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FORECASTING THE IT INDUSTRY MARKET: FROM FINANCIAL INDICATORS TO CROSS-INDUSTRY IMPACT

The accelerating pace of technological change poses fundamental challenges to labour markets across all sectors of the economy. The IT industry has moved beyond its traditional role as a self-contained sector and has become a structural force reshaping the broader economy. Artificial intelligence, robotics, and automation are penetrating every industry simultaneously, fundamentally altering the economic logic of production, employment, and service delivery. Thousands of workers are currently being forced to change their careers due to technological shifts they did not anticipate, and existing analytical frameworks rarely account for the regulatory dimension of this process. This paper pursues two interconnected objectives. First, it analyses IT market dynamics at both global and national levels, drawing on data from the National Bank of Ukraine, the OECD, Gartner, and the World Bank. Second, it proposes the Regulatory Automation Barrier Index (RABI) as an original composite metric for measuring the degree to which a profession's institutional and regulatory framework shields workers from technological displacement. The index comprises three equally weighted dimensions: Licensing Stringency (LS), which captures formal entry requirements; Legal Exclusivity (LE), which reflects the extent to which legislation prohibits non-human agents from performing core professional functions; and Regulatory Update Frequency (RUF), scored inversely to reflect institutional adaptability. The composite index is calculated as RABI = (LS + LE + RUF) / 3. Empirical results show that global IT spending reached $5.26 trillion in 2024 and is forecast to reach $6.15 trillion in 2026, with annual growth of 10.8%. Investment in generative AI grew from $4 billion in 2022 to $25.2 billion in 2023. Ukraine's IT sector accounts for 4.9% of GDP, with a documented structural shift from outsourcing toward product-based development between 2021 and 2023. RABI scores for selected occupations range from 0.10 for warehouse operators to 0.85 for notaries. The framework reveals that sustainable workforce planning requires an interdisciplinary lens integrating economic analysis, legal regulation, and technology foresight.

Ключові слова: *automation, sustainable employment, labour market, regulatory barriers, digital transformation, artificial intelligence, RABI, workforce planning*

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INTRODUCTION

The starting point for this paper was a recurring pattern in conversations with professionals across different fields: software developers worried about being replaced by AI, while lawyers, doctors, and accountants largely assumed the disruption would affect someone else. That asymmetry seemed worth examining. The relationship between technological change and economic structure has been a central concern of economic research for decades. Schumpeter's concept of creative destruction, later built on by Acemoglu and Restrepo (2018) in their task-based framework, helps explain how automation reshapes labour demand across sectors. More recent contributions, including Brynjolfsson and McAfee (2014), have argued that the pace of digital transformation has accelerated to a point where institutional and regulatory frameworks struggle to keep pace. Against this backdrop, the IT industry has undergone a fundamental shift: from a specialised sector serving other industries to a pervasive force reshaping them from within.

Analysis of recent research and publications

Historical precedent offers a useful lens through which to interpret the current moment. The US agricultural sector is a useful reference point. In 1800, approximately 90% of Americans were employed in farming. By the early 20th century this share had fallen to 40%, and by the end of the century to below 2%. The sector did not disappear, but mechanisation and technological progress fundamentally altered its labour intensity and its share of total employment. Economists such as Autor (2015) have drawn similar parallels to the ongoing digital transformation, noting that while previous waves of automation primarily displaced routine manual tasks, the current wave driven by artificial intelligence increasingly affects non-routine cognitive work. A process similar in nature to the agricultural transformation, yet significantly faster and broader in scope, is now unfolding across all industries simultaneously.

The **PURPOSE** of this paper is to analyse IT market dynamics at both global and national levels and to propose the Regulatory Automation Barrier Index (RABI) as an original composite metric for measuring the institutional protection of professions against technological displacement.

RESEARCH METHODS

The study draws on secondary macroeconomic data from the National Bank of Ukraine, OECD, Gartner, and the World Bank, combined with the development of the original RABI composite index. The index integrates three equally weighted dimensions: Licensing Stringency (LS), Legal Exclusivity (LE), and Regulatory Update Frequency (RUF), assessed against OECD jurisdictional norms using publicly available regulatory documentation and the OECD Employment Outlook (2023) as the primary reference source.

RESULTS

The central argument of this paper is that IT is no longer a sector developing in parallel with others. Artificial intelligence, 3D printing, and automation are penetrating every industry without exception, fundamentally altering the economic logic of production and service delivery. A concrete illustration of this dynamic is Nautilus Technology (Germany), a company familiar to the author from practice, applying AI and robotics to industrial infrastructure inspection, a field where specialists have traditionally been subject to mandatory certification under DIN EN ISO 9712 standards.

The emergence of such companies represents a broader pattern: digital technologies are entering domains previously considered resistant to automation by virtue of their specialised knowledge requirements. In the context of this transformation, analysing the IT market cannot be reduced to the sector's financial indicators alone. According to the National Bank of Ukraine, the IT sector accounts for 4.9% of GDP, with its contribution to gross value added reaching $5.5 billion. Yet these figures capture only the direct economic footprint of the sector, without accounting for the cross-industry multiplier effects that arguably constitute its most significant economic contribution.

The scale of this shift is visible in the numbers. According to Gartner, worldwide IT spending reached $5.26 trillion in 2024 and is forecast to reach $6.15 trillion in 2026, growing at 10.8% annually. The OECD Digital Economy Outlook 2024 shows that ICT sectors across OECD countries grew roughly three times faster than their overall economies in 2023. Investment in generative AI alone grew from approximately $4 billion in 2022 to $25.2 billion in 2023, representing an almost eightfold increase in a single year (Stanford AI Index 2024). Part of what makes this wave different from previous ones is that the initial surge was largely unregulated – new technology, new capital, and few legal constraints. The harder phase comes now, when deployment runs into existing professional licensing frameworks, liability rules, and institutional inertia. Table 1 compares ICT growth against GDP growth across selected countries. Germany's ratio is listed as n/a because total GDP contracted in 2023, making a meaningful ratio impossible to calculate, not because data are unavailable.

The intersection of technology and professional regulation represents a dimension of digital transformation that economic analysis frequently overlooks. Professions such as lawyers, physicians, and notaries are protected by licensing and certification requirements embedded in national and supranational legal frameworks. These requirements create a temporary institutional buffer for the relevant labour markets, slowing the pace at which automation can displace human practitioners even when the underlying technology would otherwise permit it. The economic viability of a given technology and its legal permissibility are therefore two distinct and equally important variables in any model of occupational automation risk. According to the OECD Employment Outlook 2023, when considering all automation technologies including AI, 27% of jobs in OECD countries are in occupations at high risk of automation. More specifically, the OECD explicitly identifies occupations in finance, medicine, and legal activities as being among those most exposed to AI-driven disruption, noting that these fields may suddenly find themselves at risk of automation. This represents a significant departure from earlier assumptions, notably those of Frey and Osborne (2013), which positioned high-skill professional occupations as relatively insulated from technological substitution.

What prompted the development of RABI was a gap in existing frameworks: most models of automation risk treat regulatory barriers as background noise rather than as a core variable. Yet in practice, the question of whether a profession can be automated is often less about technological readiness and more about what the law permits. A company may have the technology to replace a notary or a licensed inspector, but cannot legally deploy it until regulations change. RABI tries to make that distinction measurable. The index comprises three dimensions: Licensing Stringency (LS), which captures formal entry requirements including years of education and mandatory examinations; Legal Exclusivity (LE), which reflects how explicitly the law reserves core professional functions for human practitioners; and Regulatory Update Frequency (RUF), scored inversely, since frameworks that rarely change offer stronger short-term protection but accumulate greater disruption risk over time. The composite index is RABI = (LS + LE + RUF) / 3. To give a practical sense of how it works: a notary in most OECD jurisdictions scores around 0.85, meaning that even if AI could perform notarial functions today, the legal and institutional barriers would likely delay meaningful displacement by a decade or more. A warehouse operator, by contrast, scores around 0.10 – the technology is viable, the law does not stand in the way, and economic incentives in high-wage countries already make automation attractive. Table 2 presents scores for five occupations.

The RABI framework reveals that the conventional binary distinction between automatable and non-automatable occupations is analytically insufficient. Professions with high RABI scores are not immune to technological displacement but are rather buffered by institutional inertia, meaning that the timeline for disruption is extended rather than eliminated. Industrial inspection, illustrated by companies such as Nautilus Technology (Germany), exemplifies a mid-range RABI occupation where AI and robotics have already achieved technical competence but face persistent regulatory constraints that slow market penetration. As regulatory frameworks are updated and legal exclusivity provisions are revised, the effective protection offered by high RABI scores is expected to diminish, making proactive policy adaptation essential.

It is important to note that the impact of regulatory barriers on automation is not uniform across countries. Differences in labour costs, legal frameworks and economic incentives play a critical role in shaping automation dynamics.

Table 1 – **ICT sector growth vs. total economy growth, selected OECD countries, 2023** *(compiled by the author based on OECD Digital Economy Outlook 2024, National Bank of Ukraine, Gartner IT Spending Forecast 2024)*

Country	ICT growth, 2023	GDP growth, 2023	Ratio
United Kingdom	>10%	0.4%	~25x
Germany	>10%	-0.3%	n/a
Netherlands	>10%	~0.1%	~100x
OECD average	7.6%	~1.5-2%	~4x
Ukraine	4.4%*	5.3%	~0.8x

Note: IT sector share of GDP; reflects specific conditions of the national economy in 2023

Table 2 – **Indicative RABI scores for selected occupations** *(compiled by the author)*

Occupation	LS	LE	RUF	RABI
Notary	0.90	0.95	0.70	0.85
Physician	0.95	0.90	0.60	0.82
Industrial inspector	0.60	0.55	0.50	0.55
Accountant	0.55	0.35	0.30	0.40
Warehouse operator	0.10	0.05	0.15	0.10

Note: LS – Licensing Stringency; LE – Legal Exclusivity; RUF – Regulatory Update Frequency (inverse). Scores are indicative and based on the author's assessment of regulatory frameworks across OECD jurisdictions.

In high-wage economies, firms may pursue automation even in highly regulated professions due to strong cost-saving incentives, whereas in lower-wage economies the same regulatory environment may be sufficient to delay or prevent technological substitution. At the same time, cross-country variation in legal systems, including differences in licensing regimes, liability rules and enforcement practices, further affects the speed and feasibility of technological adoption. Therefore, the practical implications of RABI scores should be interpreted in conjunction with country-specific economic conditions, including wage levels and capital costs, as well as institutional and legal characteristics.

Ukraine presents a particularly instructive case study for the analysis of IT market dynamics in a context of structural economic transition. Computer services account for 41.5% of Ukraine's total services exports, reflecting an exceptionally high concentration of export potential within a single industry. According to IT Research Ukraine, the number of IT specialists in the country reached 307,000 in 2023, an increase of approximately 8% compared to the previous year, while average salaries grew to $2,630 per month. These indicators reflect the resilience of the sector, even as IT export revenues declined by 8.4% to $6.7 billion in 2023, primarily due to a contraction in foreign client spending and broader macroeconomic pressures.

The structure of the Ukrainian IT market also exhibits a notable shift in business models. According to data from Djinni, the share of vacancies from product-based companies grew from 36% in 2021 to 55% by the end of 2023, while the share from outsourcing and outstaffing companies fell from 61% to 36% over the same period. This structural transition signals a gradual maturation of the sector and a growing orientation toward proprietary digital products rather than contract development services.

CONCLUSIONS

These findings point to a few practical consequences worth naming directly. Frameworks for IT market analysis need to go beyond financial metrics and account for how regulation slows or accelerates displacement. For regulatory bodies, this means thinking ahead rather than updating rules after the fact. Perhaps most concretely: thousands of people today are being forced to change careers because of technological shifts they did not anticipate. A tool like RABI could help students make more informed choices about which specialisations are likely to remain in demand, rather than discovering the problem only after graduating. For Ukraine specifically, the shift from outsourcing toward product development is not just a market trend but a strategic window that will not stay open indefinitely.

The evidence presented in this paper supports the conclusion that the IT industry has moved beyond the boundaries of a discrete economic sector and has become a structural force reshaping the broader economy. The pace of this transformation suggests that conventional approaches to IT market forecasting are no longer adequate. A genuinely predictive framework must integrate economic data with an understanding of regulatory dynamics and technological trajectories. For Ukraine, positioned at a critical juncture of economic recovery and digital development, this integrated perspective is not merely an academic exercise but a practical necessity.

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ПРОГНОЗУВАННЯ РИНКУ ІТ-ІНДУСТРІЇ: ВІД ФІНАНСОВИХ ПОКАЗНИКІВ ДО МІЖГАЛУЗЕВОГО ВПЛИВУ

Стрімкий розвиток технологій ставить фундаментальні виклики перед ринками праці в усіх секторах економіки. ІТ-індустрія вийшла за межі самодостатнього сектору та перетворилась на структурну силу, що трансформує ширшу економіку. Штучний інтелект, робототехніка та автоматизація одночасно проникають у всі галузі, принципово змінюючи економічну логіку виробництва, зайнятості та надання послуг. Метою статті є аналіз динаміки ІТ-ринку на глобальному та національному рівнях, а також розроблення оригінального Індексу регуляторного бар'єру автоматизації (RABI) як інструменту вимірювання ступеня інституційного захисту професій від технологічного витіснення. Методологічну основу дослідження становлять кількісний аналіз вторинних даних Національного банку України, OECP, Gartner та Світового банку, а також авторська методика побудови композитного індексу. Індекс RABI включає три рівновагових виміри: жорсткість ліцензування (LS), правова ексклюзивність (LE) та частота оновлення регуляторної бази (RUF), розраховані за формулою RABI = (LS + LE + RUF) / 3. За результатами дослідження встановлено, що світові витрати на ІТ досягли 5,26 трлн дол. США у 2024 р. та прогнозуються на рівні 6,15 трлн дол. у 2026 р. ІТ-сектор України забезпечує 4,9% ВВП, а частка вакансій від продуктових компаній зросла з 36% у 2021 до 55% у 2023 р. Значення RABI коливаються від 0,10 (складський оператор) до 0,85 (нотаріус). Запропонована концепція доводить, що традиційний бінарний поділ на автоматизовані та неавтоматизовані професії є аналітично недостатнім, а ефективне планування зайнятості потребує міждисциплінарного підходу, що інтегрує економічний аналіз, правове регулювання та технологічний форсайт. Практичне значення дослідження полягає у розробленні інструменту, який може застосовуватися як у стратегічному плануванні ринку праці, так і у виборі освітньої траєкторії.

Keywords: *автоматизація, сталий розвиток зайнятості, ринок праці, регуляторні бар'єри, цифрова трансформація, штучний інтелект, RABI, планування зайнятості*