

Assessing Enterprise Readiness for Artificial Intelligence Adoption and its Impact on Economic Performance

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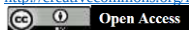
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ABSTRACT

This article examines the organizational, technological, and economic conditions that determine enterprise readiness to adopt artificial intelligence (AI) technologies and analyzes the relationship between AI readiness and economic performance. In the context of accelerating digital transformation, successful AI implementation requires not only access to advanced technological solutions but also the effective integration of digital infrastructure, high-quality data, qualified personnel, mature business processes, managerial support, and sufficient financial resources. The study aims to develop a comprehensive methodological framework for assessing enterprise readiness and identifying the potential economic effects of AI adoption. Using systems analysis, comparative assessment, indicator normalization, and conceptual modeling, the research proposes an integrated AI Readiness Index (AIRI) consisting of six interconnected components: technological infrastructure, data quality, human capital, business process maturity, managerial readiness, and financial capacity. Furthermore, the article develops a conceptual model linking AI readiness with labor productivity, operating costs, managerial decision-making quality, revenue growth, and profitability. An “AI readiness–economic effect” matrix is introduced to classify enterprises according to their preparedness and potential economic benefits, providing a basis for selecting appropriate implementation strategies. The proposed approach emphasizes the importance of identifying organizational limitations, evaluating investment risks, and prioritizing economically justified AI projects. The findings provide a conceptual foundation for improving strategic decision-making and resource allocation. The study concludes that systematic readiness assessment can support more effective AI integration, strengthen organizational competitiveness, and contribute to sustainable economic development through improved operational efficiency and innovation capacity.

Introduction

Artificial intelligence is becoming one of the key drivers of transformation in the modern economy and management. Its applications are expanding from the automation of individual routine tasks to demand forecasting, inventory management, customer personalization, intelligent document analysis, and strategic decision support. At the same time, the economic effects of AI vary considerably across enterprises. This variation arises because a technological solution produces results only when an appropriate organizational, informational, and human-capital environment is in place. According to the OECD, in 2025 the share of enterprises using AI in countries with comparable data reached 20.2%, up from 14.2% in 2024 and 8.7% in 2023. A substantial gap by business size remained: AI was used by 52.0% of large enterprises and 17.4% of small enterprises. These differences indicate that AI adoption depends not only on the availability of technology, but also on resources, skills, digital infrastructure, and an enterprise’s managerial capabilities.

Under these conditions, two interrelated questions should be addressed before large-scale AI adoption begins: how ready is the enterprise to use AI, and what economic effect can be expected at its current level of readiness? Ignoring the first question increases the risk of costly pilot projects that cannot be scaled and fail to produce sustainable economic outcomes. The aim of this study is to develop a methodological approach for comprehensively assessing enterprise readiness to adopt artificial intelligence technologies and to substantiate the mechanism through which this readiness affects economic performance.

Literature review

Contemporary research treats artificial intelligence as a general-purpose technology capable of influencing productivity, innovation, and the structure of economic activity. F. Filippucci, P. Gal, C. Jona-Lasinio, A. Leandro, and G. Nicoletti note that AI's potential contribution to productivity growth depends on the scale of adoption, the nature of the tasks performed, and organizations' ability to adapt their processes and human capital [1]. A study by the OECD, Boston Consulting Group, and INSEAD on AI adoption in firms identifies workers' skills, data availability, cloud and digital infrastructure, organizational capabilities, financing, and a supportive institutional environment as key conditions for diffusion [2]. Enterprise readiness should therefore be assessed across multiple dimensions. In modelling the macroeconomic effects of AI in G7 economies, F. Filippucci, P. Gal, K. Laengle, and M. Schief link expected productivity gains not only to the technological exposure of industries, but also to the pace of actual AI adoption [3]. This reinforces the need to include adoption readiness in models of expected impact. OECD research on digital diffusion shows that human and technological capital are critical factors in the adoption of advanced technologies. Firms using AI tend to have higher productivity on average, although some of this advantage reflects stronger initial capabilities and a more developed digital foundation [4]. Small and medium-sized enterprises face particular constraints, including skills shortages, adoption and maintenance costs, limited management time, and cybersecurity concerns. Economic assessments of AI should therefore consider not only potential benefits but also the costs of organizational adaptation [5]. Thus, the literature examines in considerable detail the drivers of AI diffusion and its potential effects on productivity. For practical management, however, a tool is needed that consolidates readiness factors into an integrated assessment and links this assessment to an enterprise's economic indicators.

Research methodology

The object of the study is enterprises considering the adoption or scaling of artificial intelligence technologies. The subject is the set of organizational and economic relationships associated with building AI readiness, selecting AI projects, and assessing their effects on economic outcomes.

The study employs systems and comparative analysis, classification, the index method, expert assessment, indicator normalization, matrix analysis, and conceptual modelling.

Enterprise readiness is assessed through six components: T — technological infrastructure; D — data and data quality; H — human capital and AI competencies; P — business process maturity; M — managerial and strategic readiness; and F — financial readiness.

The integrated AI Readiness Index is defined as follows:

$$AIRI = w_1T + w_2D + w_3H + w_4P + w_5M + w_6F$$

where AIRI is the AI Readiness Index; T, D, H, P, M, and F are normalized scores for the components, ranging from 0 to 1; $w_1 \dots w_6$ are weighting coefficients; and the sum of the weights equals 1. Equal weights may be used in an initial diagnosis. For sector-specific application, however, expert assessment or the analytic hierarchy process is recommended for determining the weights.

The AIRI is interpreted as follows: 0.00–0.39 — low readiness; 0.40–0.59 — basic readiness; 0.60–0.79 — high readiness; and 0.80–1.00 — strategic readiness to scale AI. These ranges are methodological benchmarks proposed by the authors and require empirical calibration.

Analysis and results

For practical diagnosis, each AIRI component is defined through a set of measurable indicators.

Table 1

A system for assessing enterprise readiness to adopt AI

Component	Key indicators	Managerial question	Expected outcome
T. Technology	Cloud infrastructure; system integration; computing capacity	Can the infrastructure support the AI solution?	Technical scalability
D. Data	Completeness; accuracy; accessibility; common reference data; security	Is high-quality data available for AI training and use?	Reliable analytics
H. Competencies	AI literacy; analytical skills; availability of specialists; training	Can employees use and oversee AI?	Higher productivity
P. Processes	Standardization; digitalization; measurability; KPIs	Are processes ready for automation?	Less time and fewer losses
M. Management	AI strategy; project sponsor; governance; risk management	Is the AI project linked to strategic objectives?	Manageable investment
F. Finance	Budget; total cost of ownership; expected benefits; capacity to pilot	Is adoption economically justified?	Payback and sustainability

A distinction must be made between technological availability and organizational readiness. An enterprise may purchase an off-the-shelf AI service, but without structured data, process owners, and criteria for success, the technology may be used sporadically and have no effect on economic indicators.

The economic effects of AI adoption are assessed across five dimensions: change in labor productivity (ΔLP), reduction in operating costs (ΔOC), change in quality and losses (ΔQ), revenue growth (ΔR), and change in profitability (ΔP). The integrated AI Economic Impact Index (AI-EI) may be used to compare projects:

$$AI-EI = \beta_1 \Delta LP + \beta_2 \Delta OC + \beta_3 \Delta Q + \beta_4 \Delta R + \beta_5 \Delta P$$

The indicators should be normalized so that an increase in each component represents an improvement. Costs and losses should be reverse-normalized. The β weights are determined in accordance with the enterprise's strategic priorities.

Table 2

Channels through which AI affects economic performance

Area	Example AI application	Measurable indicator	Economic effect
Productivity	AI assistants; document automation	Output per employee; processing time	Higher output with the same resources
Costs	Forecasting; automation of routine tasks	Cost per operation; labor input	Lower unit costs
Quality	Intelligent inspection; anomaly detection	Errors; defects; returns	Reduced losses
Revenue	Personalization; demand forecasting; recommendations	Conversion; average transaction value; sales	Revenue growth
Management	Analytics and decision support	Decision speed and accuracy	Lower managerial risk

The relationship between readiness and results can be expressed as follows: Economic Effect = $f(AIRI, AI \text{ intensity, process characteristics, market conditions})$. Other things being equal, a higher AIRI

increases the likelihood that AI investment will translate into measurable economic benefits. The relationship is not necessarily linear: at low readiness levels, additional expenditure on sophisticated AI solutions may generate only limited returns.

An “AI readiness–expected economic effect” matrix is proposed to support decision-making.

Table 3

“AIRI–economic effect” matrix

Situation	Readiness	Impact potential	Recommended strategy
I	Low	Low/uncertain	Do not scale AI; prepare data, processes, and competencies
II	Low	High	Run a limited pilot while addressing critical gaps
III	High	Low	Reassess the business case and select a process with greater economic value
IV	High	High	Scale the AI solution and integrate it into the KPI and control system

An economic assessment should include not only direct software costs but also the total cost of ownership: integration, data preparation, employee training, information security, maintenance, and business process changes. The study proposes the following AI-ROI measure:

$$\text{AI-ROI} = (\text{EAI} - \text{CAI}) / \text{CAI} \times 100\%$$

where EAI is the annual measurable economic benefit of the AI project, and CAI is the total cost of implementation and operation over the corresponding period. The payback period and the sensitivity of results to changes in technology costs, usage volume, and data quality should also be considered.

Establishing a baseline for performance indicators before implementation is particularly important. If process time, labor input, errors, cost per operation, and customer indicators were not measured before adoption, the enterprise will be unable to determine the contribution of AI reliably after implementation.

The proposed model may be tested in future research using the following econometric specification: $\text{ROA}_i = \alpha + \beta_1 \text{AIRI}_i + \beta_2 \text{AI}_i + \beta_3 (\text{AIRI}_i \times \text{AI}_i) + \beta_4 \text{SIZE}_i + \beta_5 \text{CAP}_i + \varepsilon_i$. A positive and statistically significant coefficient for the $\text{AIRI} \times \text{AI}$ interaction would indicate that the economic returns from AI adoption increase as enterprise readiness improves. Alternative dependent variables may include labor productivity, return on sales, operating costs per unit of output, and revenue growth. This would make it possible to test empirically not only whether AI readiness affects economic performance, but also the specific channels through which it does so.

Discussion

The findings should be interpreted within the study design and the scope of the original source materials. The analytical framework identifies relevant relationships and practical implications, but further independent data collection and empirical validation are necessary before generalizing its proposed mechanisms to all enterprises.

Conclusion and recommendations

The study concludes that artificial intelligence adoption should be viewed as an organizational and economic transformation, rather than the acquisition of a standalone digital product. Economic results emerge when technological infrastructure, data, competencies, processes, management systems, and financial resources are developed in a coordinated manner. The proposed AI Readiness Index (AIRI) provides a basis for preliminary enterprise diagnosis and helps identify constraints before significant investments are made. Used together with indicators of productivity, costs, quality, revenue, and profitability, it links digital readiness to specific economic outcomes. Before launching an AI project,

enterprises are advised to audit their data and processes; establish baseline KPIs; assign an owner responsible for realizing the business benefits; begin with processes that combine high economic value and good data quality; assess total cost of ownership; develop users' AI competencies; establish rules for quality control, security, and accountability; and scale a solution only after the pilot project has demonstrated measurable benefits. The scientific contribution of the proposed approach lies in integrating the assessment of organizational AI readiness with enterprise economic outcomes and treating readiness as a factor that can amplify or constrain returns from AI technologies. Further research should empirically test AIRI on a sample of enterprises and determine industry-specific weights and threshold values.

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