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QUALIFICATION WORK

on the topic: «**INFORMATION TECHNOLOGIES AS A TOOL FOR INCREASING THE EFFICIENCY OF MANAGEMENT DECISIONS IN PHARMACEUTICAL ACTIVITIES»**

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АНОТАЦІЯ

У даній роботі досліджено інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності. Оцінено ефективність від впровадження запропонованих заходів з удосконалення інформаційного забезпечення. Кваліфікаційна робота містить 47 сторінок, 10 таблиць, 17 рисунків, 30 джерела літератури.

Ключові слова: інформаційні технології, інструмент, ефективність, управлінське рішення, фармацевтична діяльність.

ANNOTATION

This work investigates information technology as a tool for improving the efficiency of management decisions in pharmaceutical activities. The effectiveness of the implementation of the proposed measures to improve information support is assessed. The qualification work contains 47 pages, 10 tables, 17 figures, 30 sources of literature.

Key words: information technology, tool, efficiency, management decision, pharmaceutical activities.

CONTENT

INTRODUCTION

Relevance of the research topic. The relevance of the topic is due to the growing complexity and dynamism of the modern pharmaceutical market. In conditions of fierce competition, constant changes in the regulatory environment, rapid development of medical technologies and growing consumer demands, sound and timely management decisions are becoming critical for the successful functioning of pharmaceutical organizations [5]. Effective information support is a key factor for making quality management decisions that allow pharmaceutical companies to adapt to changes, optimize operations, respond to market needs in a timely manner, and ensure sustainable growth. Insufficient or unreliable information can lead to erroneous decisions, financial losses, and reduced competitiveness of the enterprise [9]. The issues of information support for management in various aspects have been studied by many scientists, among whom a significant contribution has been made by works that consider theoretical and practical aspects of information systems, data analysis and decision support. However, the specifics of the pharmaceutical industry, with its high requirements for quality, safety of medicines, features of marketing and distribution, necessitates an in-depth study of the problems of information support in this context [15].

The relevance of this study lies in the need to develop practical recommendations for improving the information support of the process of making managerial decisions in pharmaceutical organizations, which will allow to increase the validity of managerial actions, minimize risks, optimize the use of resources and increase the overall efficiency of pharmaceutical enterprises in a changing market environment [17].

The purpose of the qualification work is to study information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities.

To achieve the goal of the qualification work, it is necessary to solve the following **tasks**:

- to reveal the essence and role of information in making management decisions;
- to provide a classification of information for making management decisions;
- to analyze the benefits of cloud technologies for information security making management decisions;
- to conduct an organizational and economic characteristic of the pharmaceutical company;
- to analyze information systems and technologies used to support management decision-making at pharmaceutical company;
- to assess the process of making management decisions in pharmaceutical company from the point of view of information support;
- develop recommendations for optimizing information flows in the pharmaceutical organization;
- to assess the effectiveness of the implementation of the proposed measures to improve information support.

The object of the study is the process of information support for making management decisions in pharmaceutical company.

The subject of the study is a set of information flows, systems, technologies, analysis tools and methods used in pharmaceutical company to support the process of making management decisions at various levels of management. The subject of the study is also the impact of the quality and timeliness of information support on the effectiveness of management decisions.

The study used various **methods,** including systems analysis to consider a pharmaceutical organization as a complex system with internal and external information connections to identify key elements and their interaction in the process of information support for decision-making; comparative analysis to compare different approaches to information support for management and their applicability in the pharmaceutical sector; generalization and synthesis to combine the obtained theoretical and empirical data to form conclusions and develop practical

recommendations; to study of internal documentation of pharmaceutical company, concerning the organizational structure, information flows, accounting and reporting systems, regulations on departments and job descriptions, management decisions made and their justification; observation of the processes of collecting, processing, transmitting and using information in various departments of the enterprise; survey among managers and employees of various levels of management of pharmaceutical company to find out their opinion on the quality, sufficiency and timeliness of information support for the decision-making process.

Practical significance of the obtained results. The practical significance of the results obtained lies in the possibility of using the developed recommendations to optimize the collection, processing, storage and use of information necessary for making informed management decisions at various levels of organization management. The implementation of the proposed tools and data analysis methods will contribute to making more timely, well-founded and effective decisions that consider the specifics of the pharmaceutical market and the internal capabilities of the enterprise.

Approbation of research results and publication. Qualification work is approved on scientific-practical internet conference with international participation "Topical issues of clinical pharmacology and clinical pharmacy". Article has been published: Malyi V.V., Bondarieva I.V., Bouhafa T. Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities. Topical issues of clinical pharmacology and clinical pharmacy : materials of the scientific-practical Internet conference with international participation (October 28, 2025, Kharkiv) / editors: O. Ya. Mishchenko, Ya. O. Butko, E. V. Bondarev and others – Kharkiv: National University of Pharmacy, 2025. P.178-183.

Structure and scope of the qualification work. The qualification work consists of an introduction, a literature review, an experimental part, general conclusions, a list of used literature and appendices. The total volume of the work is 47 pages, including 17 figures and 10 tables. 30 literary sources were used for research and analysis in the work.

CHAPTER I
THEORETICAL PRINCIPLES OF INFORMATION SUPPORT FOR MANAGEMENT DECISIONS

1.1. The essence and role of information in making management decisions

Information is the basis for making management decisions, as it provides the manager with the necessary information about the internal and external environment of the organization. The essence of information in the management process lies in its ability to reduce the level of uncertainty, contribute to the formation of reasonable alternatives and the choice of the most effective solution [6, 13, 29].

Management information includes data on resources, financial indicators, personnel, market, competitors, risks, regulatory and legal framework, etc. It can be both quantitative and qualitative, as well as structured (e.g., reporting) and unstructured (e.g., expert assessments) [4].

The main characteristics of information used in management include: relevance, i.e., relevance to the current moment in time; reliability – the level of accuracy and truthfulness; completeness – providing all the necessary data for decision-making; efficiency – timely provision of information; accessibility – convenience of obtaining and processing information; and value – the degree of usefulness for achieving management goals [19].

The role of information in management is to ensure monitoring of the organization's activities, identify problems and opportunities, forecast situations, plan and model alternatives, as well as evaluate the results of management decisions [30].

Therefore, information acts not only as a management resource, but also as a strategic factor that determines the effectiveness of decision-making at all levels of the organizational hierarchy [12].

The main approaches of various authors regarding the essence of information support are presented in table 1.1.

Table 1.1

The authors' main approaches to the essence of information support for managerial decision-making

Author	**Approach (essence of the approach, name)**	**The main characteristic**
Ponomarev V.S.	System approach – information support is considered as a component of the management system	Focus on the interconnection of system elements and information flows
Babaev V.I.	Functional approach – defining information according to management functions	Information ensures the implementation of management functions
Bondarenko V.D.	Technological approach – emphasis on technology for collecting, processing and transmitting information	Information as a result of certain technological processes
Grebenyuk I.I.	Process approach – information ensures continuity of the management process	Information is considered as a resource for implementing management actions
Karpov I.V.	Integrated approach – a combination of several approaches to information management support	Ensuring the comprehensiveness, systematicity, and adaptability of information support
Melnyk O.G.	Organizational approach – information support as an element of the organizational structure of management	Ensuring the effective functioning of the organization through established information connections

Information is a key element in the process of making managerial decisions, as it provides the basis for analysis, forecasting and choosing optimal actions. The essence of information lies in its ability to reduce uncertainty by providing the

manager with data about the internal and external environment of the organization, the current state of affairs, trends and possible risks [27].

The structure of information support for management decisions is presented in Fig.1.1.

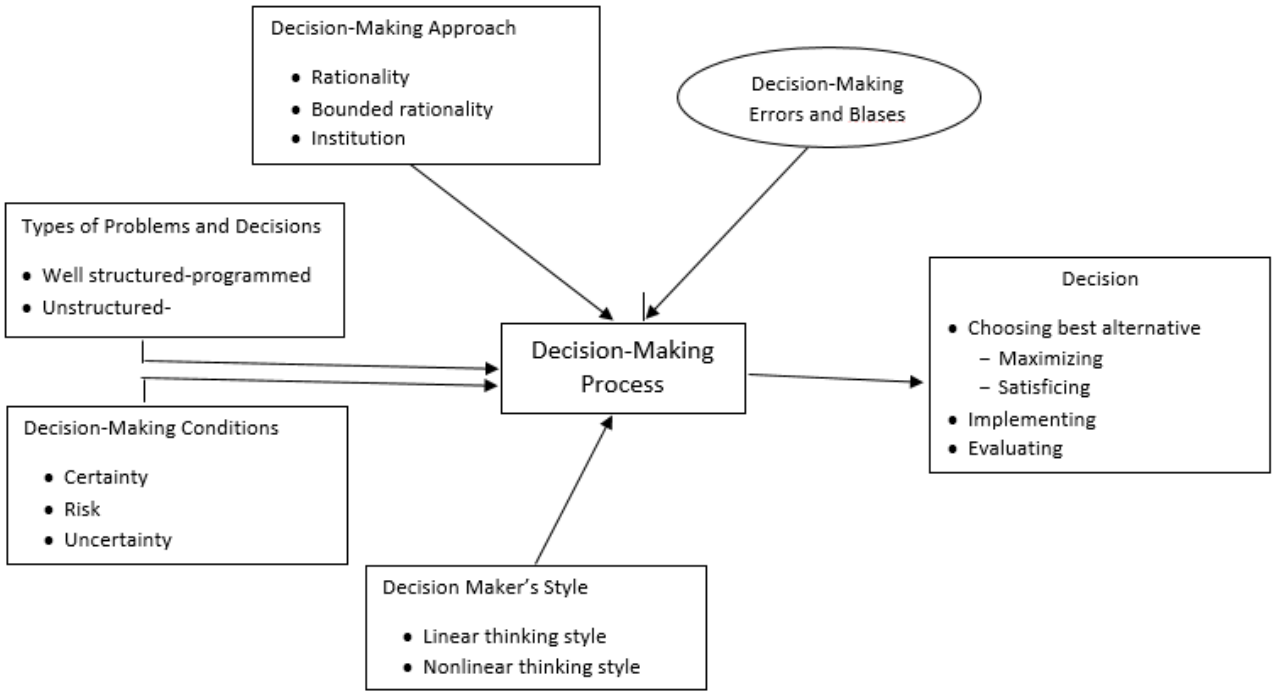

Fig. 1.1. The structure of information support for management decisions

Information – is processed data that is meaningful to the user, is relevant, reliable and timely. Qualitative information is characterized by reliability (correspondence to the real state of affairs), relevance (correspondence to current needs and situations), timeliness (availability at the time of decision-making), completeness (sufficient volume for analysis) and accessibility (ease of obtaining and using) [9].

The main structure of decision support system is presented in fig. 1.2.

Information can be quantitative (financial indicators, statistics), qualitative (expert opinions, forecasts), internal (company reports) and external (market trends, legislation). In the process of making managerial decisions, information performs several key roles. It is the basis for analysis, allowing to assess the current situation, identify problems and opportunities [13].

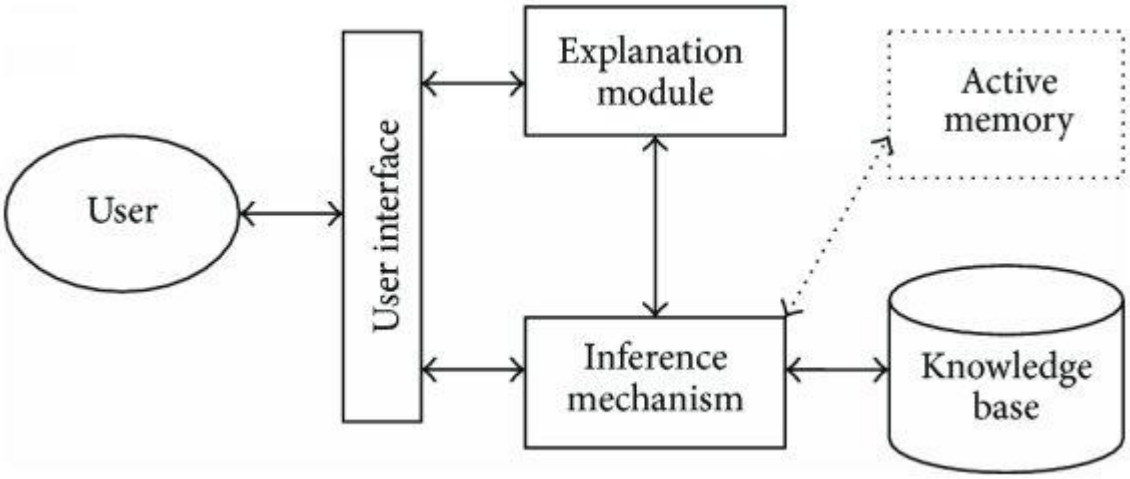

Fig. 1.2. The main structure of decision support system

Reliable data helps to reduce uncertainty, helping to predict the consequences of decisions and reduce risks. Information about markets, competitors and technologies supports strategic planning, forming the basis for long-term strategies. Data on performance provides control and evaluation, allowing to assess the effectiveness of decisions made and adjust actions [22]. Timely information increases competitiveness, allowing to respond faster to changes in the business environment. However, the use of information is associated with certain challenges, such as excess data (information overload), insufficient quality or obsolescence of information, as well as problems with access to data or its processing. Therefore, information plays a critical role in making management decisions, serving as the basis for rational choices [19]. For effective use of information, it is necessary to ensure its quality, timeliness and structure, as well as to apply modern data processing technologies, such as information management systems and analytical tools [9].

1.2. Classification of information for management decision-making

In the conditions of dynamic development of market economy, the efficiency of enterprises largely depends on the quality of management decisions. Making sound management decisions is possible only with the availability of complete,

reliable, timely and systematized information. Management information serves as the basis for planning, organization, motivation, control and analysis of the organization's activities. Therefore, information classification plays an important role in building an effective information system of the enterprise [19].

Information in management is a set of data used for analysis, forecasting, control and decision-making. It includes information about the internal environment of the enterprise (resources, finances, personnel, technology) and the external environment (market conditions, competition, legislation, socio-economic trends) [30].

Information becomes valuable only when it is able to influence the choice of a management alternative. In this context, not only the amount of information is important, but also its quality – relevance, accuracy, completeness, timeliness, accessibility and clarity [9].

Management information is classified according to various criteria. Such systematization allows managers to work more effectively with information flows, prioritize them, and form a relevant information base for decision-making [3]. Classification of information for making management decisions solutions are presented in table 1.2.

Table 1.2

Classification of information for making management decisions solutions

N	Classification criterion	Type of information	Characteristic
1	By source of origin	Internal	Data from company divisions (reporting, plans, personnel records, etc.)
		External	Information from the market, government agencies, industry reviews, and competitors
2	By submission method	Quantitative	Numerical data (production volume, profit, profitability)
		High quality	Descriptive characteristics (customer satisfaction, staff motivation)

3	By level of management	Strategic	Long-term, for strategic planning
		Tactical	Medium-term, for coordination of departments
		Operational	Short-term, for ongoing management
4	By functional purpose	Planned	To form plans
		Accounting	Formed in the process of activity
		Control	To evaluate results and identify deviations
		Analytical	To analyze the effectiveness of management actions
5	By frequency of use	Regular	Used constantly (reporting, operational information)
		Episodic	Formed as needed (e.g. for a new strategy)
6	By level of detail	Summary	Aggregated data for management
		Detailed	Information for operational management at the unit level

Decision making is the process of choosing the best course of action from among several alternatives. At each stage of this process – identifying a problem, forming criteria, analyzing options, predicting consequences, and choosing a solution – information plays a key role [18].

An important characteristic is the relevance of information, i.e. its compliance with current management needs. Inaccurate or untimely information leads to ineffective decisions, which can have significant financial or reputational consequences for the enterprise [19].

In modern conditions of digitalization, automation of information processing is also important, which allows reducing the time for its analysis, reducing the influence of the human factor, and improving the quality of management decisions [30].

Information classification is an important prerequisite for building an effective management system. The diversity of information flows requires a structured approach to their processing and analysis. The use of classified information ensures more accurate and efficient management decision-making,

increasing the competitiveness of the enterprise in a market economy [1].

1.3. Analysis of the benefits of cloud technologies for information security making management decisions

In today's digitalization and global competition, enterprises are actively implementing the latest information technologies to improve management. One of the most effective solutions in the field of data storage, processing and analysis is cloud technologies. They allow to significantly increase the speed and quality of management decision-making due to flexible access to relevant information in real time [19].

The main advantages of cloud technologies have been considered in detail by us. Firstly, it is accessibility and mobility. One of the main advantages of cloud technologies is the ability to access information from anywhere in the world where there is an Internet connection. This ensures the mobility of management personnel, efficiency in decision-making and the ability to work in a remote or hybrid format [9]. Secondly, it is a reduction in infrastructure costs. Thanks to the use of cloud solutions, enterprises significantly reduce costs for their own servers, licensed software and IT infrastructure maintenance. The "cloud as a service" model allows to pay only for the resources actually used [6]. Thirdly, it is scalability and flexibility. Cloud platforms easily adapt to changes in data volumes or business structure. In the event of a company's growth or a change in strategy, systems can be quickly scaled without the need for significant investments in technical re-equipment [15]. Fourthly, it is security and reliability. Modern cloud services provide a high level of information protection through multi-layered encryption, authentication, backup and monitoring. Large cloud service providers such as Amazon Web Services, Microsoft Azure or Google Cloud, have certificates of compliance with international security standards [5]. Fifth, it is improved analytics and integration with BI systems. Most cloud solutions integrate with analytical tools (Power BI, Tableau, Google Data Studio, etc.), which allows you to create interactive panels, conduct in-depth analysis, model scenarios and provide

management with visualized, structured information for making strategic decisions [3]. Sixth, this is teamwork and integration of teams. The cloud promotes effective cooperation between employees and departments in real time. Thanks to the synchronization of documents and management systems (ERP, CRM), management decisions are made on the basis of a single, up-to-date information [14].

To make management decisions on logistics optimization, a company can use a cloud-based analytical platform that combines inventory data, transportation costs, demand forecasts, and supplier geolocation. Managers can quickly adjust supplies, minimizing costs and improving customer service [11]. Cloud technologies provide a new quality of information management support through a combination of high availability, security, cost-effectiveness, and analytical power. Their implementation helps to increase the adaptability of the enterprise, reduce the time for information processing, and make informed management decisions. In the context of digital business transformation, the cloud is not only a tool, but a strategic resource for effective management [22].

Conclusions to chapter I

Analysis of the theoretical foundations of information support for managerial decision-making allows us to draw important conclusions. The key is the importance of information in management as the basis for informed decisions, which reduces uncertainty, identifies problems and opportunities, affecting efficiency. The quality of decisions depends on the completeness, reliability, relevance, efficiency and accessibility of information. Different approaches emphasize the importance of information as an integral component of management, covering system interconnection, functional role, technological processes, cycle continuity, support complexity, and organizational linkages. Classification of information according to various criteria is essential for effective work, allowing managers to navigate and make timely decisions at various levels. Cloud technologies open up new opportunities for agility, flexibility, and management efficiency through availability, cost-effectiveness, scalability, security, analytics, and collaboration.

CHAPTER II
ANALYSIS OF THE STATE OF INFORMATION SUPPORT FOR MANAGEMENT DECISION-MAKING OF COMPANY

2.1. Organizational and economic characteristics of pharmaceutical company

Pharmaceutical company LLC “TD” (full name – Limited Liability Company “Trading House”) is a legal entity registered on June 2, 2020 with the EDRPOU code 43644089. As of May 10, 2025, the legal status of the enterprise is “Registered”. The organizational and legal form is a limited liability company, the form of ownership is private [13].

The main activity of the enterprise according to the KVED is 46.75 - wholesale of chemical products. In addition to the main activity, the enterprise carries out a number of other activities, in particular: wholesale of pharmaceutical goods (46.46), activities of intermediaries in the trade of a wide range of goods (46.19), non-specialized wholesale trade (46.90), rental of machinery, equipment and real estate (77.39, 68.20), consulting and information services (70.22, 63.99), support activities for transport (52.29), as well as repair and maintenance of equipment (33.19).

Pharmaceutical company carries out its business activities in the field of wholesale trade, in particular chemical products and pharmaceuticals, and is an active participant in the Ukrainian distribution market. The company demonstrates dynamic development, expanding the range of services and activities in accordance with market needs. Additionally, the company appears in open court registers, where you can familiarize yourself with court decisions and the status of case consideration, as well as with financial statements and the history of changes in registration documents [8].

Based on the financial statements of pharmaceutical company we analyzed the structure of its low-value assets. The results of this analysis are presented in

Table 2.2, which reflects the dynamics of assets for the period 2022-2024 in thousands of UAH.

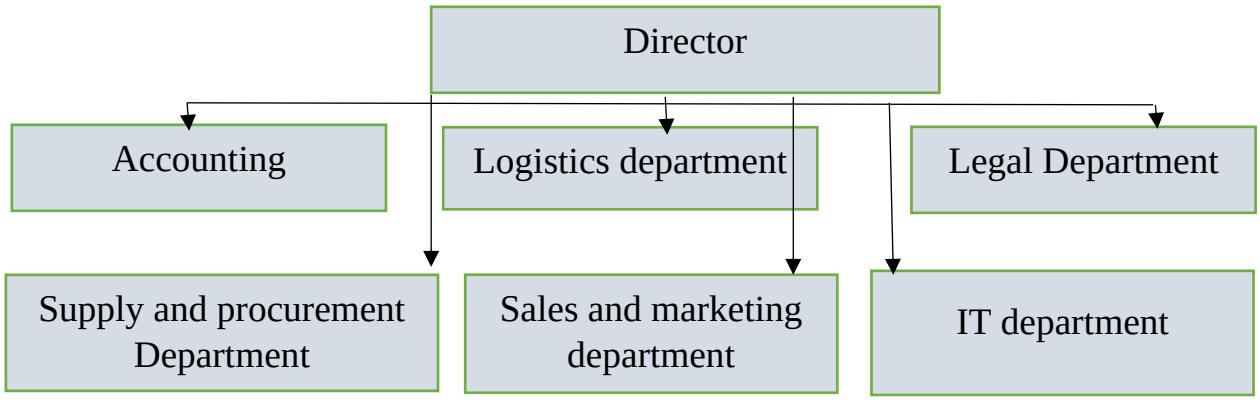

Fig. 2.1 Organizational structure of pharmaceutical company LLC “TD”

Positions and main responsibilities in pharmaceutical company are presented in table 2.1.

The dynamics of low-value assets over the three years reflect significant changes driven by external and internal factors. The overall growth of assets in 2023 and 2024 of 34% and 35% respectively indicates investment and development.

Non-current assets demonstrate heterogeneous dynamics: a decrease in intangible assets and investments in progress is accompanied by a significant increase in fixed assets, which indicates investments in infrastructure and equipment renewal. An increase in the original cost and depreciation of fixed assets indicates active depreciation and the need for further investments [23].

Table 2.1

Positions and main responsibilities of pharmaceutical company’s staff

Position	Main responsibilities
Director	General management of the enterprise, strategic planning
Accounting	Financial accounting, reporting, tax planning
Logistics Department	Organization of storage and transportation of goods
Legal Department	Legal support, contractual work, judicial issues

Supply department	Purchasing goods from manufacturers, negotiating, and forming an assortment.
Sales department	Product sales, customer service, marketing.
IT department	Technical support, automation, data security.

Based on the financial statements of pharmaceutical company, we analyzed the structure of its low-value assets. The results of this analysis are presented in table 2.2, which reflects the dynamics of assets for the period 2022-2024 in thousands of UAH.

The dynamics of low-value assets over the three years reflect significant changes driven by external and internal factors. The overall growth of assets in 2023 and 2024 of 34% and 35% respectively indicates investment and development.

Non-current assets demonstrate heterogeneous dynamics: a decrease in intangible assets and investments in progress is accompanied by a significant increase in fixed assets, which indicates investments in infrastructure and equipment renewal. An increase in the original cost and depreciation of fixed assets indicates active depreciation and the need for further investments [15].

Table 2.2

Dynamics of assets of pharmaceutical company for 2022-2024 (thousands of UAH)

Indicators	**2022**	**2023**	**2024**	**Deviation (+,-) 2023 from 2022**	**Deviation (+,-) 2024 from 2023**	**Growth rate, % 2023/ 2022**	**Growth rate, % 2024/ 2023**
I. Non-current assets							
Intangible assets	622	462.6	621	-159.4	158.4	-25.63	34.24
original cost	1748.2	2104.6	2755	356.4	650.4	20.39	30.9
accumulated depreciation	1126.2	1642	2134	515.8	492	45.8	29.96
Uncompleted capital investments	710.3	4142.7	1126	3432.4	-3016.7	483.23	-72.82
Fixed assets:	11092.9	18219.7	36838	7126.8	18618.3	64.25	102.19

original cost	28001.2	45408.7	83437	17407.5	38028.3	62.17	83.75
wear and tear	16908.3	27189	46599	10280.7	19410	60.8	71.39
Total for section I	12425.2	22825	38585	10399.8	15760	83.7	69.05
II. Current assets							
Stocks	71263.1	93895.4	180792	22632.3	86896.6	31.76	92.55
Accounts receivable for goods, works, services	18868.7	22866	1223	3997.3	-21643	21.18	-94.65
Accounts receivable from settlements with the budget	411.1	911.8	949	500.7	37.2	121.8	4.08
Other current receivables	39744.4	51909.5	12024	12165.1	-39886	30.61	-76.84
Current financial investments	0	0	2586	0	2586	x	x
Money and its equivalents	7444.1	10376	6147	2931.9	-4229	39.39	-40.76
Deferred expenses	5.1	5.1	7	0	1.9	0	37.25
Other current assets	1770.8	983.3	3530	-787.5	2546.7	-44.47	259
Total under Section II	139507	180947	237942	41439.8	56994.9	29.7	31.5
Total assets	151933	203772	276527	51839.6	72754.9	34.12	35.7

Current assets are characterized by a significant increase in inventories of almost ninety-three percent, reflecting the expansion of the assortment. Trade receivables and other current liabilities have decreased significantly, indicating an improvement in cash flows and settlement terms. The decrease in cash is accompanied by an increase in current financial investments, which may indicate new financial management strategies [8].

In general, the analysis shows the company's active investment in fixed assets and inventories, which is a positive signal for development. The growth of fixed assets contributes to increased efficiency. Reducing receivables requires further optimization of financial flows. Reducing cash with increasing financial investments requires careful liquidity management. Positive changes in the asset structure indicate a strategic focus on development and modernization [13].

Analysis of the dynamics of the asset structure for the years 2022-2024 reveals trends in the change of strategic emphases and financial condition of the enterprise. The ratio of current and non-current assets reflects important structural changes,

interpreted as a response to the needs of expansion and modernization. In 2022, non-current assets accounted for eight point eighteen hundredths of a percent of total assets, which is a relatively small figure, indicating a focus on operational assets for current activities. However, in subsequent years the structure changed. In 2023, the share of non-current assets increased to eleven-point twenty-one percent, which is three point two hundredths of a percent more. This growth is explained by active investments in fixed assets, which indicates preparation for the expansion of production capabilities and maintenance of long-term sustainability. In 2024, the share of non-current assets increased further to thirteen point ninety-five hundredths of a percent, an increase of two point seventy-five hundredths of a percent, reflecting continued investment in fixed assets and long-term capital expenditures. At the same time, the share of current assets decreased from ninety-one point eighty-two hundredths of a percent in 2022 to eighty-six point five hundredths of a percent in 2024. This indicates a greater focus on long-term development, which requires significant capital investments, while maintaining a significant amount of current assets for ongoing operations [23].

A decrease in the share of current assets also indicates a decrease in dependence on short-term financial instruments and inventories, and instead an increase in investments in own development, which is a typical strategy for stable long-term growth. Using the company's financial statements, we will analyze the components of liabilities of low-value assets (Table 2.3).

Analysis of liabilities for 2022-24 allows us to assess the financial structure of the enterprise and identify key changes.

Equity has undergone significant fluctuations: after a loss of four million three hundred and thirty-four thousand hryvnias in 2022, in 2023 there was an improvement to over two million UAH. In 2024, profit decreased to one million eight hundred and thirty-two thousand, which indicates instability, but overall positive dynamics [8].

Long-term liabilities increased from almost eight hundred thousand to over two million in 2023, but were fully repaid in 2024, which may indicate a change in

financial policy. Current liabilities increased from one hundred and fifty-five million UAH in 2022 to two hundred and seventy- four million UAH in 2024. The largest increase is observed in accounts payable for goods and other current liabilities, which is likely due to the increase in procurement volumes [13].

Therefore, despite positive developments in equity, the enterprise must control the dynamics of current liabilities to maintain financial stability.

Table 2.3

Dynamics of liabilities of enterprise for 2022-2024

Indicators	Years			Deviation (+,-)		Growth rate, %	
	2022	2023	2024	2023from2022	2024from 2023	2023/2022	2024/2023
I. Equity							
Registered (share) capital	2	2	0	0	0	0	0
Retained earnings (uncovered loss)	-4334.1	2201.3	1832	6535.4	-369.3	-150.79	-16.78
Unpaid capital	2	2	0	0	-2	0	-100
Total for section I	-4334.1	2201.3	1834	6535.4	-367.3	-150.79	-16.69
II. Long-term liabilities, earmarked financing and provisioning	792.7	2206.6	0	1413.9	-2206.6	178.37	-100
III. Current liabilities							
Current accounts payable for goods, works, services	141653	149960	180748	8307.5	30787.9	5.86	20.53
Current accounts payable for settlements with the budget	1184.7	1330.2	2663	145.5	1332.8	12.28	100.2
including income tax	0	296.1	310	296.1	13.9	x	4.69
Current payables for insurance payments	181	150.3	0	-30.7	-150.3	-16.96	-100
Current accounts payable for payroll calculations	35.8	35.3	0	-0.5	-35.3	-1.4	-100
Current payables from internal settlements	0	0	74432	0	74432	x	x
Current provisions	0	0	2395	0	2395	x	x
Other current liabilities	12419.8	47888.3	14455	35468.5	-33433	285.58	-69.82
Total under Section III	155474	199364	274693	43890.3	75328.8	28.23	37.78
Total liabilities	151933	203772	276527	51839.6	72754.9	34.12	35.7

An analysis of the main financial results of enterprise for 2022-2024 is presented in Fig. 2.2 and Fig. 2.3.

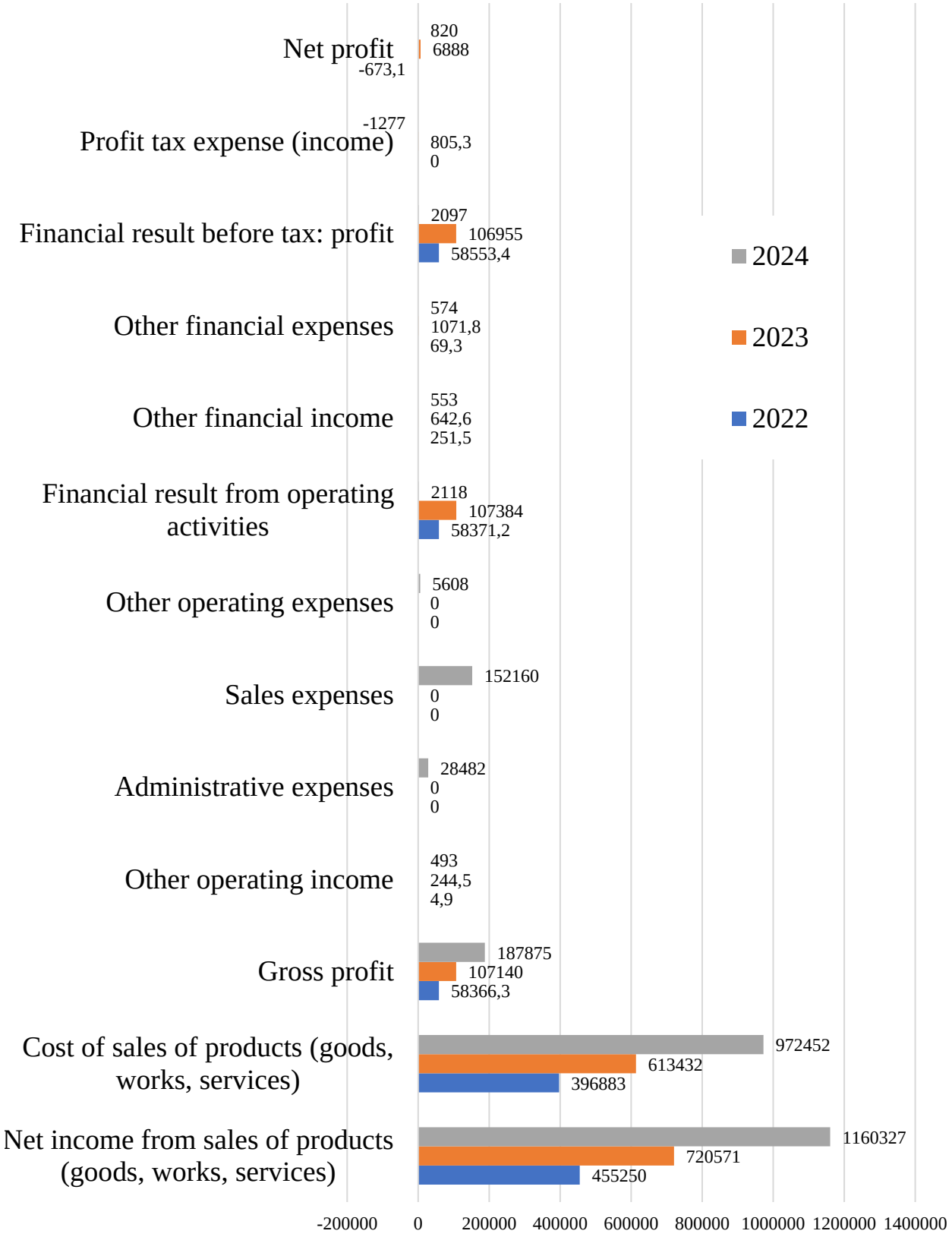

Fig. 2.2 Analysis of the main financial results of pharmaceutical company for 2022-2024

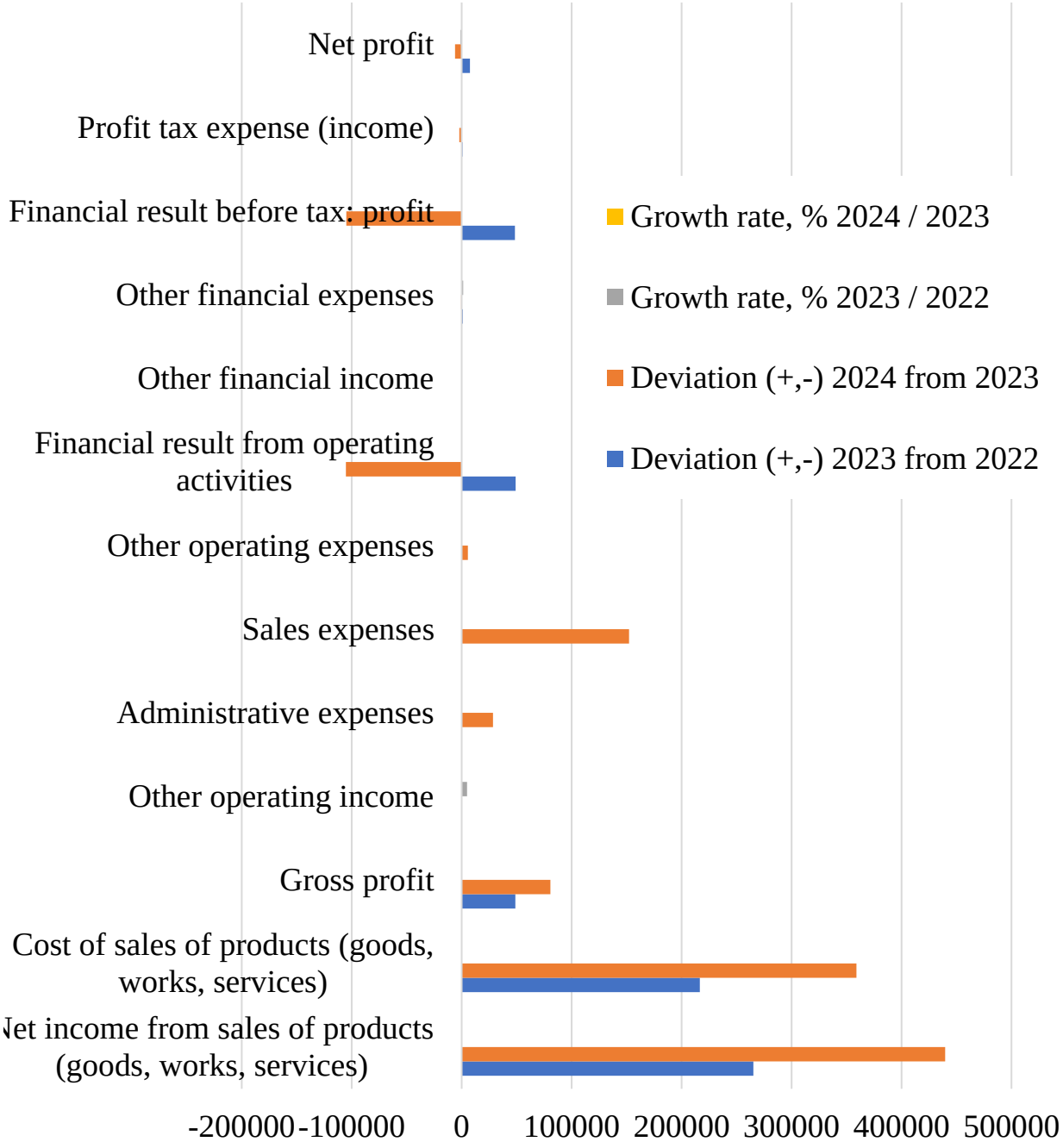

Fig. 2.3 Analysis of the main financial results of pharmaceutical company for 2022-2024

Analyzing the dynamics of the main financial results of pharmaceutical company for the period 2022-2024, presented in the table, we can note significant changes in the key performance indicators of the enterprise.

During 2022-2024, pharmaceutical company demonstrated rapid growth in net income, which increased from 455,250 thousand UAH in 2022 to 1,160,327

thousand UAH in 2024. Gross profit also increased significantly, reaching 187,875 thousand in 2024 UAH.

Operating activities in 2023 were profitable, but in 2024 the company suffered a significant operating loss (-105,266 thousand UAH).

A similar situation is observed with the financial result before tax, which after profit in 2023 changed to a significant loss in 2024 (-104,858 thousand UAH).

The company's net profit was also unstable: after a loss in 2022, a profit was made in 2023, but a loss was recorded again in 2024 (-6,068 thousand UAH). An increase in administrative expenses and sales expenses in 2024 could have negatively affected profitability [13].

Thus, although pharmaceutical company showed significant growth in sales volumes, its profitability was unstable, especially in 2024, when the company faced significant losses. To clarify the reasons for such dynamics, a more detailed analysis of revenues and expenses is required. Calculations of financial condition ratios of pharmaceutical company for 2022-2024 are presented in Table 2.4.

Table 2.4

Calculations of financial condition ratios of pharmaceutical company for 2022-2024

Indicators	2022	2023	2024	Deviation (+,-)		Growth rate, %	
				2023 from 2022	2024 from 2023	2023/ 2022	2024/ 2023
Current liquidity ratio	0.9	0.91	0.87	0.01	-0.04	1.11	-4.4
Absolute liquidity ratio	0.05	0.05	0.04	0	-0.01	0.00	-20
Quick liquidity ratio	0.44	0.44	0.21	0	-0.23	0.00	-52.27
Autonomy coefficient	-0.03	0.01	0.01	0.04	0	-133.33	0
Return on assets (ROA), %	-0.44	3.38	0.3	3.82	-3.08	-868.18	-91.12
Return on equity (ROE), %	16.84	-645.91	40.64	-662.75	686.55	-3935.57	-106.29
Net margin	0	0.01	0	0.01	-0.01	x	-100
Non-current assets coverage ratio by equity	-0.35	0.1	0.05	0.45	-0.05	-128.57	-50
Debt ratio	1.02	0.98	0.99	-0.04	0.01	-3.92	1.02

Analysis of the financial condition ratios of pharmaceutical company for 2022-2024 reveals the instability of key indicators. Liquidity, in particular current, fluctuated, decreasing to 0.87 in 2024.

Absolute liquidity decreased to 0.04 in 2024, and quick liquidity fell significantly to 0.21 in 2024.

Financial sustainability, represented by the autonomy ratio, increased from a negative value in 2022 to a positive value in 2023-2024. The level of debt tended to decrease, but increased slightly in 2024.

Return on assets (ROA) showed significant fluctuations, peaking in 2023 and then declining. Return on equity (ROE) also showed sharp changes. Net margin was close to zero during the period. The non-current asset to equity ratio increased in 2023 and then decreased in 2024.

In general, the dynamics of financial ratios of pharmaceutical company indicates the instability of liquidity and profitability, which requires further analysis to determine the reasons for such changes and develop management measures.

Next, we conducted a SWOT analysis of pharmaceutical company, which is presented in table 2.5 pharmaceutical company is a young but ambitious company with a wide range of activities, focused on a stable presence in the field of wholesale trade and services [13].

Its strengths lie in flexibility, adaptability and diversification. At the same time, the company faces a number of internal and external challenges that require strategic management.

To strengthen its market position and further develop, it is advisable for the company to: attract additional investments to expand capital; invest in digital solutions; work on strengthening the reputation and openness of the business; focus on the formation of specialized competitive advantages.

Thus, the SWOT analysis indicates the presence of potential for growth and modernization of the activities of pharmaceutical company provided that competent strategic risk management is implemented.

Table 2.5

SWOT analysis of pharmaceutical company

Strengths	Weaknesses
▪ Diversification species activities — from wholesale trade to consulting and transport services ▪ Active participation on market distributions chemical and pharmaceutical products ▪ Flexibility in conducted business thanks to status LLC and private form property ▪ Availability two authorized persons with clearly distributed functions — efficiency management	▪ Relatively little statutory capital, which maybe limit the scale of investments ▪ Availability mentions in judicial registers maybe create risk reputational losses or complications in partnership ▪ Absence specialized products (mainly non-specialized trade) can reduce competitive advantage ▪ is young (registered in 2020) — its reputation and history are not yet fully formed.
Opportunities	**Threats**
▪ Expansion into new market segments by providing rental, consulting and repair services ▪ Integration of digital solutions (CRM, ERP, cloud services) to improve business processes ▪ The possibility of entering international markets and attracting foreign partners ▪ Cooperation with government or medical institutions as a sales channel	▪ Economic instability in Ukraine, which may affect logistics, procurement and demand ▪ Increasing competition in the distribution of chemical and pharmaceutical products ▪ Changes in legislation, in particular regulation of activities with chemical products or pharmaceuticals ▪ Risks associated with compliance with safety standards when working with chemical products

2.2. Analysis of information systems and technologies used to support management decision-making in the company

To analyze the information systems and technologies used to support management decision-making at pharmaceutical company, we conducted a survey of 20 employees (Fig. 2.4).

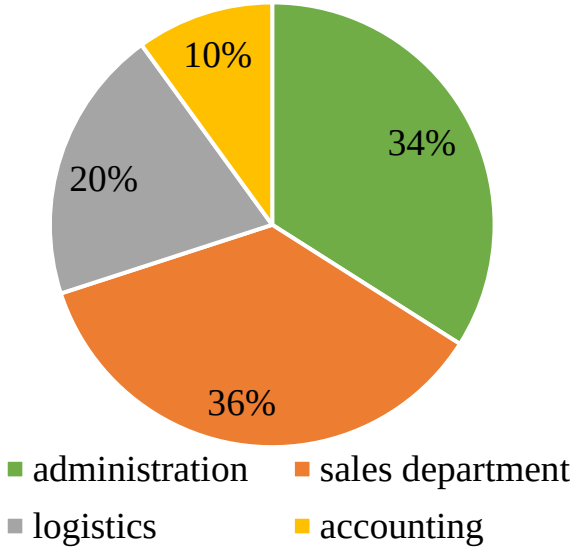

Fig. 2.4. Distribution of respondents by divisions of pharmaceutical company

It was determined that the largest share of respondents (36%) is represented by the sales department. Administrative staff made up 34% of the total number of respondents. Logistics department employees made up 20% of the respondents, and the smallest share of respondents (10%) represented the company's accounting department. This distribution allows us to get an idea of the opinions and needs of representatives of key divisions of the enterprise regarding information support for management decisions (Fig. 2.4).

Analysis of the positions of the 20 employees of the pharmaceutical company surveyed showed that the largest share of respondents (50%) are middle managers. Managers made up 34% of the total number of respondents. The smallest share of respondents (16%) is specialists. This distribution allows us to take into account the opinions of representatives of different levels of management when assessing

information systems and technologies to support management decision-making (Fig. 2.5).

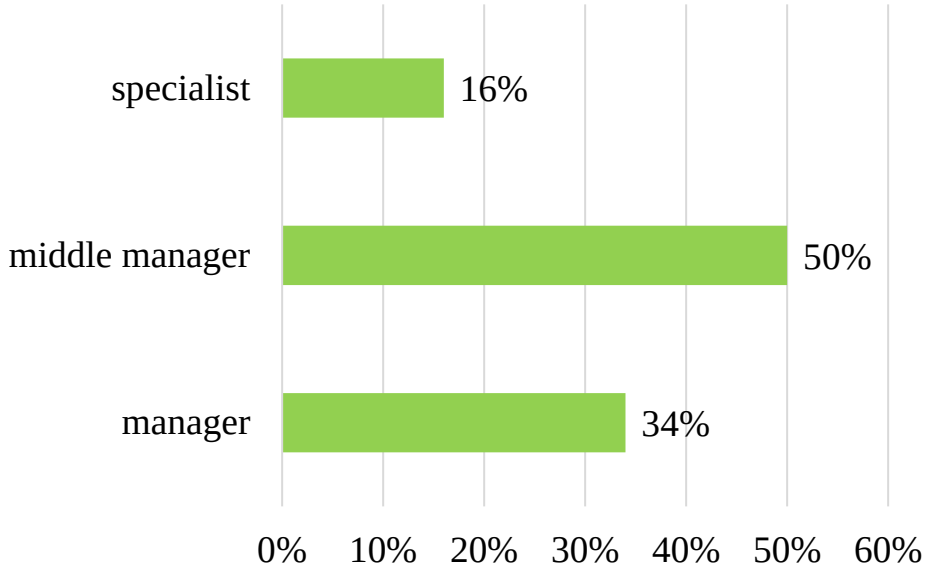

Fig. 2.5. Distribution of respondents by positions in pharmaceutical company

It was determined that 74% of respondents believe that they have enough information to make management decisions (Fig. 2.6). A fifth of respondents (20%) indicated that they only have partial information. Only a small number of employees (6%) indicated that they do not have enough information to make management decisions.

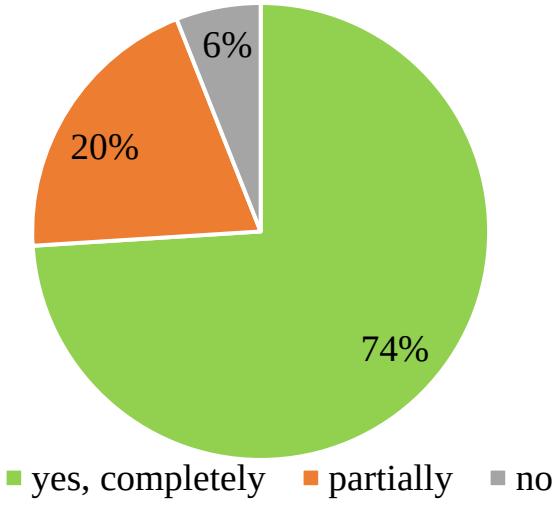

Fig. 2.6. Respondents' assessment of the sufficiency of information for making management decisions

These data indicate a generally positive assessment of the information support of the management process in the company, but emphasize the need to pay attention to the needs of that small part of the staff who feel a lack of information.

We further determined that the most popular source is an accounting system (e.g., 1C, SAP, other), which is used by 24% of respondents. The second place in popularity was shared by a CRM system and spreadsheets (e.g., Excel, Google Sheets), which are used by 19% of respondents. Business intelligence (BI) systems are used by 12% of employees, and document management systems are used by 11%.

The least popular sources of information were project management systems (10%) and corporate portal/ intranet (5%). This data reflects the preference for using accounting and client systems, as well as traditional spreadsheets, to inform management decisions in the company (Fig. 2.7).

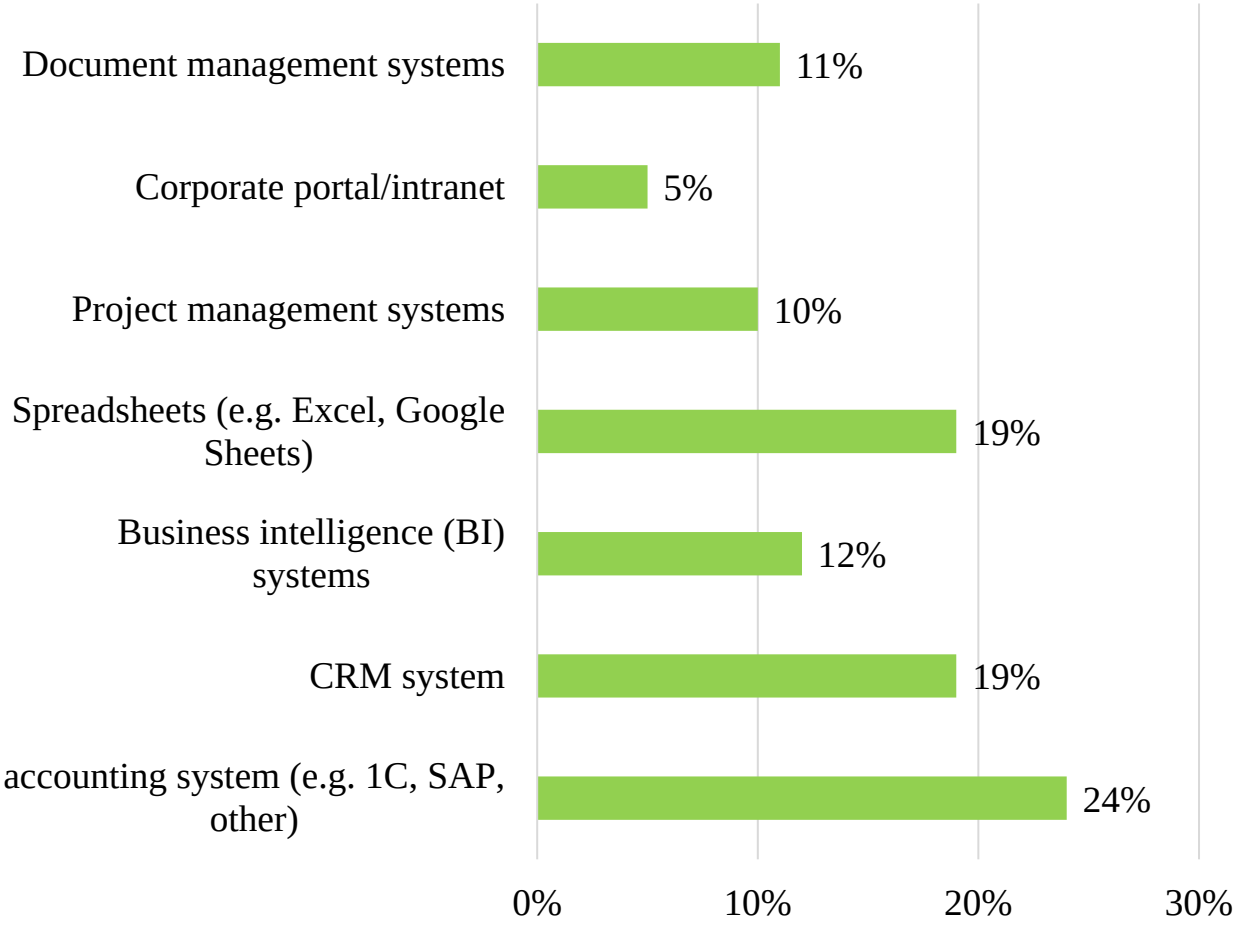

Fig. 2.7. Analysis of the most frequently used sources of information for making management decisions by employees of pharmaceutical company

2.3. Assessment of the process of making management decisions in the company from the point of view of information support

It was determined that the vast majority of surveyed employees of pharmaceutical company (74%) assess the timeliness of providing information for making management decisions as "always on time". Only 14% of respondents noted that they often receive information late. A small part of those surveyed (5%) indicated that information arrives "very often late". Another 7% of respondents found it difficult to answer this question. Thus, most employees are satisfied with the efficiency of obtaining the necessary data for making decisions, however, there is a small proportion of staff who experience problems with the timeliness of information provision (Fig. 2.8).

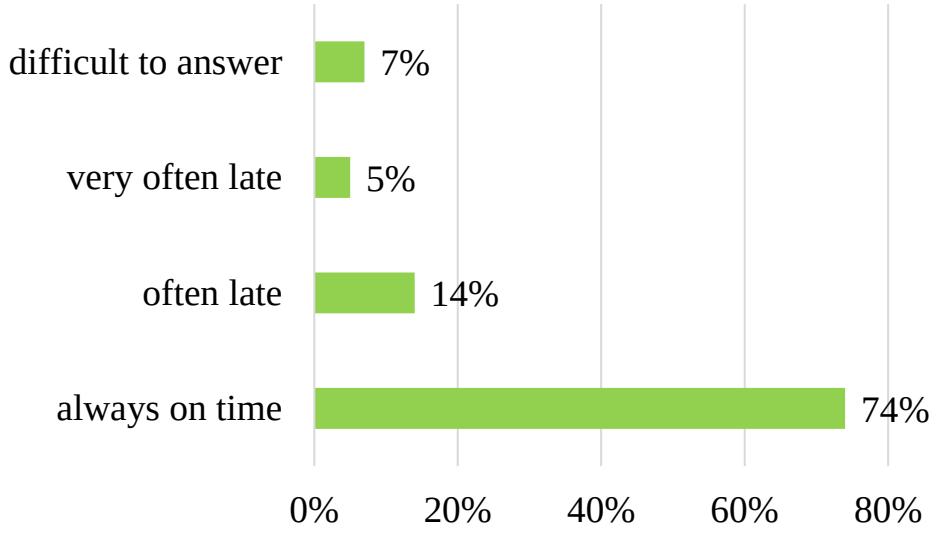

Fig. 2.8. Respondents' assessment of the timeliness of providing information for making management decisions in pharmaceutical company

It was determined that the vast majority of surveyed employees of pharmaceutical company (80%) believe that information processes at their workplace are automated. Fifteen percent of respondents noted that automation is only partial. Only a small proportion of respondents (5%) indicated the absence of automation of information processes at their workplace. These data indicate a fairly high level of automation of information processes in the company from the point of view of the majority of its employees (Fig. 2.9).

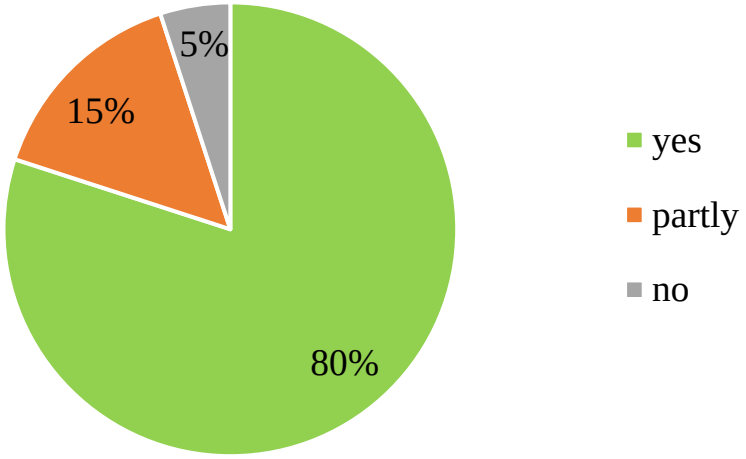

Fig. 2.9. Respondents' assessment of automation of information processes in the workplace at pharmaceutical company

It was determined that the biggest problem for employees of pharmaceutical company when making management decisions is the lack of strategic information (long-term forecasts, market trends), which was indicated by 60% of respondents. Operational information (daily/weekly data) is most often lacking for 17% of respondents, and analytical information - for 14%. The least problem was the lack of financial information, which was indicated by only 9% of respondents. These data indicate an urgent need to improve access to strategic information to support effective management decision-making in the company (Fig. 2.10).

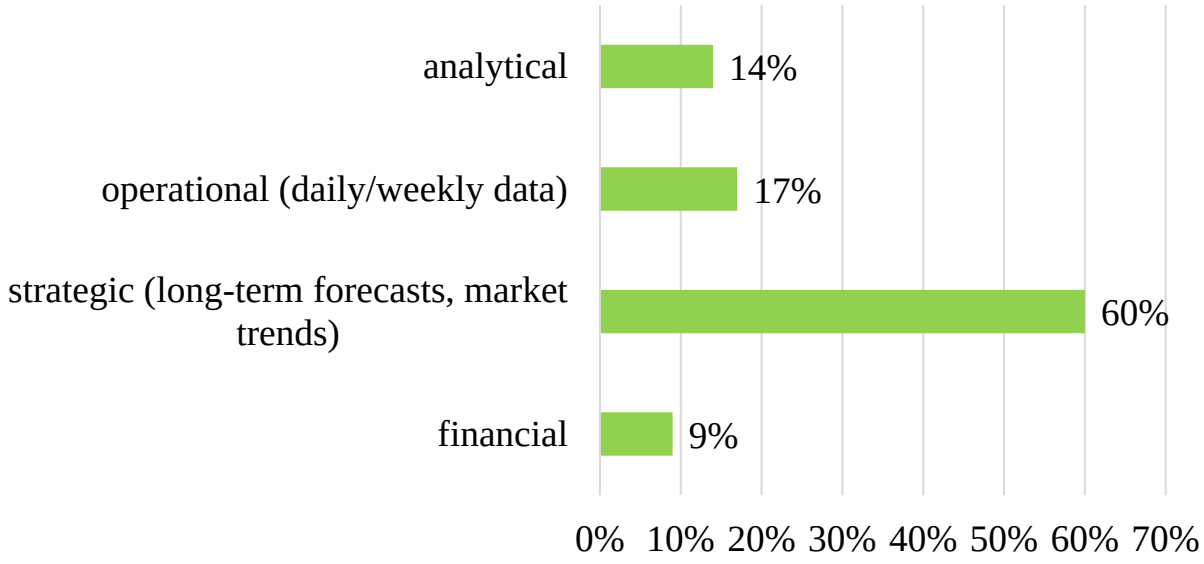

Fig. 2.10. Analysis of information that employees of pharmaceutical company most often lack to make management decisions

It was determined that almost half of the surveyed employees of pharmaceutical company (48%) consider the information systems and technologies used to be "very effective" to support management decision-making. Another 24% assess them as "rather effective". Fifteen percent of respondents took a neutral position on this issue. A small proportion of respondents consider the systems used to be "rather ineffective" (5%), and 8% of respondents found it difficult to answer. In general, most employees positively assess the effectiveness of the information systems and technologies that they use in their work to make management decisions (Fig. 2.11).

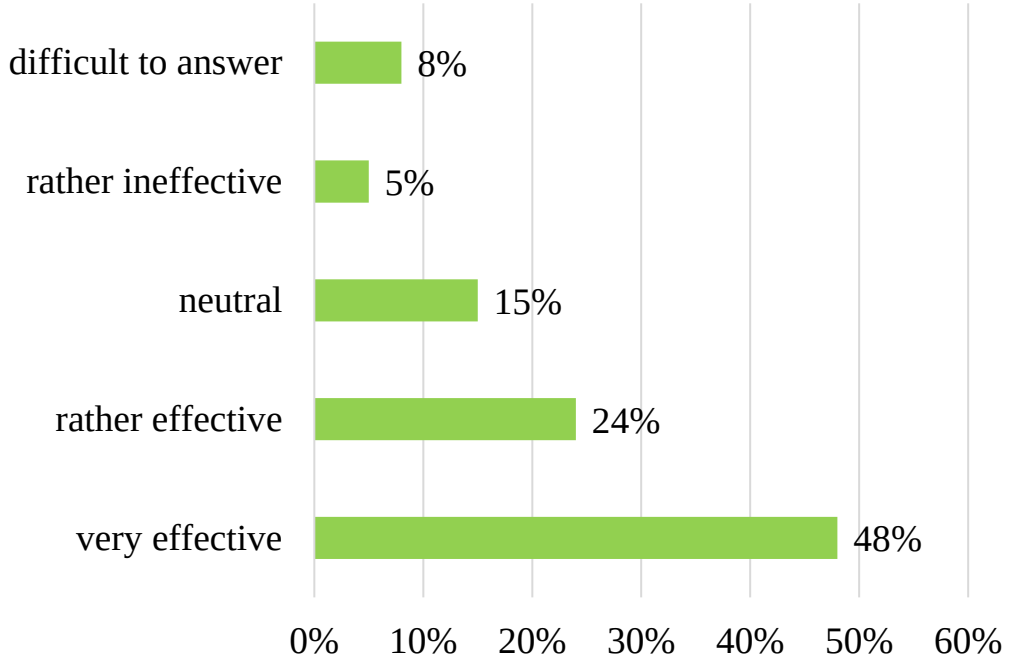

Fig. 2.11. Rating respondents of the effectiveness of information systems and technologies used to support management decision-making in pharmaceutical company

It was determined that, according to the surveyed employees of pharmaceutical company, the most useful aspect of the information systems and technologies used for making management decisions is the completeness and relevance of data (19%). The second most important feature is data analysis and

visualization capabilities (18%). Data processing speed and information accessibility (14% each) are also quite important.

Integration with other systems was noted as useful by 13% of respondents. The least important, according to the respondents, are a user-friendly interface and the ability to generate reports (11% each).

These data indicate the priority of substantive and analytical characteristics of information systems to support management decision-making in the company (Fig. 2.12).

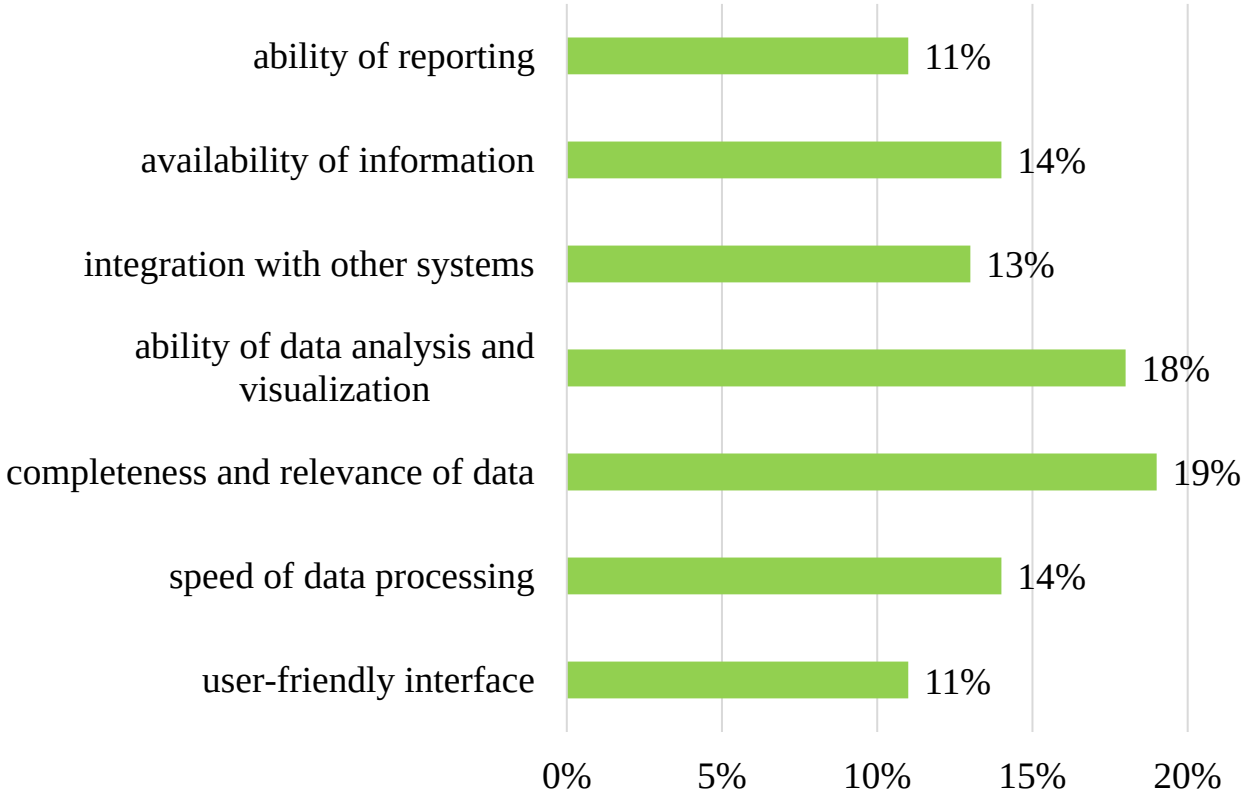

Fig. 2.12. Assessment of the most useful aspects of the information systems and technologies used for making management decisions in pharmaceutical company

It was determined that the biggest problem faced by employees of pharmaceutical company when using information systems and technologies for making management decisions is limited access to information (14%). The second most frequently mentioned problem is insufficient functionality of the systems

(15%). Also, significant problems are the lack of necessary analytical tools and the complexity of generating the necessary reports (12% each), as well as a complex interface and problems with integration with other systems (11% each). Low system speed is experienced by 10% of respondents, and incomplete or outdated data - by 7%. Insufficient user support was noted by 9% of respondents. These data indicate a number of aspects that need improvement to increase the efficiency of using information systems in the process of making management decisions (Fig. 2.13).

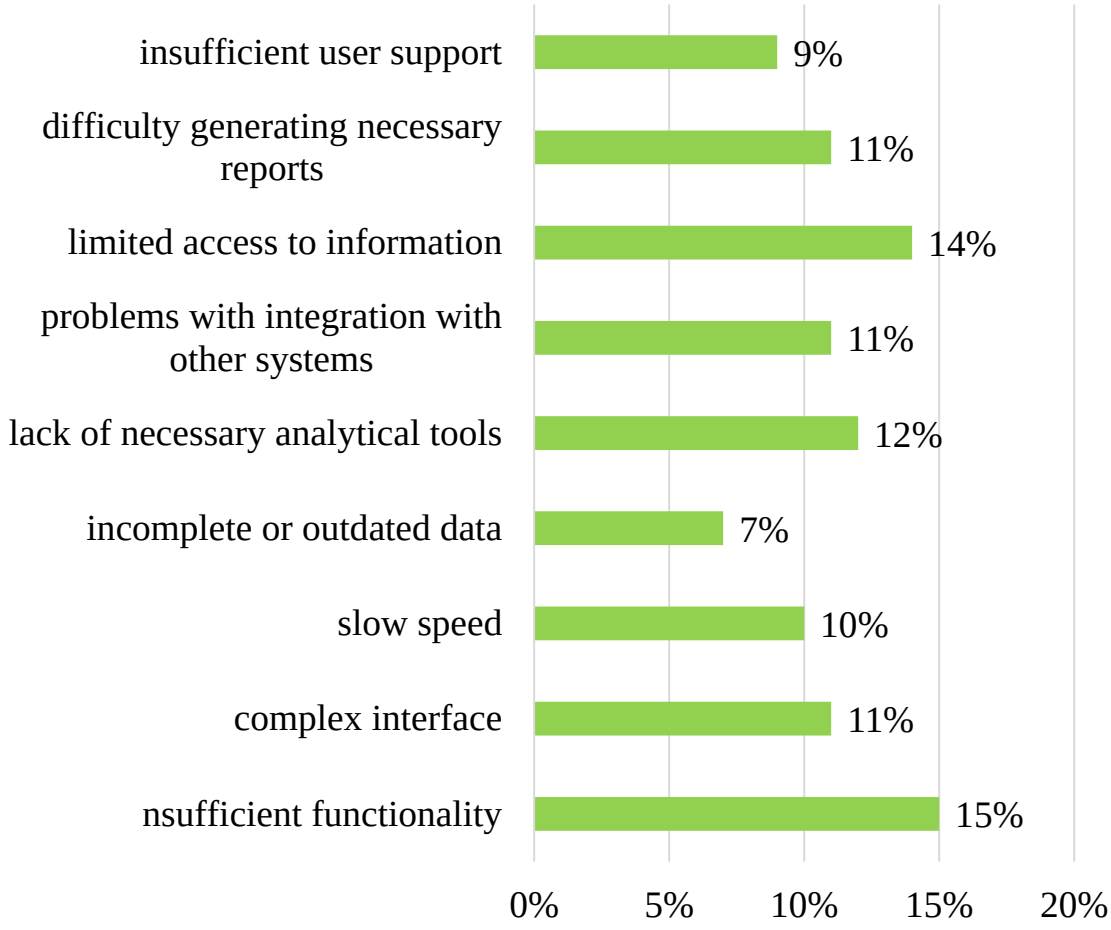

Fig. 2.13. Assessment of problems and limitations experienced by employees of pharmaceutical company when using information systems and technologies for making management decisions

It was determined that the vast majority of surveyed employees of pharmaceutical company (70%) assess the quality and reliability of the information

they use to make management decisions as "always high-quality and reliable". Another 20% of respondents consider it "often high-quality and reliable".

A small portion of respondents (5%) indicated that the information is “sometimes of good quality, sometimes not” or “often of poor quality or unreliable”. These data indicate a generally high level of employee trust in the quality and reliability of information support for the company’s management decision-making process (Fig. 2.14).

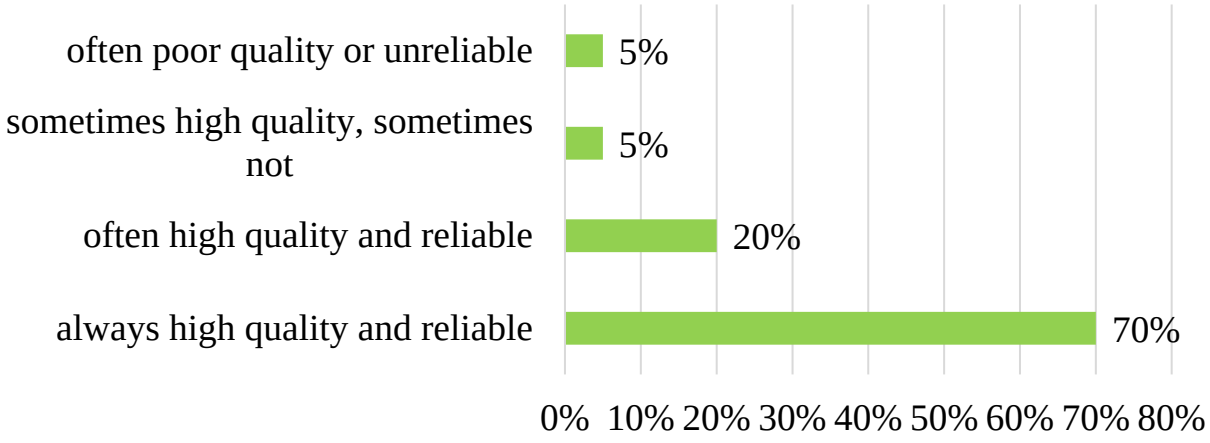

Fig. 2.14. Respondents' assessment of the quality and reliability of information used to make management decisions in pharmaceutical company

It was determined that the majority of surveyed employees of pharmaceutical company (65%) consider the amount of information they receive for making management decisions to be optimal (Fig. 2.15).

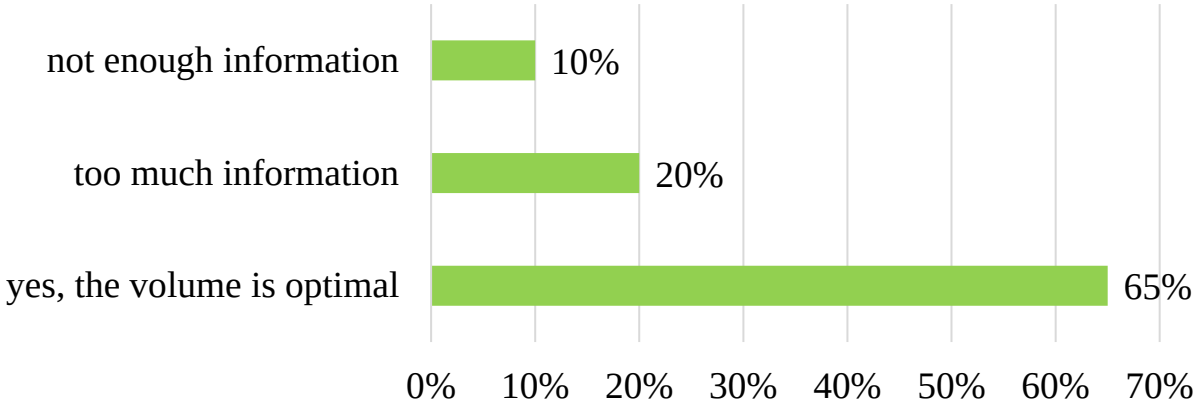

Fig. 2.15. Respondents' assessment of the optimality of the amount of information for making management decisions in pharmaceutical company

At the same time, a significant portion of respondents (20%) indicate that there is too much information. Ten percent of respondents believe that the amount of information is not enough. These data indicate that for most employees the information load is acceptable, but there is a need to optimize the amount of information for a certain part of the staff to avoid information overload or data insufficiency.

Conclusions to chapter II

1. A study of the organizational and economic characteristics of pharmaceutical company was conducted. The enterprise demonstrates a diversified structure of activities, also covering intermediary, transport, consulting services and rental. The organizational structure of pharmaceutical company is functional, with a clear division of responsibilities between departments.

2. Analysis of asset dynamics showed a significant increase in non-current and current assets during 2022-2024, which indicates active investment in fixed assets and expansion of inventories. At the same time, there is a positive trend towards a decrease in receivables. Analysis of liabilities revealed instability of equity, growth of current liabilities and full repayment of long-term liabilities in 2024.

3. An analysis of the financial results of pharmaceutical company for the period 2022-2024 revealed a significant increase in net income, but unstable profitability, in particular a significant loss from operating activities and a net loss in 2024. An analysis of financial condition ratios indicates the instability of liquidity and profitability, which requires careful monitoring and the implementation of appropriate management measures.

4. SWOT analysis of pharmaceutical company revealed the company's strengths, such as diversification of activities and flexibility, as well as weaknesses, including small authorized capital and the presence of mentions in court registers. Among the opportunities of pharmaceutical company were noted expansion into

new markets and integration of digital solutions, and among the threats - economic instability and increased competition.

5. A survey of 20 employees of pharmaceutical company was conducted. It was found that most respondents believe that they have enough information to make management decisions, but there is a small proportion of staff who feel that it is lacking. The most popular sources of information are accounting systems, CRM systems and spreadsheets.

6. It was determined that the majority of employees of pharmaceutical company are satisfied with the timeliness of information provision and consider information processes at their workplaces to be automated. However, the biggest problem is the lack of strategic information (long-term forecasts, market trends).

7. It was found that the majority of respondents of pharmaceutical company positively assesses the effectiveness of the information systems and technologies used, considering the most useful aspects to be the completeness and relevance of data, as well as the possibilities of analysis and visualization. Among the main problems when using IT, limited access to information and insufficient functionality of the systems were noted.

8. It was found that the majority of employees of pharmaceutical company highly appreciate the quality and reliability of the information used and consider its volume to be optimal, although a significant part indicates the redundancy of information.

CHAPTER III
DIRECTIONS FOR IMPROVING INFORMATION SUPPORT FOR MANAGEMENT DECISION-MAKING OF COMPANY

3.1. Development of recommendations for optimizing information flows in pharmaceutical company

Information support for management decision-making in a company is a multi-step process that begins with determining the need for information (table 3.1). At this stage, the management problem or opportunity is identified, the decision-making objectives are clearly formulated, stakeholders and their information needs are identified, and the type of information required is established [8].

The next step is to search for and collect information, which includes identifying internal and external sources of information, selecting appropriate methods for collecting primary and secondary data, and assessing the relevance and reliability of the collected information [19].

This is followed by information processing and analysis, where data is systematized and organized, various analysis methods are applied to identify patterns and key factors, and data visualization is performed for better understanding [12].

The fourth stage is providing information for decision-making, which involves choosing the optimal format for presenting information, preparing clear conclusions and recommendations, ensuring the timeliness of information provision and communicating key messages to decision-makers [5].

The final stage is monitoring and evaluating the results of information provision, which includes collecting feedback, assessing the impact of the information provided on the quality of decisions, analyzing the effectiveness of sources and methods of information collection, and adjusting the process for its further improvement.

Table 3.1

Stages of information support for making management decisions in pharmaceutical company

Stage	Description	Basic actions
1. Determining the need for information	Identifying a management problem/opportunity and establishing information requirements	Problem/Opportunity Formulation Defining the objectives of the solution Identifying stakeholders Determining the type of information required
2. Search and collection of information	Identifying and obtaining the necessary data from various sources	Defining internal and external sources Choosing data collection methods Collecting primary and secondary data Relevance and credibility assessment
3. Information processing and analysis	Transforming collected data into useful information for decision-making	Systematization and organization of data Application of analysis methods Identifying patterns and trends Data visualization
4. Providing information for decision-making	Delivering analysis results to decision-makers in a user-friendly format	Choosing a presentation format Preparing conclusions and recommendations Ensuring timeliness Delivering key messages
5. Monitoring and evaluation of information support results	Assessing process effectiveness and making necessary adjustments	Collecting feedback Assessment of the impact on the quality of decisions Analysis of the effectiveness of sources and methods Making adjustments

We have developed a system of information support for management decisions for pharmaceutical company (table 3.2), which aims to provide effective information support at all stages of company management. The basis of system is clearly defined goals and principles, among which the key ones are focus on user

needs, data integration, information availability, its timeliness, reliability, flexibility and security [13].

Table 3.2

Information support system for making management decisions for pharmaceutical company

Section	Stage	Key elements and actions	Responsible persons /departments	Technical support	Expected results
I. Objectives and principles of the system	Defining strategic principles	- Formulation of the main goal of the system - Definition of key principles (orientation, integration, accessibility, timeliness, reliability, flexibility, security)	Company management, department heads	-	Clear understanding of the purpose and principles of functioning of the system by all participants
II. Stages of functioning of the system	1. Determining the need for information	- Regular analysis of information needs of departments - Formation of formalized requests for information - Definition of key performance indicators (KPIs) - Forecasting future information needs	Heads of departments, analytical department (if any)	-	Clear understanding of information needs for decision-making at different levels
	2. Searching and collecting information (Data Management)	- Data integration from accounting, CRM and other systems - Data collection from internal (reports, tables) and external (market research, statistics, court registers) sources - Automation of data collection processes	IT department, database managers, analytical department	Integrated database (data warehouse), ETL tools	Creating a single, relevant and reliable information space

	3. Information processing and analysis (Business analytics)	- Implementation/ expansion of BI platform (Tableau, Power BI) - Standardization of different types of reports - Conducting special analytical studies - Forecasting, segmentation, data classification	Analytical department, specialized department specialists	BI platform, statistical software	Gain valuable insights, identify patterns and trends for informed decisions
	4. Providing information (Information support for decision-making)	- Creating interactive dashboards with KPIs - Automated sending of regular reports - Providing information upon request - Using a corporate portal/ intranet for information exchange - Presentation of analysis results at meetings	Analytical department, department heads	BI platform, corporate portal	Timely and convenient provision of necessary information in an understandable format
	5. Monitoring and Evaluation (Information Quality Management)	- Regular collection of feedback from users - Assessing the impact of information on decisions made - Periodic audit of information systems and processes - Analysis of the use of SIZPUR - Making changes and updates to the system	Company management, analytical department, IT department	Feedback accounting systems, monitoring tools	Continuous improvement of the SIZPUR, increasing its efficiency and compliance with needs
III. Technical infrastructure of system	Ensuring the functioning	- Integrated database (data warehouse) - Tools - BI platform - Corporate portal/ intranet - Access control system	IT department		Reliable and secure technical basis for the functioning of the system
IV. Organi	Ensuring effective use	- Identification of responsible persons for the stages of the system	Company manage		Effective use of system by all employees,

zational aspects		- Conducting user training - Development of regulations and instructions - Creation of cross-functional working groups	ment, HR departm ent, departm ent heads		clear understanding of roles and responsibilities

The functioning of the system unfolds in five main stages. The first stage - determining the need for information, involves an in-depth analysis of information requests from various departments, formalization of these requests, determination of key performance indicators and forecasting the company's future information needs. The second stage - searching and collecting information, focuses on integrating data from existing accounting, CRM and other internal systems, as well as collecting the necessary information from external sources, including market research, statistical data and court registers, with an emphasis on automating these processes. The third stage - processing and analyzing information, includes the implementation or expansion of the use of a powerful BI platform (for example, Tableau or Power BI), standardization of reports, conducting special analytical studies, as well as the application of forecasting and data segmentation methods to identify valuable insights. The fourth stage - providing information, ensures timely and convenient communication of analysis results to decision-makers through interactive dashboards, automated report distribution, providing information on request and using a corporate portal for knowledge exchange. The final, fifth stage - monitoring and evaluation, aimed at continuous improvement of the system by regularly collecting feedback from users, assessing the impact of information on decisions made, conducting audits of information systems and analyzing the use of the system to make necessary changes and updates [11]. The technical infrastructure of the system includes an integrated database, ETL tools for data processing, a selected BI platform, a corporate portal/ intranet, and a reliable access management system. The organizational aspects of the implementation and operation of the system include a clear definition of responsible persons for each stage, training users in working with

the system, development of relevant regulations and instructions, and the creation of cross-functional working groups to discuss and improve information support. Given the specifics of company, special attention in system is paid to overcoming identified problems, such as lack of strategic information, limited access to data, and instability of financial results. The system provides for in-depth analysis of market trends, expansion of the functionality of existing information systems or implementation of new analytical tools, as well as the creation of an effective system for monitoring financial indicators. The implementation of system will allow company to significantly optimize the process of making management decisions, increase their validity, and contribute to the achievement of the company's strategic goals. The process of making management decisions at company is characterized by a generally positive assessment of information support by the majority of employees. However, there are certain problematic aspects related to the lack of strategic information, limited access to data, and the need to optimize the amount of information for certain categories of personnel [6]. To increase the efficiency of the management decision-making process, it is recommended to: to pay attention to improving access to strategic information, including long-term forecasts and market trend analysis; to conduct an audit of the information systems used to identify opportunities to expand their functionality and improve integration between different systems; to optimize the amount of information provided to employees at different levels of management to avoid information overload and ensure that only relevant data is provided; to consider implementing or more actively using business intelligence (BI) systems to improve data analysis and visualization capabilities; to provide appropriate support for users of information systems and conduct training on their effective use. In the context of financial instability, special attention should be paid to information support for financial management, including operational monitoring of key financial indicators and analysis of the causes of unprofitability in 2024. The implementation of these recommendations will contribute to increasing the validity and timeliness of management decisions, which will positively affect the further development and financial stability of company [13].

3.2. Assessment of the effectiveness of the implementation of the proposed measures to improve information support

The implementation of a comprehensive information support system for management decision-making system for company is a strategically important step aimed at increasing management efficiency and ensuring stable development of the enterprise in a dynamic market environment. The proposed measures to improve information support, including data integration, implementation of business analytics tools, automation of reporting and improvement of access to strategic information, will have a positive impact on various aspects of the activities of company. Based on the calculations in table 3.3, the total costs of creating and implementing system during the first year will range from 210,000 UAH to 1,650,000 UAH. This range depends on the selected software, the need to modernize the infrastructure, the involvement of external consultants, and the amount of staff training. To assess the economic efficiency of implementing system, it is necessary to forecast the potential revenue growth or cost reduction that can be achieved through improved information support. Implementing system will allow company to achieve a 1% increase in net income due to more effective market analysis, optimization of purchases and sales, and improved inventory management [23].

Using the net income for 2024 of 1,160,327 thousand UAH, the potential income growth will be: income growth = UAH 1,160,327 thousand * 1% = UAH 11,603.27 thousand per year. To estimate the payback period, we will consider only the first year's costs and potential revenue growth: with minimal costs (210,000 UAH): payback period = 210,000 UAH / 11,603,270 UAH/year ≈ 0.018 years or about 6.5 days.

Table 3.3

Calculation of costs for the creation of system for company

Expense item	Description	Estimated cost (UAH)
Software costs (SW)		
Purchasing licenses for the BI platform	Depending on the chosen solution and number of users	50,000 - 500,000 (one-time or annual subscription)

Purchasing or upgrading ETL tools	As needed	30,000 - 200,000 (one-time)
Expanding the functionality of existing accounting and CRM systems	Analytics and integration modules	20,000 - 100,000
Technical infrastructure costs		
Server upgrades/purchases	If necessary, to host a data warehouse and BI platform	50,000 - 300,000
Creating and configuring an integrated database (data warehouse)	Included in the cost of implementation or payment of IT specialists	-
Implementation and setup costs		
Payment for the services of external consultants/integrators	Depending on the complexity of the project	100,000 - 500,000
Salaries of in-house IT specialists and analysts	Depends on the amount and duration of involvement	-
Staff training costs		
Payment for training for employees	Using the BI platform and new tools	10,000 - 50,000
Operating costs (after implementation) - Annually		
Software and infrastructure support and maintenance	Licenses, updates, technical support	10% - 20% of the cost of software and infrastructure
Database Administrator and Analyst Salary	Depends on the state	-
Approximate calculation of total costs (first year)		210,000 - 1,650,000
Software		100,000 - 800,000
Technical infrastructure	As needed	0 - 300,000
Implementation and configuration		100,000 - 500,000
Staff training		10,000 - 50,000

At maximum costs (1,650,000 UAH): Payback period = 1,650,000 UAH / 11,603,270 UAH/year ≈ 0.142 years or about 1.7 months.

Let's consider scenarios for revenue growth and implementation costs:

First scenario: Revenue growth – 2%, implementation costs – minimal (210,000 UAH).

Income growth = 1,160,327 thousand UAH * 2% = 23,206.54 thousand UAH/year.

Payback period = 210,000 UAH / 23,206,540 UAH/year ≈ 0.009 years or about 3 days.

Second scenario: Revenue growth – 0.5%, implementation costs – maximum (1,650,000 UAH).

Income growth = 1,160,327 thousand UAH * 0.5% = 5,801.64 thousand UAH/year.

Payback period = 1,650,000 UAH / 5,801,640 UAH/year ≈ 0.284 years or about 3.4 months.

In addition to quantitative indicators, the implementation of the SIZPUR will have significant qualitative benefits, such as: Improving the quality of management decisions through access to more complete and analytically processed information. Increasing management efficiency through quick access to key data and automated reporting. Improved coordination between departments thanks to an integrated information system. Risk reduction through better monitoring and analysis of potential threats. Increasing employee satisfaction by providing modern and effective tools for work [6].The implementation of system for company is an economically sound and strategically beneficial solution. The projected payback period for investments is relatively short, and significant qualitative advantages will contribute to increasing management efficiency, reducing risks, and ensuring the sustainable development of the company in the long term.

Conclusions to chapter III

1. To improve the efficiency of the management decision-making process, it is necessary to focus on optimizing information flows at each of the five identified stages. This includes clearly defining information needs, establishing effective data collection channels, implementing modern processing and analysis methods, ensuring timely and convenient provision of information, as well as systematic monitoring and assessment of the quality of information support.

2. An information support system for management decision-making has been developed, which is a comprehensive system aimed at integrating data from

various sources, applying business analytics tools, automating reporting, and improving access to strategic information. Its implementation will allow creating a single information space, increasing the validity and efficiency of management decision-making at all levels of management.

3. The implementation of system is a tool for solving the identified problems of information support of company, in particular, the lack of strategic information, limited access to data and the need to optimize the volume of information for different categories of personnel. The system provides for measures to improve access to market trends and long-term forecasts, expand the functionality of existing information systems and implement business analytics tools.

4. The assessment of the economic efficiency of the implementation of system showed a potentially rapid payback period for investments, even under conservative scenarios. The expected increase in net income due to improved quality of management decisions and optimization of business processes significantly exceeds the costs of creating and implementing the system in the medium term.

5. In addition to quantitative indicators, the implementation of system will provide significant qualitative benefits, including improving the quality of management decisions, increasing management efficiency, improving coordination between departments, reducing risks, and increasing employee satisfaction.

6. Improving the information support for management decision-making requires a systematic approach that includes not only the implementation of technical solutions, but also organizational changes, personnel training, and constant monitoring of the effectiveness of the system.

7. Thus, the implementation of the developed system is a promising direction for improving the information support for making management decisions in company, which will contribute to increasing the efficiency of operations, reducing risks, and ensuring the sustainable development of the company.

CONCLUSIONS

1. Analysis of the theoretical foundations of information support for managerial decision-making emphasized the key role of high-quality information (completeness, reliability, relevance, efficiency, accessibility) as the basis for sound managerial decisions. Different approaches consider information as an integral component of management. Information classification is important for the effective work of managers. Cloud technologies open up new opportunities for management.

2. The study of pharmaceutical company revealed a diversified structure of activities and a functional organizational structure. Analysis of the dynamics of assets showed growth, and liabilities - instability of equity. Financial results demonstrate growth in net income, but unstable profitability with a loss in 2024. SWOT analysis revealed the strengths and weaknesses, opportunities and threats of the enterprise. Employee survey showed general satisfaction with information support, but revealed a lack of strategic information and limited access to data.

3. To increase the efficiency of management decision-making, it is proposed to optimize information flows at all stages. A comprehensive system of information support for management decision-making has been developed, aimed at data integration, business analytics, reporting automation, and improving access to strategic information to overcome existing problems.

4. The assessment of the economic efficiency of the implementation of system showed a potentially rapid return on investment and a significant increase in net income. Qualitative benefits are also expected, such as improved decision quality, efficiency, coordination, risk reduction and increased employee satisfaction. Improving information support requires a systemic approach, including organizational changes and staff training.

5. The implementation of pharmaceutical company is a promising direction for increasing the efficiency of the activities of pharmaceutical company reducing risks and ensuring sustainable development.

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APPENDICES

APPENDIX A

Questionnaire

for information support for making management decisions at pharmaceutical company mark one or more answers

1.Your department:

- administration
- sales department
- logistics
- accounting
- other: _____

2.Your position:

- head
- middle manager
- specialist
- other: _____

3. Do you have enough information to make management decisions?

- yes, completely
- partially
- no

4. What sources of information do you use most often?

- accounting system (e.g. 1C, SAP, other)
- CRM system
- business intelligence (BI) systems
- spreadsheets (e.g. Excel, Google Sheets)
- project management systems
- corporate portal/ intranet
- document management systems
- other (please specify): _____
- I don't use specialized systems.

continued appendix A

5. How do you assess the timeliness of providing information for decision-making?

- ☐ always on time
- ☐ often late
- ☐ very often late
- ☐ difficult to answer

6. Are information processes at your workplace sufficiently automated?

- ☐ yes
- ☐ partially
- ☐ no

7. What information is most often lacking for decision-making?

- ☐ financial
- ☐ strategic (long-term forecasts, market trends)
- ☐ operational (daily/weekly data)
- ☐ analytical

8. In your opinion, how effective are the information systems and technologies that you use to support management decision-making?

- ☐ very effective
- ☐ rather effective
- ☐ neutrally
- ☐ rather ineffective
- ☐ very inefficient
- ☐ difficult to answer

9. What aspects of the information systems and technologies used, in your opinion, are most useful for making management decisions?

- ☐ user-friendly interface
- ☐ data processing speed
- ☐ completeness and relevance of data

continued appendix A

- data analysis and visualization capabilities
- integration with other systems
- information availability
- the ability to generate reports

10. What problems or limitations do you experience when using information systems and technologies to make management decisions?

- insufficient functionality
- complex interface
- low speed of operation
- incomplete or outdated data
- lack of necessary analytical tools
- problems with integration with other systems
- limited access to information
- the complexity of generating the necessary reports
- insufficient user support

11. How high-quality and reliable is the information you use to make management decisions?

- always high quality and reliable
- often high-quality and reliable
- sometimes high quality, sometimes not
- often poor quality or unreliable
- almost always poor quality or unreliable

12. Do you think that the amount of information you receive for making management decisions is optimal?

- yes, the volume is optimal
- too much information
- not enough information
- difficult to answer

APPENDIX A

Міністерство охорони здоров'я України
Національний фармацевтичний університет
Інститут підвищення кваліфікації спеціалістів фармації
Кафедра клінічної фармакології

АКТУАЛЬНІ ПИТАННЯ КЛІНІЧНОЇ ФАРМАКОЛОГІЇ ТА КЛІНІЧНОЇ ФАРМАЦІЇ (TOPICAL ISSUES OF CLINICAL PHARMACOLOGY AND CLINICAL PHARMACY)

Матеріали науково-практичної
Internet-конференції з міжнародною участю
28 жовтня 2025 року
м. Харків

Харків
НФаУ
2025

continued appendix B

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ
ІНСТИТУТ ПІДВИЩЕННЯ КВАЛІФІКАЦІЇ СПЕЦІАЛІСТІВ ФАРМАЦІЇ
КАФЕДРА КЛІНІЧНОЇ ФАРМАКОЛОГІЇ

АКТУАЛЬНІ ПИТАННЯ КЛІНІЧНОЇ ФАРМАКОЛОГІЇ ТА КЛІНІЧНОЇ ФАРМАЦІЇ (TOPICAL ISSUES OF CLINICAL PHARMACOLOGY AND CLINICAL PHARMACY)

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28 жовтня 2025 року
м. Харків

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НФаУ
2025

continued appendix B

Висновки. ШІ має значний потенціал у розвитку клінічної фармації. Його використання дозволяє реалізувати головну ідею персоналізованої медицини — підібрати для кожного пацієнта ті лікарські засоби, які будуть максимально ефективними й безпечними. Подальше впровадження таких технологій потребує міждисциплінарної співпраці лікарів, фармацевтів, ІТ-фахівців і державної підтримки, адже саме від цього залежить якість та майбутнє сучасної фармакотерапії в Україні.

UDC: 339.138:614.272:615.235

INFORMATION TECHNOLOGIES AS A TOOL FOR INCREASING THE EFFICIENCY OF MANAGEMENT DECISIONS IN PHARMACEUTICAL ACTIVITIES

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The aim of the work is to study information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities.

Materials and methods. A survey of 20 employees of a pharmaceutical company was conducted to analyze the use of information systems and assess the information support of the process of making management decisions.

Results. It was found that 74% of respondents believe that they have enough information to make management decisions. 80% of respondents consider information processes in the workplace to be automated. The most popular sources are accounting systems, CRM systems and spreadsheets. The biggest problem is the lack of strategic information. The majority positively assess the effectiveness of the IT used, noting the completeness and relevance of data and the ability to analyze and visualize as the most important factors.

Conclusions. The majority of employees of the pharmaceutical company are satisfied with the information support, its timeliness and level of automation. However, a critical area for improvement is the provision of strategic information (forecasts, market trends) and addressing the problems of limited access and insufficient functionality of existing IT systems.

Keywords: *pharmaceutical activity, management decisions, information technology, strategic information, automation.*

continued appendix B

УДК: 339.138:614.272:615.235

ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ ЯК ІНСТРУМЕНТ ПІДВИЩЕННЯ ЕФЕКТИВНОСТІ УПРАВЛІНСЬКИХ РІШЕНЬ У ФАРМАЦЕВТИЧНІЙ ДІЯЛЬНОСТІ

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Метою роботи є дослідження інформаційних технологій як інструменту підвищення ефективності управлінських рішень у фармацевтичній діяльності.

Матеріали та методи. Проведено опитування 20 співробітників фармацевтичної компанії для аналізу використання інформаційних систем та оцінки інформаційного забезпечення процесу прийняття управлінських рішень.

Результати. Встановлено, що 74% опитаних вважають, що мають достатньо інформації для прийняття управлінських рішень. 80% респондентів вважають інформаційні процеси на робочому місці автоматизованими. Найпопулярнішими джерелами є облікові системи, CRM-системи та електронні таблиці. Найбільшою проблемою названо брак стратегічної інформації. Більшість позитивно оцінюють ефективність використовуваних IT, відзначаючи як найбільш важливі фактори повноту та релевантність даних та можливості аналізу та візуалізації.

Висновки. Більшість співробітників фармацевтичної компанії задоволені інформаційним забезпеченням, його своєчасністю та рівнем автоматизації. Проте, критичною зоною для вдосконалення є забезпечення стратегічною інформацією (прогнози, ринкові тенденції) та вирішення проблем обмеженого доступу й недостатнього функціоналу існуючих IT-систем.

***Ключові слова**: фармацевтична діяльність, управлінські рішення, інформаційні технології, стратегічна інформація, автоматизація.*

Introduction. The modern pharmaceutical industry operates in a highly dynamic and competitive environment, characterized by rapid market changes, stringent regulatory requirements, and the constant need for innovation. In this context, the quality and speed of management decisions (MD) are critical determinants of a company's success and sustainability. Effective decision-making relies fundamentally on timely, accurate, and comprehensive information.

The integration of information technologies (IT) is no longer merely an option but a strategic imperative. Modern IT systems provide tools for collecting, processing, analyzing, and visualizing vast amounts of data – from internal financial records and operational metrics to external market trends and long-term forecasts. By leveraging IT, pharmaceutical enterprises can significantly increase the validity of managerial actions, minimize operational risks, optimize the use of scarce resources, and ultimately enhance overall efficiency [1-3].

continued appendix B

The relevance of this study lies in the need to develop practical recommendations for improving the information support of the process of making managerial decisions in pharmaceutical organizations, which will allow to increase the validity of managerial actions, minimize risks, optimize the use of resources and increase the overall efficiency of pharmaceutical enterprises in a changing market environment.

Aim is to study information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities.

Materials and methods of research. A survey of 20 employees of a pharmaceutical company was conducted to analyze the use of information systems and assess the information support of the process of making management decisions.

Results and discussion. To analyze the information systems and technologies used to support management decision-making at the pharmaceutical company, we conducted a survey of 20 employees. Analysis of the positions of the 20 employees of the pharmaceutical company surveyed showed that the largest share of respondents (50%) are middle managers. Managers made up 34% of the total number of respondents. The smallest share of respondents (16%) is specialists. This distribution allows us to consider the opinions of representatives of different levels of management when assessing information systems and technologies to support management decision-making.

It was determined that 74% of respondents believe that they have enough information to make management decisions. A fifth of respondents (20%) indicated that they only have partial information. Only a small number of employees (6%) indicated that they do not have enough information to make management decisions.

These data indicate a generally positive assessment of the information support of the management process in the company, but emphasize the need to pay attention to the needs of that small part of the staff who feel a lack of information.

We further determined that the most popular source is an accounting system (e.g., 1C, SAP, other), which is used by 24% of respondents. The second place in popularity was shared by a CRM system and spreadsheets (e.g., Excel, Google Sheets), which are used by 19% of respondents. Business intelligence (BI) systems are used by 12% of employees, and document management systems are used by 11%.

The least popular sources of information were project management systems (10%) and corporate portal/ intranet (5%). This data reflects the preference for using accounting and client systems, as well as traditional spreadsheets, to inform management decisions in the company.

It was determined that the vast majority of surveyed employees of pharmaceutical company (74%) assess the timeliness of providing information for making management decisions as "always on time". Only 14% of respondents noted that they often receive information late. A small part of those surveyed (5%) indicated that information arrives "very often late". Another 7% of respondents found it difficult to answer this question. Thus, most employees are satisfied with the efficiency of obtaining the necessary data for making decisions, however, there is a small proportion of staff who experience problems with the timeliness of information provision.

continued appendix B

It was set that the vast majority of surveyed employees of pharmaceutical company (80%) believe that information processes at their workplace are automated. Fifteen percent of respondents noted that automation is only partial. Only a small proportion of respondents (5%) indicated the absence of automation of information processes at their workplace. These data indicate a fairly high level of automation of information processes in the company from the point of view of the majority of its employees.

It was found that the biggest problem for employees of pharmaceutical company when making management decisions is the lack of strategic information (long-term forecasts, market trends), which was indicated by 60% of respondents. Operational information (daily/weekly data) is most often lacking for 17% of respondents, and analytical information - for 14%. The least pressing gproblem was the lack of financial information, which was indicated by only 9% of respondents. These data indicate an urgent need to improve access to strategic information to support effective management decision-making in the company.

It was determined that almost half of the surveyed employees of pharmaceutical company (48%) consider the information systems and technologies used to be "very effective" to support management decision-making. Another 24% assess them as "rather effective". Fifteen percent of respondents took a neutral position on this issue. A small proportion of respondents consider the systems used to be "rather ineffective" (5%), and 8% of respondents found it difficult to answer. In general, most employees positively assess the effectiveness of the information systems and technologies that they use in their work to make management decisions.

It was set that, according to the surveyed employees of pharmaceutical company, the most useful aspect of the information systems and technologies used for making management decisions is the completeness and relevance of data (19%). The second most important feature is data analysis and visualization capabilities (18%). Data processing speed and information accessibility (14% each) are also quite important.

Integration with other systems was noted as useful by 13% of respondents. The least important, according to the respondents, are a user-friendly interface and the ability to generate reports (11% each).

These data indicate the priority of substantive and analytical characteristics of information systems to support management decision-making in the company.

It was found that the biggest problem faced by employees of pharmaceutical company when using information systems and technologies for making management decisions is limited access to information (14%). The second most frequently mentioned problem is insufficient functionality of the systems (15%). Also, significant problems are the lack of necessary analytical tools and the complexity of generating the necessary reports (12% each), as well as a complex interface and problems with integration with other systems (11% each). Low system speed is experienced by 10% of respondents, and incomplete or outdated data - by 7%. Insufficient user support was noted by 9% of respondents. These data indicate a number of aspects that need

continued appendix B

improvement to increase the efficiency of using information systems in the process of making management decisions.

It was set that the vast majority of surveyed employees of pharmaceutical company (70%) assess the quality and reliability of the information they use to make management decisions as "always high-quality and reliable". Another 20% of respondents consider it "often high-quality and reliable".

A small portion of respondents (5%) indicated that the information is "sometimes of good quality, sometimes not" or "often of poor quality or unreliable". These data indicate a generally high level of employee trust in the quality and reliability of information support for the company's management decision-making process.

It was determined that the majority of surveyed employees of pharmaceutical company (65%) consider the amount of information they receive for making management decisions to be optimal.

At the same time, a significant portion of respondents (20%) indicate that there is too much information. Ten percent of respondents believe that the amount of information is not enough. These data indicate that for most employees the information load is acceptable, but there is a need to optimize the amount of information for a certain part of the staff to avoid information overload or data insufficiency.

Conclusions. A survey of 20 employees of pharmaceutical company was conducted. It was found that most respondents believe that they have enough information to make management decisions, but there is a small proportion of staff who feel that it is lacking. The most popular sources of information are accounting systems, CRM systems and spreadsheets.

It was determined that the majority of employees of pharmaceutical company are satisfied with the timeliness of information provision and consider information processes at their workplaces to be automated. However, the biggest problem is the lack of strategic information (long-term forecasts, market trends).

It was found that the majority of respondents of pharmaceutical company positively assesses the effectiveness of the information systems and technologies used, considering the most useful aspects to be the completeness and relevance of data, as well as the possibilities of analysis and visualization. Among the main problems when using IT, limited access to information and insufficient functionality of the systems were noted.

It was found that the majority of employees of pharmaceutical company highly appreciate the quality and reliability of the information used and consider its volume to be optimal, although a significant part indicates the redundancy of information.

References:

1. Later stages of acute stress impair reinforcement-learning and feedback sensitivity in decision making / N. Ben Hassen et al. // *Biol. Psychol.* 2023. Vol. 180. P. 10858.
2. Global and national overview of the digital health ecosystem / S. Z. Attila et al. // *Inf. Tarsad.* 2021. Vol. 21. P. 47–66.
3. Implicit negativity bias leads to greater loss aversion and learning during decision-making / F. Molins et al. // *Int. J. Environ. Res. Public Health.* 2022. Vol. 19. P. 170.

Ф А 2.2.1–32-366

National University of Pharmacy

Faculty pharmaceutical
Department management, marketing and quality assurance in pharmacy
Level of higher education master
Specialty 226 Pharmacy, industrial pharmacy
Educational and professional program Pharmacy

APPROVED
The Head of Department
management, marketing and quality assurance in pharmacy
_____
Volodymyr MALYI
«01» September 2025

ASSIGNMENT
FOR QUALIFICATION WORK
OF AN APPLICANT FOR HIGHER EDUCATION
Tariq BOUHAFA

1. Topic of qualification work: «Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities», supervisor of qualification work: Volodymyr MALYI, D.Sc.Ph, prof.

approved by order of NUPh from "31" of March 2025 № 81

2. Deadline for submission of qualification work by the applicant for higher education: November 2025

3. Outgoing data for qualification work: sources of scientific literature, directories, retail sector of the pharmaceutical market, legislative and regulatory framework, statistical and reporting data, activity of pharmacy enterprises, analysis of professional periodicals.

4. Contents of the settlement and explanatory note (list of questions that need to be developed): to reveal the essence and role of information in making management decisions; to provide a classification of information for making management decisions; to analyze the benefits of cloud technologies for information security making management decisions; to conduct an organizational and economic characteristic of the pharmaceutical company; to analyze information systems and technologies used to support management decision-making at pharmaceutical company; to assess the process of making management decisions in pharmaceutical company from the point of view of information support; develop recommendations for optimizing information flows in the pharmaceutical organization; to assess the effectiveness of the implementation of the proposed measures to improve information support.

5. List of graphic material (with exact indication of the required drawings):
Figures – 17, tables – 10.

6. Consultants of chapters of qualification work

Chapters	Name, SURNAME, position of consultant	Signature, date	
		assignment was issued	assignment was received
1	Volodymyr MALYI, professor of department management, marketing and quality assurance in pharmacy	01.09.2025	01.09.2025
2	Volodymyr MALYI, professor of department management, marketing and quality assurance in pharmacy	30.09.2025	30.09.2025
3	Volodymyr MALYI, professor of department management, marketing and quality assurance in pharmacy	15.10.2025	15.10.2025

7. Date of issue of the assignment: «01» September 2025.

CALENDAR PLAN

№ з/п	Name of stages of qualification work	Deadline for the stages of qualification work	Notes
1	Collection and generalization of data from scientific literature by areas of qualification work	September 2025	**done**
2	Study of the theoretical basis of information support for management decisions	September 2025	**done**
3	Analysis of information systems and technologies used to support management decision-making in the company	September 2025	**done**
4	Development of recommendations for optimizing information flows in pharmaceutical company	September 2025	**done**
5.	Assessment of the effectiveness of the implementation of the proposed measures to improve information support	October 2025	**done**
6	Writing and design of qualification work	October 2025	**done**
7	Approbation of qualification work	October 2025	**done**
8	Submission of the qualification work to the EC of the National University of Pharmacy	November 2025	**done**

An applicant of higher education _____ Tariq BOUHAFA

Supervisor of qualification work _____ Volodymyr MALYI

ВИТЯГ З НАКАЗУ №81

По Національному фармацевтичному університету

від 31 березня 2025 року

Затвердити теми кваліфікаційних робіт здобувачам вищої освіти 5-го курсу першого циклу Фм21*(4,10д)англ-01 2025-2026 навчального року, освітньо-професійної програми – Фармація, другого (магістерського) рівня вищої освіти, спеціальності 226 – Фармація, промислова фармація, галузь знань 22 Охорона здоров'я, денна форма здобуття освіти (термін навчання 4 роки 10 місяців), які навчаються за контрактом (мова навчання англійська).

Прізвище, ім'я здобувача вищої освіти	Тема кваліфікаційної роботи		Посада, прізвище та ініціали керівника	Рецензент кваліфікаційної роботи
• **по кафедрі менеджменту, маркетингу та забезпечення якості у фармації**				
Бухафа Тарік	Інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності	Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities	проф. Малий В.В.	доц. Волкова А.В.

Ректор

Вірно. Секретар

ФА2.8-03-317

ВИСНОВОК

експертної комісії про проведену експертизу

щодо академічного плагіату у кваліфікаційній роботі

здобувача вищої освіти

«11» листопада 2025 р. № 332603513

Проаналізувавши кваліфікаційну роботу здобувача вищої освіти БУХАФА Тарік, групи Фм21*(4,10д)-01, спеціальності 226 Фармація, промислова фармація, освітньої програми «Фармація» очної (денної) форми навчання на тему: «Інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності / Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities», експертна комісія дійшла висновку, що робота, представлена до Екзаменаційної комісії для захисту, виконана самостійно і не містить елементів академічного плагіату (компіляції).

Голова комісії,
проректор ЗВО з НПР,
професор **Наталя ПОЛОВКО**

Ф А 2.2.1-32-353

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Tariq BOUHAFA

on the topic: «Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities»

Relevance of the topic. In conditions of fierce competition, constant changes in the regulatory environment, rapid development of medical technologies and growing consumer demands, sound and timely management decisions are becoming critical for the successful functioning of pharmaceutical organizations.

Practical value of conclusions, recommendations and their validity. The qualification work explores the essence and role of information in making management decisions; provides a classification of information for making management decisions; analyzes the advantages of cloud technologies for information support making management decisions.

Assessment of work. Tariq BOUHAFA conducted a significant research work and successfully coped with it, showed the ability to analyze and summarize data from literary sources, to work independently. In the work, the research results are properly interpreted and illustrated with figures. While completing the qualification work, the higher education applicant showed creativity, purposefulness, independence, and perseverance.

General conclusion and recommendations on admission to defend. The qualification work of the 6th year applicant of higher education Phm21*(4,10) eng-01 group Tariq BOUHAFA on the topic: "Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities" is a completed scientific study, which in terms of relevance, scientific novelty, theoretical and practical significance meets the requirements for qualification works, and can be presented to the EC of the National University of Pharmacy.

Scientific supervisor _____ Volodymyr MALYI
12 November 2025

Ф А 2.2.1-32-356

REVIEW

for qualification work of the master's level of higher education, specialty 226 Pharmacy, industrial pharmacy

Tariq BOUHAFA

on the topic: «Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities»

Relevance of the topic. Effective information support is a key factor for making quality management decisions that allow pharmaceutical companies to adapt to changes, optimize operations, respond to market needs in a timely manner, and ensure stable growth. Insufficient or unreliable information can lead to erroneous decisions, financial losses, and a decrease in the competitiveness of the enterprise.

Theoretical level of work. All scientific provisions stated by the higher education applicant are reliable and are based on a theoretical study of methodological materials, works of domestic and foreign economists on issues of information support for making management decisions in a pharmaceutical organization.

Author's suggestions on the research topic. Based on the results of the study, a comprehensive information support system for making management decisions has been developed, aimed at data integration, business analytics, reporting automation, and improving access to strategic information to overcome existing problems.

Practical value of conclusions, recommendations and their validity. Practical significance lies in the possibility of using the developed recommendations to optimize the collection, processing, storage and use of information necessary for making informed management decisions at various levels of organization management.

Disadvantages of work. As a remark, it should be noted that some results of the literature review, which are presented in the first chapter, need stylistic refinement. In general, these remarks do not reduce the scientific and practical value of the qualification work.

General conclusion and assessment of the work. Tariq BOUHAFA qualification work "Information technologies as a tool for increasing the efficiency of management decisions in pharmaceutical activities" is a scientifically based analytical study that has theoretical and practical significance. The qualification work meets the requirements for qualification papers and can be submitted to the EC of the National University of Pharmacy.

Reviewer _____ assoc. prof. Alina VOLKOVA

13 November 2025

Ф А2.2.1-91-287

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ВИТЯГ З ПРОТОКОЛУ № 5

14 листопада 2025 року

м. Харків

засідання кафедри менеджменту, маркетингу
та забезпечення якості в фармації

Голова: завідувач кафедри ММЗЯФ, доктор фарм. наук, професор Малий В. В.

Секретар: доцент ЗВО, канд. фарм. наук, доц. Жадько С.В.

ПРИСУТНІ: зав. кафедри ММЗЯФ, доктор фарм. наук, проф. Малий В.В., професор ЗВО, докт. фарм. наук, проф. Пестун І.В., професор ЗВО, докт. фарм. наук, проф. проф. Літвінова О.В., професор ЗВО, докт. фарм. наук, проф. проф. Коваленко С.М., професор ЗВО, докт. фарм. наук, проф. Крутських Т.В., професор ЗВО, докт. фарм. наук, проф. проф. Посилкіна О.В., доцент ЗВО, канд. фарм. наук, доц. Бабічева Г.С., доцент ЗВО, канд. фарм. наук, доц. Бондарєва І.В., канд. екон. наук, доц. Деренська Я.М., доцент ЗВО, канд. фарм. наук, доц. Жадько С.В., канд. фарм. наук, доц. Зборовська Т.В., канд. юрид. наук, доц. Коляда Т.А., канд. фарм. наук, доц. доц. Лісна А.Г., доцент ЗВО, канд. фарм. наук, доц. Малініна Н.Г., доцент ЗВО, канд. фарм. наук, доц. Рогуля О.Ю., здобувачі вищої освіти фармацевтичного факультету.

ПОРЯДОК ДЕННИЙ: Про допуск здобувачів вищої освіти випускного курсу фармацевтичного факультету спеціальності 226 Фармація, промислова фармація, освітньо-професійної програми Фармація до захисту кваліфікаційних робіт в Екзаменаційній комісії НФаУ.

СЛУХАЛИ: Про допуск здобувача вищої освіти факультету фармацевтичного випускного курсу спеціальності 226 Фармація, промислова фармація освітньо-професійної програми Фармація групи Фм21*(4,10д)англ-01 Тарік БУХАФА до захисту кваліфікаційної роботи в Екзаменаційній комісії НФаУ. Кваліфікаційна робота на тему «Інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності».

ВИСТУПИЛИ: В обговоренні кваліфікаційної роботи взяли участь проф. ЗВО Пестун І.В., доц. ЗВО Бабічева Г.С. Керівник кваліфікаційної роботи: проф., д. фарм. наук Малий В.В.

УХВАЛИЛИ: Допустити здобувача вищої освіти Тарік БУХАФА до захисту кваліфікаційної роботи на тему «Інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності» в Екзаменаційній комісії НФаУ.

Зав. каф. ММЗЯФ, доктор фарм. наук,
професор Володимир МАЛИЙ

Секретар, доцент ЗВО,
канд. фарм. наук, доцент Світлана ЖАДЬКО

Ф А2.2.1-32-042

НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ПОДАННЯ
ГОЛОВІ ЕКЗАМЕНАЦІЙНОЇ КОМІСІЇ
ЩОДО ЗАХИСТУ КВАЛІФІКАЦІЙНОЇ РОБОТИ

Направляється здобувач вищої освіти Тарік БУХАФА до захисту кваліфікаційної роботи
за галуззю знань 22 Охорона здоров'я
спеціальністю 226 Фармація, промислова фармація
освітньо-професійною програмою Фармація
на тему: «Інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності».

Кваліфікаційна робота і рецензія додаються.

Декан факультету _____ / Олександр ГОНЧАРОВ /

Висновок керівника кваліфікаційної роботи

Здобувач вищої освіти Тарік БУХАФА виконав на кафедрі менеджменту, маркетингу та забезпечення якості у фармації НФаУ кваліфікаційну роботу, яка присвячена дослідженню інформаційних технологій як інструменту підвищення ефективності управлінських рішень у фармацевтичній діяльності.

Перший розділ присвячено дослідженню теоретичних принципів інформаційного забезпечення управлінських рішень. У другому розділі проаналізовано інформаційні системи та технології, що використовуються для підтримки прийняття управлінських рішень у компанії. Третій розділ містить оцінку ефективності впровадження запропонованих заходів щодо покращення інформаційного забезпечення.

У цілому подана до захисту кваліфікаційна робота Тарік БУХАФА на тему «Інформаційні технології як інструмент підвищення ефективності управлінських рішень у фармацевтичній діяльності» відповідає вимогам, що висуваються до кваліфікаційних робіт, оцінюється позитивно і може бути рекомендована для захисту в Екзаменаційну комісію НФаУ.

Керівник кваліфікаційної роботи
_____ Володимир МАЛИЙ

12 листопада 2025 року

Висновок кафедри про кваліфікаційну роботу

Кваліфікаційну роботу розглянуто. Здобувач вищої освіти Тарік БУХАФА до захисту даної кваліфікаційної роботи в Екзаменаційній комісії.

Завідувач кафедри
менеджменту, маркетингу та
забезпечення якості у фармації
_____ Володимир МАЛИЙ

14 листопада 2025 року

Qualification work was defended

of Examination commission on

«26» of November 2025

With the grade _____

Head of the State Examination commission,

D.Pharm.Sc, Professor

_____ /Volodymyr YAKOVENKO/