AI ADOPTION IN UZBEKISTAN'S SMES: A CONCEPTUAL FRAMEWORK LINKING WORKFORCE SKILLS AND ORGANIZATIONAL AGILITY

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Abstract. *This article examines how workforce skills may help small and medium-sized enterprises (SMEs) in Uzbekistan incorporate artificial intelligence (AI) into everyday work and respond more readily to changing business needs. Drawing on a purposive review of academic studies and policy reports, it combines the Technology-Organization-Environment (TOE) framework with absorptive capacity theory. The relationships it proposes are contingent on whether tasks are suited to AI, whether reliable information is available and how firms organize decision-making. In micro-enterprises, external advice and the owner's direct involvement are likely to matter most. The central argument is that regular AI use contributes to agility only when a firm can evaluate the knowledge it gains and build it into its procedures. Three propositions and a monitoring matrix turn this argument into questions for future research and programme evaluation. The framework has yet to be tested empirically.*

Keywords: *artificial intelligence; SMEs; absorptive capacity; organizational agility; Technology–Organization–Environment framework; Uzbekistan.*

Introduction

For a small business, the value of AI depends in large part on whether employees can use it reliably in their daily work. Yet training may achieve little if the firm lacks usable records, time to experiment or a clear allocation of responsibility for checking outputs. Resolution PQ-358 of 14 October 2024 makes AI infrastructure, skills and responsible development national priorities in Uzbekistan [1]. This article considers how those priorities might be pursued inside firms that differ widely in resources and management practice. Its central question is how workforce skills contribute to organizational agility, and under what conditions that contribution is likely to be limited.

Review method and evidence selection

The review drew on a core set of academic and policy documents, supplemented by targeted searches conducted in October 2026. Searches combined terms such as "artificial intelligence", "SMEs", "absorptive capacity" and "organizational readiness", and the publication pages of UNDP Uzbekistan were searched for material on AI, skills and SMEs. Recent evidence was limited to 2022–2026, while earlier foundational theory was included where it supplied core concepts. A source was retained if its authorship and content could be verified and it dealt with AI-related learning, SME adoption or Uzbekistan's institutional setting. Duplicates, inaccessible texts and material outside this scope were excluded. The review is therefore purposive rather than exhaustive.

The eleven documents cited comprise two foundational works, four recent journal articles, four institutional reports and one policy instrument. Each was read for what it says about skills, organizational learning, adoption conditions and business outcomes. The theoretical works supplied definitions, the journal studies informed the proposed relationships and the local reports provided contextual evidence. PQ-358 was used to identify policy priorities and is not treated as evidence of

policy effectiveness. All selection and interpretation were carried out by the author, so the synthesis shares the limitations of a small and deliberately selected evidence base.

Theoretical integration

The TOE framework [10] distinguishes three sets of conditions for adoption. Technological conditions include the suitability of available tools, the availability of task-specific data and the tools' performance in Uzbek. Organizational conditions include the owner's commitment, available resources and the allocation of decision-making responsibility. Environmental conditions include connectivity, the supply of training and policy support. Workforce skills belong to the organizational context, but how much they achieve in practice depends on conditions in all three.

Cohen and Levinthal [11] define absorptive capacity as a firm's ability to recognize the value of external knowledge, assimilate it and apply it to commercial ends. Employees' digital literacy forms part of this foundation. Organizational learning, however, also requires that people share what they have learned, check unfamiliar outputs and revise established procedures, which is why individual competence and collective learning are treated here as separate. Three further terms are used throughout. Readiness refers to the resources and arrangements in place before adoption; embedded use means regular and accountable application of AI within a business process; and agility is the ability to adjust decisions or workflows as needs change.

Atienza-Barba et al. [2] review the growing literature on AI and agility, and Wang et al. [3] examine how AI, dynamic capabilities and innovation resilience are related in Chinese listed firms. Both studies inform the argument developed here, although how far their findings apply to Uzbek SMEs is uncertain. Abdullayev's AI–SAMARA model [4] deals with phased implementation in Uzbekistan itself. Building on this work, the present article asks why training and routine use may lead to little real adaptation when firms have few opportunities for collective learning or limited access to practical support.

Conditions affecting adoption in Uzbekistan

Consultations conducted by UNDP point to a shortage of specialists, limited AI literacy among executives, weak links between industry and academia, and insufficient Uzbek-language datasets [5, pp. 34–40, 48–49]. These are barriers reported by stakeholders, not adoption patterns measured in a nationally representative sample. Magendzo [6] and Khursanaliyev et al. [7] also underline the role of institutional networks and regional differences. All three sources describe conditions at the time they were prepared, and infrastructure and support services may have changed since.

Management practices vary considerably, even among formally registered firms. Where orders are kept in notebooks or messaging applications and cash sales leave incomplete records, a forecasting tool will have little dependable information to work with. An owner-run firm can still make good use of a supervised drafting assistant, provided it works from approved source material and keeps a simple log of corrections. A larger SME, by contrast, may employ digital staff and follow formal approval procedures. For this reason, legal registration and the degree to which management procedures are documented should be assessed separately.

Regional comparisons likewise need to look at actual access to services. Firms in Tashkent, the Fergana Valley and Samarkand may differ in connectivity and in access to advisers, but location by itself says little about a firm's readiness. Shared technical assistance could support firms that have no specialists of their own. Data needs depend on the task: inventory prediction requires reliable historical records, whereas supervised drafting can start from accurate product information. In either

case, the tool should be tested in the language that employees and customers actually use.

Conditional propositions

P1. Task-specific workforce skills are more likely to support regular, accountable AI use when the available tools meet the firm's language and information needs. Access to external assistance is expected to have a stronger effect on this relationship in micro-enterprises without IT staff than in firms with dedicated digital capacity.

P2. Organizational readiness strengthens the relationship between workforce skills and embedded AI use. The arrangements that support this relationship differ with management practice: owner-led firms rely on personal accountability and simple records, whereas firms with distributed authority need documented review and escalation procedures.

P3. Absorptive capacity strengthens the relationship between embedded AI use and organizational agility. Among firms that use AI to a similar extent, those that share and evaluate the resulting knowledge and revise their procedures accordingly are more likely to adapt successfully. The proposed indirect link between skills and agility therefore depends on how firms learn from use.

Testing these propositions will require longitudinal data. A study could assess skills and readiness before adoption, follow changes in use and learning practices over time, and then examine subsequent adjustments to business processes. Comparisons should take account of firm size, management practices and location. Researchers should also allow for reverse causality, since firms that are already adaptable may be more inclined to adopt AI in the first place.

Policy application and evaluation

Table 1 links the priorities of PQ-358 [1] to possible firm-level measures, following UNDP's guidance on setting baselines and reviewing results [9]. These measures are proposed for evaluation purposes only and are not official strategy indicators. Training providers could rely on practical assessments, and business-support organizations could compare anonymized pilot results across firm sizes and regions. Where a project involves regulatory questions that call for supervised experimentation, an AI sandbox offers a further route [8].

Table 1. Proposed indicators aligned with PQ-358

Strategy priority	**Firm-level measure**	**Evidence and responsibility**
Skills development	Verified task competence before and after training	Owner or provider assessment
Data infrastructure	Required inputs checked for completeness and language fit	Checklist or sample audit
Responsible AI	Reviewed outputs and correction records	Named owner or review team
Economic application	Time to implement a quality-approved workflow change	Baseline and follow-up log

As a hypothetical illustration, consider an owner-run retailer that tests draft customer replies against approved product information. A pilot of this kind could be evaluated before the firm invests in inventory prediction based on incomplete sales records. It should compare similar tasks and include

the costs of training, subscriptions, review and rework. Beyond time saved, the evaluation should examine output quality, privacy incidents and the changes that were actually made to the business. Shared advisers or training vouchers could also be piloted as ways of supporting firms with limited resources.

Conclusion

Workforce training is likely to be most useful when a firm has suitable tasks, dependable information and clear responsibility for AI-supported work. Under those conditions, sustained learning may allow routine use to develop into a greater capacity to adapt. The framework set out here specifies these relationships and proposes measures for examining them in Uzbekistan's SMEs. Whether it holds will depend on empirical studies that test the propositions across firms of different sizes, with different management practices and in different regions.

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