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ORGANIZATIONAL CULTURE OF A MEDICAL INSTITUTION AS A MODERATOR OF STAFF DIGITAL COMPETENCE DEVELOPMENT

ОРГАНІЗАЦІЙНА КУЛЬТУРА МЕДИЧНОГО ЗАКЛАДУ ЯК МОДЕРАТОР РОЗВИТКУ ЦИФРОВИХ КОМПЕТЕНТНОСТЕЙ ПЕРСОНАЛУ

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Громтєв К.М., Крупський О.П., Стасюк Ю.М. Організаційна культура медичного закладу як модератор розвитку цифрових компетентностей персоналу. Науково-методична стаття.

У статті досліджено роль організаційної культури медичного закладу як ключового модератора розвитку цифрових компетентностей персоналу в умовах цифрової трансформації системи охорони здоров'я. Обґрунтовано, що цифровізація медичних організацій має соціотехнічний характер і потребує узгодженого розвитку технологічної інфраструктури, людського потенціалу та культурного середовища. На основі аналізу сучасних наукових підходів систематизовано ключові чинники формування цифрових компетентностей медичного персоналу, зокрема психологічну безпеку, лідерську підтримку, культуру навчання та міжпрофесійну взаємодію. Виявлено дисбаланс між темпами впровадження цифрових технологій і рівнем розвитку цифрової професійної культури, що виступає однією з основних причин неефективності цифрових реформ у сфері охорони здоров'я. Запропоновано концептуальну модель взаємозв'язку організаційної культури, цифрових компетентностей та ефективності цифрової трансформації, у межах якої культура розглядається як активний модератор, що визначає інтенсивність і результативність цифрових змін. Розроблено практичні рекомендації щодо інтеграції цифрових компетентностей у систему управління персоналом та формування сприятливого культурного середовища для підтримки цифровізації медичних закладів.

Ключові слова: організаційна культура, цифрові компетентності, цифрова трансформація, медичний менеджмент, охорона здоров'я, цифрова культура, управління персоналом, цифровізація

Hromtsev K.M., Krupskiy O.P., Stasiuk Yu.M. Organizational Culture of a Medical Institution as a Moderator of Staff Digital Competence Development. Scientific and methodical article.

This article examines the role of a healthcare institution's organizational culture as a key moderator in the development of staff digital competencies amid the digital transformation of the healthcare system. It is argued that the digitalization of healthcare organizations is socio-technical in nature and requires the coordinated development of technological infrastructure, human capital, and the cultural environment. Based on an analysis of contemporary scientific approaches, the key factors in the formation of digital competencies among medical staff are systematized, including psychological safety, leadership support, a culture of learning, and interprofessional collaboration. An imbalance has been identified between the pace of digital technology adoption and the level of development of digital professional culture, which is one of the main reasons for the ineffectiveness of digital reforms in the healthcare sector. A conceptual model of the interrelationship between organizational culture, digital competencies, and the effectiveness of digital transformation is proposed, within which culture is viewed as an active moderator that determines the intensity and effectiveness of digital change. Practical recommendations have been developed for integrating digital competencies into the human resources management system and fostering a supportive cultural environment to promote the digitalization of healthcare facilities.

Keywords: organizational culture, digital competencies, digital transformation, healthcare management, healthcare, digital culture, human resources management, digitalization

The current stage of development in the healthcare system is characterized by the rapid spread of digital technologies, which are transforming both organizational processes and models of healthcare delivery. The implementation of electronic health records, telemedicine services, clinical decision support systems and medical data analysis tools is creating new requirements for the professional training of healthcare staff. One of the key factors determining the effective use of such technologies is the level of personnel digital competencies, which shapes the ability of medical organizations to adapt to digital transformation [1]. At the same time, research findings indicate that the development of employees' digital skills depends not only on individual characteristics or the technical infrastructure of a healthcare facility, but also on the features of the organizational environment, in particular, the prevailing organizational culture [2].

This issue is particularly relevant in the context of the large-scale digitalization of the healthcare sector currently taking place in Ukraine, where the effective use of digital technologies is increasingly determined by an organization's managerial and cultural characteristics, whilst issues with the electricity supply shape regional variations in how staff at healthcare facilities perceive digitalization processes. The literature review suggests that organizational culture can act as a key moderator of digital transformation processes, influencing the perception of innovation, staff readiness for training, and the intensity of knowledge exchange within the professional environment [3]. In healthcare institutions, this influence is particularly significant, as the introduction

of digital technologies reshapes established clinical processes and requires interprofessional collaboration among diverse groups of specialists [4]. At the same time, in many healthcare organizations, digital transformation is occurring unevenly, due to varying levels of support for innovation, learning and experimentation within the organizational culture [5]. This highlights the need for a scientific analysis of the role of a healthcare organisation's organisational culture as a moderator of staff digital competence development.

Analysis of recent publications on the problem

The issue of relationship between organizational culture and staff digital competencies has been the subject of active research in recent years within the framework of the organizational digital transformation theory. The academic literature emphasizes that digitalization is not merely a technological process, but rather a complex socio-technical transformation in which the managerial and cultural characteristics of an organization play a key role. In particular, recent studies demonstrate that the effectiveness of digital transformation initiatives depends to a large extent on the level of development of organisational culture, leadership style and staff readiness to acquire new competencies [2]. It is emphasized that even significant investments in digital technologies do not deliver the expected results without corresponding changes in the "soft" components of management, which include organizational culture, the motivation system and knowledge management [2]. In the context of developing employees' digital competencies, organizational culture is considered as an environment that fosters employees' readiness for learning, innovation and experimentation with new technologies.

A separate area of contemporary research focuses on the role of organizational culture in the digital transformation of the healthcare system. Academic studies demonstrate that the implementation of digital technologies in healthcare settings is linked not only to technical aspects, but also to the need to transform management approaches and the professional practices of medical personnel. It has been established that the level of digital competence among healthcare professionals is one of the key factors in the successful implementation of modern technological solutions, such as electronic health records, telemedicine and medical data analysis systems [6]. At the same time, research in the field of healthcare management emphasizes that organisational culture can both stimulate the use of digital tools and create barriers to their adoption due to resistance to change or insufficient support for innovation [5, 7]. Thus, an approach is emerging in the scientific literature whereby organizational culture is viewed as one of the key management mechanisms determining the intensity of staff digital competence development and the effectiveness of digital transformation in healthcare organizations.

At the same time, organizational culture is increasingly viewed not merely as the general context

within which an organization operates, but as an active management mechanism capable of modifying the influence of other factors on the development of staff digital competencies. The concept of the moderating role of organizational culture is widely used in the academic literature; this role can either enhance or, conversely, weaken the effectiveness of management practices aimed at the digitalization of an organization's activities. In particular, studies show that organizational culture can modify the relationship between digital HR management practices and the level of perceived digital competence among employees [3]. In a broader sense, organizational culture can be viewed as a facilitator of economic culture, which determines the behavioural patterns of individuals in a professional environment and their ability to adapt to new operating conditions [8]. Similar findings have been reported in studies of organizational digital transformation, which have established that a culture of innovation, openness to change and cross-functional collaboration contributes to the creation of a favourable environment for the staff's digital skills development and the enhancement of organizational effectiveness [9]. Thus, contemporary scientific research provides a conceptual framework for analyzing the organizational culture of a healthcare institution as a key factor influencing the staff digital competencies development in the context of the digital transformation of the healthcare system.

Formulation of research objectives (task setting)

The aim of the article is to provide a theoretical justification for the role of a healthcare institution's organizational culture as a facilitator of personnel digital competence development and to formulate management recommendations for supporting the digital transformation of the healthcare system. The object of the study is the process of developing digital competencies among medical personnel in the context of the healthcare organizations' digitalization. The subject of the study is the managerial mechanisms through which organizational culture influences the formation, dissemination and practical application of digital competencies among employees of healthcare institutions. The paper puts forward the hypothesis that organizational culture can act as a key moderator of digital transformation processes in a healthcare institution, influencing the intensity of training, personnel adaptation to new technologies, and the effective use of digital tools in medical practice.

The study is interdisciplinary in nature and integrates approaches from organizational management, human resource management, digital transformation theory and healthcare management. It is conceptual and analytical in nature, based on a comparative analysis of contemporary scientific approaches to the digitalization of organizations and the development of personnel professional competencies. The study substantiates a generalized management model that explains the mechanism through which organizational culture influences the development of digital competencies among healthcare workers. Particular attention is paid to the key concepts

interpretation of digital transformation, organizational culture and digital competencies in human resource management within the healthcare sector.

The theoretical framework of this study draws on contemporary approaches to analysing organizational culture and the digital transformation of organizations. The study draws on concepts of digital organizational culture, which view an organisation's cultural environment as a factor in shaping staff innovation behaviour and supporting technological change [2, 10]. It also considers scientific approaches to the digital competencies development among healthcare professionals, which emphasise the importance of continuous professional development, organisational support and interprofessional collaboration in the development of personnel's digital skills [1, 11]. To interpret the role of organizational culture in the organization's digital transformation, we draw on the principles of organizational culture and knowledge management theories, which explain the mechanisms for creating an enabling innovative environment within an organization [5, 12].

To establish the analytical framework for the study, a systematic search of academic sources was conducted in the Google Scholar, Scopus and Web of Science databases, covering the period 2019–2025. The search was carried out using the following keywords: "organizational culture", "digital competencies", "digital transformation", "healthcare management", "digital health", "medical staff competencies", "digital organizational culture", "healthcare digitalization".

The total volume of the initial information base comprised over 600 publications on the digitalization of organizations, personnel's digital skills development, and change management in healthcare organizations. Based on the initial search, an initial set of academic sources was compiled, comprising 90 relevant publications. To ensure the analytical integrity of the study and reduce information noise, several source selection criteria were applied:

- 1) the source must include an analysis of organizational culture, digital transformation or staff digital skills development;
- 2) priority was given to studies examining the healthcare institutions' digitalization or digital transformation processes within organizations;
- 3) publications were selected that are of scientific significance and are used in current research on digital transformation.

The relevance of this study stems from its focus on academic works published between 2019 and 2025, which enables it to take into account current trends in digital transformation, whilst classical theoretical studies serve as the basis for establishing the methodological framework of the work.

As a result, 36 academic sources that met the specified criteria and provided a sufficient theoretical basis for investigating the role of organizational culture in digital competencies development among healthcare personnel were included in the main analytical corpus. These sources were used to develop a conceptual model of the relationship between organizational

culture, digital competencies and the effectiveness of digital transformation in healthcare organizations.

The research approach we applied combines theoretical analysis, the systematisation of scientific perspectives, conceptual modelling, and managerial interpretation of the obtained results. This enabled us to develop a scientifically grounded understanding of the role of organisational culture in moderating the digital competencies of healthcare personnel amid the contemporary digital transformation of the healthcare system.

Materials and methods

The study is interdisciplinary and combines approaches from organizational management, human resource management, digital transformation, and healthcare management. The research is conceptual and analytical in nature and applies methods of comparative analysis, systematization, conceptual modeling, and managerial interpretation.

A systematic literature search was conducted in Google Scholar, Scopus, and Web of Science databases for the period 2019–2025 using the keywords "organizational culture", "digital competencies", "digital transformation", "healthcare management", and related terms. More than 600 publications were initially identified, of which 36 relevant scientific sources were selected according to criteria of relevance, scientific significance, and focus on healthcare digitalization. The selected sources formed the theoretical and analytical basis of the study.

Presentation of main results and their justification

Within the framework of the study, the presentation of the main results is structured in accordance with the logic of managerial analysis of digital transformation processes in healthcare organizations. First, the essence of digital transformation as a multidimensional organizational process is examined. Next, the role of organizational culture as an environment for developing personnel digital competencies is substantiated. Particular attention is dedicated to identifying the imbalance between the pace of digitalization and the level of digital professional culture among healthcare workers. The final stage involves constructing a conceptual model that integrates cultural, competency-based, and performance-related aspects of digital transformation into a unified managerial system.

Digital transformation of healthcare organizations

In today's conditions, this process is not merely a local technological upgrade, but a profound managerial process of restructuring the clinical, administrative and communication mechanisms underpinning the functioning of a healthcare institution. It involves the integration of electronic health records, telemedicine, artificial intelligence, big data analytics and digital patient engagement services into the day-to-day practice of healthcare institutions. Scholars emphasize that the digitalization of the healthcare sector is aimed at improving the quality of medical services, optimizing costs and expanding access to care; however, achieving these results is only possible provided there is proper organizational integration of technologies into the institution's operations [4, 13,

14]. Digital transformation requires not only technical modernization, but also a re-evaluation of the entire (conventional) approach to managing a healthcare organization, as technology is changing the nature of professional interactions, decision-making and the handling of medical data [2, 10]. The concept of digital competencies in modern healthcare management has its roots in approaches to developing professionals' information literacy, which involves integrating technological, analytical and communication skills into professional practice [15]. This is precisely why, in healthcare management, digital transformation should be considered as a process of strategic organizational adaptation rather than as a process of introducing new digital tools.

One of the central challenges of digital transformation is the uneven readiness of different stakeholder groups to adopt digital solutions. Scholars note that resistance to digital innovations arises not only among medical personnel but also among patients and service providers of healthcare institutions, with the causes of such resistance being both behavioural and organizational in nature [16]. For doctors and nursing personnel, new digital systems are often associated with an increased administrative burden, disruptions to established clinical procedures, and a reduction in professional autonomy. For patients, particularly those in older age groups, limited digital literacy, the complexity of digital interfaces, and a low level of readiness to use remote services present a significant barrier [17]. In turn, healthcare providers often display latent resistance to digitalization, as the introduction of end-to-end monitoring necessitates radical transparency in operational processes, which conflicts with the desire to preserve informal management practices and autonomous resource allocation [18, 19]. At the same time, international studies on the digital competence of healthcare workers show that abilities of personnel to interact effectively with digital systems varies significantly across countries, professional groups and institutional settings, and therefore cannot be regarded as an automatic consequence of a healthcare institution's technical infrastructure [11, 20]. This means that digital transformation requires targeted human resource management and the systematic development of personnel digital competencies.

Furthermore, significant constraints on the digital transformation of healthcare institutions are driven by organizational, financial and infrastructural factors. The implementation of digital projects in the healthcare sector requires significant investment in hardware, software, cloud services, analytics modules and technical support, making digitalization a complex management decision, particularly for resource-constrained organisations and developing countries. Furthermore, a serious problem remains the shortage of professionals who combine clinical knowledge with digital, analytical and managerial training, which slows down the full integration of technologies into work processes. Some studies highlight that even where technological resources are available, digital transformation is often slowed down by low

organizational readiness, fragmented processes and limited cross-departmental coordination [21, 22]. Furthermore, the problem is exacerbated by poor interoperability between digital systems, resulting in data remaining scattered across incompatible platforms, which hinders the creation of a comprehensive patient information ecosystem and complicates the management of healthcare quality [4]. Consequently, digital transformation should be considered as a multi-level process, where technical innovation without organisational alignment fails to deliver the expected results.

Data security, ethical regulation and trust in digital systems are becoming particularly important in the digital transformation of healthcare organizations. The proliferation of electronic health records, remote monitoring platforms and cloud-based solutions makes healthcare organizations more vulnerable to cyber threats, requiring a comprehensive approach to information security and compliance with regulatory requirements for the protection of personal health data [23]. Furthermore, using artificial intelligence in diagnostic and prognostic systems highlights the issue of algorithmic bias, transparency of decisions and accountability for their consequences. Digital transformation requires not only technical reliability but also the establishment of clear data governance mechanisms that combine technological efficiency, ethical soundness and a focus on patient rights. Research into the barriers and facilitators of digital technology use by healthcare professionals confirms that trust in the system, clarity of its functions and a sense of security in the digital environment directly influence the frequency of digital decision-making in professional practice [7]. Therefore, digital transformation in the healthcare sector must be accompanied not only by technical standardisation, but also by ethical and managerial regulation of the digital environment.

From a management perspective, the success of digital transformation is determined primarily by the ability of a healthcare organization's leadership to combine technological modernization with the development of personnel competencies and the fostering of an innovative organizational culture. Systematic reviews show that educational interventions can positively influence the development of healthcare professionals' digital competencies; however, their effectiveness depends significantly on the organizational conditions in which the training takes place [24]. In turn, research into digital skills sharing in healthcare demonstrates that inter-professional collaboration, management support, recognition of the training value, and the presence of mechanisms for disseminating digital knowledge within the organization are critically important [25, 26]. This means that the digital transformation of healthcare organizations is not merely a matter of technical implementation, but also a matter of managing professional behaviour, training, and personnel adaptation to new working models. To conclude, it can be argued that such a transformation is a multidimensional process, the effectiveness of which

depends on the interaction between organizational culture, technological resources, organizational readiness for innovation, employees' digital competencies and the quality of managerial support for change.

Organizational culture in a healthcare institution as an environment of personnel digital skills development.

The organizational culture of a healthcare institution should foster an institutional environment within which the professional and digital competencies of healthcare personnel can be developed. Recent research emphasizes that the digital transformation of healthcare organizations cannot be achieved solely through the implementation of information systems or technical infrastructure [27].

The nature of the organizational environment is of crucial importance, as it determines personnel readiness for training, innovative behaviour and using digital tools in clinical practice. It is the organization's cultural environment that sets the normative framework for professional interaction, shapes attitudes towards technological change and influences the pace at which new digital solutions are adopted [28, 29]. Narrative practices, in particular storytelling, serve as an important tool for shaping and sustaining organizational culture in healthcare institutions, as they help to convey the values, norms and behavioural models of staff in the context of digital change [30]. Consequently, in the field of healthcare organization management, the internal institutional culture must act as a key institutional mechanism that will either stimulate or hinder the development of specialists' digital competencies.

One of the key ways in which organisational culture influences the digital skills development is by fostering an atmosphere of psychological safety and support for professional development. Research findings indicate that in healthcare organizations where experimentation with new technologies is encouraged, a constructive attitude towards mistakes is permitted, and collective responsibility for professional development is supported, personnel are more actively engaged in digital learning and integrate new tools into their practice more quickly [31]. In contrast, in rigidly hierarchical or risk-oriented organizational cultures, healthcare personnel often avoid using new digital systems due to fears of making mistakes or facing additional scrutiny. This leads to a superficial use of digitalization opportunities, even where modern technical infrastructure is available. The process of creating a supportive cultural environment should be considered as a necessary prerequisite for the effective development of digital competencies among personnel in healthcare organizations.

Management leadership plays a key role in fostering such a culture. Research in the field of healthcare management shows that active support for digital initiatives from senior management significantly increases personnel readiness to develop digital skills and adopt new technologies [32]. Leaders who demonstrate their own digital competence integrate digital goals into the organization's strategic priorities and recognize digital literacy as an integral

part of healthcare specialists' professional culture, thereby sending a powerful normative signal to personnel. Furthermore, organizational cultures focused on digital transformation combine innovative values with the overarching mission of a healthcare organization: "ensuring the safety and quality of healthcare" [33], which shifts the focus of personnel digital competence development from a purely technical direction towards a professional and ethical one.

Another important cultural factor in digital competences development is the level of interprofessional collaboration and knowledge sharing within an organisation. Healthcare institutions are often characterized by a high degree of professional differentiation among personnel, as doctors, nurses, pharmacists and administrative personnel have different professional roles and varying levels of digital proficiency. In such conditions, a culture of teamwork creates opportunities for the horizontal exchange of digital knowledge and practices regarding the use of software products. A literature review suggests that a collaborative organizational culture can significantly improve the effectiveness of healthcare services and facilitate faster adoption of digital tools by staff [34]. Simultaneously, strategies for healthcare professionals' digital competencies development must take into account varying initial levels of digital literacy and the specific nature of professional roles within the healthcare system [35].

The organizational context of educational programmes and professional training plays a distinct role in the digital competences development. Systematic reviews show that educational interventions can be an effective tool for improving the healthcare professionals' digital competence; however, their effectiveness depends to a large extent on the organisational culture [36]. Training programmes implemented in organizations with an open culture, high levels of trust and support for innovation demonstrate more sustainable results and a higher level of practical application of digital skills. In modern healthcare organizations, new institutional roles aimed at supporting digital learning are also increasingly being introduced, in particular the role of digital navigators, who help personnel to adapt to the use of digital resources and technologies [37]. Thus, the organizational culture of a healthcare institution is the key environment within which the formation, development and practical application of personnel digital competencies take place (Table 1).

From a management perspective, the digital competencies development among healthcare personnel should be considered as an integral part of strategic management of organizational culture and the human resources management system. Such competencies development cannot be limited to one-off training initiatives, but requires the integration of digital skills into HR policy, professional development systems and internal knowledge-sharing mechanisms within the organization. Practice in managing the digital transformation of healthcare institutions demonstrates the effectiveness of institutional

mechanisms supporting digital learning, in particular digital mentoring programmes, interprofessional teams for sharing experience of software products, and specialized roles supporting personnel digital adaptation. As a result, organizational culture becomes

a management resource that ensures not only digital technologies implementation but also their effective integration into the clinical and management processes of a healthcare institution.

Table 1. Key cultural factors influencing the digital skills development among healthcare personnel

| Cultural factor | Managerial content | Impact on the digital skills development |
|--|---|--|
| Psychological safety | Encouraging experimentation and tolerance for mistakes | Increases personnel readiness to use new digital tools |
| Leadership support | Integration of digital goals into the organizational strategy | Encourages motivation to develop digital skills |
| Learning culture | Continuous professional development and knowledge sharing | Ensures the systematic development of digital skills |
| Team collaboration | Interprofessional collaboration and horizontal exchange of experience | Helps to accelerate the uptake of digital practices |
| Institutional support for digitalization | Introduction of specialized roles and digital services | Helps personnel to adapt to new technologies |

Source: authors' own elaboration

Imbalance between the pace of healthcare systems digitalization and the development of a digital professional culture among personnel.

The accelerated digitalization of society as a whole, and of healthcare systems as part of that society, is accompanied by a significant imbalance between the pace of digitalisation of administrative and clinical processes and the development of a corresponding digital professional culture among healthcare staff. Modern healthcare organizations are actively implementing electronic health records, clinical decision support systems, telemedicine platforms and medical data analysis tools; however, the development of the cultural and competency prerequisites for their

effective use is proceeding much more slowly [38]. As a result, a socio-technical gap is emerging between the technological infrastructure and the actual professional practices of healthcare workers. The formation of a digital professional culture requires much broader changes than basic technical training, as it involves new norms development for interacting with digital systems, trust in algorithmic decisions, ethical responsibility for using medical data, and the ability to work in digital communication environments [39]. A summary of the main manifestations of this imbalance, their organizational causes and consequences for healthcare institutions is presented in Table 2.

Table 2. Manifestations of the imbalance between healthcare system digitalisation and the development of digital professional culture

| Manifestations of the imbalance | Organizational reasons | Potential risks |
|--|---|---|
| Anticipatory implementation of digital technologies | Reform orientation toward technical modernisation | Low utilisation of digital systems |
| Insufficient digital skills among healthcare personnel | Limited integration of digital courses into medical education | Failures in using digital tools |
| Personnel resistance to digital change | Violation of normal clinical processes | Development of informal 'workarounds' |
| Work-related stress among healthcare workers | Intensive implementation of new digital workflows | Burnout and reduced performance |
| Digitalization gap among patients | Inequitable access to digital technologies | The growing inequality in access to healthcare services |

Source: authors' own elaboration

Empirical research shows that a lack of digital skills among healthcare personnel is a widespread phenomenon, even in "technologically advanced healthcare systems". For instance, a survey of medical students in Germany revealed that most future doctors do not receive systematic training in digital technologies as part of their university programmes, and only a small proportion consider themselves ready to work in a digital healthcare environment [40]. Similar problems are observed in other countries, where the roll-out of digital healthcare services significantly outpaces the development of digital

literacy among healthcare professionals [41, 42]. In such circumstances, digital systems are often perceived as an external administrative tool that complicates work processes, rather than as a means of improving the quality of clinical practice. This contributes to the formation of latent resistance to digital innovations and reduces the effectiveness of digital reforms in the healthcare sector.

The consequences of such an imbalance extend beyond organizational efficiency and can directly impact patient safety and the professional well-being of healthcare personnel. The rapid implementation of

digital systems without adequate cultural adaptation of personnel leads to the emergence of informal "workarounds", which can reduce the quality of medical data and create risks for clinical decisions [43]. At the same time, the prevalence of so-called technostress is increasing – "the psychological strain associated with the need to constantly adapt to new digital work processes" [44]. Furthermore, the problem is exacerbated by the existence of a digital divide between different social and demographic groups, which may deepen inequalities in access to healthcare services [45]. Thus, without the proper development of a digital professional culture, the digitalization of the healthcare system may not only lose its effectiveness but also create new social and organizational risks.

The data summarized in Table 2 indicate that the key issue lies not in the intensity of digitalization itself, but in the asymmetry between the technological renewal of the system and the organizational readiness of personnel for new models of professional activity. From an applied perspective, this means that digital transformation programmes in healthcare institutions must be accompanied by parallel managerial measures: integrating digital competencies into continuous professional development, adapting educational programs, reducing excessive digital workload on personnel, and establishing mechanisms to support digital adaptation within the organization. Only under these conditions does digitalization cease to be a

formal technical process and instead become a managed organizational change that enhances the quality of medical care and strengthens the institution's resilience to future technological transformations.

Model of the interrelation between organizational culture, digital competencies, and the effectiveness of digital transformation in healthcare organizations

The synthesis of the results of the theoretical analysis and the preceding sections of the study makes it possible to formulate a conceptual model of the interrelation between the organizational culture of a healthcare institution, the digital competencies of its personnel, and the digital transformation effectiveness. Contemporary research on digital transformation emphasizes that the success of digital change largely depends on the organizational environment [2, 46]. The formalization of organizational culture through a corporate style, including communication standards, visual identity and behavioral norms, creates additional prerequisites for the coherent integration of digital practices into the operations of healthcare organizations [47]. Organizational culture functions as an institutional prerequisite for the development of digital competencies, which, in turn, ensure the actual implementation of digital technologies in clinical and managerial processes. Thus, the interrelation between these components is substantiated as a moderator-mediated model (Fig. 1).

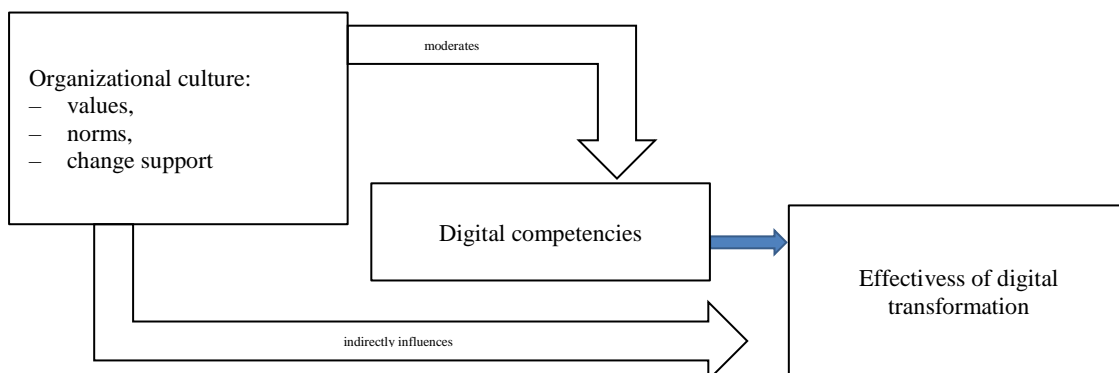


Figure 1. Moderating model of the influence of organizational culture on the development of digital competencies and the effectiveness of digital transformation in organizations

Source: authors' own elaboration

Unlike existing approaches, in which organizational culture is considered primarily as a background or accompanying factor of digital transformation, in our model it is interpreted as an active moderator that determines the intensity and effectiveness of digital competence development among personnel. The proposed model makes it possible to integrate three key management levels, cultural, competence-based and performance-oriented, into a single analytical framework that reflects not only direct but also indirect interrelations among them. This approach expands traditional understandings of digital transformation in the healthcare sector by emphasizing the role of intangible organizational factors as decisive determinants of technological change effectiveness. The presented scheme (Fig. 1) can be used as a

managerial analysis tool for assessing digital transformation in healthcare organizations.

It is appropriate to determine organizational culture as a system of values, norms, and interaction patterns that shape personnel adaptability, innovation orientation, and learning capacity. In particular, organizational culture is interpreted as "a specific set of values and norms shared by individuals and groups within an organization, as well as the way in which they interact with one another and with stakeholders outside the company" [48]. These very characteristics create an environment in which employees are willing to experiment with new technologies, engage in digital learning, and integrate digital tools into clinical practice [5].

Personnel digital competencies constitute the central element of the proposed model, as they ensure

the practical integration of technologies into the operations of healthcare organizations. Such competencies include digital literacy, the ability to work with medical information systems, skills in medical data analysis, and the integration of digital tools into clinical workflows. The level of digital competencies among healthcare professionals directly influences the effectiveness of digital transformation by determining the extent to which digital systems are used and the degree to which they affect the performance outcomes of healthcare institutions [35, 49]. Thus, digital competencies function as a key mediator between the cultural characteristics of an organization and the actual results of digital change.

The digital transformation effectiveness is manifested through a set of organizational and clinical outcomes, including improved quality of care, administrative processes optimization, enhanced

patient interaction, and increased operational efficiency of healthcare organizations. At the same time, research shows that achieving these outcomes is possible only under the condition of the synchronous development of technological infrastructure, the digital competencies of personnel, and an organizational culture oriented toward innovation and continuous learning [32, 50]. Otherwise, digital systems remain underutilized or are integrated into workflows only formally, without producing a substantial impact on the performance of a healthcare institution

To systematize the interrelations between the core elements of the proposed model, we present their operationalization in the form of a structured managerial framework (Table 3), which reflects the key factors of digital transformation and their managerial significance.

Table 3. The model operationalization of the interrelation between organizational culture, digital competencies, and the digital transformation effectiveness

| Model component | Main features | Managerial tools | Expected outcomes | Measurement indicators |
|---|---|--|---|---|
| Organizational culture | Innovation, learning culture, psychological safety, support for digital transformation | Leadership support for digital initiatives, internal training programmes, fostering innovation | Creating a conducive environment for digital transformation | Level of personnel engagement with digital initiatives; organizational culture index; proportion of employees participating in training |
| Personnel digital competencies | Digital literacy, work with medical information systems, data analytics, using digital tools in clinical practice | Digital learning programmes, interprofessional teams, digital mentorship | Improving the effectiveness of digital tool use | Level of digital literacy; competency testing results; frequency of IT-system use |
| Effectiveness of digital transformation | Quality of medical care, process efficiency, patient engagement, innovation development | Digital strategy, IT-system integration, data management | Sustainable development of medical organizations | Reduction of data processing time; patient satisfaction level; economic efficiency; level of process digitalization |

Source: authors' own elaboration

The proposed approach makes it possible to align the cultural, competency-based, and technological dimensions of digital transformation within a unified managerial logic. Its application in healthcare management practice can support more effective planning of digital change, as the emphasis shifts from the technical implementation of systems to the development of the organization's human and cultural potential. The presented indicators enable a transition from a conceptual description of the model to its practical application within the management system of medical organizations.

Thus, we emphasize that the digital transformation of healthcare institutions should be viewed as a comprehensive organizational change that requires the simultaneous development of technological infrastructure, personnel digital competencies, and an appropriate organizational culture.

THE RESULTS DISCUSSION.

The results obtained confirm that the digital transformation of medical organizations has a

pronounced sociotechnical nature, in which technological change represents only one component of the broader organizational transformation. Unlike traditional approaches focused primarily on the implementation of information systems, the findings highlight the decisive role of organizational culture as a mechanism that moderates the intensity of staff digital competency development. It is the cultural characteristics, such as a learning orientation, openness to change, psychological safety, and support for innovation, that create an environment in which digital competencies evolve from a formal construct into a practical instrument of professional activity.

At the same time, the identified imbalance between the pace of digitalization and the development of a digital professional culture offers a new interpretation of the reasons behind the inefficiency of digital reforms in the healthcare system. The findings indicate that the main barriers to digital transformation stem not so much from technological limitations as from insufficient organizational readiness and an

underdeveloped digital culture among personnel. The proposed model demonstrates that effective management of digital change in medical organizations requires the alignment of cultural, competency-based, and strategic decisions.

Conclusions and prospects for further research

The conducted study made it possible to identify key patterns in the relationship between a medical institution's organizational culture, the personnel digital competencies development, and the effectiveness of digital transformation. The findings confirmed that the digitalization of the healthcare system is not merely a technological process but, above all, an organizational and managerial one in which the cultural environment plays a decisive role. It was demonstrated that organizational culture influences the intensity of digital tool adoption, staff readiness for learning, and the integration level of digital solutions into clinical practice. It was established that in the absence of a well-developed digital professional culture, even a high level of technological capacity does not ensure the expected effectiveness of transformation processes. The article proposes a conceptual model that explains the interconnection between organizational culture, digital competencies, and the performance of digital transformation in healthcare organizations. The proposed model has an applied character and can be used as a change-management tool in the healthcare sector, particularly in the development of digital-development strategies, professional training programmes, and human-resource management systems. Its practical value lies in enabling a shift from a technocratic approach to digitalization toward an integrated managerial logic that combines the development of culture, competencies, and technologies. Special attention should be given to the role of leadership, which must act not only as an initiator of digital change but also as a moderator of the organization's cultural transformation.

The results obtained also revealed a systemic imbalance between the pace of digital technology implementation and the development level of the digital professional culture of medical personnel. This allows us to conclude that it is necessary to shift the managerial focus from technical provisioning toward building organizational readiness for change, fostering a culture of learning, and supporting the digital

adaptation of staff. Future research prospects are associated with the empirical validation of the proposed model, tools development for assessing the digital culture of medical organizations, and the examination of how different types of organizational cultures influence the effectiveness of digital transformations in healthcare.

The study limitations. Despite the results obtained, the study has several limitations that should be taken into account when interpreting the conclusions. First, the research has a conceptual and analytical character and is based on the synthesis of contemporary scientific approaches to digital transformation, organizational culture, and the development of digital competencies. This limits the possibility of directly conducting empirical verification of the proposed model within specific medical organizations and requires its further testing under real managerial conditions. Second, the proposed model has a generalized character and does not fully account for the specific features of different types of healthcare institutions, levels of medical care, and national characteristics of health systems. Organizational, institutional, and resource differences may significantly influence the nature of the relationship between culture, competencies, and the outcomes of digital transformation, which necessitates additional adaptation of the model to particular contexts. Third, the study did not include quantitative measurement of the impact of individual cultural factors on the employees' digital competencies development, which restricts the ability to precisely determine the strength and nature of these relationships. Several factors also remained outside the scope of analysis, including individual psychological characteristics of employees, informal interaction practices, and the specifics of internal communication, i.e. the elements that may substantially affect digital transformation processes. Fourth, the study only partially addresses the influence of the external environment, including regulatory requirements, technological standards, and socio-economic conditions, on the formation of digital culture and competencies in healthcare institutions. These factors may act as additional drivers or constraints of digital transformation, opening avenues for further research aimed at a comprehensive analysis of the external and internal determinants of digital development within the healthcare system.

Abstract

The article examines the role of organizational culture in healthcare institutions as a key moderator of the development of personnel digital competencies in the context of healthcare digital transformation. It is argued that digital transformation in healthcare should be understood as a socio-technical process that requires the alignment of technological infrastructure, human resource capabilities, and organizational culture.

The study adopts a conceptual and analytical approach, integrating perspectives from organizational management, human resource management, digital transformation theory, and healthcare management. Based on a systematic review of recent research literature (2019-2025), the study identifies the main cultural determinants influencing the digital competencies development among healthcare professionals, including psychological safety, leadership support, a learning-oriented culture, and interprofessional collaboration.

The findings reveal a significant imbalance between the rapid pace of digitalization and the slower formation of a digital professional culture among medical personnel. This asymmetry leads to underutilization of digital technologies, resistance to innovation, and the emergence of informal workarounds, ultimately reducing the

effectiveness of digital transformation initiatives. The study demonstrates that the main barriers to digital transformation are not technological limitations but rather insufficient organizational readiness and the underdevelopment of digital culture within healthcare institutions.

A conceptual model is proposed to explain the interrelationship between organizational culture, digital competencies, and the effectiveness of digital transformation. In contrast to traditional approaches, organizational culture is conceptualized not as a background factor but as an active moderator that influences both the intensity of competency development and the digital transformation outcomes. The model integrates cultural, competency-based, and performance dimensions into a unified analytical framework.

The practical implications of the study include managerial recommendations for integrating digital competencies into human resource management systems, promoting continuous professional learning, and fostering a supportive organizational culture that encourages innovation and adaptation to digital technologies. The proposed model can be applied in healthcare management practice to enhance strategic planning of digital transformation and improve the effectiveness of digital initiatives.

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