BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg
BG PULSE JOURNAL

IMPROVING THE ECONOMIC EFFICIENCY OF SMALL BUSINESSES AND ENTREPRENEURSHIP IN THE DIGITAL ECONOMY

Samarkand State Technical University
Djurayeva Maxzuna Azamovna
Munosibova Malika Ravshanjon qizi
doi:https://doi.org/10.5281/zenodo.23859097

Abstract. This article examines mechanisms through which digital transformation may improve the economic efficiency of small businesses, with particular attention to Uzbekistan. It combines descriptive country-level evidence, a critical synthesis of OECD, World Bank and UNDP research, and a conceptual firm-level evaluation framework. The study distinguishes digital access, active use and realized value, proposes performance indicators and a difference-in-differences research design, and develops a staged implementation roadmap. Sector-specific pathways, discounted cash-flow appraisal and cybersecurity constraints are discussed. The article does not claim causal estimates from enterprise-level data. Its principal contribution is an integrated framework for selecting, implementing and evaluating digital tools according to measurable productivity, profitability and resilience outcomes.

Keywords: digital economy; small business; entrepreneurship; economic efficiency; digital transformation; e-commerce; customer relationship management; labor productivity.

Introduction. Digital technologies are changing how firms interact with customers, maintain accounts, allocate resources, and sell products. For small businesses, e-commerce, digital payments, cloud accounting, and customer relationship management (CRM) systems may improve market access and reduce operating costs. Purchasing technology alone, however, does not guarantee higher productivity: results depend on staff skills, organizational readiness, and effective integration into daily processes.

According to the National Statistics Committee of Uzbekistan, the share of small business in GDP was 53.8% in 2023, 53.5% in 2024, and 52.2% in 2025 [1]. A falling share does not necessarily imply a decline in the absolute output of small businesses, because the indicator also reflects growth elsewhere in the economy. Therefore, the economic benefits of digitalization should be assessed through firm-level productivity, profitability, and process indicators rather than through GDP share alone.

Literature Review. The OECD (2024) highlights the contribution of digital tools to business resilience, market access, and streamlined internal operations while identifying persistent gaps in digital skills and technology adoption [2]. The 2025 OECD D4SME Survey focuses on artificial intelligence, financial technologies, cybersecurity, and the barriers faced by SMEs, including maintenance costs and limited time for training [3]. Its surveyed firms are not statistically representative of all SMEs, so the findings should not be generalized without qualification.

The World Bank (2025) emphasizes the financing constraints faced by micro, small, and medium-sized enterprises in Uzbekistan and the need to improve access to formal financial services [4]. This suggests that digitalization should be considered alongside finance, business capabilities, and institutional support. UNDP (2025) likewise documents opportunities and constraints in Uzbekistan's digital entrepreneurship ecosystem [6].

The analytical contribution of this article is to connect digital adoption decisions with measurable firm-level outcomes rather than treating technology expenditure as an end in itself. It distinguishes between digital access (availability of tools), digital use (integration into recurring processes), and digital value (observable changes in cost, quality, revenue, or resilience). This distinction matters because two firms can subscribe to the same software yet realize substantially different returns owing to differences in staff capability, process redesign, and customer demand.

Research Methodology. The study employs descriptive analysis of publicly available statistics, comparative review of international publications, and conceptual development of a performance measurement framework for small enterprises. The quantitative context covers 2023–2025, while the literature review focuses mainly on studies published in 2024–2025. No original enterprise survey, controlled experiment, or firm-level econometric estimation was conducted. Consequently, the proposed indicators and implementation stages are methodological recommendations, not verified causal findings.

Analytical Framework and Scope. The unit of analysis in the proposed evaluation is the enterprise-quarter. An intervention can be defined as adoption of a specific digital tool, such as cloud bookkeeping, electronic invoicing, online sales, or inventory automation. Baseline and follow-up observations should record revenue, operating expenses, employees, orders, transaction errors, and the total cost of implementation. The preferred observation window is at least four quarters before and four quarters after adoption where data are available, to reduce the influence of seasonality.

For empirical implementation, a difference-in-differences specification may be used: $Y_{it} = \alpha + \beta(Treated_i \times Post_t) + \gamma X_{it} + \mu_i + \tau_t + \varepsilon_{it}$, where Y_{it} denotes an outcome such as log revenue per worker or operating cost per transaction; $Treated_i$ identifies adopting firms; $Post_t$ identifies the post-adoption period; X_{it} includes time-varying controls; and firm and period effects account for stable firm characteristics and common shocks. The coefficient β would measure a conditional association attributable to adoption only under assumptions including parallel pre-treatment trends and the absence of major simultaneous confounding interventions. No such model is estimated in this paper.

Measurement and Evidence Boundaries. The source material combines Uzbekistan-level descriptive statistics and internationally published SME surveys. These are different populations and must not be pooled into a single representative estimate. OECD survey percentages describe respondents in surveyed countries; they are not estimates for Uzbekistan. The proposed indicators and evaluation design are methodological recommendations, not evidence of observed effects among Uzbek firms. No interviews, enterprise survey, randomized experiment, or firm-level administrative microdata were collected for this article.

Results and Analysis

Table 1. Share of small business in Uzbekistan's GDP

Year	Share (%)	Change from previous year (percentage points)
2023	53.8	—
2024	53.5	−0.3
2025	52.2	−1.3

Source: Compiled from National Statistics Committee SIAT data [1].

Between 2023 and 2025, the share of small businesses in GDP declined by 1.6 percentage points. These aggregate figures do not establish whether digital technology caused any change in enterprise performance. Instead, they provide a macroeconomic context for considering how small firms might strengthen their competitiveness.

Digital transformation can influence efficiency through three potential channels. First, operational efficiency may improve when digital accounting and inventory systems reduce errors and order-processing time. Second, market efficiency may increase through online sales and targeted digital marketing. Third, managerial efficiency may benefit from CRM systems and analytics that improve stock planning, customer retention, and decision-making.

To evaluate these mechanisms at firm level, the following indicators are proposed: labor productivity = revenue / average number of employees; net profit margin = net profit / revenue × 100%; digital sales share = digital-channel sales / total sales × 100%; customer acquisition cost = marketing expenditure / number of new customers; and average order-processing time. Measurements should be collected consistently before and after implementation, ideally alongside a comparable group of firms that did not adopt the technology.

Table 2. Proposed stages of digital transformation for small enterprises

Stage	Main activities	Monitoring indicators
1. Diagnosis	Audit business processes and costs; define baseline KPIs	Baseline metrics established
2. Core digitization	Introduce electronic accounting, payments, and inventory records	Errors and processing time tracked
3. Market expansion	Adopt e-commerce, CRM, and digital marketing	Digital sales share and acquisition cost
4. Integration	Introduce analytics, automation, and cybersecurity controls	Productivity, profitability, and security indicators

Source: Author's proposed framework informed by OECD studies [2, 3]. The indicators are intended for monitoring, not forecasts.

Investment appraisal should accompany technology adoption. A simplified return on investment measure is ROI = (incremental net economic benefit − project cost) / project cost × 100%. Economic benefit may include additional contribution margin and verified cost savings, while costs should include software, equipment, training, maintenance, and implementation. The baseline, evaluation horizon, and possible displacement of existing activities must be clearly defined to avoid overstating returns.

International Evidence and Its Transferability

The OECD 2024 D4SME survey identifies increased domestic sales, wider customer reach, and automation as frequently reported benefits of digital tools among respondents [2]. The OECD 2025 survey also points to greater use of artificial intelligence and fintech alongside persistent gaps in cybersecurity and skills [3]. These findings suggest a multi-dimensional performance perspective: growth in online orders is insufficient if acquisition costs rise faster than gross margins or if operational exposure to fraud and data loss increases.

International evidence requires cautious adaptation. Uzbekistan's small enterprises differ in sectoral composition, financing arrangements, connectivity, language, and management capacity. Consequently, policies imported from higher-income countries should be piloted and evaluated locally. The 2025 UNDP assessment documents Uzbekistan's digital entrepreneurship ecosystem and regulatory challenges [6], while the World Bank highlights persistent gaps in MSME access to formal finance [4]. Together, these sources imply that technology adoption and access to working capital are complementary rather than interchangeable constraints.

Sector-Specific Pathways to Efficiency

In retail, inventory synchronization and point-of-sale analytics can reduce stock-outs and excess inventory; useful outcomes include inventory turnover, stock-out frequency, and gross margin per transaction. In food services, online ordering can improve order capture but may increase platform fees; firms should monitor net contribution margin after commissions and delivery costs. In professional services, appointment scheduling, cloud documents, and customer databases can reduce administrative hours and missed appointments. In small manufacturing, digital production planning and equipment monitoring may improve utilization, but often require greater up-front investment and technical support.

Digital Investment Appraisal

An enterprise should compare the full incremental cash flows of a digital investment with its counterfactual operating practice. A useful appraisal is NPV = Σ[t=1…T] (B_t − C_t)/(1+r)^t − I_0, where B_t denotes incremental cash benefits, C_t recurring operating and support costs, I_0 initial implementation expenditure, and r the discount rate. Benefits should be based on incremental contribution rather than gross sales, and the model should account for employee training, downtime, cybersecurity, customer support, and software renewal. Positive NPV indicates financial attractiveness under the stated assumptions, not guaranteed performance.

For illustration only, suppose a small retailer incurs an initial digitalization cost of UZS 20 million and realizes incremental net cash benefits of UZS 9 million annually for three years, with a 15% discount rate and no terminal value. The resulting illustrative NPV is approximately UZS 0.55

million (9/1.15 + 9/1.15² + 9/1.15³ − 20, in millions). A 10% reduction in annual benefits would make the NPV negative. This hypothetical calculation is not an observed Uzbek enterprise result; it demonstrates why sensitivity analysis is necessary.

Risks and Implementation Constraints

Cybersecurity and privacy are economic efficiency issues because breaches can impose recovery costs, interruptions, reputational losses, and regulatory exposure. Minimum controls include access management, multi-factor authentication, backups, staff awareness, and vendor due diligence. A second risk is platform dependence: firms that rely on a single marketplace may face unilateral fee changes or loss of customer access. A third risk is digital exclusion where workers or customers lack the skills or connectivity to use a service. Therefore, gradual adoption should preserve accessible offline alternatives during transition.

Proposed Implementation Roadmap

Phase 1 (months 1–2): conduct a digital-readiness assessment and establish baseline indicators. Phase 2 (months 3–4): implement one high-frequency use case, such as electronic accounting or inventory control, with staff training. Phase 3 (months 5–6): integrate sales, payments, and customer records while checking data quality and security. Phase 4 (months 7–12): evaluate changes in productivity, profitability, customer retention, and operating risk; scale only the tools with demonstrated net benefits. Each phase should have an accountable manager, a cost ceiling, and predefined success thresholds.

Policy and Research Implications

A practical support package for Uzbekistan could combine diagnostic vouchers, short sector-specific training, affordable cloud subscriptions, and independent cybersecurity guidance. Financial institutions may use verified digital transaction records to improve credit assessment, subject to appropriate consent and safeguards. Policymakers should avoid measuring success solely by the number of software subscriptions or trainees: more informative indicators include the share of firms that sustain active use, changes in revenue per worker, transaction costs, survival rates, and business formalization.

Future evaluation should stratify participating enterprises by sector, region, size, and gender of ownership, then compare adopters and non-adopters with transparent matching or panel-data methods. Researchers should preregister primary outcomes and report confidence intervals, attrition, and implementation costs. Such evidence would clarify which digital interventions work, for whom, and at what cost.

Discussion

Because small enterprises face resource constraints, immediately deploying complex enterprise resource planning or AI systems may be inappropriate. A more manageable strategy is to digitize high-frequency functions first, including accounting, payments, inventory, and customer records. Technology selection should reflect firm size and sector, while employee training and data protection must advance in parallel.

Potential policy instruments include digital-readiness assessments, practical training vouchers, affordable cloud-service catalogues, and standardized guidance for measuring productivity gains.

Their effectiveness should be tested by comparing supported firms with suitably matched non-participants, rather than assuming that technology adoption automatically leads to better outcomes.

Conclusions and Recommendations

The reviewed evidence indicates that digital tools offer pathways to higher small-business efficiency, but realized benefits depend on organizational readiness and implementation quality. For Uzbekistan, five priorities emerge: (1) assess digital maturity using a simple diagnostic tool; (2) digitize accounting, payments, inventory, and sales processes first; (3) define measurable KPIs and investment costs for each project; (4) develop staff digital skills and cybersecurity practices; and (5) evaluate support programs through transparent outcome monitoring.

The main limitation is the absence of enterprise-level data and causal econometric analysis. Future research should use survey or panel data across industries and regions to test the association between digital adoption and labor productivity, controlling for firm size, sector, location, and access to finance.

References

1. National Statistics Committee of the Republic of Uzbekistan (2026). Share of small business and private entrepreneurship in GDP. SIAT. https://siat.stat.uz/data/1840/?lang=en
2. OECD (2024). SME Digitalisation to Manage Shocks and Transitions: 2024 OECD D4SME Survey. OECD SME and Entrepreneurship Papers, No. 62. https://doi.org/10.1787/eb4ec9ac-en
3. Bianchini, M., & Lasheras Sancho, M. (2025). SME Digitalisation for Competitiveness: The 2025 OECD D4SME Survey. OECD SME and Entrepreneurship Papers, No. 68. https://doi.org/10.1787/197e3077-en
4. World Bank (2025, December 15). Improved Access to Finance to Help 7,000 Businesses in Uzbekistan Grow and Create Jobs. https://www.worldbank.org/en/news/press-release/2025/12/15/improved-access-to-finance-to-help-7000-businesses-in-uzbekistan-grow-and-create-jobs
5. World Bank (2023, November 30). World Bank to Support Uzbekistan in Developing the Digital Economy and Creating New Jobs in the Information Technology Sector. https://www.worldbank.org/en/news/press-release/2023/11/30/world-bank-to-support-uzbekistan-in-developing-the-digital-economy-and-creating-new-jobs-in-the-it-sector
6. UNDP (2025, May 14). Digital Economy of Uzbekistan: The State of Digital Entrepreneurship and Artificial Intelligence. https://www.undp.org/uzbekistan/publications/digital-economy-uzbekistan-state-digital-entrepreneurship-and-artificial-intelligence
7. OECD (2026). Empowering SMEs in the Age of AI: The 2026 OECD D4SME Survey. OECD SME and Entrepreneurship Papers, No. 78. https://doi.org/10.1787/bf5a9816-en
8. Accion (2026, February 5). Unlocking Digital Adoption and Embedded Finance for Small Businesses in Central Asia: Insights from Kazakhstan and Uzbekistan.

https://www.accion.org/report/unlocking-digital-adoption-and-embedded-finance-for-small-businesses-in-central-asia/

9. Eurostat (2024). Digitalisation in Europe—2024 Edition. https://ec.europa.eu/eurostat/web/interactive-publications/digitalisation-2024