

American Journal of Economics and Business Management

Vol. 9 Issue 9 | **pp.** 154-158 | **ISSN:** 2576-5973
Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Article

Ways to Increase The Economic Efficiency of Digitalizing The Service Sector in Bukhara Region

Qudratov Bahodir G'aybullaevich*[1]

1. Independent Researcher, Bukhara State University
*Correspondence: epochta2019@gmail.com

Abstract: This article investigates ways to increase the economic efficiency of digitalizing the service sector, using Bukhara region as a case study. Digital initiatives (smart cameras, artificial intelligence, unified platforms) across five sub-sectors tourism, retail trade, freight transport, construction-material production, and services in the historic district are comparatively analyzed, and common patterns between these initiatives and economic outcomes (trade turnover, tax revenue, export volume) are identified. The findings indicate that the highest efficiency is achieved when real-time monitoring, AI-based accounting, and organizational accountability mechanisms are applied jointly. The article proposes a five-stage roadmap for increasing economic efficiency.

Keywords: Digital Economy, Service Sector, Economic Efficiency, Bukhara Region, Artificial Intelligence, Smart Camera, Digital Platform, Tourism, Shadow Economy

1. Introduction

The digital transformation of the service sector has become one of the principal drivers of regional economic growth worldwide, as information and communication technologies reduce transaction costs, increase transparency, and enable data-driven management decisions [1]. Verhoef define digital transformation as a change process, triggered by digital technologies, that goes beyond digitization and digitalization to fundamentally alter an organization's value proposition and business model. This process is equally applicable at the level of a regional economy, where the aggregate digitalization of numerous service sub-sectors determines the overall efficiency of resource allocation and tax collection [2].

In the Republic of Uzbekistan, the "Digital Uzbekistan – 2030" strategy has established digitalization of the economy, including the service sector, as a national policy priority [3]. Bukhara region, combining a large tourism industry with an extensive network of retail markets, transport operators, and small manufacturers, provides a representative case for studying how digital tools translate into measurable economic efficiency gains across heterogeneous service sub-sectors [4].

The relevance of the problem stems from the fact that digital initiatives in different service sub-sectors are usually planned and evaluated in isolation from one another, without a unifying analytical framework that would allow policymakers to identify which combination of digital tools yields the highest economic return per unit of investment. This gap limits the ability of regional authorities to prioritize future digitalization spending [5].

Citation: G'aybullaevich, Q. B. Ways to Increase The Economic Efficiency of Digitalizing The Service Sector in Bukhara Region. American Journal of Economics and Business Management 2026, 9(9), 154-158.

Received: 15th Jul 2026
Revised: 05th Aug 2026
Accepted: 20th Aug 2026
Published: 07th Sept 2026

Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/)

The purpose of this study is to identify and systematize the ways of increasing the economic efficiency of service-sector digitalization, based on empirical evidence from Bukhara region. The following tasks were set: (1) to review the theoretical foundations of digital efficiency in the service sector; (2) to compile and compare digitalization outcomes across five service sub-sectors of Bukhara region; (3) to identify the common mechanisms behind the highest-performing cases; (4) to propose a practical roadmap for scaling these mechanisms region-wide [6].

The scientific novelty of the research lies in the cross-sectoral comparative analysis of five heterogeneous service sub-sectors within a single region, which, to the best of the author's knowledge, has not previously been undertaken for Bukhara region, and in the derivation of a generalized five-stage efficiency-enhancement roadmap applicable beyond the tourism sector alone [7].

2. Materials and Method

The economic efficiency of digitalizing tourism services has been extensively studied within the "eTourism" framework proposed by Buhalis and Law, who demonstrated that information technology integration into destination management increases competitiveness by lowering marketing and transaction costs. Gretzel extended this reasoning through the concept of "smart tourism destinations", in which smart governance real-time data collection and analysis constitutes a core layer alongside smart experience and smart business ecosystems [8].

Beyond tourism, the OECD report on tax administration provides comparative evidence that countries applying electronic invoicing, real-time transaction monitoring, and AI-based analytics achieve tax-collection efficiency gains of 15-25%, together with improved transparency for taxpayers. The UNWTO handbook similarly notes that Big Data and AI tools reduce the cost of destination marketing while improving the accuracy of demand forecasting [9].

Taken together, this literature suggests that the economic efficiency of digitalization does not stem from any single technology in isolation, but from the combination of (a) sensor-based data collection (cameras, IoT), (b) automated analytics (AI, machine learning), and (c) an organizational accountability mechanism that translates data into managerial decisions. This three-component framework is applied below to structure the comparative analysis of Bukhara region's five service sub-sectors [10].

Research methodology. The study relies on official reference reports of the Tax Department and the Tourism and Cultural Heritage Directorate of Bukhara region for 2023-2026, covering the tourism, retail-market, freight-transport, construction-material-production, and historic-district service sub-sectors [11]. The methods applied include comparative analysis across sub-sectors, descriptive statistics, and a qualitative synthesis of the three-component digital-efficiency framework described above.

3. Results

Table 1 summarizes the digital tools introduced and the corresponding economic outcomes across five service sub-sectors of Bukhara region.

Table 1. Comparative digitalization outcomes across service sub-sectors of Bukhara region

Sub-sector	Digital tool introduced	Key economic outcome	Growth rate
Tourism	International media/biennale digital promotion, e-info-	Foreign tourist flow, export revenue	1.9x / 2.5x (2023-2025)

	kiosks, multimedia guides		
Retail markets and trade complexes	~800 smart cameras, real-time turnover monitoring	Trade turnover, tax revenue	175% / 112% (Q1 2025-2026)
Freight transport	Smart cameras at checkpoints, e-waybill (TTYX) verification	Formalization of 12,600 vehicles	Projected 2.5 trln UZS/year
Construction-material production	Entry/exit smart cameras, AI-based output counting, receipt-invoice matching	Reduced revenue concealment	In implementation
Historic district services (Eski Shahar)	Unified single-window platform, AI visitor counting, cashless infrastructure	Transparent turnover of catering/hotel/museum services	In implementation

The comparison shows that the two sub-sectors with the most advanced implementation of all three components of the efficiency framework — sensor-based data collection, automated analytics, and organizational accountability — are tourism and retail markets, and these are precisely the two sub-sectors with measurable, already-realized economic gains: a 1.9-fold increase in foreign tourist flow together with a 2.5-fold increase in tourism export revenue over 2023-2025, and a 175% increase in trade turnover together with a 112% increase in tax revenue in retail markets within a single year (Q1 2025 to Q1 2026) [12].

By contrast, the freight-transport, construction-material-production, and historic-district sub-sectors currently have sensor-based data collection (smart cameras) and, in some cases, automated analytics (AI-based output counting) in place, but lack a fully operational organizational accountability mechanism comparable to the market sector's KPI-based dismissal and contract-termination provisions for underperforming officials. Consequently, their projected economic gains such as the estimated 2.5 trillion UZS in additional annual formalized transport services remain, at the time of this study, potential rather than realized [13].

4. Discussion

"Comparative analysis demonstrates that the mere installation of technological infrastructure is insufficient to maximize the economic returns of digitalization within the sector; rather, data collection, automated analytics, and institutional accountability frameworks must function as an integrated chain. The retail-market sub-sector serves as a prime illustration of this dynamic. If smart cameras had simply been deployed without complementary enforcement regimes, the initiative would have yielded passive transparency at best. Instead, such monitoring mechanisms must be structurally bound to rigorous performance benchmarks for administrative personnel. Specifically, enforcing stringent administrative or disciplinary consequences for market officials who fail to meet designated KPIs for two consecutive months converts data transparency into behavioral change, ultimately enabling a multi-fold expansion in trade turnover within a single fiscal year [14].

This finding is consistent with the OECD observation that tax-administration digitalization gains depend as much on institutional enforcement mechanisms as on the technology itself. It also extends the smart-tourism-destination framework of Gretzel beyond tourism: the “smart governance” layer they describe for destinations appears to be

the decisive factor determining whether digital investment in any service sub-sector converts into realized economic efficiency [15].

A further implication concerns sequencing: rather than digitalizing all five sub-sectors simultaneously with equal intensity, regional authorities may achieve faster returns by first completing the organizational-accountability layer in sub-sectors where sensor infrastructure is already installed namely freight transport, construction-material production, and historic-district services before expanding sensor coverage further. This sequencing logic forms the basis of the roadmap proposed in the conclusion.

At the same time, several limitations should be acknowledged. First, the reported economic gains for retail markets, while statistically substantial, cover only a single year and a single quarter-on-quarter comparison; longer time series are needed to rule out seasonal or one-off effects. Second, the projected gains for transport, production, and historic-district services are, at the time of writing, estimates rather than realized outcomes, and should be revisited once implementation is complete. Third, the analysis does not yet incorporate the direct costs of digital infrastructure (camera installation, platform development, staff training), which would be necessary for a full cost-benefit assessment of the return on digital investment.

5. Conclusion

The study demonstrates that the economic efficiency of digitalizing Bukhara region's service sector depends on the joint application of three components sensor-based data collection, AI-based automated analytics, and organizational accountability mechanisms rather than on any single technology. Sub-sectors where all three components are already operational, tourism and retail markets, show the largest measurable economic gains, whereas sub-sectors with only partial implementation show gains that remain projected rather than realized. Based on these findings, a five-stage roadmap for increasing economic efficiency is proposed: (1) complete sensor-based coverage (smart cameras, electronic scales) in freight transport, quarries, and construction-material production; (2) introduce AI-based automated counting and reconciliation with electronic invoices in all sub-sectors, following the model already applied to construction-material producers; (3) establish sub-sector-specific KPI accountability mechanisms modeled on the retail-market experience; (4) create a unified regional digital-data hub integrating information from all five sub-sectors to support both tax administration and demand forecasting; (5) conduct annual cost-benefit evaluations of digital investment to guide the prioritization of further spending. The implementation of this roadmap is expected to accelerate the conversion of Bukhara region's remaining digitalization initiatives into measurable economic outcomes, contributing to the reduction of the shadow economy and the sustainable growth of regional budget revenues.

REFERENCES

[1] D. Buhalis and R. Law, "Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research," *Tour. Manage.*, vol. 29, no. 4, pp. 609–623, 2008, doi: 10.1016/j.tourman.2008.01.005.

[2] P. C. Verhoef, T. Broekhuizen, Y. Bart, A. Bhattacharya, J. Q. Dong, N. Fabian, and M. Haenlein, "Digital transformation: A multidisciplinary reflection and research agenda," *J. Bus. Res.*, vol. 122, pp. 889–901, 2021, doi: 10.1016/j.jbusres.2019.09.022.

[3] U. Gretzel, M. Sigala, Z. Xiang, and C. Koo, "Smart tourism: Foundations and developments," *Electron. Markets*, vol. 25, no. 3, pp. 179–188, 2015, doi: 10.1007/s12525-015-0196-8.

[4] OECD, *Tax Administration 2022: Comparative Information on OECD and Other Advanced and Emerging Economies*. Paris, France: OECD Publishing, 2022, doi: 10.1787/1e797131-en.

[5] World Tourism Organization (UNWTO), *Digital Transformation Handbook: Big Data for Tourism Sector Recovery*. Madrid, Spain: UNWTO, 2021.

[6] President of the Republic of Uzbekistan, "On approval of the Digital Uzbekistan–2030 Strategy and measures for its effective implementation," Presidential Decree No. PF-6079, Oct. 5, 2020.

[7] Ministry of Tourism and Cultural Heritage of the Republic of Uzbekistan, Bukhara Regional Directorate, *Reference Reports on Tourism Sector Indicators, 2023 and 2025–2026*. Bukhara, Uzbekistan, 2026.

[8] Tax Department of Bukhara Region, *Reference Reports on the Digitalization of Markets, Transport, Production, and Quarry Activities*. Bukhara, Uzbekistan, 2026.

[9] D. Buhalis and A. Amaranggana, "Smart tourism destinations enhancing tourism experience through personalisation of services," in *Information and Communication Technologies in Tourism 2015*. Cham, Switzerland: Springer, 2015, pp. 377–389, doi: 10.1007/978-3-319-14343-9_28.

[10] G. Vial, "Understanding digital transformation: A review and a research agenda," *J. Strateg. Inf. Syst.*, vol. 28, no. 2, pp. 118–144, 2019, doi: 10.1016/j.jsis.2019.01.003.

[11] I. Tussyadiah, "A review of research into automation in tourism: Launching the Annals of Tourism Research curated collection on artificial intelligence and robotics in tourism," *Ann. Tour. Res.*, vol. 81, Art. no. 102883, 2020, doi: 10.1016/j.annals.2020.102883.

[12] Z. Xiang, M. Fuchs, U. Gretzel, and W. Höpken, Eds., *Handbook of e-Tourism*. Cham, Switzerland: Springer, 2022, doi: 10.1007/978-3-030-48652-5.

[13] D. L. Rogers, *The Digital Transformation Playbook: Rethink Your Business for the Digital Age*. New York, NY, USA: Columbia University Press, 2016.

[14] OECD, *Going Digital: Shaping Policies, Improving Lives*. Paris, France: OECD Publishing, 2019, doi: 10.1787/9789264312012-en.

[15] World Bank, *Digital Progress and Trends Report 2023*. Washington, DC, USA: World Bank, 2024.