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MINISTRY OF HEALTH OF UKRAINE
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QUALIFICATION WORK

on the topic: «**RESEARCH ON THE IMPACT OF DIGITAL TECHNOLOGIES ON CHANGE MANAGEMENT IN PHARMACEUTICAL ORGANIZATIONS»**

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АНОТАЦІЯ

У кваліфікаційній роботі проаналізовано вплив цифрових технологій на управління змінами у фармацевтичних організаціях. Проведено оцінку основних адаптивних дій фармацевтичних підприємств. Загальний обсяг кваліфікаційної роботи становить 40 сторінок, містить 15 рисунків. Також надається бібліографія, що включає 30 джерел.

Ключові слова: вплив, цифрові технології, управління змінами, фармацевтичні організації, адаптивний менеджмент.

ANNOTATION

The impact of digital technologies on change management in pharmaceutical organizations was analyzed in the qualification work. Evaluation of core adaptive actions taken by pharmaceutical enterprises has been conducted. The total volume of the qualification work is 40 pages, contains 15 figures. A bibliography including 30 sources is also provided.

Key words: impact, digital technologies, change management, pharmaceutical organizations, adaptive management.

CONTENT

INTRODUCTION

Relevance of the research topic. Recently, the pace of change in the external environment impacting pharmaceutical organizations has accelerated, intensifying its influence on the operational processes of these enterprises. Economic conditions not stable and fierce competition significantly complicate management processes, making future outcomes increasingly difficult to predict. Under these conditions, merely implementing quick adaptive actions is insufficient. To maintain stability and control, pharmaceutical organizations must proactively prepare for external changes and devise and execute suitable adaptive strategies [7].

Today, for companies to survive and maintain competitive edge, they must continuously modify their business operations. Change has become an essential component of any organization's growth, substantially affecting its operational framework. Managers at all levels must acknowledge that as business systems become more complex, the value of effective change management increases. Organizations now experience such a constant need for change that these transformations often occur unplanned and unmanaged. Therefore, for pharmaceutical companies to operate effectively, a structured approach to change management is essential [14].

The adaptation challenges faced by pharmaceutical organizations in response to external changes have been addressed in the works of researchers such as B.P. Hromovyk, V.A. Zahoriy, Z.M. Mnushko, A.V. Posylkina, M.M. Slobodyanyuk, I.V. Pestun, others. However, there remains a lack of scientific and methodological frameworks specifically aimed at enhancing the adaptability of pharmaceutical organizations to external changes as a strategic priority in the industry. Further in-depth study is needed to understand external environmental factors affecting enterprise performance and to evaluate the effectiveness of adaptive measures [10].

The purpose of the qualification work is to research on the impact of digital technologies on change management in pharmaceutical organizations.

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

- to study key phases and techniques in the implementation of change processes;
- to research academic studies on adaptive management in pharmaceutical organizations;
- to study major pharmaceutical market trends influencing pharmaceutical enterprises;
- to investigate of change management procedures in pharmaceutical enterprises;
- to evaluate of core adaptive actions taken by pharmaceutical enterprises;
- to research on the impact of digital technologies on change management in pharmaceutical organizations;
- to assess of the effectiveness of implemented adaptive actions and necessary adjustments.

The **object** of the research – pharmaceutical organizations implementing digital technologies, including processes and strategies related to change management within these organizations.

The **subject** of the study – the influence of digital technologies on change management frameworks, methodologies, and organizational dynamics in pharmaceutical companies, including how these technologies impact adaptability, decision-making processes, and operational efficiency.

The study utilized multiple **methods**, including historical, systematic, and logical analysis; comparative analysis; document review; structural-functional, economic, and statistical analysis; sociological research methods, including expert evaluations; market research; as well as functional, logical, and economic-mathematical modeling. Mathematical data processing was performed using Excel and Statistica software.

Practical significance of the obtained results. The results of this research offer practical insights into optimizing change management in pharmaceutical

organizations through digital technology integration. By identifying effective digital tools and strategies, this study provides a framework for enhancing adaptability, improving decision-making, and streamlining operations within pharmaceutical companies. These findings can aid managers in proactively preparing for market shifts, increasing competitive advantage, and achieving greater operational efficiency. Furthermore, the research offers a set of adaptive measures and an algorithmic approach to digital transformation, allowing organizations to better manage change in dynamic environments. These practical applications can be utilized by industry professionals to support sustainable growth and resilience in an increasingly technology-driven pharmaceutical landscape.

Approbation of research results and publication. Approbation of research results and publication. The qualification work was tested on IV International Scientific and Practical Conference "Fundamental and applied research in the field of pharmaceutical technology". The summaries of the reports were published: Malyi V.V., Bondarieva I.V., Ait Khalik Adil. Research on the impact of digital technologies on change management in pharmaceutical organizations. Fundamental and applied research in the field of pharmaceutical technology : Collection of scientific materials of the IV International Scientific and Practical Conference (Kharkiv, November 25, 2024). Kh.: View of NUPh, 2024.- P. 292.

Structure and scope of qualification work. The qualification work consists of an introduction, a literature review, an experimental section, general conclusions, a list of references, and appendices. The total length of the work is 40 pages, which includes 15 figures. Additionally, the work references 30 sources of literature that were utilized for research and analysis.

Part 1

SCIENTIFIC AND THEORETICAL FOUNDATIONS OF CHANGE ADMINISTRATION IN PHARMACEUTICAL ORGANIZATIONS

1.1. Key phases and techniques in the implementation of change processes

Today, many organizations, including pharmacies, are transforming their management approaches to enhance organizational efficiency and encourage entrepreneurial activity. This need for change arises from the socio-economic conditions that require modern enterprises to quickly adapt to rapidly evolving circumstances and competitive pressures. Key goals for today's enterprises include achieving profitability, expanding sales, increasing market share, and fostering self-development capabilities. To accomplish these goals, it is essential to adopt structured approaches to organizational change, making the processes manageable and directed. For this, a robust methodological foundation is needed, enabling managers to design and execute change initiatives and assess their outcomes effectively. Leaders must have a clear understanding of the company's current position, its target state, and possess a tailored framework to guide the desired transformations [20].

Change management process is presented on fig.1.1.

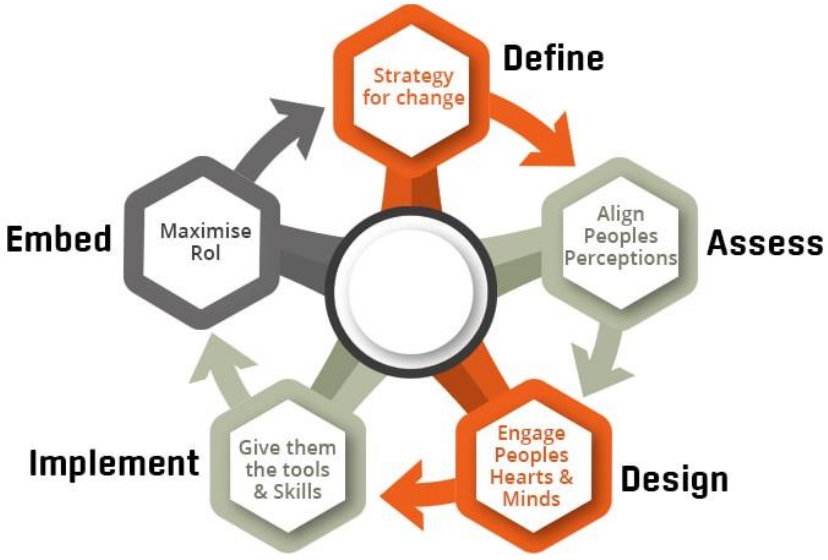

Fig. 1.1. Change management process

Every organization is constantly undergoing changes; otherwise, its survival in a dynamic environment could be at risk. Organizational changes sometimes occur deliberately, guided by a systematically developed plan for improvement, while in other cases, they are more informal and adaptive, as the organization (or parts of it) quickly adjusts its behaviour in response to current events. Senior management typically initiates the decision to implement innovations, assigning specific individuals or teams the responsibility for various aspects of the change process [16].

The stages of change are presented on fig.1.2.

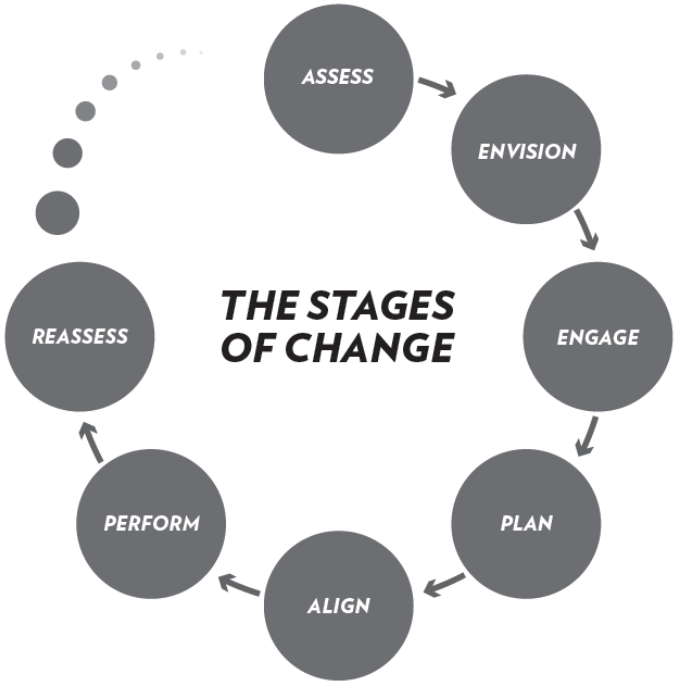

Fig. 1.2. The stages of change

In marketing, changes and innovations in organizational behaviour are understood as processes of renewal (transformation) within the organization, driven by innovations in organizational processes. The necessity for such changes and innovations stems from the need for the organization to adapt to internal and external environmental demands, acquire new knowledge, and adopt new technologies—especially crucial in a market-driven economy. Planning organizational changes includes analytical and forecasting activities, development initiatives, and selecting the most suitable strategy. The planning process must consider the degree of intervention needed in the existing structure and address various organizational

factors, such as structure and processes, production and information technology, and organizational culture as it relates to core values and human resource principles [15].

Changes in organizations can be either radical or partial. Radical changes are essential when there has been rapid market development following a period of stability, combined with prolonged neglect of necessary adaptation measures. Partial changes, on the other hand, are based on existing values, structures, and processes, prioritizing the practical effectiveness of the project over the pursuit of an idealized (conceptual) state [22].The types of organizational change are presented on fig.1.3.

Fig. 1.3. The types of organizational change

The analysis indicates that change management can be applied in diverse situations and implemented in various forms. A crucial area for further research is understanding the interconnections influenced by external and internal factors, organizational human dynamics, crisis types, and core change management tools. The primary step is to clearly identify these relationships and then experimentally assess the organization's readiness and the adequacy of the tools used for implementing change. Leaders overseeing change programs should address employment issues responsibly, ensuring that displaced staff are not adversely

affected and are supported in re-entering the labor market. The aim of change management is not merely to reduce staff but to unleash and realize employee potential, thus enhancing organizational competitiveness [6].

Organizational transformation is a complex, ambiguous, and often conflict-laden process. Initiating changes requires a thorough understanding of the organization, its issues, and the expectations of its people. Prior to implementing changes, it is essential to conduct a detailed analysis of the organization's past development, current state, and future potential. This includes examining the organizational structure, goals, management, human resources, and the social and psychological atmosphere [13].

A change program should encompass several stages, including preparation, data collection, identification of key areas and anticipated impacts, organizational and technical planning, and the practical implementation of changes [4, 7, 30]. These stages should be conducted sequentially. Measuring the success of organizational change is presented on fig.1.4.

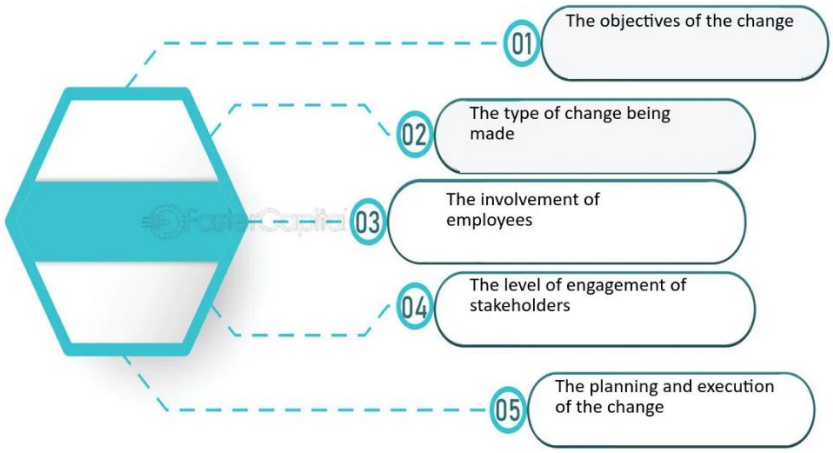

Fig. 1.4. Measuring the success of organizational change

Planning organizational changes involves setting management goals to shape the organization's future state. At this stage, relevant information must be collected, and internal and external factors analyzed to forecast outcomes, which are then formulated as change plans [21].

Organizing employee teams and individual contributors involves establishing teams and assigning roles for change participants, which lays down the principles of change management [10].

Change management maturity model is presented in fig. 1.5.

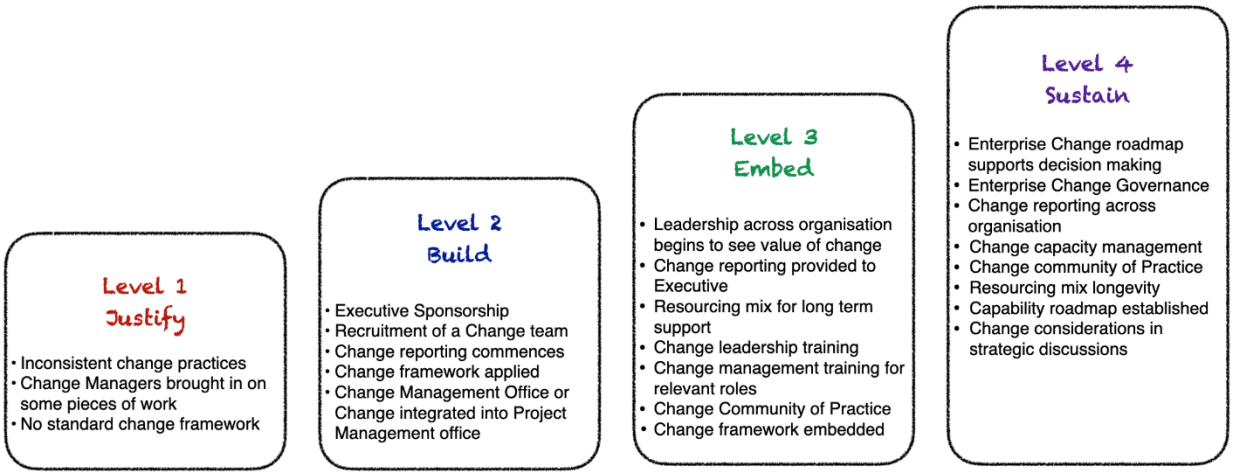

Fig. 1.5. Change management maturity model

Encouraging employees to participate actively in the change process is crucial to achieving desired outcomes.

Management reviews how effectively changes have been implemented and determines if adjustments are necessary. Managed change is presented in fig. 1.6 [30].

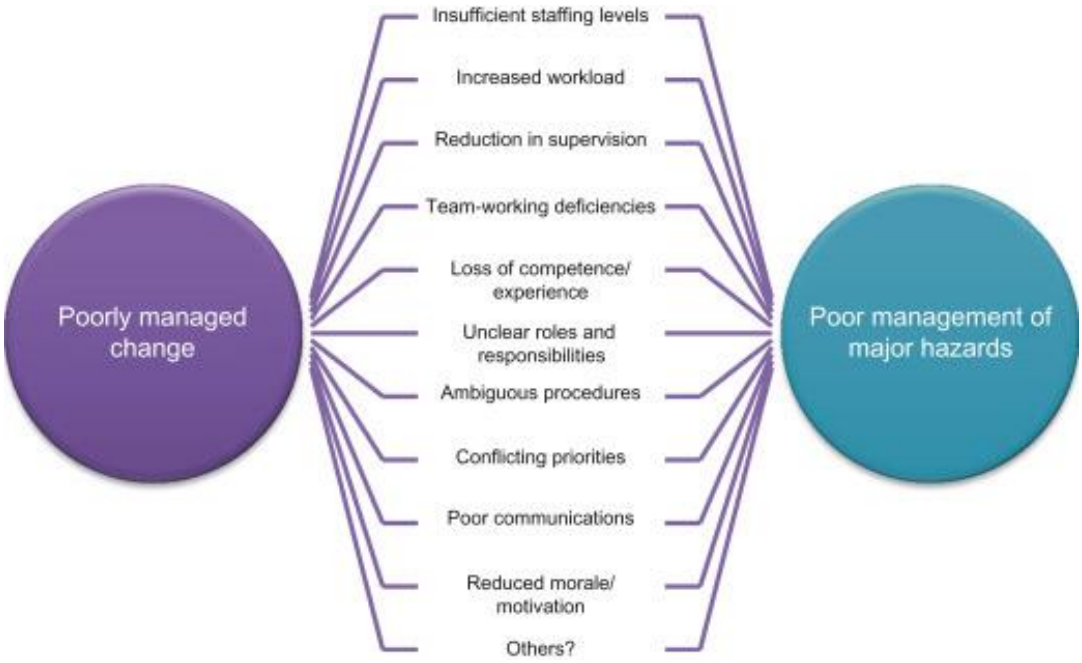

Fig. 1.6. Managed change

Addressing deviations and failures focuses on correcting any issues identified in the implementation process. It is essential in maintaining the effectiveness of change management, as corrective actions can be applied at any stage. Following this analysis, it is essential to adopt a clear vision of change management and consider these stages in further studies of change processes [12].

1.2. Academic studies on adaptive management in pharmaceutical organizations

Change management is complex and can be implemented through several methods [6]: methods focused on people and culture (organizational diagnosis discussions: collecting and presenting information to employees to help them address specific challenges; team building: working groups diagnose and plan changes to improve cooperation; process consultation: a consultant assists employees in understanding work processes and interpersonal dynamics; quality of work life programs: initiatives to improve work conditions, safety, employee involvement, and job satisfaction; high-commitment systems: approaches that integrate technical and team efforts to foster employee ownership and engagement); methods focused on tasks and technology (work design: structuring tasks to boost motivation, engagement, and productivity; socio-technical systems: balancing technological and social aspects for efficiency; quality circles: small groups work collaboratively to address quality and process improvements; business process reengineering: radical redesign of processes to improve quality, efficiency, and cost-effectiveness; total quality management: ensuring all processes meet customer needs while uniting employees around quality-focused values); methods focused on structure and strategy (adaptive organizational structures: flexible structures that allow organizations to adjust to new working method; strategic changes: redefining the mission, goals, and strategies to achieve organizational objectives) [21].

Organizations operate within environments that influence them through a range of direct and indirect factors, requiring internal responses. Often, this response entails adopting changes essential for remaining competitive in the marketplace. For

these internal changes to be effective, they must be managed systematically and strategically, respecting effective management principles based on systematic and situational approaches, utilizing the outlined stages and methods. The planned change management model is presented in fig. 1.7. [7].

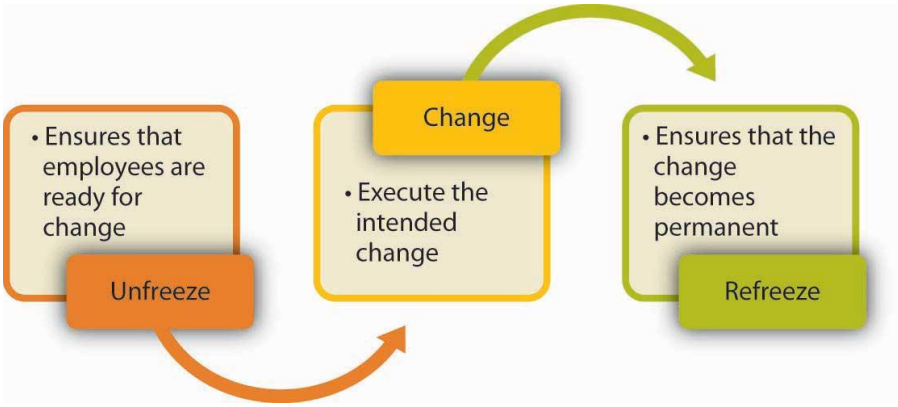

Fig. 1.7. The planned change management model

Adaptive management is increasingly relevant for pharmaceutical organizations facing rapid technological advances, regulatory changes, and dynamic market demands. Adaptive management, in essence, is a structured, flexible approach to decision-making in situations with uncertainty. It involves continuous assessment and adjustment of strategies based on outcomes, with the aim of achieving optimal results. This concept is particularly pertinent in pharmaceutical organizations, where complex processes, strict regulations, and high stakes in product development and patient safety necessitate flexible yet robust management strategies [9].

The pharmaceutical industry is characterized by intense regulatory scrutiny, long product development cycles, and significant investment in research and development (R&D). In this context, traditional management approaches often fall short, as they are too rigid to respond to the uncertainties and rapid changes in scientific knowledge, market needs, and regulatory landscapes. Adaptive management provides a solution by enabling organizations to remain agile. This agility is crucial for pharmaceutical companies that must frequently navigate

unpredictable challenges, such as changes in clinical trial requirements, patient needs, and scientific advancements [5].

For instance, the COVID-19 pandemic demonstrated the need for adaptive strategies as pharmaceutical companies worldwide pivoted rapidly to develop vaccines. Adaptive management allowed organizations to reallocate resources, reengineer R&D processes, and collaborate with external partners swiftly, all while meeting regulatory requirements and maintaining product safety standards. This exemplifies how adaptive management can enhance resilience and responsiveness, enabling firms to thrive in volatile environments [3].

Adaptive management in pharmaceutical organizations typically involves several key principles:

- Pharmaceutical companies must treat each project as an opportunity to gain knowledge, which is then fed back into the organization. This principle emphasizes iterative learning, where strategies are constantly adjusted based on new findings.
- Engaging stakeholders such as regulators, healthcare providers, and patients in the decision-making process helps organizations anticipate external requirements and align their objectives with broader public health goals.
- To respond to changing demands, pharmaceutical firms using adaptive management maintain flexible resource allocation systems. This involves rapid redeployment of personnel, capital, and technology based on project needs.
- Adaptive management also emphasizes proactive risk management and scenario planning. By anticipating multiple potential outcomes and preparing for each, pharmaceutical companies can minimize disruptions to their R&D and production processes [3].

Despite its advantages, implementing adaptive management in the pharmaceutical sector presents challenges. First, the regulated nature of the industry means that changes to processes and products are subject to strict approvals, which can slow down adaptation efforts. Additionally, pharmaceutical organizations often operate with long-standing protocols and systems that are resistant to change.

Overcoming this requires a cultural shift towards embracing flexibility and experimentation, which can be difficult in organizations where precision and predictability have historically been prioritized [22].

Moreover, adaptive management requires significant investment in data infrastructure and analytical capabilities to monitor and assess performance continuously. Companies need access to real-time data on clinical outcomes, market trends, and regulatory developments, as well as the analytical tools to interpret this data effectively. Building this capability can be resource-intensive and requires a workforce skilled in data analysis and digital technology [4].

Adaptive management offers pharmaceutical organizations a strategic framework to navigate uncertainty and complexity. By fostering a culture of continuous learning, involving stakeholders, maintaining flexibility, and practicing proactive risk management, these organizations can improve their resilience and ability to innovate. As the pharmaceutical industry continues to evolve, adaptive management is likely to become increasingly essential in achieving sustained growth and addressing emerging public health challenges [8].

CONCLUSIONS TO PART I

1. Key phases and techniques in the implementation of change processes are presented.
2. Academic studies on adaptive management in pharmaceutical organizations were described.

PART II
EXAMINATION OF ADAPTIVE MANAGEMENT OF PHARMACEUTICAL ENTERPRISES

2.1. Review of major pharmaceutical market trends influencing pharmaceutical enterprises

Today, to enhance the competitiveness of pharmaceutical companies, it is essential to implement new technologies in pharmaceutical manufacturing, modernize production in line with Good Manufacturing Practice (GMP) standards, and strengthen the legal framework. This process also involves adopting advanced technologies and quality standards within the pharmaceutical sector, incorporating scientific advancements and innovations into production practices, and developing strategies to promote pharmaceutical products. Efforts are also needed to combat counterfeit products and illegal drugs, uphold free market principles, and advocate for the interests of pharmaceutical industry across legislative, executive, and judicial bodies [17].

Key characteristics of the pharmaceutical market include:

- an aging population trend;
- seasonal demand patterns, with increased drug sales in the third and fourth quarters, partly due to the annual flu season;
- heavy reliance on imported raw materials, making the cost structure and prices susceptible to exchange rate fluctuations against the dollar and euro;
- a gradual shift towards GMP compliance in production processes;
- a focus on expanding generic drug production, responding to rising demand for generics in recent years;
- ongoing government regulation of the sector [27].

For the study of adaptive regulation in the pharmaceutical market, we conducted research using the expert opinion method, which was based on insights from pharmaceutical manufacturers. At the time of our research, approximately 200 companies were operating in the pharmaceutical market. We interviewed 47 respondents from these pharmaceutical organizations.

The research provided valuable information on the key trends in the pharmaceutical market that affect the operations of pharmaceutical enterprises. This data was gathered through a questionnaire. The primary trends influencing the activities of pharmaceutical companies were identified as follows: the introduction of new drugs, expansion of product ranges, improved cooperation with suppliers, and increased enterprise income, with respective ratings of 9.9, 8.0, 7.2, and 7.0.

In conclusion, the analysis of the major development directions for pharmaceutical companies in the current environment confirmed that the industry operates in a dynamic and unstable setting. This justifies the need to study the adaptive management of pharmaceutical companies in response to external macro- and micro-environmental factors, ensuring their ability to adjust to changes in the pharmaceutical market [30].

The pharmaceutical industry is in a state of constant evolution, with new trends continually shaping the strategies and operations of pharmaceutical enterprises. These changes are driven by a variety of factors, including technological advancements, shifts in regulatory landscapes, changing market demands, and the preferences of consumers. Below is an overview of the primary trends influencing the pharmaceutical industry [21].

Development of new drugs and treatments is a significant trend in the pharmaceutical market. Advances in fields like biotechnology, genomics, and personalized medicine have enabled the development of more targeted therapies for various diseases, including cancer, rare conditions, and chronic illnesses. This trend not only opens new revenue streams for pharmaceutical companies but also necessitates substantial investment in research and development (R&D) to maintain a competitive edge. Breakthrough drugs often disrupt the market, pushing out older treatments and leading to shifts in market dominance [8].

Another important trend is the diversification of pharmaceutical companies' product portfolios. Companies are increasingly expanding their range of offerings to address different therapeutic needs and patient demographics. This includes the growth of generics, over-the-counter medicines, vaccines, and biosimilars, which

provide more cost-effective treatment options and offer new opportunities for growth. Expanding the product range helps pharmaceutical companies manage risks associated with patent expirations and the saturation of particular drug markets [12].

Strengthening relationships with suppliers has become a key focus for pharmaceutical companies. Ensuring the timely and reliable supply of high-quality raw materials and active pharmaceutical ingredients (APIs) is crucial for operational stability. This trend has been further emphasized by recent global supply chain disruptions, such as those caused by the COVID-19 pandemic. By collaborating more effectively with suppliers, companies can control costs, improve production efficiency, and ensure consistent product quality, all of which are necessary for meeting stringent regulatory standards like Good Manufacturing Practices [5].

The pharmaceutical sector is increasingly embracing digitalization and automation. Digital technologies, such as artificial intelligence, big data analytics, and process automation, are being utilized to streamline drug discovery, optimize manufacturing processes, and improve patient outcomes. These tools also enable pharmaceutical companies to enhance supply chain management, reduce costs, and facilitate better decision-making. Additionally, digital platforms foster improved communication and collaboration within organizations, which in turn accelerates time-to-market for new drugs [30].

Pharmaceutical companies face increasingly complex and varied regulatory requirements across different global markets. Regulatory challenges also extend to sustainability initiatives, where companies must meet environmental standards while maintaining product compliance. Adapting to these regulations is essential for companies to avoid delays in product approvals and to maintain access to global markets [20].

As healthcare systems worldwide seek more cost-effective solutions, the demand for generic drugs has risen significantly. Generics offer affordable alternatives to branded medications and provide substantial savings for both healthcare systems and patients. This trend is driven by the expiration of patents for major pharmaceutical products, allowing generics to enter the market and capture

market share. In addition, biosimilars close replicas of biologic drugs are also gaining traction, contributing to the growing generic market segment [10].

The pharmaceutical industry is increasingly prioritizing sustainability. Companies are adopting greener practices, such as reducing waste, using renewable energy sources, and improving packaging to minimize their environmental impact. This focus on sustainability extends throughout the entire value chain, from raw material sourcing to end-product disposal. The growing consumer demand for environmentally and ethically produced products is prompting pharmaceutical companies to integrate sustainability into their business models, which can also enhance their public image and competitiveness [23].

Government regulation, particularly regarding drug pricing, is becoming more prominent in pharmaceutical markets worldwide. Many countries, including those in Europe and the USA, have implemented price controls and negotiated drug pricing to ensure medications are more affordable for consumers. Pharmaceutical companies are therefore under increasing pressure to balance profitability with public accessibility. This trend may lead to the development of innovative pricing models and cost-saving strategies to maintain competitiveness while complying with government regulations [18].

The growing problem of counterfeit drugs remains a significant challenge for the pharmaceutical industry. Counterfeit medications pose risks to patient safety and undermine the credibility of pharmaceutical companies. In response, companies are adopting advanced technologies such as serialization, blockchain, and digital tracking systems to prevent counterfeit products from entering the supply chain. Additionally, pharmaceutical companies are collaborating with regulatory bodies and law enforcement agencies to fight illegal drug production and distribution, ensuring the safety and integrity of their products [4].

In conclusion, the pharmaceutical industry is navigating a rapidly changing environment driven by technological advancements, regulatory pressures, market dynamics, and evolving consumer expectations. To remain competitive, pharmaceutical companies must innovate, expand their product offerings, enhance

supplier relationships, and embrace digital technologies. Sustainability, compliance with regulatory frameworks, and the fight against counterfeit products are essential for maintaining relevance and consumer trust. By staying ahead of these trends, pharmaceutical enterprises can position themselves for long-term success in an increasingly complex global market [1].

2.2. Investigation of change management procedures in pharmaceutical production enterprises

The key trends within pharmaceutical companies have a significant impact on how organizations adapt to changes in the external environment. For manufacturing pharmaceutical enterprises to operate effectively, it is crucial to stay attuned to these trends. We conducted an analysis of the major changes observed in pharmaceutical enterprises over the past decade, categorizing them based on their prevalence [5].

The changes were divided into three levels of prevalence: low, medium, and high, according to the assessments provided by the heads of the enterprises. We focused on those companies that had not implemented certain changes in their operations. The results revealed that the most widespread changes (high prevalence) among pharmaceutical organizations leaders included the introduction of new positions, changes in ownership structure, expansion of product offerings, improvements in employee incentive systems, changes in organizational structure, and the conducting of marketing research [2].

Changes with a medium prevalence included the establishment of GMP-certified departments, expansion of additional services, the development of marketing information systems and marketing analysis software, and the creation of Customer Relationship Management (CRM) systems. Notably, some enterprises had not implemented certain changes, such as adjustments to organizational structure or the development of marketing information systems and CRM systems. This suggests a lack of either informational resources or financial capability to introduce these innovations within their operations [17].

It should be noted that when introducing changes, personnel can be divided into three typical groups based on their reaction to the proposed changes. First, supporters, those who see the obvious benefits of the proposed changes and enthusiastically support their introduction. They actively participate in the implementation of changes and make efforts to adapt to the changes. Second group – ambivalent people, those for whom the benefits and the lack of changes are equivalent. The previously upset state of affairs seems less risky to them, they are afraid of any change. At the same time, if you press them, they will be ready to put up with the changes as an inevitable evil. They will not show strong resistance to the changes, but at the same time they will not show a strong personal interest in the changes. Most likely, they will just wait until they go through the stage of experiments without which they could completely cope. The third group is the opponents, their attitude to the established situation is negative and they devote all their energy to preventing changes. These employees are unwilling to accept changes, sometimes they rebel against them, and when they are defeated in their efforts, they will portray themselves as innocent victims. They will constantly begin to discover small flaws, draw public attention to them. Opponents will never look for ways to adapt to changes. At best, they will reconcile with them, feeding on indignation and resentment. Ambivalently adapting people and opponents of changes are likely to do everything possible to resist changes [2].

Any change should be carefully thought out and dictated by the need to eliminate the emerging problems in order to increase the operational efficiency of the company. The need for change in enterprises is influenced by both external factors (external economic conjuncture, social changes, new discoveries, increased competition, etc.) and internal factors, such as low efficiency, high production costs, financial problems, ineffective organizational structure, the need to improve production. However, when introducing changes, staff resistance to them increases. During our research, we found that 97% of managers faced staff resistance to changes, 80 % of which was continuous, and 20% - occasionally. During the research, information on the reasons for staff resistance to change was of interest.

Among them, the leaders of the pharmaceutical manufacturing enterprises selected the most. The most common reason is the fear of the “new”, people get used to certain patterns of behavior, stereotypes of thinking, and any change requires some willingness to give up the old and the usual, to take a step towards the new and the unexplored. are so conservative that they are unable to adapt to changes [8].

The majority of respondents also indicated such reasons: the uncertainty of the current situation and the belief that changes will not bring an improvement in the situation, often members of the organization simply do not see the prospect of introducing innovations and have a feeling of a possible fiasco. That is why they try to idealize the state of the existing organization and show resistance to innovation. The least were indicated for such reasons for resistance to change: a different attitude to personal changes, a feeling of possible own losses and the expectation of negative consequences [11].

To overcome resistance to change in pharmaceutical companies, managers use the following basic measures: comparing the arguments of different sides, openly discussing ideas and measures for implementing changes, and involving subordinates in making decisions [20].

As for the methods of overcoming resistance to change in pharmaceutical companies, which are least appreciated, managers at different management levels chose the following: coercion, creating a personal incentive mechanism for introducing changes, co-optation, and maneuvering [27].

In addition to thoughtful measures to overcome resistance to change, methods are proposed that increase employee interest in changes: drawing employees' attention to external threats, the presence of which justifies reorganization; presenting examples of past failures that confirm the urgent need to implement changes in the work of the enterprise; giving employees the opportunity to independently see the differences between the organization's work and the real external conditions of existence (changes in structure and number); giving employees the opportunity to independently identify factors that adversely reflect on the company's efficiency; providing employees with current data on the structure of

existing customers, changes in their quantity, location, characteristics; informing employees about current data on company ratings, comparing them with competitors, and the results of benchmarking; providing employees with the results of research into the causes of user dissatisfaction with the company's work; providing employees with the opportunity to directly communicate with consumers, so that employees can get an idea of their attitude to the nature and quality of the products offered by the company; providing employees with the opportunity to monitor existing practical work in other organizations in order to facilitate their receptivity to new ideas; conducting measures that encourage discussion of the expected changes (conferences, educational courses, further training courses, etc.) [6].

2.3. Evaluation of core adaptive actions taken by pharmaceutical enterprises

In the context of the ongoing global economic crisis, pharmaceutical companies are facing significant challenges, including substantial fluctuations in exchange rates, energy supply instability, low-paying partners, and a lack of investment in replacing outdated equipment and adopting new competitive technologies. These issues highlight the urgent need to enhance the operational efficiency of these companies. Consequently, pharmaceutical enterprises must allocate time to analyze and forecast changes in their external environment, while identifying and implementing strategies to adapt to evolving business conditions [10].

As part of this process, respondents assessed which category best describes their enterprise in terms of innovation adoption. The results showed that 60% of pharmaceutical companies are classified as "skillful," meaning these companies introduce new elements to their operations by carefully analyzing information and the outcomes of previous innovators [5].

20% of respondents identified their companies as "innovators," meaning they are the first to introduce new developments. 13% of the enterprises are categorized

as "early majority," which means they adopt innovations only after seeing successful implementation in other companies over several years. Finally, 7% of companies belong to the "late majority" category, introducing innovations only after many years of successful use by other organizations. This classification reflects the varying levels of innovation adoption among pharmaceutical enterprises. Additionally, respondents provided insights into the key adaptation measures being employed by these companies [20].

The primary adaptive measures employed by pharmaceutical companies include: modifying the company’s product assortment policy (reported by 85% of respondents), implementing a robust pricing policy (68%), exploring new sales channels (59%), and developing and executing an effective marketing strategy. Additionally, participating in congresses, conferences, seminars, and workshops, as well as creating and implementing strategic programs for pharmaceutical enterprises, were cited by 50% of respondents [5].

Other commonly used adaptive strategies include information and communication technologies (cited by 30% of respondents), risk insurance against changes in the external environment, and the development of Management Information Systems (MIS) and marketing analytics software (29%). Furthermore, the creation of information systems to manage external environmental changes and the development of Customer Relationship Management (CRM) systems were mentioned by 19% of respondents. However, recent data suggest that the level of IT adoption in pharmaceutical companies remains quite low [2].

These findings highlight that change management is an essential component of the successful operation of pharmaceutical manufacturing enterprises. Effective change management helps prevent negative outcomes such as reduced productivity, resistance to staff changes, disengagement of employees, burnout, voluntary employee turnover, conflicts, delays in implementing changes, and division among staff. Therefore, after analyzing the significant changes in the external environment, it is crucial to develop adaptive management models for pharmaceutical companies, taking inspiration from the practices of pharmaceutical enterprises.

CONCLUSIONS TO PART II

1. The pharmaceutical industry is undergoing significant transformations driven by a range of external and internal factors, which necessitate ongoing adaptations from pharmaceutical enterprises. The rapid pace of technological advancements, evolving regulatory environments, market demand shifts, and growing competition all contribute to a dynamic and volatile industry landscape. To remain competitive and viable in this ever-changing environment, pharmaceutical companies must continually innovate, modernize their operations, and effectively manage changes.

2. Pharmaceutical market trends and change management in pharmaceutical enterprises has highlighted several key aspects that influence the operations and strategies of these organizations. First, the growing demand for innovation whether in drug development, production methods, or organizational structure has become a fundamental driver of success. Companies must embrace new technologies and manufacturing practices, such as GMP compliance, to meet the rising expectations of consumers and regulators alike. Moreover, expanding product ranges, particularly through generics, biosimilars, and over-the-counter products, has proven essential for maintaining market share and profitability.

3. Large number of pharmaceutical companies are still grappling with the challenge of adapting to change. Despite the recognition of the need for innovation, resistance to change remains prevalent, primarily due to fear, uncertainty, and a general preference for the status quo. It is essential for managers to address this resistance by fostering a culture of openness, involving employees in decision-making processes, and highlighting the long-term benefits of proposed changes.

4. Adaptive strategies such as modifying product assortment policies, adjusting pricing strategies, exploring new sales channels, and enhancing marketing efforts were identified as key measures that companies are implementing to stay competitive. However, the relatively low level of IT adoption and digital transformation in many pharmaceutical enterprises points to an area of improvement. To truly capitalize on the opportunities that the digital age presents,

pharmaceutical companies must accelerate their integration of information systems and other digital technologies.

5. Pharmaceutical companies must not only focus on innovation and operational improvements but also cultivate adaptive management practices that allow them to respond swiftly to external changes. By investing in change management processes, fostering innovation, and embracing digitalization, pharmaceutical enterprises can better navigate the challenges of the modern marketplace and position themselves for long-term success. Ultimately, the ability to adapt to market trends and effectively manage change will be the key determinant of sustainability and growth in the pharmaceutical industry.

PART III
RESEARCH ON THE IMPACT OF DIGITAL TECHNOLOGIES ON CHANGE MANAGEMENT IN PHARMACEUTICAL ORGANIZATIONS

3.1. Study on the influence of digital technologies on change management in pharmaceutical organizations

A survey of 47 respondents was conducted for research on the impact of digital technologies on change management in pharmaceutical organizations (appendix A). The respondents held various positions within their organizations: 57% identified as managers, 28% as project managers, 10% as IT specialists, and 5% as change management specialists. The diverse roles of participants provided valuable perspectives on how digital technologies are influencing change management practices in the pharmaceutical industry (fig. 3.1).

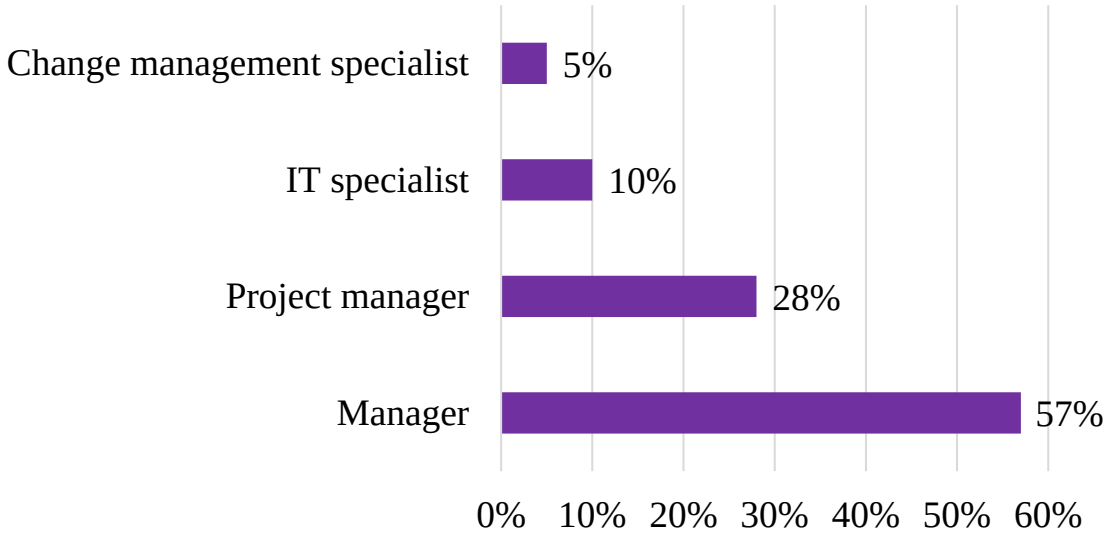

Fig. 3.1. Study of positions of respondents

It was found that pharmaceutical organizations of varying sizes are implementing digital technologies to support change management. The survey data revealed that 40% of respondents work in organizations with fewer than 100 employees, 37% are in organizations with 101-500 employees, 7% represent organizations with 501-1000 employees, and 16% work in larger organizations with

over 1000 employees. This distribution provides insights into how different scales of pharmaceutical companies are adapting to digital transformations, with smaller organizations showing high representation in this research, potentially reflecting their agile approach to integrating new technologies for change management (fig. 3.2).

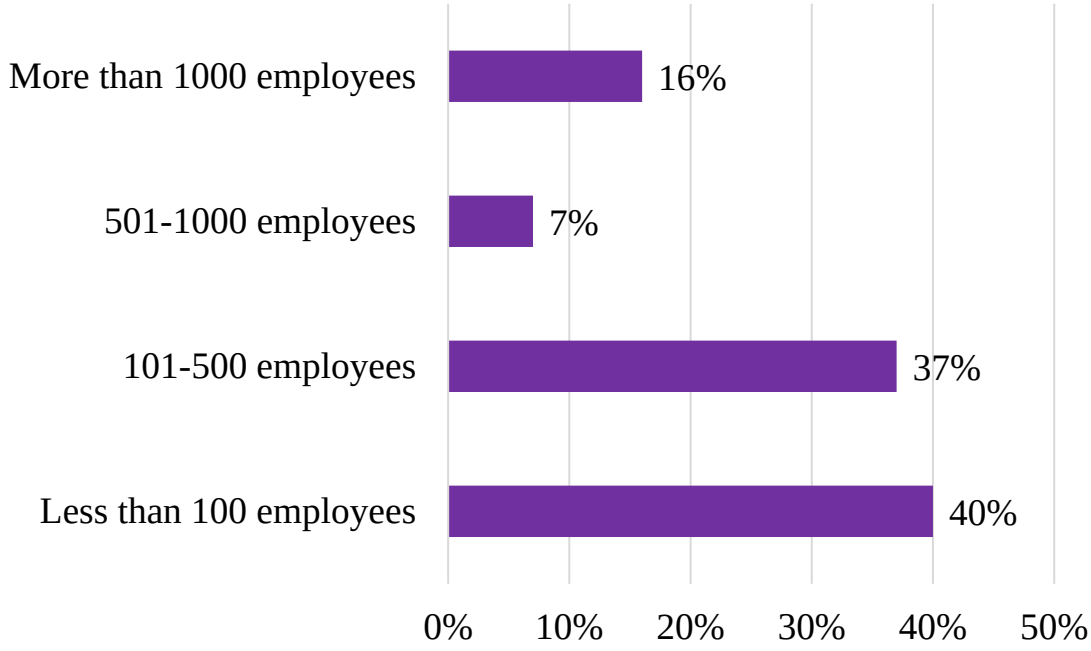

Fig. 3.2. Distribution of respondents by organization size

It was observed that the respondents in the survey have a diverse range of experience in the pharmaceutical industry, providing a balanced perspective on how digital technologies impact change management across different career stages (fig. 3.3).

Specifically, 4% of participants have less than one year of experience, 30% have worked in the industry for 2-5 years, 34% have 6-10 years of experience, and 32% have over 10 years of experience. This distribution shows a strong representation of both early-career professionals and seasoned experts, offering comprehensive insights into the adaptability and perceived value of digital technologies in managing change across various experience levels in pharmaceutical organizations (fig. 3.3).

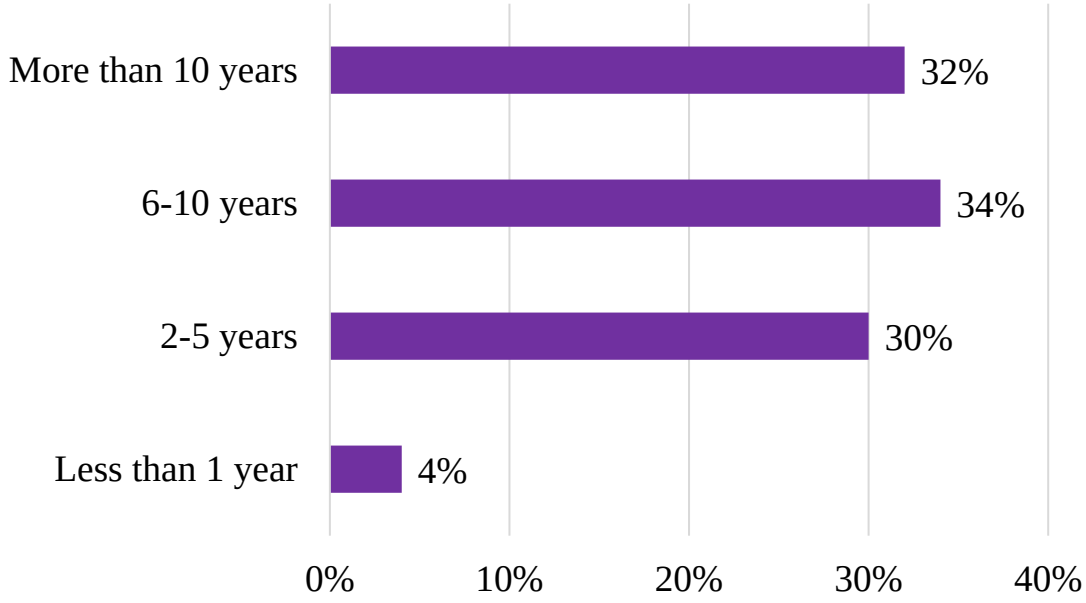

Fig. 3.3. Analysis of respondent's experience in the pharmaceutical industry

It was found that pharmaceutical organizations use a variety of digital technologies to support change management processes (fig. 3.4).

According to the survey, 40% of respondents reported using communication platforms such as Microsoft Teams or Slack, making these tools the most commonly utilized in facilitating collaboration and communication during organizational changes. Additionally, 26% of participants indicated the use of project management systems like Microsoft Project or Asana, as well as knowledge management systems such as Confluence.

These tools help manage workflows and ensure that knowledge is effectively shared across teams. Meanwhile, only 8% of organizations use analytics platforms such as Power BI or Tableau for change management, indicating a relatively lower adoption of advanced data analysis tools in this context (fig. 3.4).

It was observed that digital technology plays a key role in supporting change management in pharmaceutical organizations by addressing various operational challenges. The survey revealed that 30% of respondents believe digital technologies improve communication between departments, helping teams collaborate more effectively during periods of change (fig. 3.5).

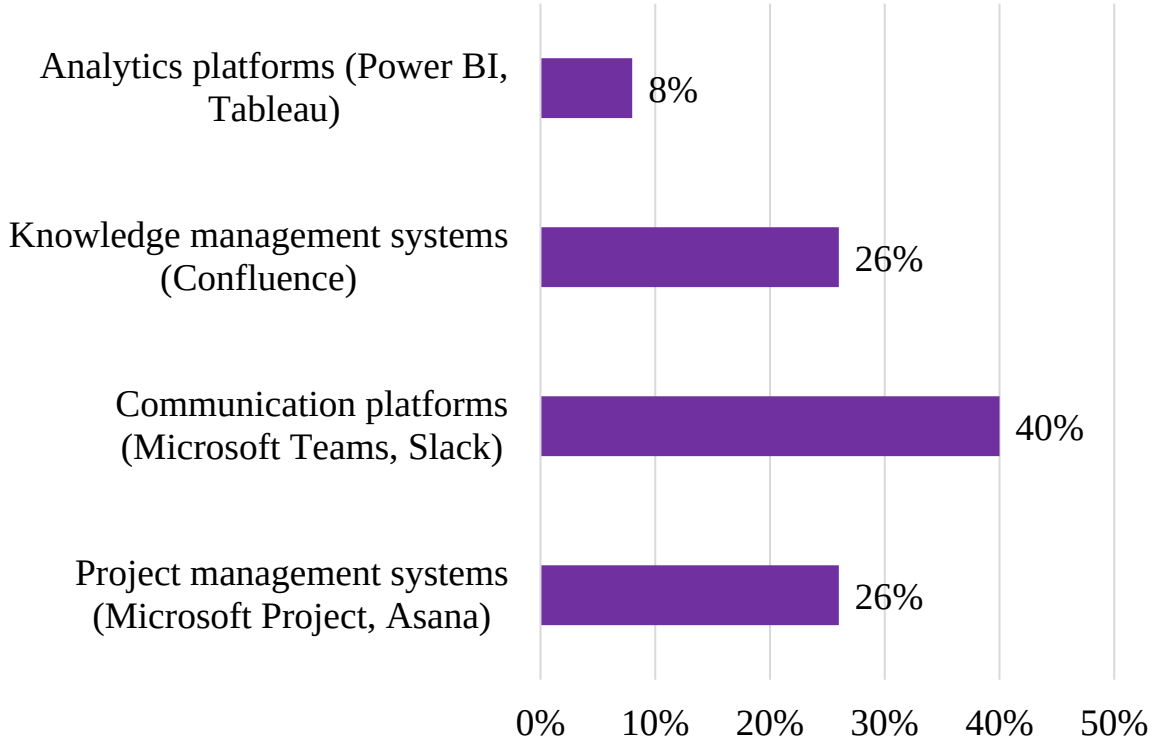

Fig. 3.4. Analysis of digital technologies used in change management processes

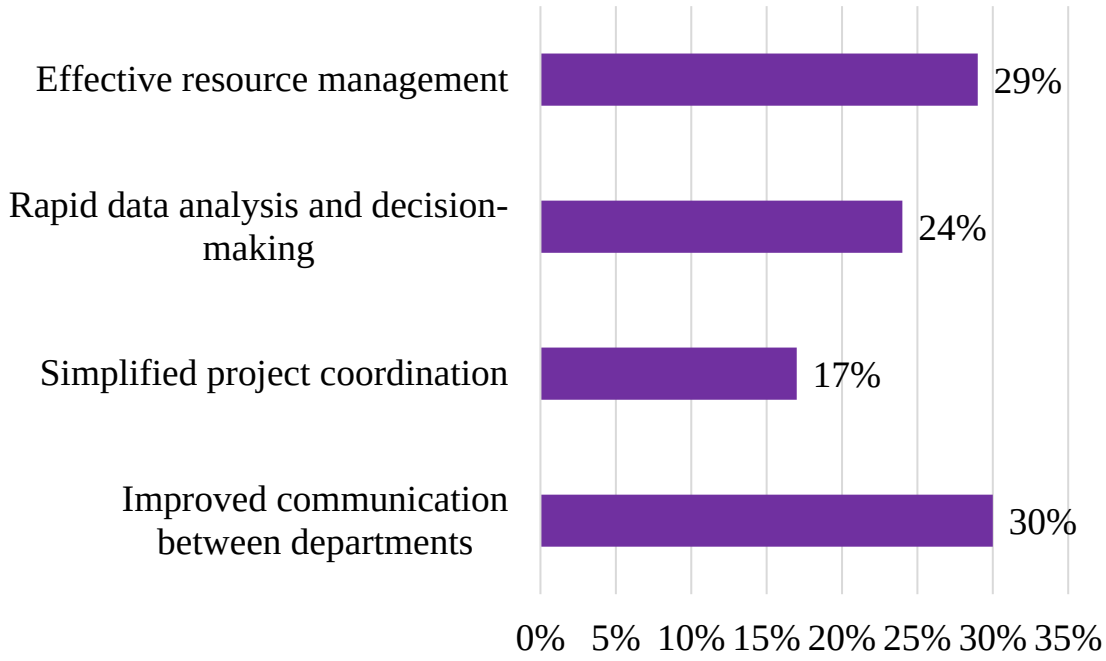

Fig. 3.5. Study of how digital technology assists in managing change

Additionally, 24% noted that rapid data analysis and decision-making are enhanced through the use of digital tools, allowing for quicker responses to shifting conditions. Effective resource management was highlighted by 29% of participants as another major benefit, with digital technologies helping to allocate and track resources more efficiently. Meanwhile, 17% of respondents emphasized that digital tools simplify project coordination, ensuring smoother execution of change initiatives (fig. 3.5).

It was found that respondents rated various digital technologies differently in terms of their usefulness for change management. Project management systems were rated the highest, with an average score of 5, indicating that these tools are considered very useful for coordinating and managing change initiatives. Communication platforms followed closely with a rating of 4, reflecting their significant role in improving collaboration and information flow across departments. Knowledge management systems received a more moderate rating of 3, suggesting they are useful but perhaps not as critical as project management and communication tools in the context of change management. Lastly, analytic platforms were rated the lowest, with a score of 2, indicating that, while useful, they are seen as less essential for supporting change management processes compared to other technologies (fig. 3.6).

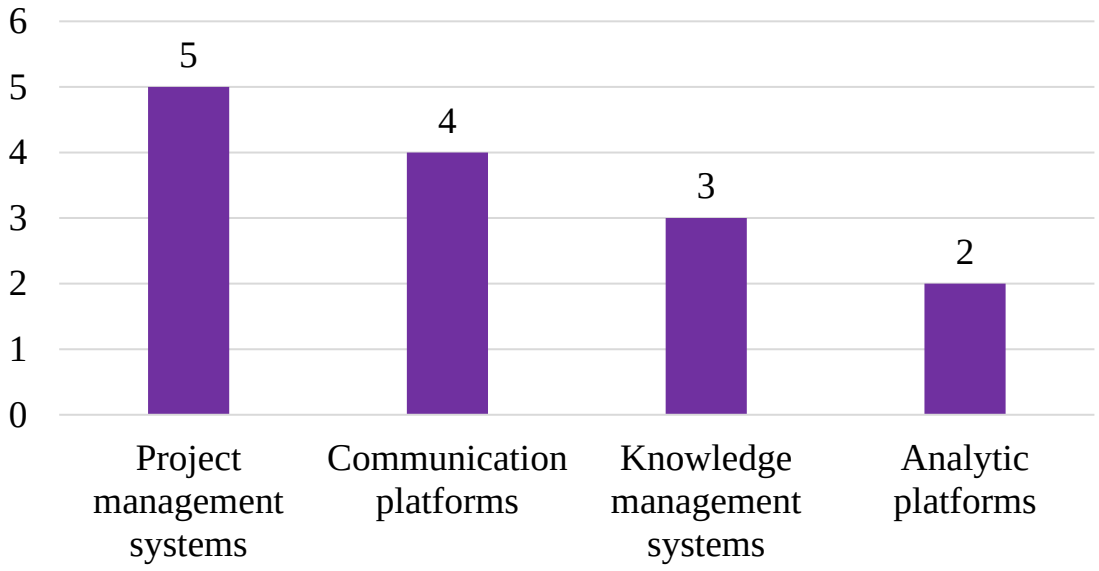

Fig. 3.6. Study of usefulness of digital technologies for change management

It was found that respondents identified several key benefits of digital technologies in the change management process, with varying levels of emphasis. The most frequently cited benefit was improving the quality of internal processes, with 25% of participants highlighting its importance. Following closely, 23% of respondents emphasized that digital technologies help increase the accuracy of decision-making, enabling more informed and timely responses to changes. Another significant benefit was the speed of response to changes, noted by 18% of participants, demonstrating the ability of digital tools to enhance agility within organizations. Additionally, 20% of respondents believed that digital technologies contribute to reducing management costs, while 14% mentioned that they also help increase employee engagement during periods of change (fig. 3.7).

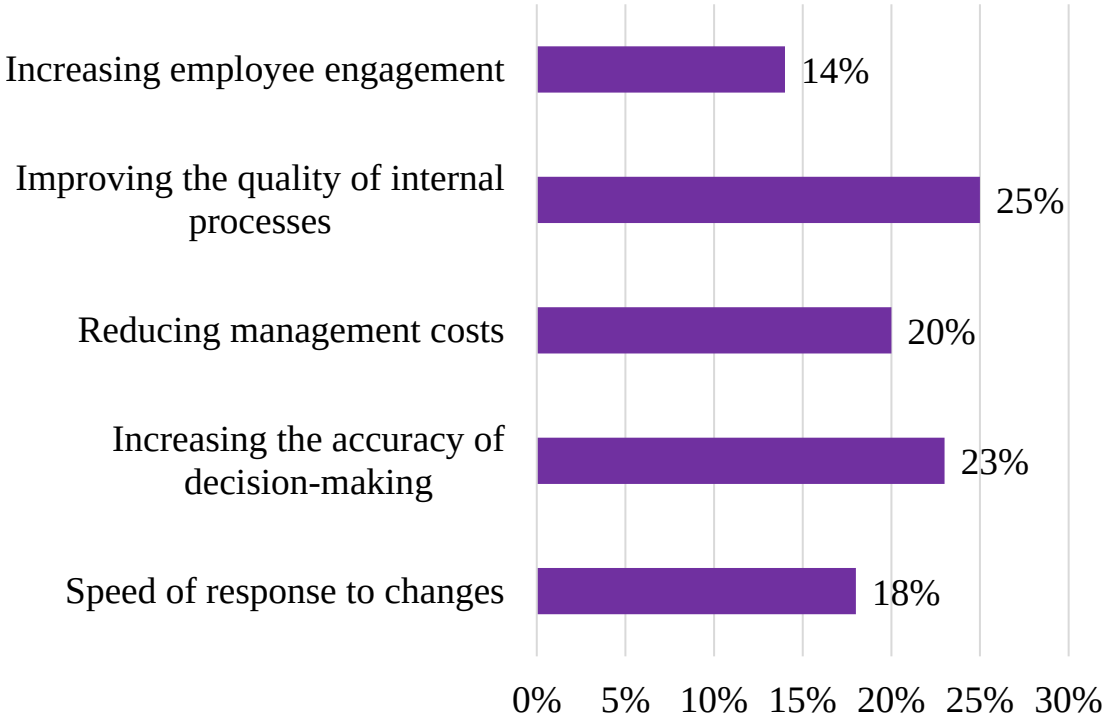

Fig. 3.7. Study of key benefits of digital technologies in change management

It was observed that respondents generally agreed with the positive impact of digital technologies on change management processes within their organizations. The statement that "digital technologies have a positive impact on the adaptability of our organization to changes" received the highest rating, with most respondents giving it a score of 5, indicating strong agreement with this view. The use of digital

technologies to reduce the time for implementing changes was also positively rated, with an average score of 4, reflecting the efficiency gains that digital tools bring to change management. On the other hand, digital tools' ability to improve the quality of communication in the change management process received a more moderate rating of 3, suggesting that while communication is improved, there may still be challenges to overcome. Lastly, the statement regarding digital platforms contributing to more effective knowledge management in the organization received the lowest rating of 2, indicating that respondents believe digital tools have a relatively limited impact on this aspect of change management (fig. 3.8).

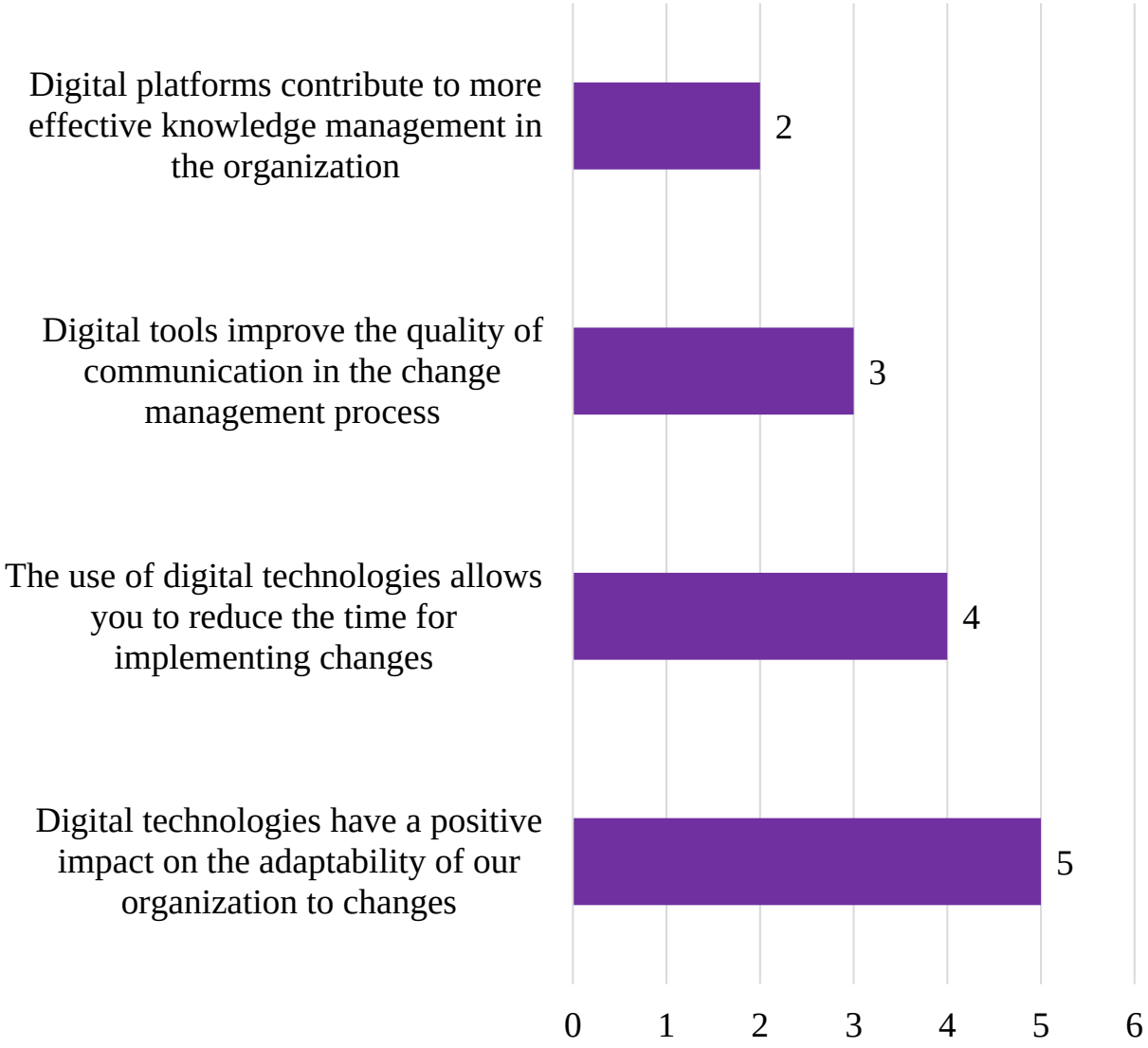

Fig. 3.8. Study of respondents' agreement on the impact of digital technologies on change management

3.2. Tracking and documenting shifts in the external environment of pharmaceutical enterprises

Today, organizations must continuously evolve to survive and stay competitive. Change has become a fundamental aspect of development for any enterprise, significantly impacting its operational efficiency. Employees across all management levels must recognize that the increasing complexity of business systems inherently raises the value of effective change management. The need for adaptation is now so prevalent that organizations often undergo changes without proper planning or oversight, leading to unstructured adjustments. To ensure the smooth functioning of pharmaceutical companies, change management is essential. It involves continuously realigning organizational direction, updating structures, and exploring new opportunities to enhance market shares that the market landscape can shift unexpectedly, requiring organizations to be prepared to implement necessary adaptations to maintain their positions and secure resources for future progress. However, integrating new business practices and procedures effectively requires careful handling, as changes can disrupt workflow coordination, corporate culture, and compatibility with existing systems and personnel decisions.

To successfully implement change, leadership must develop a thorough strategy that manages associated risks, aligns with stakeholder expectations, and ensures meticulous execution to reduce unforeseen issues and their potential impact on performance. Effective first-time implementation enables the enterprise to gain a competitive edge while conserving resources and time.

This study examines the unique aspects of change management in pharmaceutical manufacturing. The pharmaceutical industry is among the most dynamic and profitable globally, though it remains highly regulated by government authorities. The pharmaceutical market’s 2024 data show that medicines comprise approximately 73% of total sales volume, medical products 29%, and cosmetic products 4%. Manufactured medicines account for about 70% of the market by volume, with sales growth averaging 41%, compared to 17% for foreign products. Financially, local products represent 30% of sales, while imports constitute 80%.

Over 595 pharmaceutical producers are active, with 120 being local companies. Although the pharmaceutical market has grown at a substantial annual rate of 27%, per capita drug spending remains low, ranking 4th–5th in average expenses, with the market valued at $3 billion in 2024.

In an unstable environment, pharmaceutical companies cannot rely solely on quick adjustments to adapt. For sustainable market positioning, management strategies must be informed by a comprehensive study of the external environment. The effectiveness of adaptive transformations depends heavily on the degree of inter-unit collaboration within the organization. Research indicates that models lacking recognition of different internal interests fail to capture the true adaptation process within an unpredictable environment. Therefore, a tailored organizational model that considers interdepartmental interaction is essential for effective adaptation.

To gain a comprehensive and accurate understanding of the pharmaceutical enterprise environment, it is essential to leverage a wide range of internal and external sources. Internal information on macro- and microenvironmental factors is collected through document analysis, departmental insights, external contacts, and surveys of personnel within pharmaceutical companies. For external "secondary" information, resources like magazines, official publications, books, catalogs, legal regulations, and online sources are invaluable. Additionally, to obtain detailed information on microenvironmental elements (such as customers, competitors, suppliers, and other stakeholders), "primary" data should be gathered through observation, surveys, and experiments. This environmental data collection supports strategic planning, environmental monitoring, timely decision-making, and identifying early signals of change.

For an pharmaceutical company, external macro- and micro-environmental components generally support operations, although certain components score between 0 and -3, with economic and political factors rated negatively. Some macro factors (like unemployment rates and self-management levels) and micro factors (such as the impact of competitors, government organizations, civil society, and

public opinion groups) were rated neutrally, with scores of 0. While these components do not currently affect the company's operations, their potential impact is critical to the pharmaceutical industry’s success. A lack of integration of these factors indicates incomplete management efficiency.

When comparing the macro-environmental impact estimates of the pharmaceutical company to industry averages, most deviations are minor and often positive, apart from factors like exchange rates and unemployment rates. For microenvironmental factors, some estimates align with industry norms, while others show a positive trend.

Following environmental monitoring and impact assessment, these factors are incorporated into the adaptation model. This model enables the company to adapt to continuous changes in the external environment, influencing the pharmaceutical company’s internal environment as well.

The complexities of the market environment driven by competition, advancements in information technology, globalization, and high levels of uncertainty and instability heighten the need for modern organizations to adapt effectively to new realities. For pharmaceutical enterprises to operate efficiently, methods are needed that not only adjust to ongoing external changes but also map out the transformation process within their internal environment.

To ensure the survival, resilience, and growth of pharmaceutical enterprises amid external shifts, a model is essential that illustrates the transformation of the internal environment in response to these constant changes. A stochastic adaptation model, which functions as a tracking system, effectively depicts the ongoing internal adjustments within pharmaceutical enterprises as they adapt to external fluctuations. This adaptive process can be illustrated as a generalized framework for the industry.

In studying the adaptive qualities of a company in transition, adaptation is seen as the pharmaceutical enterprise's aim to minimize persistent deviations from the standards set by shifts in the external environment. Here, inefficiencies may arise, as the company may experience either a negative (lagging) or positive (leading) deviation, based on the conditions shaped by specific external factors. This

adaptive transformation process can be modeled as an economic and mathematical tracking system, which enables feedback on the outcomes of these transformations [8]. The structural adaptation model encompasses: a harmonization matrix (interactive planning), a resource matrix, and a matrix of structural interactions.

CONCLUSIONS TO PART III

1. The survey conducted on the impact of digital technologies on change management in pharmaceutical organizations provides valuable insights into the current practices and perceptions of professionals in the industry. The respondents, including managers, project managers, IT specialists, and change management experts, represent diverse roles, offering a well-rounded view of how digital tools are being implemented in managing organizational change.

2. The findings reveal that pharmaceutical organizations of varying sizes are utilizing digital technologies, with a higher representation from smaller organizations. This suggests that smaller organizations may be more agile in adopting new technologies to support change management processes. Furthermore, the survey highlighted that respondents from various experience levels, ranging from less than one year to over ten years in the industry, provided a balanced perspective on the effectiveness and challenges of using digital tools.

3. The most commonly used digital technologies for change management in the pharmaceutical industry include communication platforms such as Microsoft Teams or Slack, and project management systems like Microsoft Project or Asana. These tools are seen as essential in enhancing collaboration and managing workflows during periods of change. Despite their utility, more advanced technologies like analytics platforms (e.g., Power BI, Tableau) are used less frequently, indicating that while data analysis tools hold potential, their adoption for change management is still limited.

4. Digital technologies are perceived to significantly improve communication between departments, streamline decision-making, and aid in resource management. They also help in simplifying project coordination and

increasing the overall agility of organizations. Respondents generally rated project management systems as the most useful technology, followed by communication platforms. However, while these tools are valuable, their impact on knowledge management was perceived as less significant, indicating that this area may still require further digital enhancement.

5. The key benefits identified by respondents included improving internal processes, increasing decision-making accuracy, and enhancing organizational responsiveness to changes. These findings underscore the role of digital technologies in making pharmaceutical organizations more adaptable and efficient in the face of change. Although there are challenges related to implementation and adaptation, the survey results suggest that digital tools play a crucial role in optimizing change management strategies.

6. Overall, the survey shows that digital technologies have a positive influence on change management in pharmaceutical organizations, with respondents agreeing that these tools enhance adaptability and reduce the time required for implementing changes. However, further attention may be needed to improve communication quality and knowledge management through digital platforms.

GENERAL CONCLUSIONS

1. Key phases and techniques in the implementation of change processes are presented. Academic studies on adaptive management in pharmaceutical organizations were described.

2. The pharmaceutical industry is undergoing significant changes driven by various external and internal factors, requiring companies to adapt continuously. Rapid technological advancements, regulatory shifts, changing market demands, and increasing competition create a dynamic and challenging environment. To stay competitive, pharmaceutical companies must innovate, modernize operations, and manage change effectively.

3. Embracing new technologies and adhering to GMP standards are essential to meet evolving consumer and regulatory expectations. Expanding product ranges, particularly through generics and biosimilars, is crucial for maintaining market position.

4. Despite recognizing the need for change, many pharmaceutical companies face resistance due to fear and uncertainty. Addressing this resistance requires fostering a culture of openness, involving employees in decision-making, and emphasizing long-term benefits. Companies are also implementing adaptive strategies, such as adjusting product offerings, pricing, and marketing, but there is still room for improvement in IT adoption and digital transformation.

5. Pharmaceutical companies must focus on innovation, operational improvements, and adaptive management practices to respond to external changes.

6. The survey conducted on the impact of digital technologies on change management in pharmaceutical organizations provides valuable insights into the current practices and perceptions of professionals in the industry. The respondents, including managers, project managers, IT specialists, and change management experts, represent diverse roles, offering a well-rounded view of how digital tools are being implemented in managing organizational change.

7. The findings reveal that pharmaceutical organizations of varying sizes are utilizing digital technologies, with a higher representation from smaller

organizations. This suggests that smaller organizations may be more agile in adopting new technologies to support change management processes. Furthermore, the survey highlighted that respondents from various experience levels, ranging from less than one year to over ten years in the industry, provided a balanced perspective on the effectiveness and challenges of using digital tools.

8. The most commonly used digital technologies for change management in the pharmaceutical industry include communication platforms such as Microsoft Teams or Slack, and project management systems like Microsoft Project or Asana. These tools are seen as essential in enhancing collaboration and managing workflows during periods of change. Despite their utility, more advanced technologies like analytics platforms (e.g., Power BI, Tableau) are used less frequently, indicating that while data analysis tools hold potential, their adoption for change management is still limited.

9. Digital technologies are perceived to significantly improve communication between departments, streamline decision-making, and aid in resource management. They also help in simplifying project coordination and increasing the overall agility of organizations. Respondents generally rated project management systems as the most useful technology, followed by communication platforms. However, while these tools are valuable, their impact on knowledge management was perceived as less significant, indicating that this area may still require further digital enhancement.

10. The key benefits identified by respondents included improving internal processes, increasing decision-making accuracy, and enhancing organizational responsiveness to changes. These findings underscore the role of digital technologies in making pharmaceutical organizations more adaptable and efficient in the face of change. Although there are challenges related to implementation and adaptation, the survey results suggest that digital tools play a crucial role in optimizing change management strategies. Digital technologies have a positive influence on change management in pharmaceutical organizations, with respondents agreeing that these tools enhance adaptability and reduce the time required for implementing changes.

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APPLICATIONS

Appendix A

QUESTIONNAIRE

Survey on the impact of digital technologies on change management in pharmaceutical organizations

Thank you for participating in our study! The purpose of this study is to study the impact of digital technologies on change management in pharmaceutical organizations. Your answers will be used exclusively for scientific purposes and will remain confidential.

1.Your position in the pharmaceutical organization

- Manager
- Project manager
- IT specialist
- Change management specialist
- Other (specify) _____

2.Size of your organization:

- Less than 100 employees
- 101-500 employees
- 501-1000 employees
- More than 1000 employees

3.How many years have you been working in the pharmaceutical industry?

- Less than 1 year
- 2-5 years
- 6-10 years
- More than 10 years

4.What digital technologies does your organization use to support change management processes? (select all that apply)

- Project management systems (Microsoft Project, Asana)
- Communication platforms (Microsoft Teams, Slack)
- Knowledge management systems (Confluence)
- Analytics platforms (Power BI, Tableau)
- Other (specify) _____

5.How does digital technology help your organization manage change? (select all that apply)

- Improved communication between departments
- Simplified project coordination
- Rapid data analysis and decision-making
- Effective resource management

6.Which of these technologies are most useful for change management? Rate them on a scale of 1 (not useful) to 5 (very useful):

- Project management systems
- Communication platforms
- Knowledge management systems
- Analytic platforms

cont. appendix A

7.What are the main challenges you observe when implementing digital technologies in the change management process? (select all that apply)

- □ High implementation costs
- □ Staff resistance to change
- □ Insufficient technical training of employees
- □ Difficulties with integrating new technologies
- □ Other (specify) _____

8.What benefits of digital technologies in the change management process do you consider the most important? (select up to 3 options)

- □ Speed of response to changes
- □ Increasing the accuracy of decision-making
- □ Reducing management costs
- □ Improving the quality of internal processes
- □ Increasing employee engagement
- □ Other (specify) _____

9.To what extent do you agree with the following statements? (rate from 1 - completely disagree, to 5 - completely agree):

- □ Digital technologies have a positive impact on the adaptability of our organization to changes
- □ The use of digital technologies allows you to reduce the time for implementing changes
- □ Digital tools improve the quality of communication in the change management process
- □ Digital platforms contribute to more effective knowledge management in the organization

Thank you for participating!

Appendix B

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ
КАФЕДРА ПРОМИСЛОВОЇ ТЕХНОЛОГІЇ ЛІКІВ ТА КОСМЕТИЧНИХ ЗАСОБІВ
КАФЕДРА АПТЕЧНОЇ ТЕХНОЛОГІЇ ЛІКІВ

MINISTRY OF HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY
DEPARTMENT OF INDUSTRIAL TECHNOLOGY OF MEDICINES AND COSMETICS
DEPARTMENT OF DRUG TECHNOLOGY

Матеріали
IV міжнародної науково-практичної конференції
Proceedings of the IV International Scientific and Practical Conference

ФУНДАМЕНТАЛЬНІ ТА ПРИКЛАДНІ ДОСЛІДЖЕННЯ У ГАЛУЗІ ФАРМАЦЕВТИЧНОЇ ТЕХНОЛОГІЇ

FUNDAMENTAL AND APPLIED RESEARCH IN THE FIELD OF PHARMACEUTICAL TECHNOLOGY

25 жовтня 2024 р.
October 25, 2024
Харків, Україна
Kharkiv, Ukraine

УДК:615.014.2:615.2

Фундаментальні та прикладні дослідження у галузі фармацевтичної технології: Збірник наукових матеріалів IV Міжнародної науково-практичної конференції (м. Харків, 25 листопада 2024 р.). Х.: Вид-во НФаУ, 2024.- С. 361 (Серія «Наука»)

Збірник містить матеріали IV Міжнародної науково-практичної конференції «Фундаментальні та прикладні дослідження у галузі фармацевтичної технології».

Розглянуті теоретичні аспекти та перспективи розробки лікарських препаратів, висвітлені напрямки наукової роботи спеціалістів фармацевтичної галузі, що стосуються питань сучасної технології створення лікарських препаратів, контролю їх якості, організаційно-економічних аспектів діяльності фармацевтичних підприємств, маркетингових досліджень сучасного фармацевтичного ринку, фармакологічних досліджень біологічно активних речовин.

Для широкого кола наукових, науково-педагогічних і практичних працівників, що займаються питаннями розробки та впровадження сучасних лікарських препаратів.

Матеріали подаються мовою оригіналу.
За достовірність матеріалів відповідальність несуть автори.

УДК:615.014.2:615.2

НФаУ, 2024

RESEARCH ON THE IMPACT OF DIGITAL TECHNOLOGIES ON CHANGE MANAGEMENT IN PHARMACEUTICAL ORGANIZATIONS

Malyi V.V., Bondarieva I.V., Ait Khalik Adil
National University of Pharmacy, Kharkiv, Ukraine

Introduction. The rapid advancement of digital technologies has significantly transformed industries across the globe, including the pharmaceutical sector. Digital innovations, such as artificial intelligence, big data analytics, and cloud computing, are driving change within pharmaceutical organizations, impacting everything from research and development to supply chain management and patient care. As these technologies continue to evolve, understanding their role in facilitating effective change management becomes increasingly important for maintaining competitive advantage, ensuring regulatory compliance, and improving operational efficiency. This study focuses on the influence of digital technologies on change management processes in pharmaceutical organizations, aiming to identify how these tools support organizational adaptation to new challenges and opportunities.

The aim of the study is to investigate the impact of digital technologies on the change management processes within pharmaceutical organizations.

Methods of research. To address the research objective, a mixed-methods approach was employed: content analysis, survey.

Main results. The research findings indicate that digital technologies significantly enhance change management in pharmaceutical organizations by providing tools that improve communication, data-driven decision-making, and process automation. The use of big data analytics and AI allows organizations to process vast amounts of information quickly, leading to more informed and timely decisions during change initiatives. Cloud-based collaboration platforms facilitate real-time communication between departments, which is critical during organizational transitions. This reduces miscommunication and accelerates the implementation of new strategies. Automation technologies reduce the burden of manual tasks, allowing employees to focus on higher-value activities, such as strategy development and patient care. This contributes to smoother transitions during periods of change. Despite the benefits, some challenges remain, particularly regarding the integration of legacy systems with new digital platforms and the need for employee training to fully utilize these technologies.

Conclusions. The study concludes that digital technologies play a crucial role in modernizing change management processes within pharmaceutical organizations. By leveraging AI, big data analytics, and cloud computing, organizations can streamline decision-making, enhance communication, and automate processes, all of which contribute to more effective change management. However, successful integration requires overcoming challenges such as system compatibility and workforce readiness. Continuous investment in digital tools and training is essential for ensuring that pharmaceutical organizations remain adaptable and competitive in a rapidly changing industry.

cont. app. B

Ministry of Health of Ukraine
National University of Pharmacy
Department of Industrial Technology of Medicines and Cosmetics
Department of Pharmaceutical Technology of Drugs

Certificate

This is to certify that

Ait Khalik Adil

has participated in the IV International Scientific and Practical Conference

"FUNDAMENTAL AND APPLIED RESEARCH IN THE FIELD OF PHARMACEUTICAL TECHNOLOGY"

October 25, 2024, Kharkiv, Ukraine

Vice-Rector for scientific and pedagogical work of NUPh, prof. Inna VLADYMYROVA

Ф А 2.2.1–32-366

National University of Pharmacy

Faculty for foreign citizens' education
Department management, marketing and quality assurance in pharmacy
Level of higher education master
Specialty 226 Pharmacy, industrial pharmacy
Educational program Pharmacy

APPROVED
The Head of Department
management, marketing and quality assurance in pharmacy
_____
Volodymyr MALYI
02" September 2024

ASSIGNMENT
FOR QUALIFICATION WORK
OF AN APPLICANT FOR HIGHER EDUCATION

Adil AIT KHALIK

1. Topic of qualification work: «Research on the impact of digital technologies on change management in pharmaceutical organizations», supervisor of qualification work: Iryna BONDARIEVA, PhD, assoc. prof.

approved by order of NUPh from "06" of February 2024 № 34

2. Deadline for submission of qualification work by the applicant for higher education: October 2024

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 study key phases and techniques in the implementation of change processes; to research academic studies on adaptive management in pharmaceutical organizations; to study major pharmaceutical market trends influencing pharmaceutical enterprises; to investigate of change management procedures in pharmaceutical enterprises; to evaluate of core adaptive actions taken by pharmaceutical enterprises; to research on the impact of digital technologies on change management in pharmaceutical organizations; to assess of the effectiveness of implemented adaptive actions and necessary adjustments.

5. List of graphic material (with exact indication of the required drawings):
Pictures – 15

6. Consultants of chapters of qualification work

Chapters	Name, SURNAME, position of consultant	Signature, date	
		assignment was issued	assignment was received
1	Iryna BONDARIEVA, associate professor of higher education institution of department pharmaceutical management and marketing	02.09.2024	02.09.2024
2	Iryna BONDARIEVA, associate professor of higher education institution of department pharmaceutical management and marketing	09.09.2024	09.09.2024
3	Iryna BONDARIEVA, associate professor of higher education institution of department pharmaceutical management and marketing	30.09.2024	30.09.2024

7. Date of issue of the assignment: 02” September 2024.

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	June 2024	**done**
2	Analysis of key phases and techniques in the implementation of change processes	June 2024	**done**
3	Evaluation of core adaptive actions taken by pharmaceutical enterprises	September 2024	**done**
4	Research on the impact of digital technologies on change management in pharmaceutical organizations	September 2024	**done**
5	Assessment of the effectiveness of implemented adaptive actions and necessary adjustments	September 2024	**done**
6	Writing and design of qualification work	October 2024	**done**
7	Approbation of qualification work	October 2024	**done**
8	Submission of the qualification work to the EC of the National University of Pharmacy	October 2024	**done**

An applicant of higher education _____ Adil AIT KHALIK

Supervisor of qualification work _____ Iryna BONDARIEVA

ВИТЯГ З НАКАЗУ № 34
По Національному фармацевтичному університету
від 06 лютого 2024 року

1. Затвердити теми кваліфікаційних робіт здобувачам вищої освіти 5-го курсу 2 циклу Фм20*(4,10д) 2024-2025 навчального року, ступінь вищої освіти «магістр», галузь знань 22 Охорона здоров'я, спеціальність 226 – Фармація, промислова фармація, освітньо-професійна програма – Фармація, денна форма здобуття освіти (термін навчання 4 роки 10 місяців). Мова навчання англійська

№ з/п	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**					
6.	Аіт Халік Аділ	Дослідження впливу цифрових технологій на управління змінами в фармацевтичних організаціях	Research on the impact of digital technologies on change management in pharmaceutical organizations	доц. Бондарєва І.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 2024 р. № 329576151

Проаналізувавши кваліфікаційну роботу здобувача вищої освіти Аіт Халік Аділ, Фм20*(4,10д)-англ-01, спеціальності 226 Фармація, промислова фармація, освітньої програми «Фармація» навчання на тему: «Дослідження впливу цифрових технологій на управління змінами в фармацевтичних організаціях / Research on the impact of digital technologies on change management in pharmaceutical organizations», 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 **Інна ВЛАДИМИРОВА**

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

Adil AIT KHALIK

on the topic: «Research on the impact of digital technologies on change management in pharmaceutical organizations»

Relevance of the topic. Recently, changes in the external environment affecting pharmaceutical organizations have been occurring more rapidly, increasing their impact on the operational processes of these enterprises. Unstable economic conditions and fierce competition complicate management, making it increasingly difficult to predict future results. Under such conditions, simply implementing rapid adaptive measures is not enough. To maintain stability and control, pharmaceutical organizations must prepare for change in advance and develop and implement appropriate adaptive strategies.

Practical value of conclusions, recommendations and their validity. The results of this research offer practical insights into optimizing change management in pharmaceutical organizations through digital technology integration. By identifying effective digital tools and strategies, this study provides a framework for enhancing adaptability, improving decision-making, and streamlining operations within pharmaceutical companies.

Assessment of work. Adil AIT KHALIK 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 Phm20*(4,10) eng-01 group Adil AIT KHALIK on the topic: "Research on the impact of digital technologies on change management in pharmaceutical organizations" 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 _____ Iryna BONDARIEVA

3rd of October 2024

Ф А 2.2.1-32-356

REVIEW

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

Adil AIT KHALIK

on the topic: «Research on the impact of digital technologies on change management in pharmaceutical organizations»

Relevance of the topic. Today, in order to survive and maintain competitive advantages, companies must constantly update their business processes. Change has become an important element of the development of any organization, significantly affecting its operational structures. Managers at all levels must understand that as business systems become more complex, the value of effective change management also increases.

Theoretical level of work. The qualification work reveals change administration in pharmaceutical organizations.

Author's suggestions on the research topic. The author has developed a structured approach to change management that considers the involvement of employees at all levels of management and contributes to the formation of a culture of openness to change.

Practical value of conclusions, recommendations and their validity. The research offers a set of adaptive measures and an algorithmic approach to digital transformation, allowing organizations to better manage change in dynamic environments.

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. Adil AIT KHALIK qualification work "Research on the impact of digital technologies on change management in pharmaceutical organizations" 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. Alina VOLKOVA

14 of October 2024

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ВИТЯГ З ПРОТОКОЛУ № 5

22 листопада 2024 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. Гладкова О.В., канд. екон. наук, доц. Глєбова Н.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. екон. наук, доц. Ковальова В.І., 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., асистент, канд. фарм. наук Шуванова О.В., здобувачі вищої освіти факультету з підготовки іноземних громадян

ПОРЯДОК ДЕННИЙ: Про допуск здобувачів вищої освіти випускного курсу факультету з підготовки іноземних громадян спеціальності 226 Фармація, промислова фармація, освітньої програми Фармація до захисту кваліфікаційних робіт в Екзаменаційній комісії НФаУ.

СЛУХАЛИ: Про допуск здобувача вищої освіти факультету з підготовки іноземних громадян випускного курсу спеціальності 226 Фармація, промислова фармація освітньої програми Фармація групи Фм20*(4,10д)англ-01 Аділ АІТ ХАЛІК до захисту кваліфікаційної роботи в Екзаменаційній комісії НФаУ. Кваліфікаційна робота на тему «Дослідження впливу цифрових технологій на управління змінами в фармацевтичних організаціях».

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

УХВАЛИЛИ: Допустити здобувача вищої освіти Аділ АІТ ХАЛІК до захисту кваліфікаційної роботи на тему «Дослідження впливу цифрових технологій на управління змінами в фармацевтичних організаціях» 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 Аділ АІТ ХАЛІК до захисту кваліфікаційної роботи
за галуззю знань 22 Охорона здоров'я
спеціальністю 226 Фармація, промислова фармація
освітньою програмою Фармація
на тему: «Дослідження впливу цифрових технологій на управління змінами в фармацевтичних організаціях».

Кваліфікаційна робота і рецензія додаються.

Декан факультету _____ / Світлана КАЛАЙЧЕВА /

Висновок керівника кваліфікаційної роботи

Здобувач вищої освіти Аділ АІТ ХАЛІК виконав на кафедрі менеджменту, маркетингу та забезпечення якості у фармації НФаУ кваліфікаційну роботу, яка присвячена дослідженню впливу цифрових технологій на управління змінами в фармацевтичних організаціях.

У першому розділі роботи досліджується адміністрування змін у фармацевтичних організаціях. Другий розділ присвячений дослідженню процедур управління змінами на підприємствах фармацевтичного виробництва. У третьому розділі досліджено впливу цифрових технологій на управління змінами у фармацевтичних організаціях.

У цілому подана до захисту кваліфікаційна робота Аділ АІТ ХАЛІК на тему «Дослідження впливу цифрових технологій на управління змінами в фармацевтичних організаціях» відповідає вимогам, що висуваються до кваліфікаційних робіт, оцінюється позитивно і може бути рекомендована для захисту в Екзаменаційну комісію НФаУ.

Керівник кваліфікаційної роботи
_____ Ірина БОНДАРЄВА

3 жовтня 2024 р.

Висновок кафедри про кваліфікаційну роботу

Кваліфікаційну роботу розглянуто. Здобувач вищої освіти Аділ АІТ ХАЛІК допускається до захисту даної кваліфікаційної роботи в Екзаменаційній комісії.

Завідувач кафедри
фармацевтичного менеджменту та маркетингу
_____ Володимир МАЛИЙ

22 листопада 2024 р.

Qualification work was defended

of Examination commission on

«28» of November 2024

With the grade _____

Head of the State Examination commission,

D.Pharm.Sc, Professor

_____ /Oleh SHPYCHAK/