional features			
Ability to adjust to the task	-	+	+
Networking	-	+	+
Availability of functional product line	-	+	+

An effective tool for integrating the audit of integrated reporting with accounting information technology is the introduction of the accounting information array into the audit program, which is used to perform the tasks of enterprise management (Fig. 20).

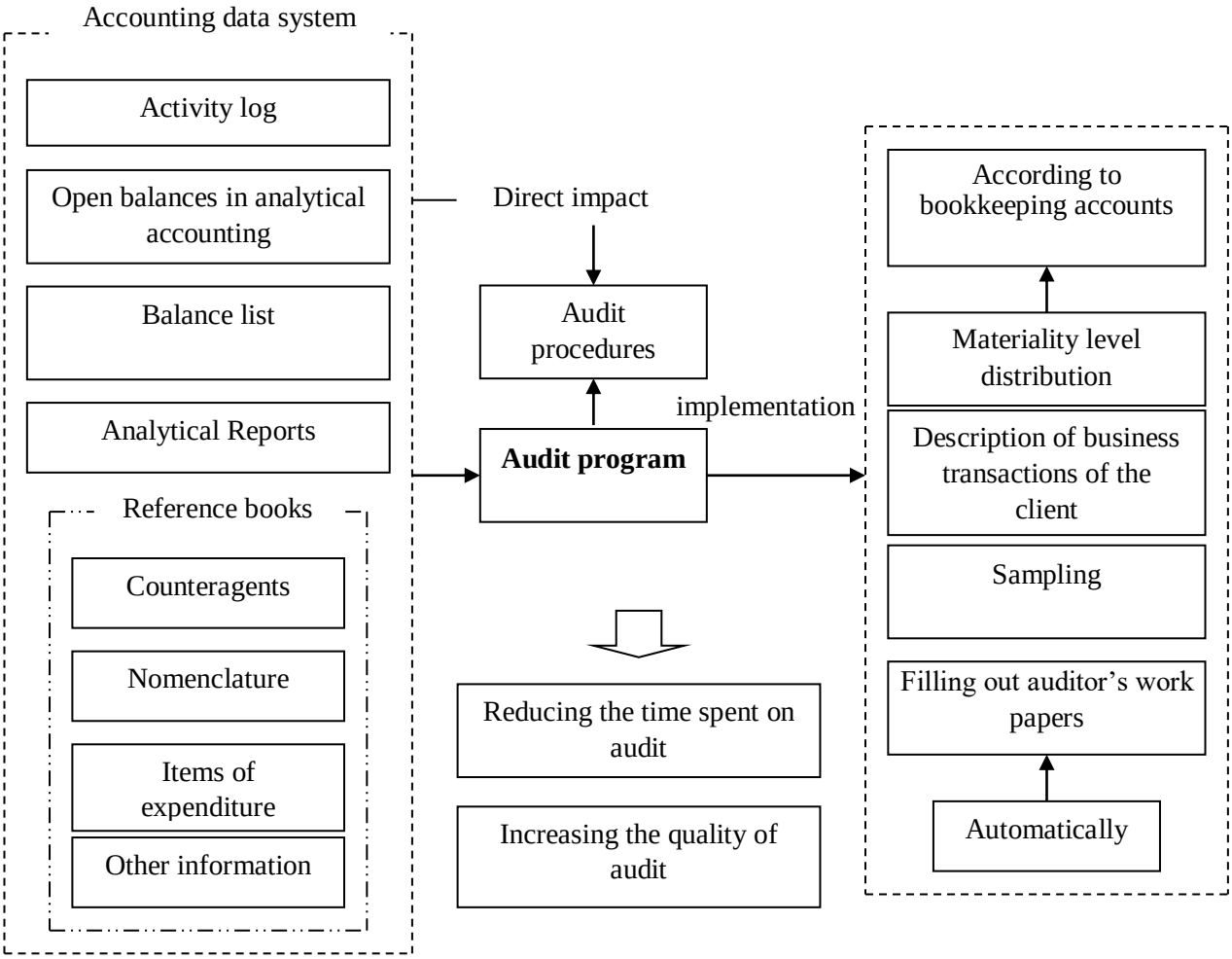


Fig. 20 - Formation of internal audit database for integrated reporting

The functions listed above are most fully implemented in the Audit Expert program, which allows you to automatically download accounting data from such programs (Fig. 21) as 1C:Accounting, 1C:Enterprise, Info-Bookkeeper, INFIN-Bookkeeping, the "Parus" program.On the other hand, the toolboxes allow you to setup the program for importing data from txt files.

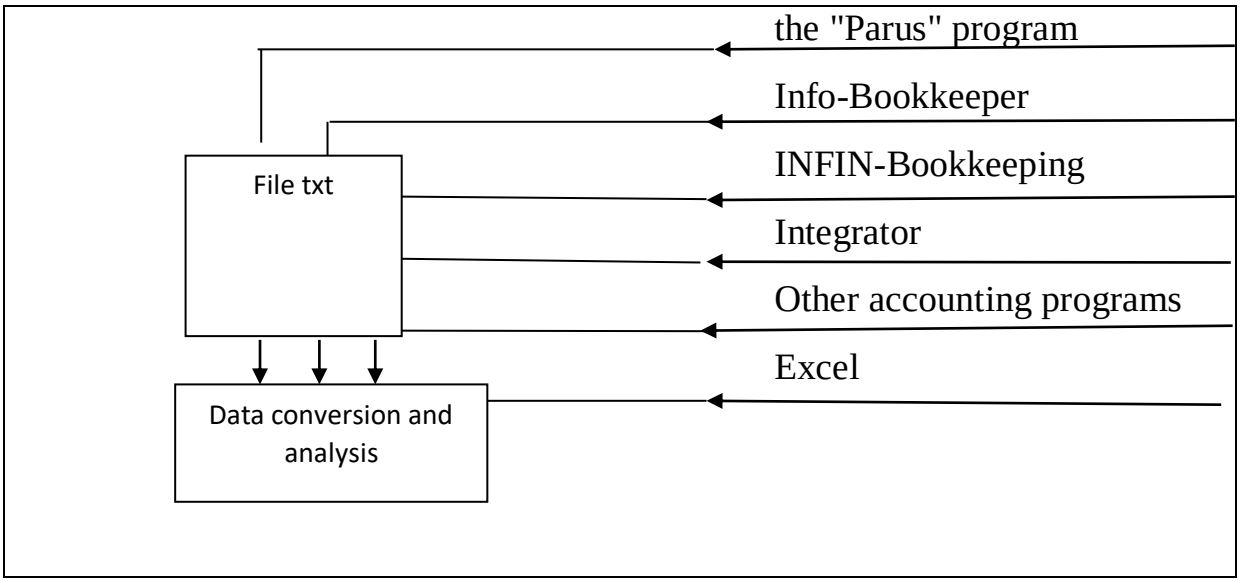


Fig. 21 - Export-import opportunities of the "Audit Expert" software complex

Audit Expert program allows testing the information system of accounting in the hotel complexes. It is used to audit and analyze records based on certain criteria in order to determine their quality, completeness, capability and correctness. The database of knowledge is also applied for these purposes. It helps to identify inconsistencies and make the necessary decisions.

This software allows testing of calculations, performing the necessary recalculations and comparing the results obtained with normative and estimated and industry averages.

This makes it possible to conduct an analysis according to certain criteria and to obtain the necessary management decision. Figure 22 shows the scheme of organization of the auditor's work in the environment of electronic data processing. The structure of the combined audit system “Audit Expert” is presented in Figure 22.

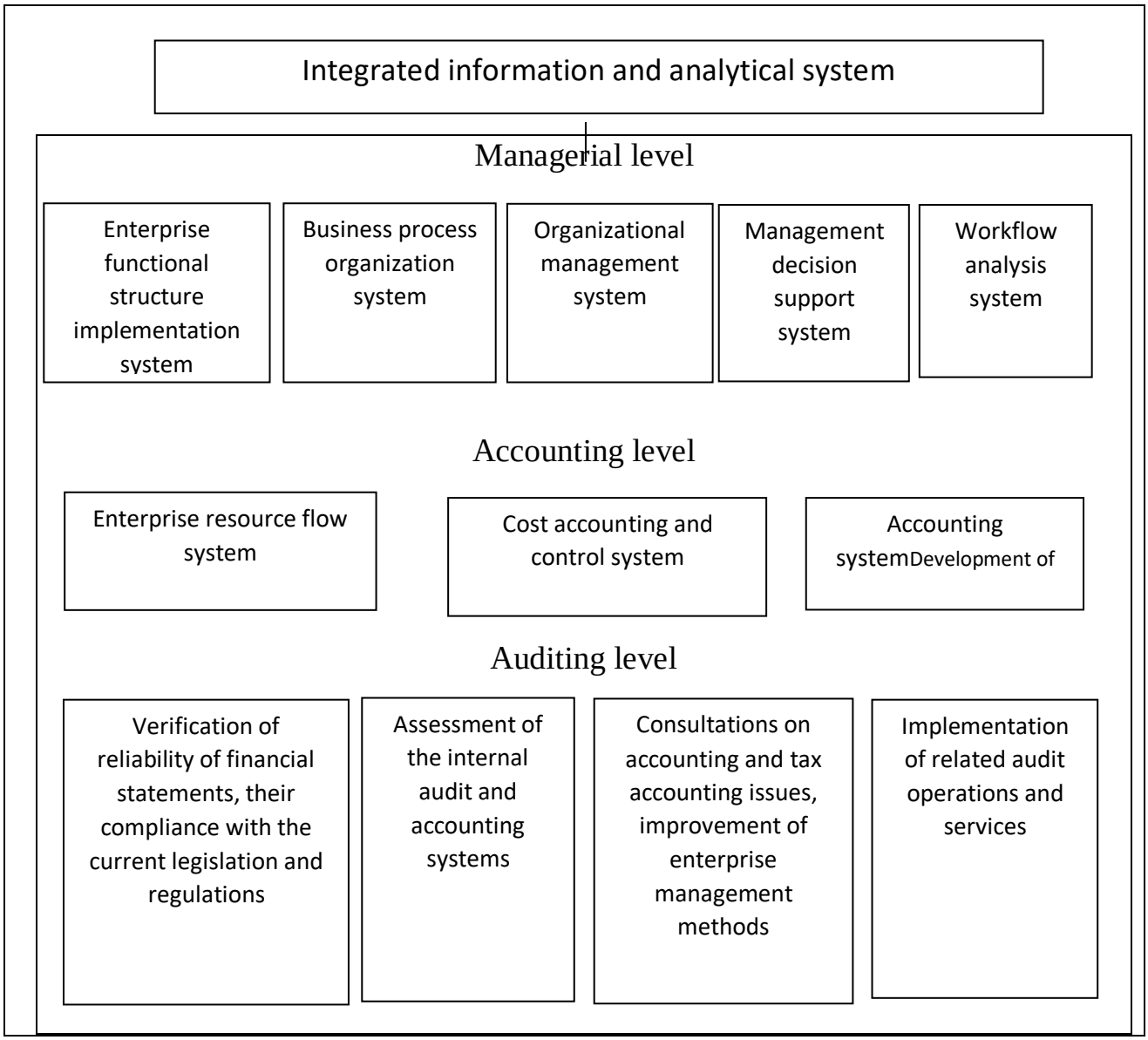


Fig. 22 - Structure of the combined internal audit system ofintegrated reporting

With the help of built-in basic functions, the Audit Expert software allowscalculating the main financial indicators of the enterprises, which can be used in the audit. In addition, this program allows reflecting the dynamics of the audit indicators for a certain period, using their own methods of forecasting, as well as attach to the basic set of reports forecast data that can be used for auditing business entities at the real level.The implementation of the proposed computer audit system will contribute to the intellectualization of auditing and the scientific validation of its conclusions. However, it should be taken into consideration that control functions are functions that are difficult to automate. The auditors should not separate financial

accounting and auditing from oversight of data-generating information systems [67, p. 679].

Modern trends look like the future of the audit profession is not for "economic control" or "audit" as an inspection of accounting reporting information, but for the audit of information technology, the purpose of which is to control the information security of the enterprise and the effectiveness of information services in general. Therefore, it is advisable to distinguish such a component as IT audit in the structure of the internal audit system.

The impact of information technologies on business management is quite high, since it is directly connected with an increase in the efficiency of work of each manager individually, and the company as a whole. Information technologies influence competitiveness in today's market. The use of computer networks, Internet and Internet technologies, software products of end-to-end automation of all business processes today is not just a matter of leadership and creation of competitive advantages, but also survival in the market in the nearest future [68].

The use of the term IT-audit (information system audit) is accompanied by a lack of regulatory and methodological support, as well as unified requirements for the organization and conduct of audits. This factor has a negative impact on the development of the services sector in the information space of Ukraine. In addition, during the inspection by internal auditors, there is a question of responsibility for the quality and objectivity of the work to assess the integrity of accounting information and guarantee the confidentiality of information received during the provision of services to business entities.

Currently, in theory and practice of information systems there is no definite interpretation of IT-audit. An IT audit is interpreted as an examination of the company's information systems, security systems, systems for communication with the external environment and the corporate network for their compliance with business processes, as well as compliance with international standards, followed by an assessment of the risks of failures in their functioning"[69].

According to S. A. Petrenko, “The information system audit is a systematic process of obtaining objective qualitative and quantitative assessments of the current state of a company's information system in accordance with certain criteria and security indicators” [70]. Thus, IT-auditing in this case is reduced to checking the information security system and comparing its results with the ideal.

We propose to define IT audit as a systematic process of obtaining and assessing objective data on the current state of the current IT infrastructure of the organization, its comprehensive examination and analysis, as well as determining the level of its compliance with the specified criteria and effectiveness of use.

The main purpose of IT audit is to evaluate the risks associated with the use of information technology and development of recommendations on measures to reduce them. IT audit should be regarded as a complex consisting of the following activities: information system audit; technology infrastructure audit; information security audit; IT personnel audit.

The result of the information system audit is a set of conclusions on whether the existing information system (IS) meets the business needs of the company, development of recommendations for optimization and further development of the IS. During the audit, the analysis of compliance of the existing IS to the business processes of the company is performed, namely the analysis of the organizational structure of the company, the hierarchy of departments, electronic document management, accounting policy, compliance of functional modules of the IS with the real needs of the departments. Within the audit of integrated reporting and examination of IT infrastructure the productive completeness of functionality, security and integrity of IT processes should be examined. The audit of technological infrastructure will allow the customer to get an expert assessment of the current composition and level of functioning of technological platforms, hardware and software complexes, networks and means of communication (IT infrastructure), as well as obtain recommendations to improve the efficiency of their use, modernization, reducing the cost of ownership.

Information security audit includes the formation of an expert assessment of the current state of the information protection system, assessment of information risks, recommendations for improving the information protection system and calculation of the cost of its creation or modernization. Information security audit allows the client companies to reduce business risks and increase the level of information security. The results of IT-personnel audit allow increasing the efficiency of IT-department, optimizing IT expenses, increasing the quality of IT-services and reorganizing IT-personnel according to the business tasks of the company and modern methodology of IT-infrastructure exploitation.

Before starting the audit of information technology, the internal auditor must investigate the comprehensive automation system of the enterprise; check the provision of the hotel with technical means, the software of all areas, technological support, etc. Internal auditor should also make sure that accounting registers, formed by automation system of business entities correspond to the data of primary accounting.The changes, made in the software are documented, checked and agreed with the developer of automation system, information base provides storage of information, ease of access, coding and decoding information and limits unauthorized access to information at all levels of activity. Several programs on the Ukrainian market automate the activities of hotel enterprises. Their advantages, the main functional characteristics and examples of implementation are shown in Annex D.

The study of automation software products of hotel enterprises in Kharkiv and Kharkiv region showed that small hotel enterprises (room stock up to 50 rooms) use small automation systems, such as the software package ULTRA-Hotel, Edelweiss/Medallion, Khortitsa Mini-Hotel or hotels that are not automatized at all and keep track of all work on paper. Low-functional systems provide automation of only some parts of the hotel contain a few databases and are relatively inexpensive [1]. The study of multifunctional hotel automation systems showed that the the Ukrainian developer company "Altinet" is most adapted to the hotel and restaurant enterprises automation system "Super Hotel" [71]. The system is a universal product and provides integrated automation of hotel and restaurant, while working in "a

single database for all business areas". The advantage of the Super Hotel program is the ability to keep a detailed and complete inventory for the hotel, restaurant and other parts of the enterprise in one system, so the owner is able to keep track of the movement of inventory resources and has an analytical database for the entire business in general. In order to conduct a due diligence, the internal auditor needs to identify the functions of each program module, their full implementation and problem areas to make recommendations for their removal (Figure 23).

Taking into account the necessity of distinguishing operating segments in the information structure of the hotel, we consider it reasonable to audit the information technologies by segments: restaurant and hotel. Information flows formed in individual segments of the hotel complex are controlled by the internal audit system at the stage of transfer to the accounting system of the enterprise (Fig. 24).

Such an approach will allow investigating the technical support and information flows between different segments of the information system of a hotel and restaurant business, to reveal vulnerable sections of the information service and to prevent the probable loss of value of such type of enterprise assets as information.

Conducting IT-audit by internal audit service considering the provided recommendations will allow:

- reduce the time of managerial decision-making;
- optimize IT-infrastructure operation;
- reduce costs for operation and optimize investments in development;
- reduce the risks of equipment and software failures;
- increase the level of information protection and minimize the possibility of data loss;
- improve manageability of the information system;
- minimize the time-frame for eliminating system outrage.

The conducted survey of the peculiarities of the internal audit system design of the integrated reporting of enterprises led to the following conclusions. It is proved that an effective tool of control and management of economic security of enterprises is an internal audit of integrated reporting.

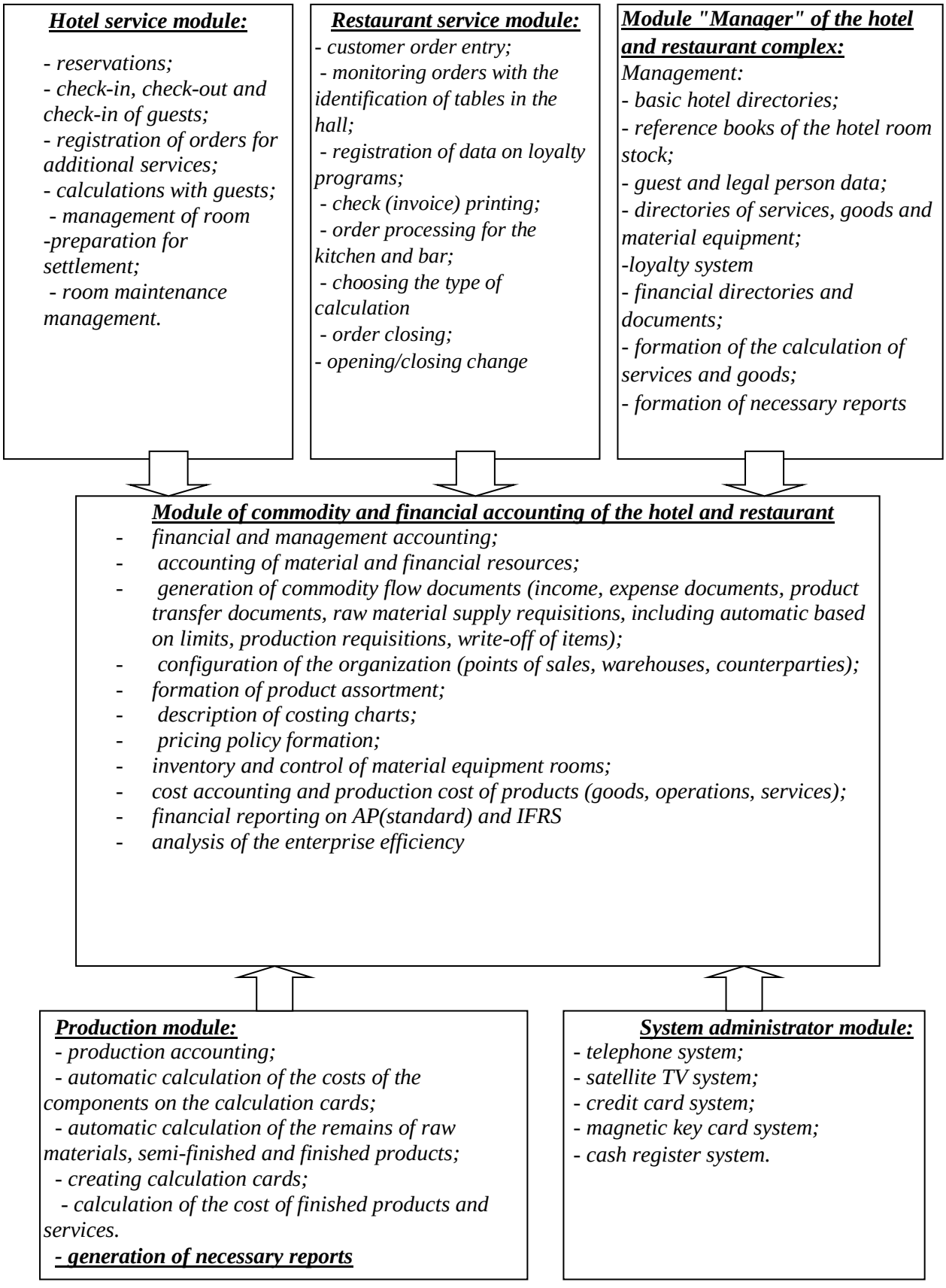


Fig. 23 - Structure of software support for internal IT audit of integrated reporting

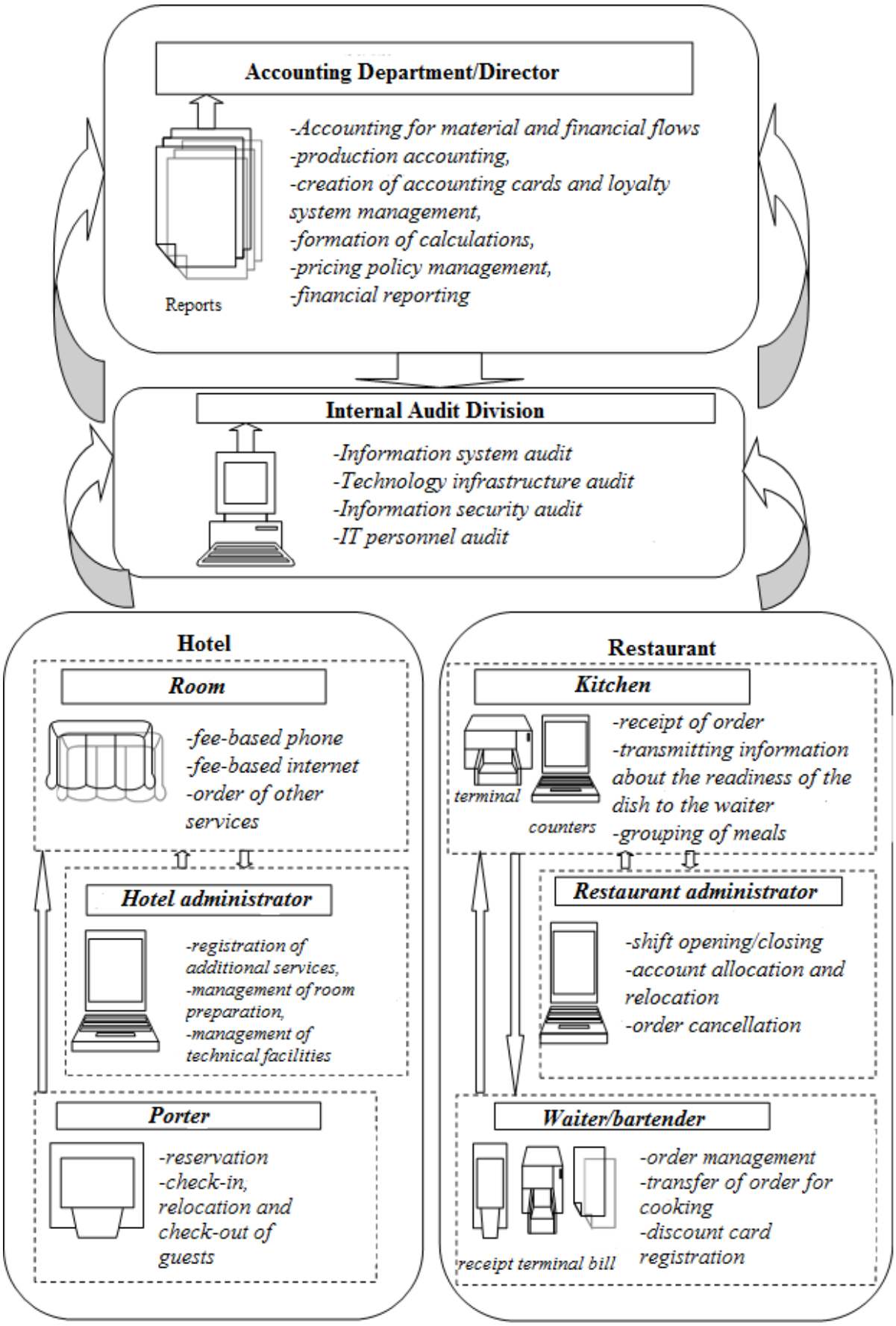


Fig. 24 - Organization of enterprise information system

While designing the organizational and methodological structure of internal audit at the enterprises, it is appropriate to use the following stages of audit development: confirmatory, system oriented and risk-based audit.

When deciding on the creation and functions of the internal audit service of integrated reporting at enterprises, the following influencing factors should be taken into account: the size and category of the enterprise, organizational and legal form of business, organizational structure of the enterprise, the needs of management personnel and the level of automation of accounting and control procedures.

The analysis of the content of accounting policies of enterprises in the Kharkiv region revealed that the lack of an independent internal audit department at enterprises leads to distortion of information on the formation of the cost of hotel services and, accordingly, incorrect determination of the accounting department of the financial result of individual units. This causes an excessively high risk of incorrect distribution of cash flows by the financial department of the enterprise.

In accordance with the defined priorities of internal audit of integrated reporting of business entities, the components of its conceptual model and the relationship with such elements of the information service of enterprises as accounting and financial services are identified.

The classification of internal economic risks is developed. Risks arising at different stages of the information service of business entities are classified into the following groups: in relation to macro- and micro-environment, nature of risks, opportunities of insurance and risk management, which allowed us to study the formation of information flows at each stage of services rendering.

The information security of 20 enterprises of Kharkiv region was studied using the proposed information risk index, the components of which consist of the calculatedinformation technology usagerate in the hotel industry, the degree of security and information threats for enterprise.

The estimation of the general state of information security of business entities is proposed to determine with the help of the matrix of specific values, which allows already at the stage of planning an audit by the internal audit department to develop a

set of procedures to verify the state of the information service. It is suggested to consider the interrelation of information management system and the internal audit system of the integrated reporting from two positions. As provision of information and communication technologies by the internal audit, which allows to increase the efficiency and effectiveness of the audit and the controlling influence of the internal audit system on the information management system, which allows to maintain a sufficient level of information security of the enterprise.

The use of the developed system of selection a criteria of internal audit software allowed substantiating the expediency of using the Audit Expert system at the enterprises, which is an effective tool for integration of audit with information technologies of accounting and implementation of the accounting information array into the audit program.

LITERATURE

1. Informatsionno-analiticheskiy portal APK Ukrainy. URL: https://agro.me.gov.ua/ua/napryamki/prodovolstvo/pidsumki-diyalnosti-pidpriyemstv-harchovoyi-ta-pererobnoyi-promislovosti/rozvitok-harchovoyi-pererobnoyi-promislovosti-za-2018-riyemstv-harchovoyi-ta-pererobnoyi-promislovosti/rozvitok-harchovoyi-pererobnoyi-promislovosti-za-2018-ri.

2. Bagrov NV Sustainable-noospheric development of the region. Problems. Solutions. Simferopol, 2010.207 p.

3. Antonyuk V. P. The role of food industry in the development of Ukraine. Electronic Science Fakhove Vidaniya z ekonomicheskikh sciences "Modern Economics". 2018. No. 10. S. 6-12.

4. Khrip'yuk V.I. Kharchova the prominence of Ukraine: a retrospective analysis of the current problems of development. Economics of the agro-industrial complex. 2018. No. 9. P. 77–86.

5. What is natural capital? URL: http://naturalcapitalforum.com/about/

6. Living Planet 2012 - summary. URL: http://www.footprintnetwork.org/content/images/uploads/LPR_2012_Russian_sum.pdf

7. Nesterenko O. O. Integration of vitality: theory, methodology, practice: monograph. Kh .: Vidavets Ivanchenko I. S., 2018.410 p.

8. Natural wealth of Ukraine: zalnoporivnya characteristic. Ukrainian magazine "Ekonomist". URL: http://ua-ekonomist.com/12920-prirodne-bagatstvo-ukrayini-zagalno-porvnyalna-harakteristika.html.

9. Matveeva O. Imperative development of territorial communities, such a theoretical ambush. Efficiency of sovereign government. 2017. Vip. 1 (50). Part 2, pp. 224–232.

10. Bezsonov Є. M., Andrєєv V. I. Ecological development of steel warehouses: setting the priority and safety lines. Visnik of the Vinnytsia Polytechnic Institute. 2015. No. 6. P. 23–29.

11. Zamula I. V. Accounting department of ecological efficiency in safe development of economy: monograph. Zhitomir: ZhDTU, 2010.440 p.

12. Taranenko I. V., Nazarenko K.V. Social and economic effect of NTP and dynamism of the development of the country. Science and economy. 2012. No. 1 (25). C. 211-218.

13. The Global Alliance for Health and Pollution (GAHP). URL: https://www.radiosvoboda.org/a/news-ekolohiya-ukrayiny/30336074.html.

14. Burkinskiy B.V., Goryachuk V.F. Assessment of the natural capital of the regions of Ukraine as a form of green economy. Economic innovations. 2013. Vip. 52. P. 9–20.

15. About the Cycle of steel development of Ukraine for the period up to 2030: Decree of the President of Ukraine dated 09/30/2019. No. 722/2019. URL: https://www.president.gov.ua/documents/7222019-29825.

16. Secretary-General's remarks at the United Nations Private Sector Forum. 2015. URL: https://www.un.org/sg/en/content/sg/statement/2015-09-26/secretary-generals-remarks-united-nations-private-sector-forum.

17. GRI – Global Reporting Initiative. URL: http://www.global[reporting.org/

18. Economic and Social Council. Report of the inter-agency and expert group on sustainable development goal indicators. New York. UN. 2016. URL: https://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-IAEG-SDGs-E.pdf.

19. Lakusha N. Svit ekobezpeki people. Globalization Wikliki. URL: http://www.knuba.edu.ua/ukr/wp-content/uploads/2018/09/Lakusha_Ekobezpeka.pdf

20. Kraus N.M., Goloborodko OP, Kraus KM Digital economy: trends and perspectives of the avant-garde nature of development. URL: http://www.economy.nayka.com.ua/pdf/1_2018/8.pdf.

21. Anandarajan A., Srinivasan C., Anandarajan M. Historical Overview of Accounting Information Systems in Business Intelligence Techniques. Springer Berlin Heidelberg, 2004. Pp. 1-19.

22. Butinets F. F. History of the accounting region: In 2 parts: Navchalny book for students of the main primary pledges of specialty 7.060106 “Oblik and audit”. Zhitomir: PP "Ruta", 2001.512 p.

23. Fanxiu G. A Study of the Internal Controls of Accounting Information Systems in the Network Environment. URL: https://ijssst.info/Vol-17/No-18/paper9.pdf.

24. Simonov R. V. Digitalization of the food market. Holy dignity and international economics. 2017. Vip. No. 4 (60). C. 15–20.

25. Ligonenko L.O., Khripko A.V., Domansky A.O. International Scientific Journal "Internauka". URL: https://www.inter-nauka.com/uploads/public/15464416163127.pdf.

26. Fontinelle A. Introduction To Accounting Information Systems. 2013. URL: http://www.investopedia.com/articles/professionaleducation/11/accounting-information-systems.asp.

27. Polishchuk O. M. Special features of the storage of computer technologies for the automation of the accounting industry at enterprises. Economics of Science. Series "Oblik and finance". 2014. Issue 11 (41). Part 2. P. 287-292.

28. Quinn M., Strauss E. The Routledge Companion to Accounting Information Systems. 2017. URL: https://www.routledgehandbooks.com/doi/10.4324/9781315647210-3

29. Belfo F., Trigo A. Accounting Information Systems: Traditions and Future Directions. Accounting Information Systems-Traditionand Future Directions. 2013. P. 536–546.

30. Grabski S. V., Leech S. A., Schmidt P. J. A Review of ERP Research: A Future Agenda for Accounting Information Systems. Journal of Information Systems. 2011. vol. 25. Pp. 37–78.

31. Abed el-Rahman Kh. El-dalabeeh The impact of accounting information systems development on improving ecommerce in the public shareholding industrial companies. Academy of Accounting and Financial Studies Journal. Volume 23, Issue 2, 2019. URL: https://www.abacademies.org/articles/The-Impact-of-Accounting-Information-Systems-Development-on-Improving-E-Commerce-1528-2635-23-2-377.pdf

32. Tour O. V. Strategic development of enterprises of kharchovoy industry: institutional changes and market factors. Agrosvit. 2017. No. 9. P. 43–47.

33. Osmyatchenko V.O., Tokar V.V. The program of securing the accounting department for outsourcing ambushes. Economy that power. 2018. No. 5. P. 17–21.

34. Brasiliy N.M., Krot Y. M., Special features in the implementation of computer accounting programs at enterprises in the current minds of the government. Accounting department, analysis and audit. Issue 22. 2018. p. 900–904.

35. Gutsalenko U. O. Computer audit in the systems of internal control / U. O. Gutsalenko // Innovation ekonomika [Electronic resource]. - Access mode: http://www.nbuv.gov.ua/portal/Soc_Gum/inek/2010_3/138.pdf.

36. Turner K., Badura T., Ferrini S. Natural capital accounting perspectives: a pragmatic way forward. Ecosystem Health and Sustainability. 2019. vol. 5. № 1. Pp. 237–241.

37. Chernysheva I. Resistance to digital projects from employees. Effective elimination of opposition. Personnel Management. 2019.S. 28–37. https://hrliga.com/docs/soprotivlenie-didzhital-proektam.pdf.

38. Dul'ska I. B. Digital technologies as a catalyst for economic growth. Economy and forecasting. 2015. No. 2. P. 119–133.

39. Redko O. Y. Audit in Ukraine: morphology: monograph / O. Yu. Redko - K.: Information and Analytical Agency, 2008. - 493 p.

40. Gays M. Y. Relevant nutrition of the theory and practice of audit in Ukraine / M. Y. Gays // Problems and prospects for the development of the banking system of Ukraine: zb. sciences. pr. - Sumi: UABS NBU, 2006 .-- 379 p.

41. Podolsky V. I. Computer audit: pr. Manual. / V. I. Podolsky, N. S. Shcherbakova, V. L. Komissarov; ed. prof. V. I. Podolsky]. - M.: UNITY-DANA, 2004 .-- 128 p.

42. Dorosh N. I. The essence of the internal audit / N. I. Dorosh // Bulletin of ZhDTU, 2006. - № 1 (35). - S. 41–46.

43. International standards for auditing, improving the performance of the ethics; per. from eng. // O. V. Seleznyov, O. L. Olkhovikova, O. V. Pik, T. Ts. Sharashidze, L. Y. Yurkivska, S. O. Kulikov. - K.: Status, 2004 .-- 1028 p.

44. About accounting oblik and financial soundness: Law of Ukraine [adopted by the Verkhovna Rada of Ukraine dated 16.07. - No. 996] [Electronic resource]. - Access mode: <http: //zakon.rada.gov. ua>.

45. Netiksha O. Organization of the process of internal audit / O. Netiksha // Accounting office and audit. - 2002. - No. 8. - P. 46–49.

46. Internal audit: monograph / V. S. Rudnitskiy, I. D. Lazarishin, G. M. Sheremet [and]. - Rivne: UDUVGP, 2003 .-- 163 p.

47. Lisa O. V. Osoblivosti auditing in the computer center / O. V. Lisa // Development of science about accounting: zb. thesis and thesis on sciences. conf. - Zhitomir: ZhITI, 2000. - Part 1. - P. 185–188.

48. Galan O. A. Methods of assessing audit risk: essence, shortcomings and shortcomings / O. A. Galan, V. M. Chubay // NLTU of Ukraine: Scientific newsletter. - 2011. - VIP. 215. - S. 196–202.

49. Chernelevsky LM Audit: theory and practice: Navch. posib. / L. M. Chernelevsky, N. I. Berenda. - K.: "Hi-Tech Press", 2008. - 560 p.

50. Mals'ka MP Organization and planning of activities of tourist enterprises / MP Mals'ka [Electronic resource]. - Access mode: <

51. Boyarko I. M. Investment Analysis: Navch. posib. / I. M. Boyarko, L. L. Gritsenko. - K.: Center for Educational Literature, 2011 .-- 400 p.

52. Urban N. M. Adequate principles of assessing the information center of internal audit of assets / N. M. Urban // Scientific newsletter of Uzhgorod University: a series of economics. - Uzhgorod, 2003. - VIP. 14. - S. 195–201.

53. ND TZI 2.5-004-99. Criteria for assessing the seizure of information in computer systems due to unauthorized access: instructions from 28 April 1999. No. 22 / Department of Special Telecommunication Systems and Information for the Security Service of Ukraine [Electronic resource]. - Access mode: <www.security.ukrnet.net/d-student/zp-nsd.rtf>.

54. Ivakhnenkov S. V. Computer audit: control methods and technologies. - K.: Znannya, 2005 .-- 286 p.

55. Audit of information and communication technologies: monograph / LM Yancheva [and]; Hark. holding un-t grub. that trade. - Kh.: KhDUKHT, 2011 .-- 294 p.

56. Manson, S. Audit Automation: Improving Quality or Keeping up Appearances / S. Manson, Sc. McCartney, M. Sherer // Current issues in auditing. – 3rd ed. – London : Paul Chapman Publishing Ltd, 1997. – 342 p.

57. Ogneva A. M. Audit of information systems and technologies / A. M. Ogneva // Bulletin of Khmelnitsky National University: Economics of Science. - 2009. - No. 6. - P. 229–232.

58. Kudritsky V. Dekilka sliv about computer audit: finance, field and audit / V. Kudritsky. - 2009. - No. 14 - pp. 331–338.

59. Gutsalenko U. O. Computer audit in the systems of internal control / U. O. Gutsalenko // Innovation Economics [Electronic resource]. - Access mode: http://www.nbuv.gov.ua/portal/Soc_Gum/inek/2010_3/138.pdf.

60. Dodonov O. G. Information support: technologies and security / O. G. Dodonov, M. G. Gorbachik, M. G. Kuznotsova // Accounting office and audit. - 2008. - No. 4. - S. 166-170.

61. Fostolovich V. A. Economic day and need for an audit / V. A. Fostolovich, S. Y. Dyakonova // Collection of scientific works

62. Taurian sovereign agro-technological university: economics of science. - 2009. - No. 7. - S. 198–204.

63. Podolsky V. I. Computer audit: pr. Manual. / V. I. Podolsky, N. S. Shcherbakova, V. L. Komissarov; ed. prof. V. I. Podolsky]. - M.: UNITY-DANA, 2004 .-- 128 p.

64. Markevich M. Deyaki aspects of the audit in the computer center / M. Markevich // University of Banking Information for the National Bank of Ukraine, 2010. - No. 6. - P. 366–369.

65. Krutova A. Prospects of the using of modern computer technologies in audit / A. Krutova // Control, Development and Applied informatics in Business and Economics. – Bucharest, Romania : “Editura Didactice si Pedegogica” Publishing House, 2008. – P. 147–151.C. 150

66. Yancheva L. Features of the computer assisted audit stages and techniques in Ukraine / L. Yancheva, A. Krutova // Proceedings of the 10th International Scientific Conference on Finance and Risk, 24–25 November 2008. – Slovakia, Bratislava : EKONOM, 2009. – P. 678–683.

67. Lutai A. P. Information technologies and management systems in the hotel and restaurant business of Ukraine / A. P. Lutai [Electronic resource]. - Access mode: http://www.nbuv.gov.ua.

68. Consulting and audit in IT spheres 2004. CNews Analytics [Electronic resource]. - Access mode: http://www.bezpeka.com.

69. Petrenko S.A. Audit of Intranet security / S.A. Petrenko [Electronic resource]. - Access mode: http://www.bezpeka.com/ru/lib/sec/analys/art526.html.

70. Integrated automation system for the hotel and restaurant complex "SuperHotel" [Electronic resource]. - Access mode: http://superhotel.com.ua.

ANNEXES

Annex A

National and international indicators of sustainable development related to conservation and restoration of natural capital

Task	SDG Indicator Name	Indicator Degree in the National Report "Sustainable Development Goals: Ukraine"
1	2	3
	Goal 2. Overcome hunger, achieve food security, improve nutrition, and promote sustainable agriculture (global definition)	
2.4 Implement sustainable food production systems and agricultural practices that improve resilience and productivity and increase output rates, contribute to ecosystem conservation, strengthen adaptive capacity to climate change, extreme weather events, droughts, floods and other disasters, and progressively improve land and soil quality up to 2030.	2.4.1 Share of agricultural areas in conditions of productive and sustainable agriculture	2.3.3 Share of agricultural lands under organic production in the total area of agricultural land in Ukraine, %
	Goal 6. Ensure availability and sustainable management of water resources and sanitation	
6.3 Improve water quality by reducing pollution, eliminating waste discharges and minimizing releases of hazardous chemicals and materials, halving the proportion of untreated wastewater and significantly increasing recycling and safe sewage reuse worldwideup to 2030.	6.3.1 Proportion of wastewater safely purified.6.3.2 Proportion of water reservoirs with high environmental quality	6.3.1 Volume of discharges of polluted (polluted without purification and insufficiently purified) wastewater into water bodies, million cubic meters 6.3.2 Share of polluted (polluted without purification and insufficiently purified) wastewater discharges to water bodies in the total volume of discharges, %

Continuation of the Annex A

1	2	3
	Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy sources for everyone	
7.2 Significantly increase the share of energy from renewable sources in the global energy mix up to 2030.	7.2.1 Share of renewable energy in total final energy consumption	7.3.1 Share of energy produced from renewable sources in total final energy consumption, %
7. a. Increase international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency as well as advanced and cleaner fossil fuel technologies, to promote investment into energy infrastructure and clean technologies up to 2030.	7.a.1 International financial flows to developing countries to support research and development of clean energy and renewable energy production, including in hybrid systems	-
	Goal 8. Promote progressive, integrated and sustainable economic growth, full and productive employment and decent work for everyone (global definition)	
8.4. Throughout the entire period until the end of 2030, gradually improve the global efficiency of resource use in consumption and production systems and seek to ensure the economic growth to be environmentally sustainable, as set out in the 10-Year Framework of Programmes for Sustainable Consumption and Production. Moreover, the developed countries should be the first to deal with this issue.	**8.4.1 Material footprint, material footprint per capita, and material footprint per GDP** **8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP**	8.2.3. Material intensity of GDP (ratio of the volume of intermediate expenditures from input-output tables of the activities producing tangible products to total GDP)
	Goal 9. Material intensity of GDP (ratio of the volume of intermediate costs from input-output tables of activities that produce tangible products to total GDP)	

Continuation of the Annex A

1	2	3
9.4 Modernize infrastructure and retrofit industrial enterprises, making them sustainable through increased resource efficiency, widespread use of clean and environmentally sound technologies and industrial processes, involving all countries according to their individual capabilities up to 2030.	9.4.1 CO2 emissions per unit of value added	-
	Goal 11. Ensure openness, safety, resilience and environmental sustainability of cities and human settlements	
11.3. Expand inclusive and sustainable urbanization and opportunities for integrated and sustainable participatory human settlements planning and management in all countries up to 2030.	11.3.1 Ratio of land consumption rate to population growth rate 11.3.2 Share of cities with a structure of direct participation of civil society in urban planning and governance that operates regularly and democratically	-
11.4 Increase efforts to protect and preserve the world's cultural and natural heritage.	11.4.1 Total expenditures (public and private) per capita spent to preserve, protect and conserve all cultural and natural heritage by types (cultural, natural, mixed and World Heritage designation), level of management (national, regional and local)/ municipal), type of expenditure (operating costs/investment) and type of private funding (in-kind donations, private non-profit sector and sponsorship)	11.3.1 Number of cultural and natural heritage sites which are included in the UNESCO World Heritage List, units 11.3.3. Area of natural reserve stock of national importance, per cent (%) of the national territory
11.6 Reduce the negative environmental impact of cities per capita, in particular through focusing on air quality, urban and other waste management up to 2030.	11.6.1 Part of regularly collected municipal solid waste with proper final disposal out of total municipal solid waste generated by cities.	11.5.1 Amount of air pollutant emissions, % to the level existed in2015. 11.5.2 Total volume of air pollutant emissions from stationary sources,

Continuation of the Annex A

1	2	3
	11.6.2 Average annual levels of fine particulates (e.g., PM2.5 and PM10) in cities (weighted population)	conditionally reduced to carbon monoxide, considering the relative aggressiveness of the main pollutants,% to the level existed in 2015. 11.5.3. Total volume of air pollutant emissions from mobile sources, conditionally reduced to carbon monoxide, considering the relative aggressiveness of the main pollutants, % to the level existed in 2015. 11.5.4 Number of cities with average daily concentrations of main air pollutant emissions exceeds the average daily maximum permissible concentrations, units
11.a. Maintain positive economic, social, and environmental linkages between urban, suburban and rural areas through improved national and regional development planning.	**11.a.1** Percentage of urban residents implementing city and regional development plans that integrate population projections and resource needs, by city size.	-
	Goal 12. Ensure the transition to sustainable consumption and production patterns (global definition)	
12.2 Achieve sustainable development and efficient use of natural resources up to 2030.	12.2.1 Material trace, material trace per capita, and material trace per GDP 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	12.1.1. Resource intensity of GDP (the share of of natural resources value per unit of GDP), %to the level existed in 2015.

Continuation of the Annex A

1	2	3
12.4. Achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with internationally agreed principles, significantly reduce their release into the air, water and soil to minimize their negative impact on human health and the environment up to 2030.	12.4.1 Number of parties to international multilateral environmental agreements on hazardous wastes and other chemicals that comply with their obligations and communication commitments under each respective agreement 12.4.2 Hazardous waste generated per capita and percentage of hazardous waste processed, by type of processing.	**12.3.1** Number of enterprises using hazardous chemicals, which propose chemical management systems in accordance with international standards, units. **12.3.2.** Percentage of enterprises with already implemented chemical management systems in accordance with international standards, in the total number of enterprises using hazardous chemicals, %
12.5. Substantially reduce waste through prevention, reduction, recycling and reuse up to 2030.	12.5.1 National recycling rate, tons of recycled material	12.4.1. Amount of generated waste of all types of economic activities per unit of GDP, kg per 1,000 USD of PPP 2011. 12.4.2. Percentage of incinerated and recycled waste in total volume of generated waste, %
12.6 Encourage companies, especially large and transnational ones, to adopt sustainable industrial practices and to display information about sustainable resource use in their reports.	12.6.1 Number of companies that publish sustainability reports	-
12.8. Ensure that people around the world have relevant information and knowledge about sustainable development and a way of life in harmony with nature up to 2030.	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are embedded in (a) national education; (b) curricula; (c) teacher training; and (d) student assessment	-

Continuation of the Annex A

1	2	3
	Goal 13. Implementation of urgent measures to combat climate change and its impacts.	
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	13.1.3 Part of local governments adopting and implementing local disaster risk reduction strategies in line with national disaster risk reduction strategies 13.1.1 Number of people killed, unaccounted and affected by disaster per 100,000 people 13.1.2 Number of countries with national and local disaster risk reduction strategies	13.1.1 Amount of greenhouse gas emissions, % to the level existed in1990.
13.3. Improve education, information dissemination and the ability of people and institutions to mitigate and reduce the impacts of climate change, adaptation to them and early prevention.	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction, and early warning into core, secondary, and tertiary curricula 13.3.2 Number of countries that reported enhanced institutional, systemic, and individual capacity building for implementation of adaptation and mitigation, as well as technology transfer and development measures	-
	Goal 14. Conservation and sustainable use of the oceans, seas and marine resources for sustainable development	-
14.1. Implement prevention and significant reduction of any pollution of the marine environment, the results of land-based activities, including marine debris and nutrient contamination up to 2025.	14.1.1 Shoreline eutrophication index and floating plastic debris density	14.1.1.Percentage of polluted wastewater discharges in the total amount of discharges into the marine environment, %

Continuation of the Annex A

1	2	3
14.2 Ensure the sustainable use and protection of marine and coastal ecosystems to prevent significant harmful impacts through increasing the resilience of these ecosystems, and take measures to restore them to ensure proper ecological status and productivity of the oceans up to 2020.	14.2.1 Percentage of national exclusive economic areas managed through using ecosystem approaches	14.2.1. Percentage of administrative-territorial units (districts) where integrated coastal area management of coastal areas has been implemented, % 14.2.2. The area of NRF territories and objects of coastal areas, % of coastal territory
14.4 Ensure effective regulation of fishing, to end overfishing, illegal, unregistered and unregulated fishing and destructive fishing practices; to implement science-based management plans to restore fish stocks as soon as possible to achieve levels that maximise sustainable yields based on the biological characteristics of these stocks by 2020.	14.4.1 Share of fish stocks within biologically sustainable levels	14.3.1.Volumes of legal recovery of marine bioresources in the exclusive maritime zone of Ukraine, thousand tons
14.5. Cover at least 10% of coastal and marine areas with environmental measures in accordance with national and international law and on the basis of the best available scientific information up to 2020.	14.5.1 Coverage of protected areas in relation to marine areas	-
Goal 15. Protection and restoration of terrestrial ecosystems as well as promotion of their sustainable use, sustainable forest management, combating desertification, halting and reversing land degradation and stopping the loss of biodiversity		
15.1. Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, including forests, wetlands, mountains and drylands, in line with obligations under international agreements up to 2020.	15.1.1 Forest area as part of the total land area 15.1.2 Share of important areas for terrestrial and freshwater biodiversity covered by protected areas, by type of ecosystems	15.1.1. The area of NRF territories and objects, thousand hectares 15.1.2. Percentage of the area of NRF territories and objects, in the total territory of the country, %. 15.1.3. Percentage of national ecological network in the total territory of the country, %
15.2. Promote sustainable management of all types of forests, stop deforestation, restore degraded forests, considerably enhance forest planting and reforestation worldwide up to 2020.	15.2.1 Progress towards sustainable forest management	15.2.1 Forest cover on the territory of the country, % 15.2.2. Wood reserves in forests, million cubic metres

Continuation of the Annex A

1	2	3
15.3. Combat desertification, restore degraded lands and soils, including those affected by desertification, drought and floods; strive to avoid land degradation worldwide up to 2030.	15.3.1 Share of lands degraded by the total land area	15.3.1. Number of defined and implemented tasks for achievement of land degradation neutrality, units 15.3.2Area of arable lands(plows), thousand hectares 15.3.3. Percentage of the area of arable lands (plows)in the total territory of the country, % 15.3.4. Area of organic lands, thousand hectares 15.3.5. Area of agricultural lands of extensive use (hayfields, grasslands), thousand hectares 15.3.6. Percentage of agricultural land of extensive use (hayfields, pastures) in the total territory of the country, %
15.4 Ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their ability to provide the benefits necessary for sustainable development up to 2030.	15.4.1 Protected areas coverage of important areas of mountain biodiversity 15.4.2 Mountain green index	15.4.1. The area of NRF territories in mountain regions, thousand hectares 15.4.2. Percentage of the area of NRF territories in mountain regionsin the total territory of the country, %
15.5 Take immediate and meaningful measures to stop the degradation of natural habitats, to halt the loss of biodiversity, to conserve and prevent the extinction of endangered species up to 2020.	15.5.1 Red List Index	-
15.6 Promote the equitable sharing of benefits arising from the utilization of genetic resources and help to ensure appropriate access to such resources under internationally agreed conditions.	Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable distribution of benefits	-

End of Annex A

1	2	3
15.7 Take immediate measures to end poaching and smuggling of protected species of flora and fauna, and address both the demand and supply of illicit wildlife products.	15.7.1 Percentage of traded wildlife that is poached or illegally traded	-
15.8. Take measures to prevent invasive alien species from entering the aquatic and terrestrial ecosystems, and to prevent limitation or elimination of priority species up to 2020.	15.8.1 Percentage of countries adopting appropriate national legislation and providing adequate resources to prevent and control invasive alien species	-
15.9. Ensure that ecosystem and biodiversity values are integrated into national and local development planning and processes, as well as into poverty reduction strategies and plans up to 2020.	15.9.1 Progress toward achieving national goals established under Biodiversity Goal 2 of the Aichi Strategic Biodiversity Plan for 2011-2020	-
15.a. Mobilize and significantly increase financial resources from all sources for the conservation and sustainable use of biodiversity and ecosystems.	15.a.1 Official development assistance and public expenditures for the conservation and sustainable use of biodiversity and ecosystems	-
15.b. Mobilize significant resources from all sources and at all levels to fund sustainable forest management, and provide developing countries with adequate incentives for such management in order to preserve and restore forests.	15.б.1 Official development assistance and public expenditures for the conservation and sustainable use of biodiversity and ecosystems	-
15.C. Intensify global efforts to combat poaching and smuggling of protected species by improving local livelihood opportunities in an environmentally sustainable manner.	15.c.1 Percentage of traded wildlife that is poached or illegally traded	-

Annex B

Degree of information technology use

№	Hotel name	Electronic Document Management System	Internet banking	Electronic Banking Systems	Online Booking Systems	Accounting Automation Systems	Internal Audit Systems	Hotel Resource Planning System (ERP)	Guest Telephone Service Management System	Electronic lock management system	Event Management System (conferences, banquets)	Hotel Budgeting System	Statistical Control and Profit Optimization System	Hotel Management System	Restaurant Management System	Bar Management System	Entertainment Management System	Total:
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	"Mir"	5	5	3	5	5	2	1	5	2	4	4	1	4	2	2	1	51
2	"Kharkiv Palace"	5	5	5	5	5	5	5	5	5	5	4	5	5	5	4	4	77
3	"Druzhba"	2	2	2	5	4	3	2	3	1	1	1	1	3	4	2	1	37
4	"Carnaval Resort"	4	2	5	5	4	2	4	5	5	4	3	3	3	3	2	4	58
5	"Artua"	3	5	5	5	4	2	2	5	5	5	4	1	4	4	1	4	59
6	"Mercury"	5	5	5	5	5	2	4	5	5	4	3	1	5	5	5	3	67
7	"Park Hotel"	1	5	5	5	4	2	3	4	3	4	3	3	3	3	3	1	52
8	"VIVA"	1	5	2	5	4	1	4	5	5	4	2	2	4	1	4	1	50
9	"Gloria"	1	5	5	5	3	1	2	4	1	1	4	4	4	1	4	1	46
10	"Chichikov"	4	5	5	5	5	4	2	5	5	4	2	2	4	4	4	2	62
11	"Gostynniy Dvir"	1	2	2	5	4	2	3	5	1	1	1	1	4	4	1	1	38
12	"Status"	1	1	1	5	3	1	1	2	2	1	1	1	4	1	4	1	30
13	"Aurora"	2	5	4	4	4	1	2	5	5	4	2	2	3	3	1	1	48
14	"Lisna"	1	1	1	1	2	1	1	2	1	1	1	1	2	2	1	1	20
15	"Victoria"	4	1	1	5	2	1	1	4	4	4	1	1	2	2	1	1	35
16	"Cosmopolit"	1	4	4	5	2	1	1	3	1	4	1		1	3	1	1	33
17	"Baden-Baden"	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	18
18	"Duke"	1	1	3	3	2	1	1	4	1	3	1	1	1	1	1	1	26
19	"Etoile"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	18
20	"Terem"	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	18

Annex C

Degree of information threats

№	Hotel name	Channels of deliberate unauthorized access to information in the absence of protection in the automated information system of the hotel																			
		Informational					Software and mathematical			Physical					Radioelectronic					Organizational and legal	
		addressability breach	unauthorized access	manipulation of information	unauthorized copying of data	breach of information processing technology	implementation of computer viruses	installation of software and hardware for information interception	destruction or modification of data	destruction of information processing and communication facilities	deletion, destruction or theft of data carriers	theft of software or hardware keys and cryptographic protection means	exposure of personnel	supplying "infected" AIS components	interception of information in technical channels of its possible leakage	introduction of electronic interception devices	interception, decryption of false information in networks	influence on password-key systems	electronic suppression of communication lines and control systems	non-compliance with legal requirements and delays in the adoption of necessary regulatory provisions in the IS	illegal access restriction to documents containing important information for citizens and organizations
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	"Mir"	5	5	4	4	3	5	1	3	1	2	4	3	2	2	1	2	2	1	3	3
2	"Kharkiv Palace"	4	3	5	5	5	1	3	3	3	4	3	4	1	1	2	3	4	2	4	2
3	"Druzhba"	3	3	2	4	3	3	2	2	2	4	2	4	1	2	3	3	2	1	4	3
4	"Carnaval Resort"	2	4	3	4	3	3	2	3	3	4	4	5	2	2	2	1	2	1	3	3
5	"Artua"	1	5	4	3	4	4	3	2	3	4	4	2	2	4	2	2	3	1	3	2
6	"Mercury"	4	2	5	5	2	3	2	3	3	5	2	2	3	3	2	2	4	2	4	3
7	"Park Hotel"	3	3	3	4	2	3	1	4	3	2	1	3	2	4	2	3	3	2	4	2
8	"VIVA"	1	2	4	3	3	2	1	4	2	2	2	4	3	3	1	3	3	1	4	3
9	"Gloria"	2	1	2	4	3	4	2	2	2	3	1	3	2	2	1	3	2	1	3	3
10	"Chichikov"	3	1	1	3	4	5	1	1	1	3	2	3	2	2	1	1	2	1	2	4
11	"Gostynniy Dvir"		2	2	5	5	4	2	1	2	3	1	3	2	3	1	1	3	1	2	2
12	"Status"	5	3	3	4	5	3	1	1	1	1	1	2	4	2	1	2	1	1	2	2
13	"Aurora"	3	4	1	4	5	4	1	3	2	2	2	2	3	3	1	1	1	1	2	1
14	"Victoria"	1	1	2	3	4	1	1	3	1	3	1	2	4	3	2	2	2	1	1	1
15	"Cosmopolit"	2	2	1	4	5	1	1	2	1	2	1	1	4	4	1	2	1	1	2	1
16	"Duke"	3	3	2	4	4	1	2	1	1	3	1	1	4	3	1	1	1	1	1	2

Annex D

Degree of information protection

№	Hotel name	identification of users, personnel and information system resources	authentication (establishment of credibility) of an object or subject by provided identifier	system authority verification	registration (logging) of requests to protected resources	reaction (alarm, switching off, delay of work, refusal in request) at attempt of unauthorized operations	shielding of working areas	protection of active and passive (archive) files and databases	confidential information flow control	protection of information from computer viruses	erasure of residual confidential information	use of legal software	availability of IS maintenance and control	compliance of software and hardware	availability of systems to counteract power surges	availability of IS software licenses	no database decentralization	training of staff to operate the IS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	"Mir"	2	2	2	4	5	5	2	3	2	4	1	1	1	2	1	2	3
2	"Kharkiv Palace"	1	1	2	2	3	2	2	2	2	3	1	1	1	2	1	2	3
3	"Druzhba"	4	3	2	2	3	3	1	2	2	4	1	1	1	1	1	2	3
4	"Carnaval Resort"	2	3	2	4	2	4	2	2	2	4	1	1	4	2	1	3	3
5	"Artua"	2	3	3	4	4	4	2	3	3	4	2	2	4	2	3	5	4
6	"Mercury"	3	2	2	4	4	4	3	3	3	3	2	2	5	3	3	5	5
7	"Park Hotel"	2	2	3	3	5	4	3	3	3	3	3	1	5	3	3	5	5
8	"VIVA"	1	1	3	3	4	4	3	3	4	4	3	1	5	4	3	5	4
9	"Gloria"	1	3	4	2	5	5	4	3	4	4	3	2	5	4	3	4	5
10	"Chichikov"	1	3	5	4	5	4	4	3	3	5	1	2	5	5	4	5	5
11	"Gostynniy Dvir"	4	3	5	3	5	5	3	4	3	5	1	3	4	4	4	4	5
12	"Status"	4	2	5	5	4	5	3	4	3	5	2	3	3	5	4	5	5
13	"Aurora"	4	4	3	2	4	5	2	4	2	5	1	3	3	4	4	3	4
14	"Victoria"	3	4	4	2	4	5	2	5	4	5	4	4	2	2	5	5	4
15	"Cosmopolit"	1	2	5	2	2	2	2	2	2	2	1	5	2	1	2	2	3
16	"Duke"	5	3	3	5	4	5	4	3	3	5	4	5	5	4	5	5	5

Annex E

Characteristics of hotel automation systems

№	System	Main characteristics	Examples of implementation
1	2	3	4
1	“Servio Hotel” program	Online hotel reservation system; security system; hotel access control; personnel management; bar and restaurant automation	the Ukraine Hotel; the Bratislava Hotel; the Mir Hotel; the Express Hotel; the Aeroport Hotel; the Boryspil MA Hotel;
2	Hotel management system “Pro Hotel”	Communication module with accounting systems, communication module with restaurant management systems, medical module, sauna management module, telephone billing control, locking system, pay TV, communication module with fiscal registrars, mini-bar module, backup data storage module, remote system management module	the George Hotel; the Kupava Deluxe hotel; the Rafael Hotel and restaurant complex; the Svyatoslav Hotel; the Valentina Hotel
3	“1C: Enterprise 8. Hotel” Software	Rooms occupancy control; individual and group reservation; mutual settlements with contractors; settlements with guests; planning of events and banquets; guest accommodation; registering foreign citizens; managing rates by days of week, by seasons; discount management; creation of cleaning tasks, planning and control of room work; online reservation module; work with credit cards via bank terminals; one database for any number of hotels and blocks;multilingual user interface (Russian/English); printing documents from the program in different languages	the Redisson (Alushta, 63 rooms); the Redisson Kyiv (Kyiv, 255 rooms); the Sevastopol (Sevastopol, 115 rooms); the Selena (Cherkasy, 40 rooms); Slavutich (Kyiv, 400 rooms)

Continuation of the Annex E

1	2	3	4
4	“UCS:Shelter” System	Contract and tariff management; reservation department; group booking department; porter; cashier; sales and marketing department; department of debtor organizations and travel agencies; CFO's office; accounting department; guest and customer accounts section; maid service; engineering service; reports.	the Podlesnoe Hotel (Donetsk, 23 rooms); the Respect Hall Resort & SPA (Yalta, 21 rooms); the Riviera Hotel (Kyiv, 80 rooms); the Rus Premier Hotel (Kyiv, 407 rooms).
5	“Epitome PMS” Hotel Management System	Basic module (porter, reservations, cashier, room management, rate management, reporting); group sales; travel agency management; guest history/company history; gift certificates; invoices receivable; reporting module	the Resort and Recreation Complex "Mindalnaya Roscha" (Alushta, 49 rooms); the Spa & Resort Hotel "More" (Alushta, 230 rooms); the Nadiya Hotel (Ivano-Frankivsk, 180 rooms)
6	“ULTRA-HOTEL” Software Package	Extended client's card; interactive room checkerboard; smart and fast procedure for booking, settling in and checking out; automatic calculation of room rates; accounting for unpaid bills from other units; accounting for additional hotel services; support for all accounting programs; linking payments on issued invoices; work in a single database	the Bartholomew Hotel (Dnipro, 12 rooms); the Victoria Hotel (Donetsk, 38 rooms); the Villa Ambassador (Truskavets, 8 rooms)
7	“Super Hotel”Hotel and restaurant automation system	Service module (front office) of the hotel; "manager" module (back office) of the hotel and restaurant complex; "commodity and financial accounting of the hotel and restaurant" module (back office); "production" module (back office); "system administrator" module (back office)	the Randevu hotel chain; the Sakhalin Hotel; the Odissey Hotel; the Premiera Restaurant; the Planeta Leta Resort; the Oberig Hotel

End of Annex E

1	2	3	4
8	“OPERA Enterprise Solution” Software Package	Automation system for guest reception and accommodation service (Property Management System); Sales and Catering automation system (Sales and Catering); Quality Management System;Revenue Management system; OPERA Activity Scheduler; OPERA Reservation System; Internet Booking Module (Web-Self Service); Customer Information System;	the Kharkiv Hotel (Kharkiv, 207 rooms); the Hyatt Regency (Kyiv, 234 rooms); the Hotel “7 Dniv” (Kamianets-Podilskyi, 218 rooms); the Alushta Hotel (Alushta, 115 rooms); the Khreshchatyk Hotel (Kyiv, 130 rooms); the Landhaus Hotel (Brovary, 40 rooms)
9	Edelweiss/Medallion” Automation System	Room reservations, procedures for registration of guests, taking into account his/her preferences, planning hotel occupancy, maintenance of statistics, providing data for the formation of accounting and management reporting	the Korona Hotel ; the Prague Hotel ; the Intourist Hotel.
10	“Khortitsa-Mini Hotel 5.03” Program	Numbering chart; reservations; prepayment; room check-in; payment acceptance; food voucher printing; settlement receipt printing; hotel pass printing; parking voucher printing. Reports: guest list, check-in date, check-out date, reservation request log, receipt log, guest archive, meal lists, cash reports, statistics.	the Slavyanskaya Hotel (Novgorod-Siversky, 36 rooms) the Old Vienna Hotel (Kyiv, 42 rooms) the DoDo Hotel (Zhytomyr, 25 rooms) the Londonskaya Hotel (Odessa, 57 rooms)

Scientific Edition

O. O. NESTERENKO, N.S. KOVALEVSKA, I.V. NESTERENKO

AUDIT OF INTEGRATED REPORTING IN CONTEXT OF SUSTAINABLE DEVELOPMENT

Accepted for publishing 03.12.2021

Publisher
Teadmus OÜ
Tallinn, Estonia
teadmus.org