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ENHANCING SOFTWARE SOLUTIONS FOR DEVELOPING DIGITAL COMPETENCE OF MANAGERIAL STAFF IN UZBEKISTAN

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Abstract
In the era of digital transformation, managerial staff must continuously develop their digital competence to ensure effective leadership and decision-making. This study examines the need for improved software solutions to enhance the digital competence of managerial personnel in Uzbekistan. The paper explores the latest trends in digital education, analyzes the challenges faced by managers in acquiring digital skills, and proposes an optimized software solution tailored to their professional needs. The findings suggest that an integrated, user-friendly software system can significantly contribute to the digital competence development of managerial staff, improving organizational efficiency and innovation, particularly within the context of Uzbekistan's digitalization initiatives.

Keywords: Digital competence, managerial staff, software development, leadership, digital transformation, Uzbekistan.

Introduction

The rapid advancement of technology necessitates the continuous development of digital skills among managerial staff. In Uzbekistan, the government has launched various initiatives such as the "Digital Uzbekistan – 2030" strategy to enhance digital transformation across all sectors. Leaders must be equipped with digital competencies to adapt to evolving business environments and leverage technological tools effectively. However, existing digital training programs in Uzbekistan often fail to meet the specific needs of managers. Many organizations still rely on traditional leadership development models that do not integrate modern digital competencies, which results in a skills gap that affects overall productivity and decision-making processes.

Additionally, global trends show that countries with digitally competent managerial staff demonstrate higher levels of economic growth and innovation. For Uzbekistan to remain competitive in the digital age, it is crucial to provide targeted, efficient, and scalable training solutions for managerial personnel. This paper aims to analyze the current challenges in digital competence development in Uzbekistan and propose an enhanced software solution to address these issues.

Main statement of the topic

In the era of rapid advancements in information technology, Uzbekistan places high priority on the automation of public administration. Recognizing the significance of digital technologies, the government is dedicated to enhancing the efficiency of public administration and delivering high-quality public services. This commitment stems from the understanding that the effective utilization of digital technologies plays a vital role in ensuring transparency and effectiveness in public administration.

Modern digital solutions have revolutionized the collection and analysis of extensive personnel data, enabling management to make informed decisions based on big data analytics. This includes evaluating employee performance, forecasting staffing requirements, optimizing salary structures, and other essential aspects of HR management.

The Republic of Uzbekistan places significant emphasis on developing the digital competencies of civil servants, demonstrating a commitment to innovative and efficient public administration.

Addressing the challenges at hand necessitates a comprehensive approach that encompasses education, collaboration, and the implementation of cutting-edge technologies. By strengthening the digital competencies of civil servants, government structures undergo modernization, ensuring the country's stable progress in the digital era.

Over the past three years, the Republic of Uzbekistan has witnessed remarkable growth in the establishment of training centers dedicated to fostering IT competencies. The number of such centers has surged to over 300 across the country. This expansion reflects the government's commitment to equipping its youth with the necessary skills for the digital age.

One notable initiative, the "One Million Uzbek Coders" project, was launched in 2019. As part of this program, a staggering 1.2 million young individuals have successfully completed training and obtained certificates. This achievement underlines the significant strides made in developing a large pool of skilled programmers who can contribute to the country's digital transformation.

Uzbekistan's progress in digitalization and e-government initiatives has been recognized on the global stage. In the United Nations e-government Survey ranking, Uzbekistan significantly improved its position, climbing 18 places in 2022. This remarkable advancement placed the country among the nations exhibiting a "high/very high level of development" in terms of e-government.1 Uzbekistan's progress in the field of public administration and public services, as well as in digital skills and innovation, has been recognized by the World Bank's GovTech Maturity Index. The country has witnessed a significant advancement, climbing 37 positions in the realm of public administration and public services. Additionally, in the area of digital skills and innovations in public services, Uzbekistan made an impressive leap of 65 positions. Uzbekistan's progress in the adoption and readiness for artificial intelligence (AI) has been notable, as demonstrated by its ranking in the "Government Readiness Index for Artificial Intelligence" developed by Oxford Insights. Over a span of four years, Uzbekistan has made remarkable strides, ascending from the 158th to the 79th position in the index.

According to the Decree of the President of the Republic of Uzbekistan on the strategy "Uzbekistan – 2030," a key objective is to boost the volume of IT services and software product exports to $5 billion.

In order to meet the challenges and demands of the digital age, Uzbekistan has taken proactive measures and remains committed to continually improving its educational initiatives. By providing ongoing training and development opportunities for civil servants, the country aims to equip them with the necessary skills and knowledge to adapt to the digital landscape effectively.

President Shavkat Mirziyoyev emphasized the importance of embracing digital technologies for the development of Uzbekistan, stating that every industry must keep pace with digital advancements.

Under the visionary leadership of President Shavkat Mirziyoyev, Uzbekistan has made significant strides in embracing digital technologies to enhance public administration in various sectors such as education, healthcare, and transport. This digital transformation necessitates civil servants to acquire new skills and competencies to effectively utilize digital tools.

With a $2 billion investment, including $700 million in direct funding, the country has created 14,000 well-paid jobs and supported 43,000 self-employed professionals. The my.gov.uz portal offers 570 online services used by over 8 million citizens, improving accessibility and efficiency.

In the rapidly evolving information society, where technological innovations are reshaping interaction

Literature Review

Digital competence is increasingly recognized as a critical factor in effective leadership. Previous studies highlight the importance of digital literacy, cybersecurity awareness, and proficiency in emerging technologies. In Uzbekistan, research on digital transformation remains limited, but efforts to implement digital learning platforms, e-governance systems, and industry-specific software solutions are growing. A key example is the introduction of the "E-government" system and the development of digital training programs under the Ministry of Digital Technologies of Uzbekistan.

Recent studies emphasize that managerial staff require continuous digital upskilling due to the rapid evolution of software tools and workplace technologies. For instance, BIM (Building Information Modeling) technologies have transformed management practices in the construction industry, providing enhanced project planning and decision-making capabilities. However, Uzbekistan still faces challenges in fully integrating such technologies into managerial training programs. Research findings suggest that adaptive learning software and interactive simulations significantly enhance digital competence development. This section reviews relevant literature on digital competence frameworks, training methodologies, and case studies from Uzbekistan and other comparable economies.

Learning Management Systems (LMS) for Managerial Training

To improve digital competence, educational institutions and corporate training programs in Uzbekistan utilize LMS platforms such as **Moodle**, **UzEMIS**, and **Google Classroom**. These systems support online training, digital resource management, and collaborative learning. The integration of artificial intelligence (AI) and analytics within these LMS solutions helps in tracking progress and personalizing learning experiences for managers.

Methodology

This study employs a mixed-methods research approach, combining qualitative and quantitative methods to analyze the effectiveness of existing software solutions for developing the digital competence of managerial staff in Uzbekistan. The methodology involves data collection through surveys, interviews, and case studies, ensuring a comprehensive understanding of the current digital transformation landscape.

A structured survey is distributed among managerial staff in government institutions, private enterprises, and educational organizations. The survey focuses on the frequency and proficiency of digital tool usage, challenges faced in adopting digital solutions, and the perceived impact of digital competence on managerial efficiency. In addition to surveys, semi-structured interviews are conducted with IT experts, policymakers, and corporate trainers to gain insights into the effectiveness of existing digital platforms, the training needs of managerial staff, and future trends and innovations in digital competence development.

Selected organizations that have successfully integrated digital competence training into their managerial practices serve as case studies. These cases provide detailed analysis of best practices and strategies for digital competence enhancement, the role of software tools in professional development, and measurable outcomes and improvements observed.

The collected data is analyzed using both qualitative and quantitative techniques. Descriptive statistics are used to identify trends and patterns in survey responses, while thematic analysis is applied to qualitative data from interviews and case studies to extract key themes and insights. Additionally, comparative analysis is conducted to evaluate the effectiveness of different software solutions across various sectors.

This research adheres to ethical research guidelines, ensuring confidentiality of respondents' information, informed consent from all participants before data collection, and objectivity in data interpretation and reporting.

The methodological approach adopted in this study ensures a holistic evaluation of digital competence development among managerial staff in Uzbekistan. By integrating multiple data sources, this research aims to provide actionable recommendations for improving digital training programs and software solutions in the country.

This methodology ensures a comprehensive understanding of the current digital competence landscape and provides empirical evidence for designing an optimized training solution.

Results and Discussion

The findings of this study provide insights into the current state of digital competence among managerial staff in Uzbekistan and the effectiveness of software solutions used for its development. The results are based on survey responses, interviews with key stakeholders, and case study analyses, which highlight both achievements and challenges in digital transformation.

Survey data reveal that a significant proportion of managerial staff actively use digital tools in their daily operations, particularly e-government platforms, ERP systems, and learning management systems. However, proficiency levels vary, with many managers expressing a need for additional training in data analytics, cybersecurity, and automation technologies. The most frequently cited barriers to digital competence development include limited access to

high-quality training programs, resistance to change, and insufficient localization of global software solutions.

Interviews with IT experts and policymakers indicate that organizations investing in digital competence training experience noticeable improvements in efficiency and decision-making processes. Successful case studies highlight the role of structured digital training initiatives in enhancing managerial performance. Organizations that integrate customized digital solutions tailored to their specific needs tend to report higher levels of adoption and effectiveness.

Despite these positive trends, challenges remain. The study identifies a gap between the availability of digital tools and their effective utilization. While various software solutions are accessible, their potential is not fully realized due to a lack of comprehensive training and support structures. Furthermore, concerns regarding cybersecurity and data privacy continue to pose risks for organizations undergoing digital transformation.

To address these issues, it is recommended that organizations adopt a more systematic approach to digital competence development. This includes increasing investments in targeted training programs, fostering a culture of digital adaptability, and enhancing cybersecurity measures. Additionally, software solutions should be further localized to align with the specific regulatory and linguistic context of Uzbekistan.

In conclusion, the results suggest that while Uzbekistan has made significant progress in integrating digital solutions into managerial practices, continued efforts are needed to fully harness their potential. By addressing key challenges and building on successful strategies, organizations can further enhance digital competence among managerial staff and drive sustainable digital transformation.

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