



INTELLIGENT MANAGEMENT ACCOUNTING SYSTEMS BASED ON AI: PILOT IMPLEMENTATIONS IN SMALL BUSINESSES IN SAMARKAND, UZBEKISTAN

Dilshod Farhadovich Nasirov

Senior lecturer at Samarkand Institute of
Economics and Service

Email: dilshodnasirov1967@gmail.com

Ravshanov Manuchehr Xasanovich

student of SamIES 3rd year

***Abstract.** This study investigates the feasibility and impact of artificial intelligence (AI)-enhanced tools in management accounting practices among small service enterprises in Samarkand, Uzbekistan. While national digitalization policies emphasize technological modernization, the adoption of analytical innovations—particularly AI-driven forecasting and decision support—remains underexplored at the SME level. A survey and pilot implementation were conducted with 15 small businesses (cafés, beauty salons, language centers, and retail shops) in April 2025. Results show moderate adoption of basic digital tools (e.g., 87% use mobile accounting apps), but only 27% utilize predictive features (e.g., cash flow forecasts). A lightweight AI prototype—integrated with MyBusiness and Payme APIs—was piloted in 5 firms. After 6 weeks, participants reported a 31% average improvement in short-term cost prediction accuracy and 40% reduction in time spent on managerial reporting. Key barriers included lack of data standardization (73%), low staff confidence in interpreting AI outputs (60%), and concerns about data privacy (47%). The findings suggest that low-complexity, locally adapted AI tools can add tangible value to SMEs, provided they are embedded in existing workflows and supported by digital literacy initiatives. This*

research extends the innovation literature in emerging economies by focusing on analytical (not just transactional) digital adoption in management accounting.

***Keywords:** artificial intelligence, management accounting, SMEs, digital transformation, innovation, Uzbekistan, Samarkand*

Introduction

Uzbekistan's strategic push toward a digital economy—exemplified by the Digital Uzbekistan 2030 Strategy and reforms in e-invoicing, open data, and fintech integration (Cabinet of Ministers, 2020)—has significantly increased the digital readiness of small enterprises. In Samarkand, a tourism and education hub with over 2 million annual visitors (State Committee on Tourism, 2024), small service businesses increasingly rely on mobile payments (Payme, Click), social media marketing, and cloud-based accounting (Nasirov et al., 2025).

However, as Nasirov et al. (2025) observe, innovation in Samarkand's SME sector remains concentrated in marketing and organizational domains, while *technological* and product innovations—especially those requiring data analytics or AI—are scarce. Management accounting, which bridges financial data and strategic decisions, is particularly vulnerable to stagnation: most SMEs rely on static Excel reports or basic dashboard views, lacking tools for scenario analysis, anomaly detection, or predictive budgeting.

Globally, AI is transforming management accounting through dynamic costing, real-time KPI tracking, and automated variance explanations (Warren et al., 2021; Appelbaum et al., 2020). Yet, evidence from Central Asia is virtually absent. This study addresses that gap by answering two questions:

(1) To what extent do small service enterprises in Samarkand use AI or predictive capabilities in management accounting?

(2) What are the outcomes and barriers of piloting a lightweight AI-augmented accounting tool?

Methods

A mixed-methods design combined a baseline survey ($n = 15$) with a focused pilot implementation ($n = 5$).

Sampling: 15 small service enterprises in Samarkand were purposively selected (April 2025):

- Cafés ($n = 5$), beauty salons ($n = 4$), language/education centers ($n = 3$), retail shops ($n = 3$).

- Criteria: <15 employees, ≥ 2 years in operation, use of at least one digital accounting or payment tool.

Data collection:

1. Survey: Structured questionnaire on accounting practices, tool usage, and perceived barriers (5-point Likert + open-ended).

2. Pilot: A prototype “AI Insight Layer” (AIL) was developed—a lightweight web module that connects to MyBusiness or Excel via API, applies simple ML models (linear regression + outlier detection), and generates:

- 7-day cash flow forecasts,
- Cost variance alerts (vs. budget),
- “What-if” sliders for staffing or pricing changes.

Interface was in Uzbek/Russian; training took ≤ 2 hours.

Implementation: 5 volunteers (2 cafés, 1 salon, 1 language center, 1 shop) used AIL for 6 weeks. Pre- and post-implementation metrics were recorded (forecast error %, reporting time, decision confidence scale).

Analysis: Descriptive statistics (frequencies, means) + thematic coding of interview responses.

Results

Baseline accounting practices (n = 15):

- 87% use mobile accounting apps (MyBusiness, Soliq),
- 60% generate weekly managerial reports,
- Only 4 (27%) use any predictive feature (e.g., trendlines in Excel),
- 0% employ external AI tools.

Pilot outcomes (n = 5):

Metric	Pre-AI	Post-AI (6 wks)	Change
Avg. 7-day cash flow forecast error	28.4%	19.7%	31%
Avg. time to prepare weekly report	3.1 hrs	1.9 hrs	39%
Managers "confident in forecasts"	2/5	5/5	↑

Barriers identified:

- Data inconsistency (e.g., manual entries, missing categories): 11/15 (73%)
- Staff discomfort with AI suggestions ("Why did it flag this?"): 9/15 (60%)
- Concern about sharing financial data externally: 7/15 (47%)

Qualitative feedback:

> “The forecast helped me delay hiring a new barista—turns out the ‘busy week’ was just Easter. But I still checked it against last year’s numbers.” — Café owner

> “I trust the numbers more when I see the reason: ‘Variance due to 40% drop in group bookings’—that’s useful.” — Language center manager

Discussion

This study confirms the “low-threshold innovation” pattern found by Nasirov et al. (2025)—SMEs readily adopt transactional digital tools but hesitate at analytical ones. Yet, the pilot demonstrates that even simple AI augmentations can deliver measurable value when designed for local constraints: lightweight, offline-capable, integrated with familiar platforms (e.g., MyBusiness), and explainable.

The high concern about data privacy (47%) reflects broader regional caution—not hostility to AI, but demand for *trusted* deployment. This aligns with Audretsch et al. (2022), who stress that in emerging economies, perceived control over technology is as important as its functionality.

Practical implications:

- Promote “AI-as-a-plugin” models, not full ERP replacements.
- Embed explainability (e.g., plain-language reasons for alerts).
- Partner with local universities (e.g., SamIES) for student-led “AI mentoring” programs.

Limitations: Small pilot size; no control group. Future work should test scalability and long-term behavioural impact.

Conclusion

AI-enhanced management accounting is neither science fiction nor out of reach for Uzbek SMEs. With thoughtful design and contextual adaptation, even minimal AI integration can improve financial foresight and operational agility. As Samarkand's service economy grows, supporting analytical innovation—not just digital presence—will be key to sustainable competitiveness. This study offers a replicable model for “frugal AI” in resource-constrained settings and contributes empirical insight from an underrepresented region.

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