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ARTIFICIAL INTELLIGENCE ADOPTION AMONG UKRAINIAN SMALL AND MEDIUM ENTERPRISES UNDER WARTIME LABOUR SCARCITY

Estimates of Ukraine's reconstruction needs now approach 588 billion US dollars, close to three times the size of the country's annual output [1]. A less visible process sits behind that headline figure: Ukrainian companies have been turning to artificial intelligence at a pace that has little precedent in a peacetime economy. This paper asks why small and medium enterprises in Ukraine report using AI more often than their counterparts across the EU-27, and argues that the answer lies in wartime labour scarcity rather than in any ordinary story of digital catch-up.

The civilian workforce has shrunk from several directions simultaneously since the full-scale invasion began. More than a million people are serving in the armed forces, roughly 1.6 million veterans had already returned to civilian life by January 2025, and internal displacement affects another 4.6 million people [2]. A Mastercard-commissioned survey found that staff shortages are the single most frequently cited operating constraint among SME owners, and that as many as 15 to 16 percent of businesses had still not resumed even partial activity by 2024 to 2025 [3]. For many firms the binding constraint is not money or premises but the absence of people willing or able to do the work.

Set against that context, the 21 percent AI adoption rate reported among Ukrainian SMEs, well above the 13.5 percent EU-27 average for the same year, deserves closer attention [4]. Ukraine's employment rate hovered around 62 percent in 2024, the weakest figure among the European economies it is typically compared with [4]. Conventional accounts of digitalisation expect it to move together with development and institutional strength. Ukraine does not fit that expectation, and the mismatch between the two pictures is the puzzle this paper sets out to explain.

A plausible explanation is that firms are turning to AI less to modernise than to keep operating with fewer people. Independent

monitoring by VoxUkraine finds meaningful shares of Ukrainian enterprises already using cloud infrastructure and data-driven tools to run day-to-day operations, a notable outcome given how many of these businesses function under fire or have had to relocate since 2022 [5]. A large majority of entrepreneurs have shifted sales and customer contact onto digital channels, cutting their reliance on physical premises and on staff who would otherwise be needed on site. Read together, these patterns look less like enthusiasm for new technology and more like firms improvising a way to keep functioning.

The consequences reach beyond Ukraine's own recovery and speak to how AI adoption should be treated in any post-conflict setting. The familiar distinction between tasks computers substitute and tasks they complement, drawn from peacetime labour economics, takes on sharper stakes here. Where the workforce has genuinely contracted, the relevant question is not simply whether AI displaces workers but whether it allows economic activity to continue at all until that workforce is rebuilt. Used to support the productivity of the staff who remain, AI buys time for reconstruction to catch up with conditions on the ground. Used carelessly, it risks shutting out the very groups whose return to work the recovery depends on: veterans coping with injury or post-traumatic stress, women carrying a disproportionate share of caregiving duties, and firms in frontline oblasts cut off by damaged transport and communications.

Two groups deserve particular policy attention for this reason. Veterans returning to civilian life often need support that a purely digital, self-service process cannot provide on its own, while businesses in frontline regions face connectivity and infrastructure constraints that limit how far AI-based tools can substitute for lost staff. Should AI-driven reconstruction concentrate its benefits where these constraints are weakest, a tendency documented in earlier post-conflict recoveries, these groups risk falling further behind even as adoption accelerates elsewhere in the economy.

There is also a question of how long this adoption will last. Behaviour adopted out of necessity during active conflict need not persist once that necessity eases. Firms that turned to AI to cope with staff shortages may scale it back once mobilisation ends and displaced workers return home, unless reconstruction finance treats AI capacity as an asset worth protecting rather than a temporary wartime fix. Ukraine's subsidised lending scheme for entrepreneurs, which had already channelled tens of billions of hryvnias to tens of thousands of businesses by mid-2025,

illustrates one existing mechanism that could be adapted to condition continued support on sustained digital investment.

Taken together, the evidence assembled here points to a single conclusion: AI adoption among Ukrainian SMEs should be read as a sign of strain and adaptation under labour scarcity, not simply as evidence of economic strength. Treating this adoption as a secured, permanent gain, rather than as a fragile wartime response that will need deliberate support to outlast the conditions that produced it, risks squandering one of the few genuine advantages Ukraine currently holds over its regional peers.

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