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THE ROLE AND IMPORTANCE OF DIGITALIZATION IN THE DEVELOPMENT OF THE UTILITY SECTOR IN UZBEKISTAN

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Article History	Abstract
Received: 15.05.2025 Accepted: 23.06.2025	This paper analyzes the role and significance of digitalization in the transformation of Uzbekistan's utility sector, which includes water supply, electricity, gas, waste management, and heating services. As part of the country's broader economic reforms, digital technologies are being increasingly adopted to address long-standing inefficiencies, technical losses, and service delivery challenges. The study highlights how digital tools—such as smart metering, integrated billing systems, real-time monitoring, and data analytics—can improve operational efficiency, enhance transparency, and elevate customer satisfaction. By reviewing international practices and aligning with national strategic goals, the paper offers practical insights into how Uzbekistan can overcome systemic barriers and accelerate the modernization of its utility infrastructure.

Keywords: Digitalization, utility sector, Uzbekistan, smart infrastructure, service efficiency, integrated systems, digital transformation, public services, energy management, modernization.

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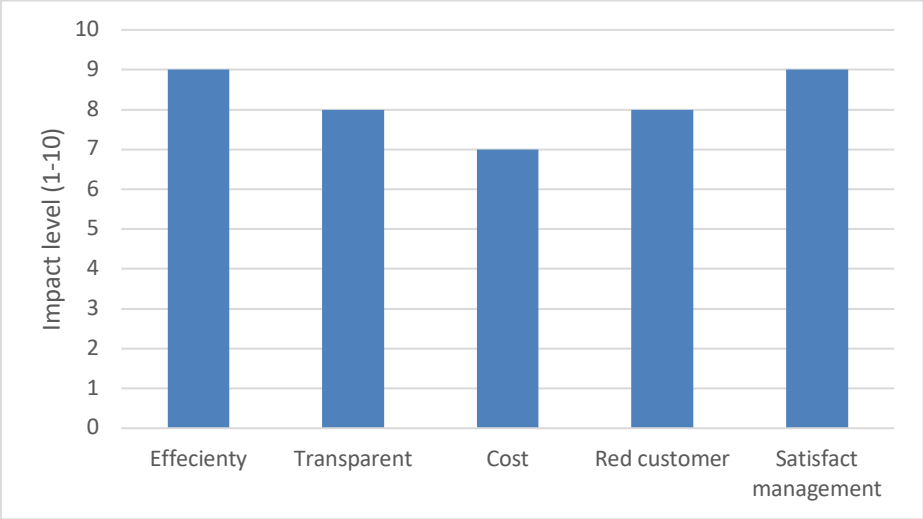
Digital transformation is becoming an integral part of economic development in the 21st century. In Uzbekistan, the utility sector — encompassing water supply, electricity, gas, waste management, and heating — is undergoing significant reforms. One of the most effective instruments for accelerating these reforms is digitalization. This paper explores the role and importance of digitalization in modernizing Uzbekistan's utility sector, drawing upon international experience, current trends, and the country's strategic goals. Despite numerous efforts, the utility sector in Uzbekistan still faces systemic issues such as service inefficiencies, high levels of technical losses, lack of consumer transparency, and poor infrastructure monitoring. Manual operations, fragmented billing systems, and outdated data collection methods lead to excessive operational costs and customer dissatisfaction.

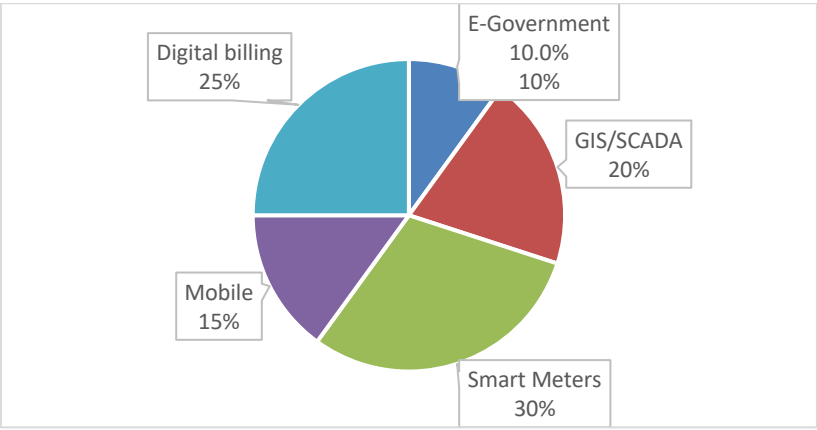
Digitalization in the utility sector introduces innovative technologies such as smart meters, Geographic Information Systems (GIS), Supervisory Control and Data Acquisition (SCADA), digital billing systems, mobile applications, and cloud-based data centers. These solutions enable real-time monitoring, accurate billing, predictive maintenance, and better customer service.



1-diagram. Key benefits of digitalization in utilities

Countries like Singapore, Germany, and Sweden have successfully implemented digital systems across their utility sectors. For instance, Singapore's PUB uses real-time sensors and digital dashboards for water management. Germany's Stadtwerke employs integrated platforms for power, heating, and waste control. These practices demonstrate that digitalization leads to resource efficiency and higher accountability.

Uzbekistan is gradually adopting smart technologies in pilot cities such as Tashkent and Samarkand. Projects include the introduction of smart water meters, automated billing, and e-governance systems for consumer feedback. The government's digital economy strategy also supports large-scale ICT infrastructure development within public services.



2-diagram. Distribution of digitalization projects in Uzbekistan

Smart Meters represent the largest share (30%) of digital initiatives due to their crucial role in resource efficiency, automation, and data collection.

Digital Billing (25%) improves financial transparency, minimizes manual errors, and boosts customer satisfaction.

Mobile Apps (15%) are gaining popularity as they offer accessible interfaces for the public but still require broader integration.

GIS/SCADA systems (20%) are central to infrastructure modernization, especially for real-time control in energy and water networks.

E-Government platforms (10%) are emerging and serve as the foundation for centralized citizen services, but adoption remains in early stages.

Digitalization leads to numerous benefits: citizens receive accurate and timely utility bills, gain access to mobile platforms for payment and feedback, and enjoy better service delivery. For the government, data-driven decision-making, reduced operational costs, and improved energy/resource planning are key outcomes.

Recommendations and Conclusion

To accelerate digital transformation in Uzbekistan's utility sector, the following recommendations are proposed:

- Expand smart meter usage in all major cities;
- Develop a unified digital utility management platform;
- Train utility staff in data management and digital tools;
- Strengthen public-private partnerships in technology adoption.

In conclusion, digitalization represents a strategic opportunity for Uzbekistan to transform its utility services. With careful planning and investment, the country can achieve a modern, efficient, and transparent utility sector that meets the needs of its people and economy.

List of references

1. Asian Development Bank (2021). *Digital Transformation of Public Utilities: Global Best Practices*. Manila: ADB Publications.

2. Ministry for Development of Information Technologies and Communications of the Republic of Uzbekistan (2023). *National Digital Economy Strategy 2023–2030*. Tashkent.

3. International Energy Agency (2020). *Smart Grids and Digitalization in the Power Sector*. Paris: IEA Publications.

4. World Bank (2022). *Digital Infrastructure for Development: Case Studies from Emerging Economies*. Washington, D.C.: World Bank Group.

5. OECD (2021). *Digital Government Index and Utility Services*. Paris: OECD Digital Economy Papers.

6. United Nations (2022). *E-Government Survey: The Future of Digital Government*. New York: UN Department of Economic and Social Affairs.

7. German Federal Ministry for Economic Affairs and Climate Action (2021). *Smart Utility Management: The German Model*. Berlin.

8. Singapore Public Utilities Board (PUB) (2022). *Water Sustainability through Smart Technology*. Singapore.

9. Statistics Agency under the President of the Republic of Uzbekistan (2024). *Digital Transformation Indicators in Public Services*. Tashkent.

10. Zaynutdinov, A. & Karimova, M. (2023). "The Role of ICT in Public Utility Reform in Uzbekistan", *Journal of Central Asian Innovations*, Vol. 5, Issue 2, pp. 58–72.