Artificial Intelligence and the Future of Working Life in Türkiye:

Digital Transformation for Inclusive Growth

ACT HUMAN

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Introduction

This report, prepared within the scope of the ActHuman Social Inclusion Initiative's 2025 program, presents an analytical framework focusing on the effects of artificial intelligence (AI) and digital transformation on Türkiye's labor market, economic structure, and social equity. It draws on current national and international data to assess Türkiye's position in the age of artificial intelligence and examines critical themes related to the transformation of the workforce, enterprises, and public policies.

To understand Türkiye's digitalization trajectory, a dual reality becomes evident: individuals exhibit a high level of engagement with AI tools, online platforms, and digital services, while enterprises, particularly SMEs, demonstrate extremely low levels of digital infrastructure and limited data-use capacity. This contrast is one of the key determinants of Türkiye's progress in the AI era. Data indicate that Türkiye accounts for 3% of global traffic to generative AI tools such as ChatGPT, placing it among the countries with the highest usage rates. Yet enterprise-level digital systems remain limited, with ERP adoption at roughly one quarter of firms and even lower rates for CRM systems. This combination reveals a strong individual appetite for digital tools alongside significant institutional under-preparedness.

Another focal area of the report is Türkiye's human capital landscape. The education system struggles to instill the critical thinking, problem-solving, and analytical skills required in the digital age, a gap clearly reflected in PISA results. High youth unemployment and NEET rates—especially among women, exceeding OECD averages—hinder the transformation of Türkiye's demographic potential into social and economic opportunity. In addition, across all education levels, women report lower rates of professional AI tool usage compared with men, highlighting the persistence of a gendered digital divide as a notable social risk.

From an economic standpoint, the low data infrastructure of SMEs, which carry the weight of production and employment in Türkiye, constitutes a major threshold for effective AI integration. In sectors where routine tasks are prevalent, increasing automation pressure, concentration of productivity gains in larger firms, and the risk of eroding competitiveness among mid-sized enterprises emerge as critical concerns. Global patterns show that

when AI is deployed in an employment-substituting manner rather than enhancing human work, income and opportunity disparities tend to widen.

The report emphasizes that, without deliberate governance and strategic policy intervention, AI-driven transformation may intensify social and economic inequalities. At the same time, it highlights Türkiye's strong potential for a digital leap through a comprehensive and inclusive public policy approach. Three policy axes stand out:

1. Strengthening basic digital capacity among SMEs,
2. Restructuring human capital for the digital era,
3. Reducing informality through digital tools.

Türkiye's trajectory in the AI age will depend on its capacity to build a data-driven economy, accelerate educational transformation, and align social policies with inequality-generating areas. For this reason, the report underscores the importance of a holistic policy framework to ensure that the country's strong digital engagement translates into broader social benefit. In a context where digital access is widespread but digital capacity is unevenly distributed, AI governance and an inclusive transformation perspective constitute essential priorities.

In conclusion, this study presents objective evidence on the risks, opportunities, and structural challenges Türkiye faces in the age of AI, offering a solid basis for discussing the social policy dimensions of digital transformation. The report's findings indicate that ensuring digitalization proceeds in a fair, accessible, and inclusive manner will be crucial for the country's economic and social resilience. In line with the ActHuman Initiative's earlier efforts, this work aims to strengthen opportunities for collaboration among policymakers, academia, the private sector, and civil society to advance social inclusion in the coming period.

Method

Preliminary Studies

During the preparatory phase of this study, an extensive review of literature and data was carried out regarding the current state of artificial intelligence, digital transformation, and the labor market in Türkiye. Updated data from national and international sources (OECD, Eurostat, TÜİK, UNDP, etc.) on Türkiye's level of digitalization were examined; statistics revealing SMEs' digital infrastructure usage, access to AI tools at the individual level, education indicators, and labor market dynamics were compiled.

This preliminary analysis made Türkiye's digitalization paradox visible (the gap between high individual technology use and low institutional digital infrastructure). It also identified structural issues in human capital, youth unemployment, women's labor force participation, and dimensions of digital inequality.

In light of these findings, a framework was developed for assessing the impacts of AI transformation in Türkiye. The main components analyzed within the study include:

- Level of individual digital engagement in Türkiye
- SMEs' digitalization capacity and data infrastructure
- Education system and skills mismatch
- Labor market vulnerabilities in the face of AI
- Regional, social, and gender-based digital inequalities
- The digital divide between firms and its economic implications

This framework formed the basis for the situational analysis that underpins the policy recommendations developed in later sections.

ActHuman Process

Establishment of the Advisory Board and Workshop – 11 September 2025

To strengthen the analytical structure of the report, an Advisory Board was formed, consisting of experts in labor, digital transformation, economics, and

social policy, as well as representatives from the private sector, technology firms, and civil society. A Workshop was held on 11 September 2025 with the participation of representatives from more than thirty institutions.

Based on the discussions held during the Workshop with Advisory Board members, the key thematic areas requiring in-depth examination were identified:

- The economic impacts of AI in Türkiye
- The role of SMEs in digital transformation
- New forms of inequality created by AI
- The transformation needed in human capital
- The guiding capacity of public policy

This step helped to concretize the focal points of the report and shape the analytical direction.

ActHuman Report Launch – 20 November 2025

The launch event and panel discussion for the report “Human in the Age of Artificial Intelligence: Rethinking Social Equality” took place on 20 November 2025 at Minerva Han. Rapporteur Emrehan Aktuğ presented the social policy report, which had been prepared based on the preliminary research and the Advisory Board’s evaluations. He also shared with participants the risks, opportunities, and structural challenges Türkiye faces in the age of AI.

During the panel session, Prof. Dr. Erkan Saka and Assoc. Prof. Zeynep Ayata provided assessments on the following key topics:

- A nationwide foundational mobilization for SME digitalization
- Restructuring human capital
- Social policy tools to reduce digital inequalities
- Managing the risks of labor-substituting automation
- Reducing the informal economy through digital tools

Following the report launch, the social policy document was disseminated widely across the ecosystem and in the media.

Executive Summary

This report examines the effects of Artificial Intelligence (AI) and automation on Türkiye's labor market, economic structure, and social fabric. Türkiye's journey in this area progresses uniquely through the combination of a large and young population, an ongoing skills mismatch, a widespread informal economy, and fundamental gaps in institutional digitalization.

The report argues that although AI presents a global paradigm shift, the path Türkiye will follow will be determined by its existing structural realities. The central thesis is that the failure to address fundamental weaknesses, most notably the insufficient digitalization of the Small and Medium Enterprise (SME) focused economy and the ongoing skills mismatch in the labor force, will lead to a significant increase in inequality.

Key Findings

1.Dual Reality:1.The Turkish economy is characterized by a "dual reality." A small segment composed of large companies with high international integration is digitally mature and ready to adopt advanced AI. However, the vast majority of firms that form the backbone of employment, SMEs, show a very weak performance in digitalization, particularly in the use of basic tools such as Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) systems. This situation leaves them on the outside of the AI revolution, making them highly vulnerable to competition. This factor is among the most significant risks of inequality.

If not managed correctly, the AI transformation will increase inequality. This transformation will create a divide between large companies and SMEs, a divide between skilled and unskilled workers, and a geographic divide between technology/finance hubs and the rest of the country. It will likely worsen gender discrimination through the automation of many roles in which women are heavily employed.

2.Human Capital Paradox: Türkiye has a significant demographic advantage with its young population. However, this potential cannot be fully utilized because it is not nourished by the dynamism required by a digitalizing world. The education system, as evidenced by low Programme for International Student Assessment (PISA) scores, struggles to equip students with the

critical thinking and digital literacy skills needed for the professions of the future. In addition, high 'Not in Education, Employment, or Training' (NEET) rates and an extremely low female labor force participation rate are key indicators of a large pool of unused talent.

3.Workforce and Firm Insufficiency: 1.The current state of most Turkish firms and a large portion of the workforce is a condition of "not being ready." Firms lack the data infrastructure, capital, and technical knowledge required to adopt basic AI. The existing workforce, especially in routine manufacturing and administrative roles, remains distant from lifelong learning pathways that would equip them with the skills and abilities for the professions of the future. This situation creates a dangerous intersection of vulnerable firms and vulnerable workers.

Core Inequalities

The AI transformation carries a multidimensional inequality risk that will deepen existing social and economic vulnerabilities if not intervened in:

- **Income and Wealth Inequality:** While the wages of a small segment with an AI-compatible "talent premium" will increase, the wages of a large segment with roles open to automation will come under pressure, and labor's share of national income will decrease.
- **·Geographic Inequality:** While high-technology investments concentrate in a few metropolitan areas, the rest of Anatolia will remain outside this new increase in prosperity and will face the risk of falling even further behind economically.
- **·Social Inequality:** Algorithmic biases and the effects of automation may further increase existing social vulnerabilities, especially for women, young people, and other disadvantaged groups.
- **·Inequality Between Countries:** The global economic and political power gap between the small number of countries that produce and manage AI technology and the rest will widen even further.

Core Scenarios

The path Türkiye will follow in this digital transformation process will lead to very different outcomes. We identify three core scenarios:

- **Scenario 1: Deepening Inequality (Non-Intervention Path):** An unmanaged transformation process in which the adoption of AI by large firms weakens the SME sector, leading to mass layoffs, extreme income polarization, and social instability.
- **Scenario 2: Divided Future (Partial Support):** A process in which technology/finance hubs in major cities develop, but regional and social inequalities deepen, creating a permanent two-tiered economy.
- **Scenario 3: Digital Leap (Strategic Support):** A proactive, state-led transformation process that prioritizes the basic digitalization of SMEs and comprehensive human capital reform, resulting in inclusive growth and shared prosperity.

Priority Policy Recommendations:

To move toward the "Digital Leap" scenario, this report advocates for a three-track national agenda:

- **Main Axis I: Building the Digital Foundation:** Expanding the scope of the **SME "Digital Transformation Program" t**o aggressively subsidize and support the adoption of basic digital tools (CRM/ERP/Supply Chain Management(SME)), integrated internal systems, and their strengthening with structured management practices in the SME sector. This state-led move to digitalize the foundation of the economy, built by SMEs, is the most critical policy for combating inequality.
- **Main Axis II: Restructuring Human Capital:** Revising the national education curriculum to focus on critical skills, transforming vocational schools into high-technology centers, and establishing a national lifelong learning platform ("Skill Acquisition Program"). AI provides the most helpful technology for a personalized learning process.
- **Main Axis III: Reducing the Informal Economy:** Recording the informal economy by making digitalization mandatory and improving fair tax collection by minimizing informal transactions, thereby creating social benefits for everyone.

The choices made over the next 10 years will determine whether AI becomes a tool of national progress or a catalyst for an unprecedented social and economic divide. Given the possible outcomes, proactive, strategic, and inclusive policy is not an option but a necessity.

Section 1: What Is the Artificial Intelligence Revolution?

The world is on the verge of an AI-powered technological revolution being adopted faster than any previous one. We are in a period in which professions, job descriptions, and the nature of employment are being fundamentally and rapidly transformed. Understanding these global trends is necessary to place Türkiye's specific challenges and opportunities in the proper context.

Artificial Intelligence and automation are no longer limited to factory floors; they are becoming part of offices, automating cognitive tasks, and fundamentally reshaping the value of human skills. While this digital transformation offers enormous opportunities for increased productivity, it also poses serious social risks.

Türkiye’s unique characteristics, its strategic location, vibrant demographic structure, and multi-layered economic order shape the possible trajectory of AI. Unlike advanced Western economies, Türkiye is not at the stage of optimizing an already highly digitalized system; instead, it faces the challenge of building its own digital foundation as the wave of advanced technology approaches.

Therefore, the central question of this report is not whether AI will change Türkiye, but how Türkiye can proactively manage this transformation to avoid further deepening existing inequalities and instead use technology to drive broad-based, inclusive growth. The future, at this point, is a phenomenon built on grounded strategies. This report presents a diagnosis of the current situation, an analysis of the key actors, firms, the workforce, and the state, and a concrete policy roadmap.

1.1 The Engine of Productivity: The Two Faces of Artificial Intelligence

The world is experiencing a technological revolution driven by digitalization, which has become the primary productivity growth engine of the 21st-century economy, and in recent years by Artificial Intelligence. Leading economic studies forecast that generative AI alone could increase global GDP by several trillion dollars annually and create value comparable to that of past general-purpose technologies such as the steam engine or electricity.

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However, this promise of unprecedented progress also carries the threat of social and economic upheaval on a scale faster and more widespread than any previous industrial revolution. AI is a double-edged sword. To understand its impact, it is critically important to acknowledge that AI is not a single and uniform force. Following the approach of economists such as Daron Acemoğlu, we can say that the effect of technology on society depends on the direction in which this technology advances: Should technology be designed primarily to strengthen human capabilities and create new tasks (labor-complementary), or to automate human labor and substitute it with capital (labor-substituting)? In this respect, the integration of AI is critical.

AI can be advanced in both directions, and the balance between these two directions will determine AI's ultimate effect on productivity and inequality:

- **Labor-Complementary Technology:** This is the path to shared prosperity. Here, AI serves as a tool that enhances the capabilities of skilled professionals. An AI can analyze millions of legal documents within seconds to assist a lawyer or generate complex code modules for a software developer. This is the human-AI collaboration in which the output of a skilled professional can increase many times over when combined with AI, leading to exponentially growing gains in high-value sectors. Critically, this type of technology **creates new, high-value tasks** for people. For example:
    - the strategic interpretation of billions of price flows in portfolio management **(portfolio managers, investment analysts)**;
    - mass targeting, A/B testing, and Search Engine Optimization (SEO) in marketing **(digital marketing specialists)**;
    - the summarization of thousands of pages of contracts within seconds in law **(contract lawyers, legal counsels)**;
    - the preliminary screening of radiological images and diagnostic support in medicine **(radiologists, pathology specialists)**;
    - predictive maintenance based on sensor data in manufacturing **(maintenance and field technicians)**;
    - real-time supply-demand balancing in energy grids **(grid operators, energy planning engineers)**;
    - -crop health analysis from drone imagery in agriculture **(agricultural engineers, agricultural consultants)**;

- extracting news value from large datasets in journalism **(data journalists, economics reporters)**;
- procedural content generation in game design **(game and level designers)**; adaptive learning paths for students in education **(teachers, instructional designers)**;
- AI model auditing and ethical compliance **(AI auditors, ethical compliance specialists)**; Prompt Engineering **(LLM integration specialists)**;
- data governance and strategic interpretation **(data strategists, business intelligence analysts)**, increasing the demand and wages for workers with such complementary skills/abilities.

- **Automation (Labor-Substituting Technology):** According to discussions in the literature, automation is one of the fundamental reasons for inequality and for the decline in labor's share of national income in recent decades. Here, AI and machine learning are used to perform cognitive tasks that humans previously carried out. For example:

  - Robotic Process Automation (RPA) software completing invoice entry and reconciliation processes within seconds in **accounting** (accounting staff, accounts payable-receivable clerks);
  - full automation of credit scoring or fraud detection **in banks** (credit analysts, fraud investigation personnel);
  - chatbots providing 24/7 customer service in **e-commerce** (live customer representatives);
  - driverless warehouse vehicles and route optimization **in logistics** (forklift operators, shipment planners);
  - cashierless payment systems **in retail** (cashiers);
  - automatic speech-to-text conversion and pre-response generation **in call centers** (call center operators);
  - instant neural machine translation **in translation offices** (human translators, editors);
  - automatic news text generation from company balance sheets **in the media** (financial reporters, data entry staff);
  - automatic appointment scheduling and insurance paperwork processing **in healthcare** (E-Nabız appointment system, appointment secretaries, insurance claims clerks)

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Such applications allow businesses to reduce costs, reduce errors, and direct human talent toward more strategic activities by automating essential repetitive functions, including data analysis, financial reporting, customer service, and supply chain management. However, this directly displaces labor, **puts downward pressure on wages for routine jobs, and shifts national income from labor to capital owners (technology owners).**

It is essential to understand that both effects operate primarily at the task level within a job rather than at the level of entire professions. This task-based approach is where productivity fully emerges, but it is also likely to become a source of fundamental social problems.

Let us consider the example of a radiologist: AI **can automate** the task of analyzing a medical scan, substituting for part of a radiologist's labor. At the same time, **by complementing** the radiologist's abilities, it can create **new, higher-value tasks** such as spending more time on complex patient consultations, treatment planning, and collaboration with other specialists. The net effect on the radiologist's job, value, and wages depends on the balance between tasks eliminated and those enhanced or newly created. If a line of work does not meet the following general criteria, it is unrealistic to claim that AI will completely substitute that job:

1. **Repetitive:** The job is based on rules and patterns, repeats frequently, and requires little judgment. Inputs/outputs are digital or easily digitized. Unusual situations are very few or nonexistent.
2. **Independent:** The job can progress independently and is not dependent on the instant status of other units.
3. **Error tolerance:** The cost of error is low, and it is easy to undo/correct.
4. **Short duration:** The job is completed quickly; quick feedback is received.

In this case, because the healthcare sector is one with relatively low error tolerance, it would not be realistic to claim that the radiology profession will become fully automated and disappear. For example, as shown in the graph below, although approximately 78% of AI-based medical equipment investments occur in radiology, the demand for radiologists remains relatively high.

At the same time, these criteria mean that professions composed of routine tasks, such as data entry, payroll processing, and basic accounting, which can be almost entirely automated, are at extremely high risk of displacement. This

transformation shows the importance of the type of AI a society chooses to develop and use. Here, the fundamental challenge is not to stop technology, but to encourage an innovation ecosystem oriented toward human-complementary technology that creates broad-based prosperity, instead of focusing entirely on labor-substituting automation.

1.2 Change in the Labor Market and New Skills/Abilities

Productivity gains obtained from AI do not occur smoothly; they put the labor market into a turbulent transformation. Along with firms' growing interest in AI, the supply of human resources here is of great importance. Just as firms must focus on AI and digital transformation to avoid falling behind the competition, the labor market must also adapt to this transformation by developing relevant skills. This restructuring can be characterized by two different forces: job churn and job polarization. These two forces, coming together, fundamentally redefine which human abilities have economic value.

- **Job Churn:** While some professions disappear, new professions that we cannot yet fully imagine will also be created (for example, AI ethics specialist, digital transformation specialist). The difficulty here is the nature of the churn, that is, the mass and rapid transition of workers from declining roles to rising roles. This process requires reskilling/upskilling, which is not equally easy for all segments of the population. For example, a renewed intensive learning process is not easy, especially for mid-career and older workers; this means that certain demographic groups are far more exposed to the risks of this transition.

- **Polarization in the Labor Market, "The Disappearing Middle":** As AI automates routine repetitive tasks, the labor market becomes polarized. Demand increases at two opposite poles, while the middle portion shrinks:

  a) The Group with Cognitive Capability: These are roles that require creativity, strategic decision-making, and complex problem-solving (engineers, data scientists, strategists). In the cognitive group, value is created by combining human intelligence with AI. This requires (i) **high-level cognitive skills**; that is, as AI advances in problem solving, leadership now passes to those who can use it for advanced creativity, critical thinking, and strategy. It also requires (ii) "**technological adaptability,**" meaning not only coding but also broad digital literacy and the ability to work competently with AI systems as a collaborator.

This group must continue to work in cooperation with AI and learn continuously to avoid falling behind the competition in the workforce.

b) The Group Requiring Human Contact (Service): These are roles based on empathy, manual skill, and interpersonal abilities and are difficult to automate (plumbers, electricians, nurses, elderly care providers). The resilience of the service group that requires human contact is based on fundamentally human skills: communication, empathy, cooperation, and negotiation. These skills, which are very difficult to digitize, are becoming increasingly valuable, as reflected in wages. Social and emotional skills play the most critical role for this group.

c) The Shrinking Middle Class: The most vulnerable are medium-skilled, routine jobs (administrative support, HR/Public Relations data processing, factory assembly-line work). This "disappearance of the middle" poses a direct threat to social cohesion by risking pushing a large portion of the middle class into lower-wage jobs.

This polarization is not merely a statistical trend; it also determines the new hierarchy of human skills. In response, the market places a significant premium on abilities that complement AI rather than compete with it, or has begun to show this value to roles that AI cannot replace. Especially in roles supported by AI, lifelong learning has become a new way of life. In an environment of constant churn, the most important ability is the capacity to learn continuously, to unlearn when necessary, and to relearn. A single university degree is no longer sufficient for lifelong employment; the ability to adapt and to learn permanently is the new diploma.

Global data confirm that this restructuring is already underway. A 2024 McKinsey survey shows that although hiring for AI-related roles is difficult, this difficulty has decreased since 2022. This indicates that the global talent market is actively adapting and reskilling to meet this new demand. The critical question for Türkiye is whether its workforce can keep up with this pace.

1.3 The Increase of Inequality by AI

The economic gains from AI are not automatically or equally distributed. If left unmanaged, the productivity factors that drive growth can serve as a powerful engine for deepening social and economic divides. Without proactive policy

intervention, this technological transformation has the potential to create inequality across multiple dimensions of society.

- **Increase in Income and Wealth Inequality**
  - **"Skill Premium" and Polarization in Wages:** A distinct "skill premium" will emerge. Workers who can collaborate with AI and possess the necessary technological skills will receive incredibly high salaries. Conversely, workers whose skills can be easily automated will face wage stagnation or decline. This will directly widen the income gap, and since skilled labor will be a numerical minority, returns will shift from labor to capital that owns technology. This process may further reduce labor's share of total income.
  - **Divergence in Skills:** The fundamental divide in society may shift from the traditional capital-labor divide to a new divide: between those who have future-ready skills and those who do not. This creates the risk of a permanent "underemployment" class. That is, individuals who are not unemployed but are constantly stuck in low-wage, insecure jobs and have no chance of advancing in a career.
  - **Divergence in Work Models:** The rise of the "gig" economy (independent and flexible work model), accelerated by digital platforms, is creating a two-tiered workforce. On the one hand are traditional workers who have social rights such as retirement, health insurance, unemployment benefits, and paid leave, while on the other hand are freelancers who are often deprived of this social safety net, leading to widespread economic insecurity and instability.
  - **Income inequality:** Whether AI complements or substitutes labor, the AI revolution provides a substantial productivity increase. This has already manifested itself in many sectors. During the digital revolution, growth and profits stemming from productivity increases turned into capital gains. The fair distribution of the gains generated by the AI revolution is essential now. Options such as increasing wages and reducing working hours without wage cuts, as well as data structures to monitor productivity increases, are crucial. In these matters, collaborations can be developed among unions, employer organizations, the public sector, and NGOs.

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- **Geographic Inequality: The Rise of "Metropolises."**
    - **Concentration of Opportunities:** Investment, innovation, and high-skilled jobs will naturally concentrate in a few "metropolitan" cities (for example, Istanbul, Ankara) that possess the necessary talent pools, universities, and infrastructure. Although this concentration may increase firm productivity, it is highly undesirable from a national welfare perspective. It creates a geographic inequality that leaves smaller cities and rural areas behind, drains their talent, and limits opportunities for a large portion of the population.

- **Social Inequality: The Deepening of Existing Biases**
    - **Algorithmic Bias and Gender Inequality:** Technology is not inherently neutral; it can absorb and even strengthen the biases present in the data on which it is trained. If hiring algorithms are trained with historical data showing that men dominate leadership roles, they may systematically discriminate against qualified female candidates. In addition, the automation of administrative and office roles, many of which have high female employment, disproportionately threatens the economic security of women and carries the risk of reversing the progress made in workplace gender equality. Similarly, the possibility that AI may engage in race-based discrimination in hiring processes should not be ignored. Algorithmic errors targeting disadvantaged groups can deepen social inequality.

    - **Inequality with Disadvantaged Groups:** With the process of the digital revolution, many organizations and NGOs are carrying out intensive work to increase the digital capacity of disadvantaged groups. Various efforts have been made, such as ensuring qualified access to the internet, providing appropriate devices, ensuring the capacity to use them for work, and increasing financial access. Instead of creating a new divide in which AI completely excludes groups such as women, older people, people experiencing poverty and poor children, refugees, and persons with disabilities, it is essential to use it as a set of tools that will bring these groups closer together. For this, public policies regarding the creation and use of resources need to undergo a fairer transformation.

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- **Inequality between countries:** While the "platform economy" created by the digital revolution gained a global character, the profits generated from it flowed to a few countries. Individuals whose personal wealth equaled that of middle-income countries emerged. While income was sourced from around the world, tax payments were collected in a single country, sparking speculation. On the other hand, its social and political reflection was that global companies gained the power to shape the world's social and political life. International policies are needed to prevent the AI revolution from

Section 2: Türkiye's Current Situation

To understand Türkiye's future in the age of Artificial Intelligence, it is first necessary to diagnose its current situation. On the one hand, Türkiye has a young, dynamic, and digitally engaged population eager to adopt new technologies. On the other hand, it is trying to cope with profound structural weaknesses in the real sector and in human capital. The country's success will depend entirely on its ability to close the gap between this high potential and the state of institutional unpreparedness in the face of AI. This section will address this paradox by first highlighting the country's digital strengths and then analyzing its fundamental weaknesses.

2.1 Türkiye's Individual Reality: The High Digital Engagement of the Population

The Turkish population is not a digitally hesitant society. Individuals are active and enthusiastic participants in global digital trends and demonstrate strong potential for technology adaptation. Therefore, there is significant potential for digitalization, but for this digital interest to be used more effectively for social welfare, it must be directed appropriately.

High Engagement with AI Tools: Türkiye ranks among the top globally in user traffic to leading generative AI platforms (e.g., ChatGPT, Claude, Gemini, Grok). With a 3% share of global web traffic, it demonstrates a significant user base that is curious and willing to adopt new technologies at the individual level.

Strong E-Commerce and E-Government Usage: Eurostat data show that in 2024, approximately 45% of individuals in Türkiye shopped online. Although this rate is below the EU average, it represents a significant and growing market. Even more impressively, approximately 60% of individuals have used e-government services, indicating high trust and engagement with digital public infrastructures such as e-government, suggesting that Türkiye is at a similar level to many EU countries.

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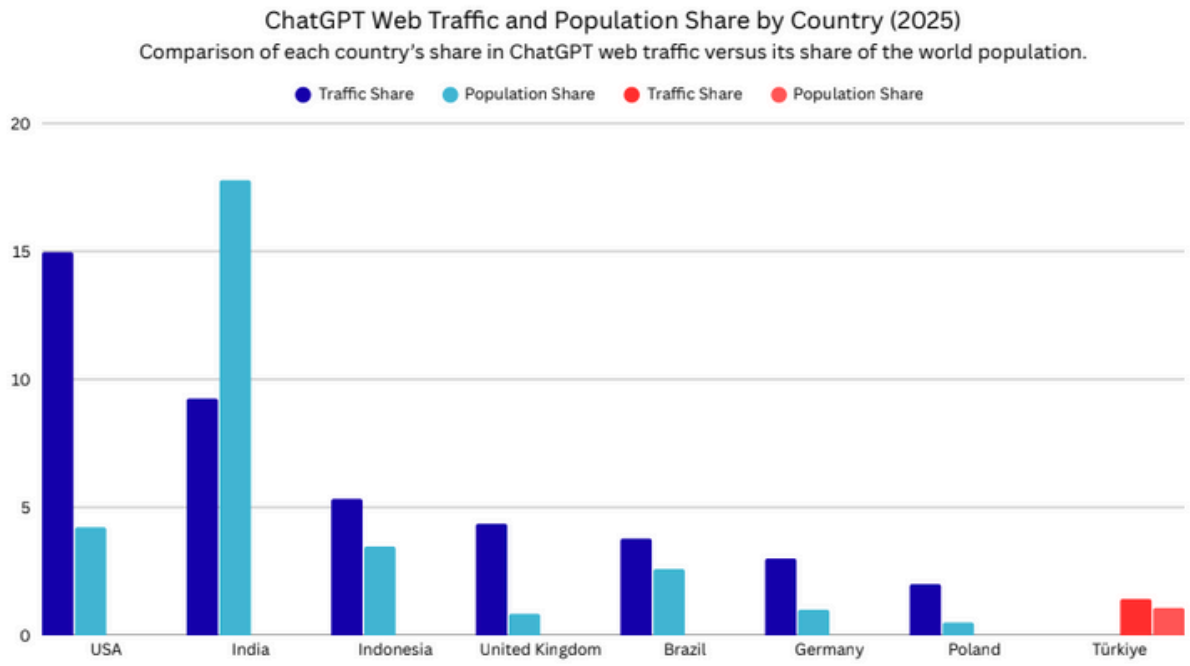


Figure 1: Distribution of ChatGPT Web Traffic by Country (2023).
Note: This bar chart, taken from Similarweb, shows Türkiye's 3% share in global traffic



Figure 2: Online Purchase of Goods and Services
Source: TÜİK

Section 2: Türkiye's Current Situation

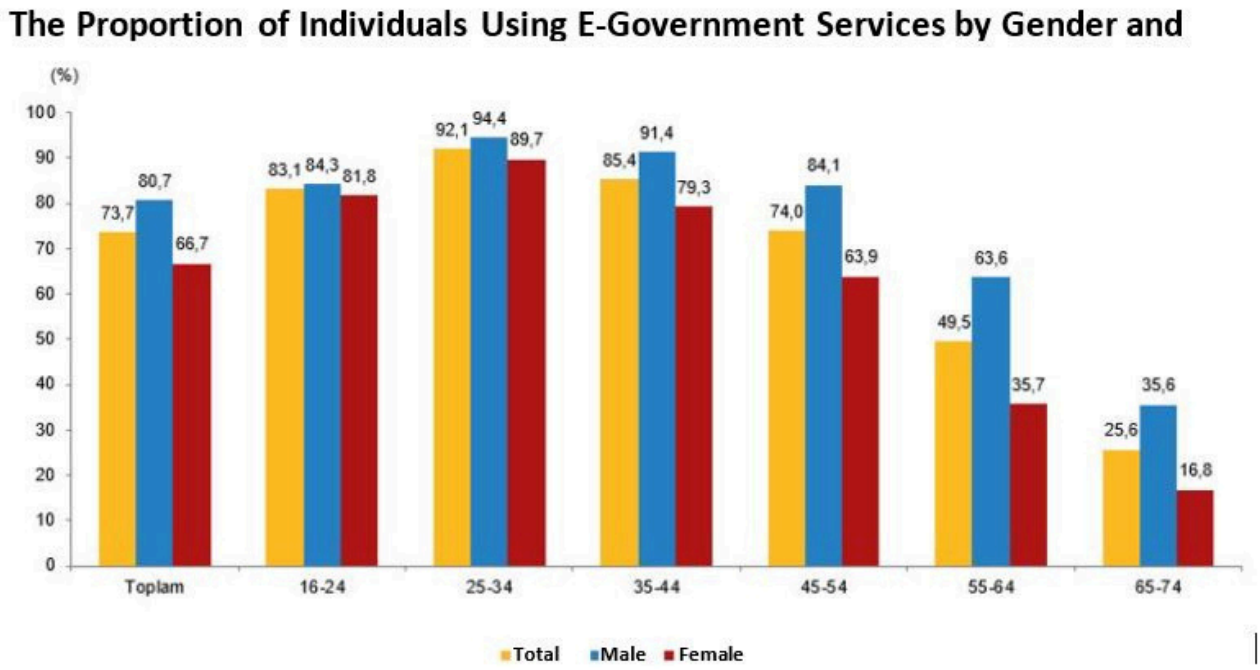


Figure 3: E-Government Usage Rate
Source: TÜİK

Türkiye is also ahead in statistics on social media usage rates, indicating that society tends toward digitalization. The internet usage rate among the population is approaching 90%; individuals use WhatsApp at 86.2%, YouTube at 71.3%, and Instagram at 65.4%, while 47.9% of those who actively use the internet use Internet-connected TVs. These TÜİK statistics also show that society closely follows the developments of the digital age.

However, the essence of the paradox in Türkiye is the contrast between high individual engagement and low institutional digitalization. The barrier in Türkiye is not the population; the real challenge lies in turning this individual inclination into a productive, skilled economic force.

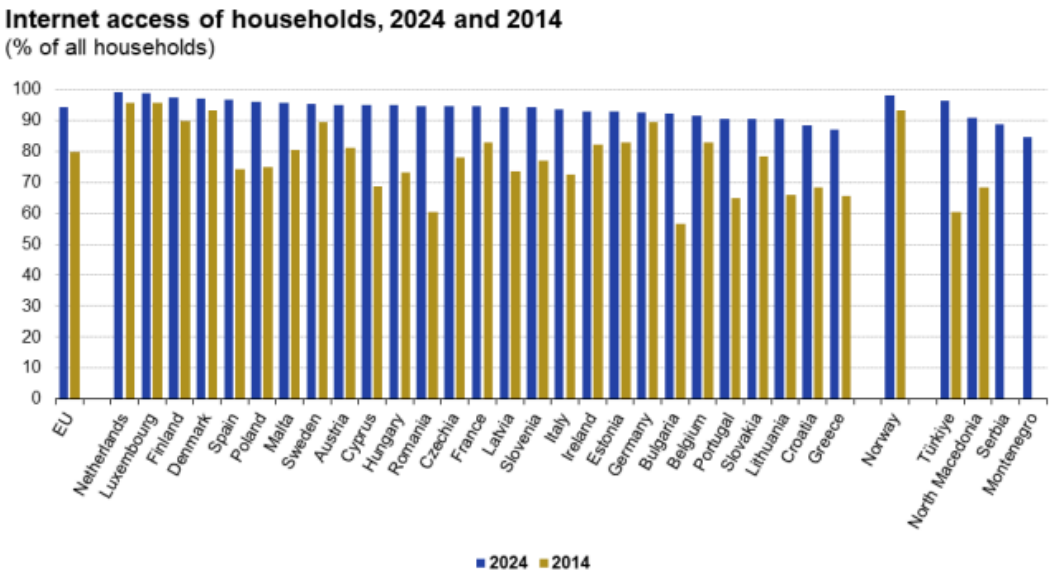


Figure 4: Internet Access Rate
Source: Eurostat

2.2 Türkiye's Institutional Reality: SMEs with a Weak Digital Foundation

The structure of the Turkish economy presents the first significant challenge. The economy is primarily based on Small and Medium-Sized Enterprises (SMEs). Although large conglomerates in sectors such as banking, automotive, and construction are highly visible, **it is SMEs, constituting more than 99% of all enterprises, responsible for approximately 72% of total employment and 50% of GDP, that form the backbone.** This means that the fate of the workforce is tightly tied to the ability of these small firms to adapt. In addition, a large informal economy (about 30% of employment) leaves millions of workers without a social safety net, making them highly vulnerable to recent technological shocks.

An economy's readiness for AI depends on its level of digitalization. And the most serious weakness of an SME-focused economy like Türkiye is the lack of basic digital infrastructure. AI readiness depends directly on this digitalization, because data is the fuel of modern algorithms. Tools such as CRM, ERP, and SCM are the engines that collect and structure this data. Türkiye faces a severe bottleneck in this area.

Section 2: Türkiye's Current Situation

According to Eurostat data, businesses lag significantly behind the EU average in adopting these basic digital tools. This is not a small technical gap; it is a fundamental weakness. This means that the majority of firms do not systematically collect data about their customers, supply chains, or internal operations. Without this data infrastructure, participating in the AI revolution is practically impossible, risking leaving them deprived of the productivity gains that will define the next decade.

Low ERP and CRM Usage: In 2023, approximately 24% of Turkish businesses used Enterprise Resource Planning (ERP) software, while use of Customer Relationship Management (CRM) software was even lower. These figures are significantly below EU averages (approximately 40% for ERP) and strikingly lower than those of leading digital economies. These figures show that most firms do not operate with standardized processes and structured data required for AI.

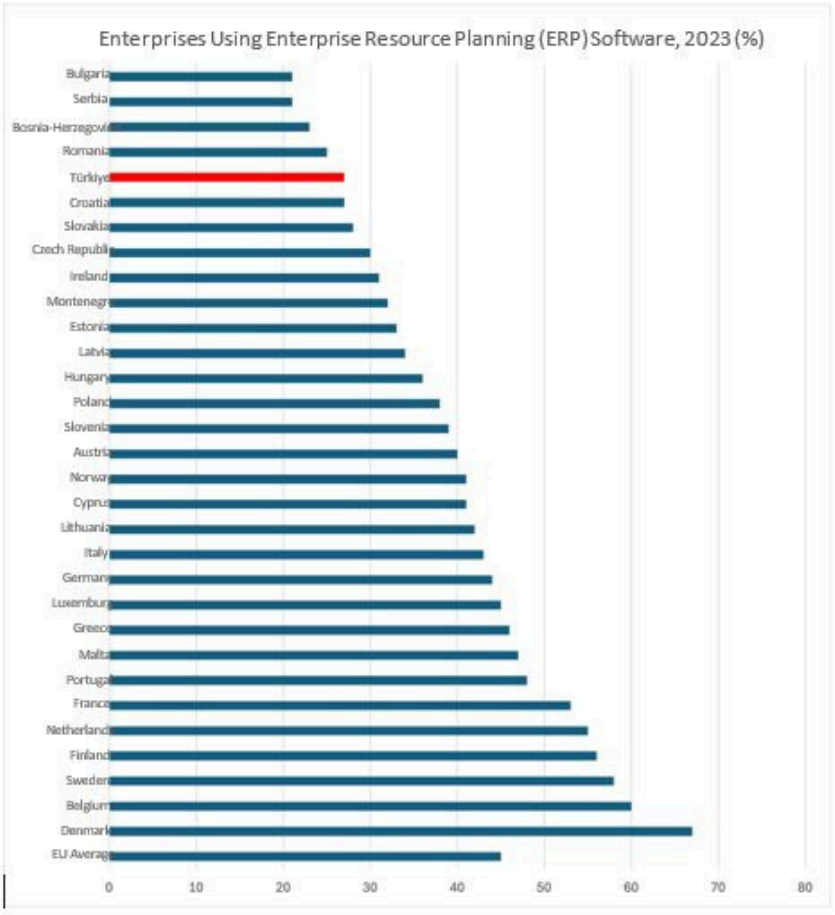


Figure 5: ERP Usage Rates
Source: Eurostat

Lagging Online Presence: Even a basic digital step, such as a company website, is less common in Türkiye than in many other OECD countries. In 2023, only 56% of Turkish businesses had a website, compared with rates exceeding 80% in many European countries.

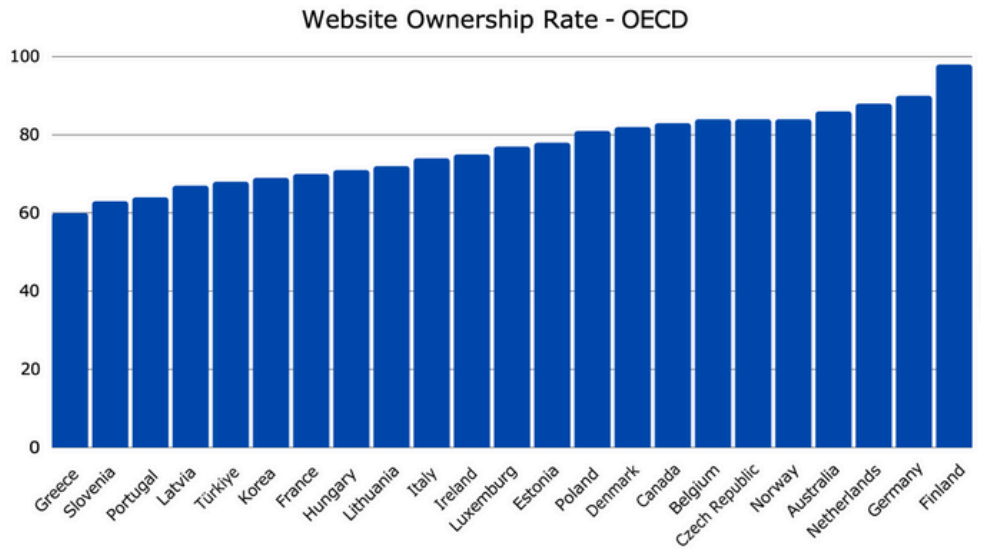


Figure 6: Website Ownership Rate
Source: OECD

This low usage shows that the vast majority of Turkish businesses, especially SMEs, have not yet taken the following steps:

1. **Collecting data systematically:** Sales, customer, and internal process data are not structured and analyzable. In this case, providing data-based consulting to these firms is not very possible.
2. **Working with standardized processes:** Workflows are instantaneous and informal, far from a standardized operation.
3. **Thinking with a data-oriented culture:** The mindset of using data for strategic decisions has not been established. Decisions are made primarily based on intuition and experience.

This is not a small technical gap; it is a fundamental weakness. This means that the majority of Turkish firms are "**data-poor.**" They do not systematically collect data, do not work with standardized workflows, and do not promote a data-oriented culture. The fundamental conclusion here is this: most business-oriented AI applications do not work without clean and structured data. While this places Turkish SMEs at risk of falling behind in competition, it also presents an opportunity to leap directly to modern, cloud-based platforms if directed by the right policy.

Low Share of High-Value-Added Sectors: This digital deficiency is intertwined with the economy's industrial structure. A significant portion of Türkiye's manufacturing and exports is concentrated in sectors with lower technological complexity and value added (for example, textiles and basic assembly). These sectors are not only more vulnerable to automation but also less likely to drive the type of innovation that creates high-skilled, high-wage jobs. Although AI and digitalization can increase operational efficiency in these traditional sectors, the most significant productivity gains are expected to be in higher-value-added industries. Therefore, the transition is a dual challenge for Türkiye: **it must both digitalize its existing industrial base and accelerate the shift toward more complex, value-added, and knowledge-intensive sectors.**

2.3 Türkiye's Labor Force and Human Capital Reality: Skills Mismatch

Although it has been converging toward trends in developed countries in recent years, Türkiye's greatest asset is its young, growing population, which is a demographic advantage. More than half of the population is under 32. However, this potential is undermined by a **profound "skills paradox,"** a mismatch between the skills the workforce possesses and those demanded by the future economy. A chronic "skills mismatch" has gripped the Turkish economy. Despite high university graduation rates, the education system often fails to equip students for the modern economy. This situation is clearly visible in international assessments.

Quality of Education and Use of AI: The root of the skills mismatch lies in the quality of basic education. The system has difficulty producing graduates equipped for the modern economy. Consistently below-average PISA scores indicate that society lacks the critical thinking, creativity, and collaborative problem-solving skills most compatible with Artificial Intelligence. This educational gap means that a large portion of the future workforce is not being prepared from an early age for a world that values analytical and adaptable abilities.

This skills gap has direct consequences. UNDP data show a strong positive relationship between education level and the use of AI tools at work. The likelihood of university graduates using AI professionally is much higher. **For Türkiye, this means that without improving the quality of higher education, the benefits of AI will be captured by a small, highly educated elite, further worsening inequality.** The data also reveal a deep gender gap in AI usage across all education levels, posing a threat of further widening existing workplace inequalities

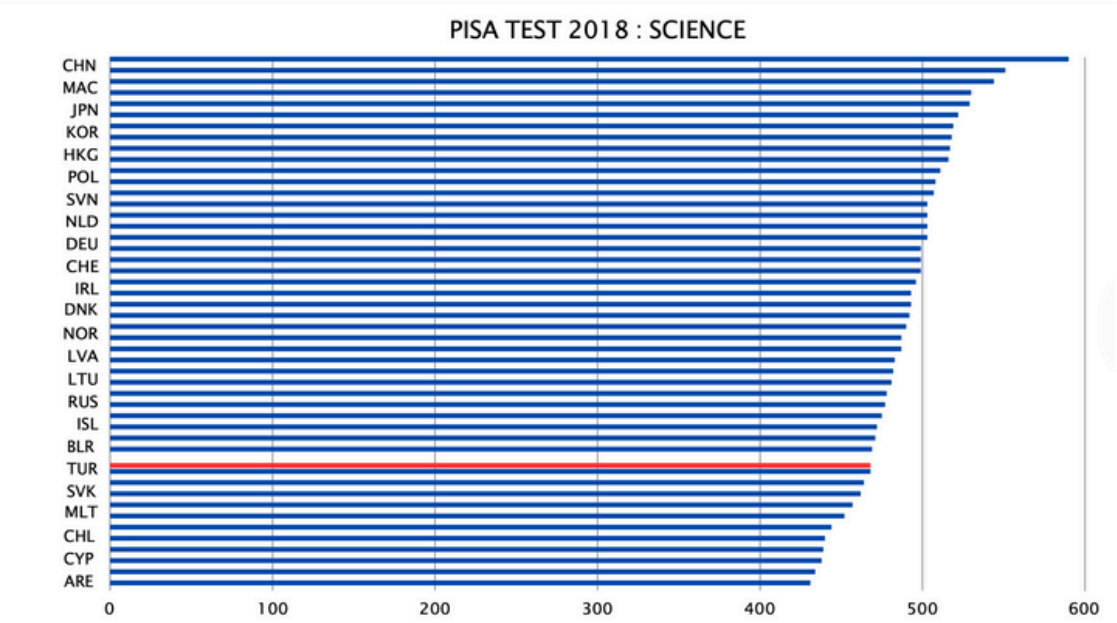


Figure 7: PISA Scores
Source: OECD

Skill Mismatch and Youth Unemployment (NEET): For many young people, the transition from school to work is disrupted. Türkiye has one of the highest NEET rates in the OECD, especially among young women. This situation represents a failure to integrate a large share of young people into the productive economy, transforming a potential demographic advantage into a social and economic burden. The problem is even more serious, especially for young women, and this situation points to deep structural and cultural barriers that go beyond just the education system.

Section 2: Türkiye's Current Situation

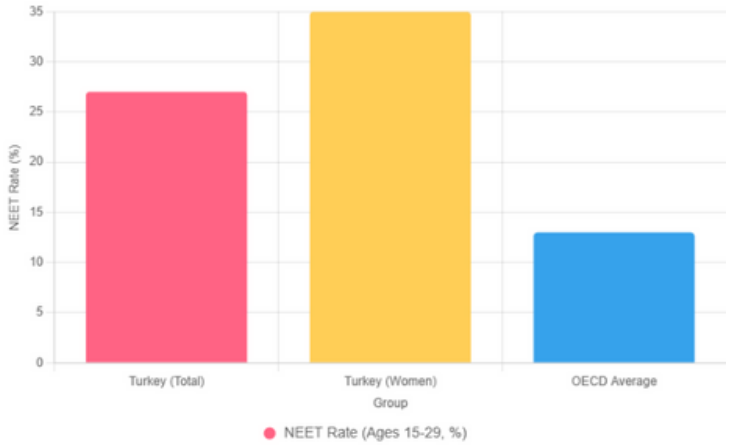


Figure 8: NEET Rate by Gender (Ages 15-29)

Lifelong Learning Culture: Opportunities for reskilling/upskilling and skill development for the existing workforce are limited. Türkiye ranks among the lowest OECD countries in adult education participation rates. This means that a 40-year-old factory worker or administrator whose job is at risk of automation has very few opportunities to acquire new and relevant skills. In an era in which continuous reskilling is essential, Türkiye's critically insufficient adult education infrastructure poses a serious risk that a "lost generation" of mid-career workers will be left behind by technological change.

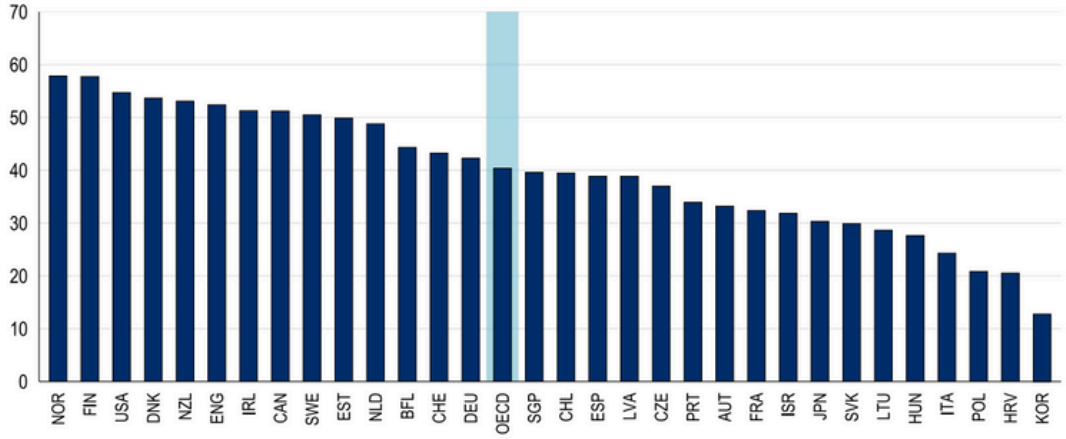


Figure 9: Adult Education Participation Rate (Ages 25-64)
Source: OECD

Female Labor Force Participation Rate (FLFPR): No discussion on Türkiye's human capital can be considered complete without addressing the deep gender inequality that restricts it. Türkiye's Female Labor Force Participation Rate (FLFPR) hovers around 34%, which is less than half that of many developed countries and one of the lowest in the OECD. This undoubtedly indicates one of the country's most significant untapped economic potentials. This situation not only suppresses growth but also concentrates women in low-paid sectors (such as services, administrative jobs, and agriculture) that are generally more vulnerable to automation. This deep structural problem, also demonstrated by the high female NEET rate, should be the central focus of every development strategy.

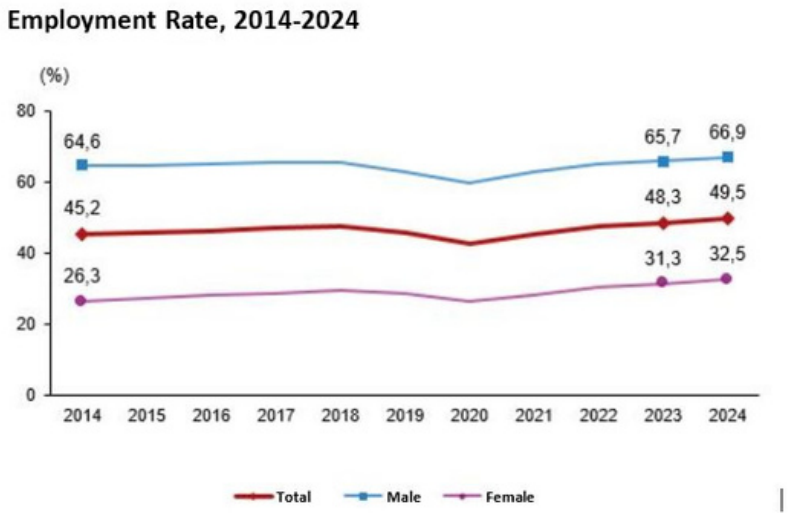


Figure 10: Female Employment Rate
Source: TURKSTAT (TÜİK)

UNDP data again reveals a persistent gender gap, showing that men report higher rates than women in the use of AI tools for work across all education levels. This situation suggests that the AI transition may further worsen existing gender inequalities if it is not actively addressed with policies that encourage women's participation in technology-related fields and roles.

Section 2: Türkiye's Current Situation

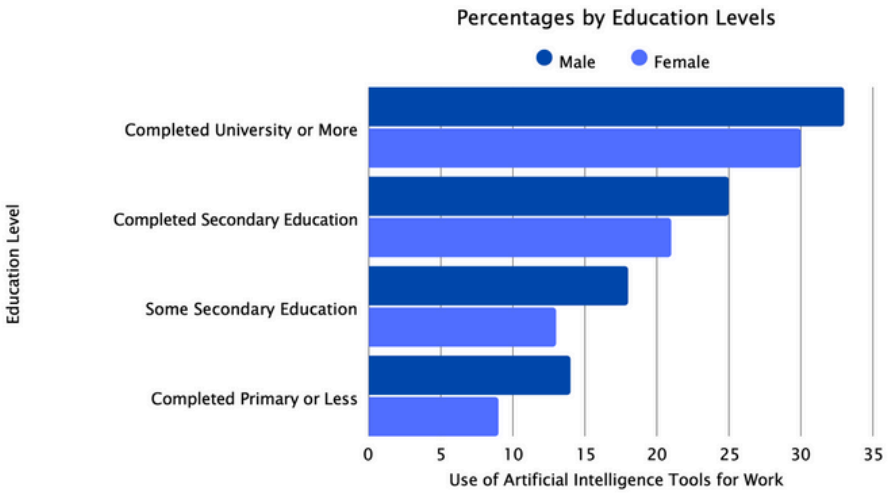


Figure 11: ChatGPT Usage by Education Level (2023)
Source: UNDP

As an upper-middle-income country, Türkiye faces an "AI access inequality." UNDP data reveal that access to generative artificial intelligence is primarily directed toward high-income countries. There is significant heterogeneity across countries, and this risk is that the global dimension of digital inequality may push countries that are already economically behind even further behind. This demonstrates Türkiye's need to realize its digitalization potential and to avoid being left behind in a world where AI is the most important source of productivity.

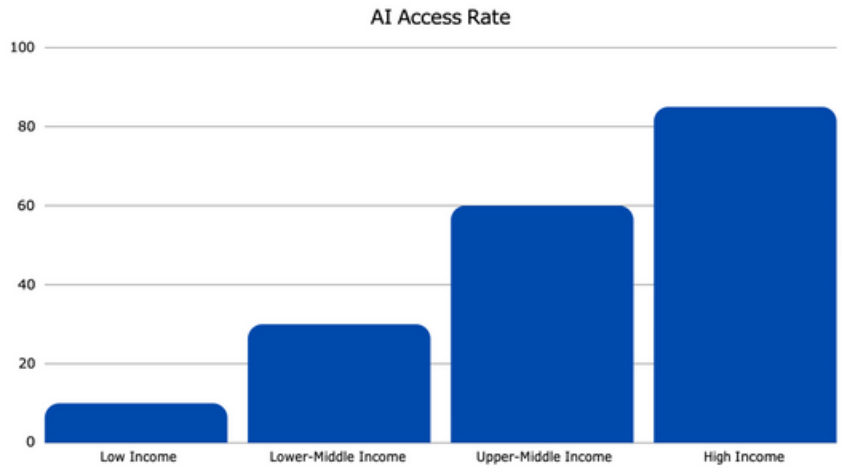


Figure 12: Access to Generative Artificial Intelligence by Country Income Group (2023)
Source: UNDP

Section 3: Risks and Deepening Digital Inequality

The Artificial Intelligence revolution will not affect Türkiye uniformly. It will show significantly different effects depending on the path taken along the current structural lines of the Turkish economy, as detailed in the previous section. The combination of a "data-poor" corporate sector and a workforce in a "skills mismatch" creates a ground that may deepen inequality. This section analyzes how the AI transition, if unmanaged, will create serious economic and human divides and lead to a fragmented, two-tiered society.

3.1 The Divide Between Firms: A Two-Tier Corporate World

A small number of large-scale firms are entering the AI era much further ahead, with higher levels of digitalization. Large conglomerates in sectors such as energy, finance, and automotive; the banking and finance sector; the vibrant startup ecosystem in cities like Istanbul and Ankara, especially in e-commerce, gaming, and FinTech; and multinational companies operating in Türkiye are primarily prepared to use AI and benefit from its applications. Surveys already show that AI adaptation is progressing much faster in these large firms. For this group, which possesses the necessary capital, data infrastructure, and international experience, adopting AI has become a fundamental path toward increasing efficiency, productivity, and profitability.

For the vast majority of SMEs, which employ most of the country's workforce, the reality is entirely different. As stated in the previous section, their low adoption of basic digital tools means that they are fundamentally unprepared for the AI revolution. They face three main obstacles regarding the adoption of AI:

1-Capital Barrier: They lack the financial resources to invest in new software, hardware, and the consulting services required for implementation.

2-Knowledge Barrier: Their owners and managers lack the digital literacy and strategic vision needed to understand why these investments are necessary and how to manage the transition. The "if it isn't broken, don't fix it" mindset is widespread, and the idea of process optimization is mostly absent. **Opportunity cost is often ignored**, and the focus remains on the current situation or short-term results.

3-Data Barrier: As highlighted by the low use of CRM/ERP, they lack basic data infrastructure. **Because they are "data-poor," they cannot benefit from most generative AI tools that are "data-hungry."** Although approximately 70% of total employment is in SMEs, only a small portion of these firms collect readable production process data or customer data. Without data, even if licensing costs decrease over time, they cannot adopt complementary AI and its related applications.

While large-capital conglomerates adopt AI and become hyper-efficient, SMEs, which employ the majority of society, will be unable to compete, remaining disconnected from the digital world and falling behind in the productivity race. This situation centralizes economic power, leads to the emergence of superstar firms in many sectors, and destroys the middle pillar of the economy.

- **Labor-Substituting Automation and Stagnation:** This dual structure among firms is not only a matter of differing adoption speeds; it also determines what type of AI will be used. Following Nobel laureate Daron Acemoğlu's framework, we can foresee that the digital elite will likely prioritize automation-focused AI as they focus on cost reduction and process optimization in existing sectors. This Labor-Substituting technology is designed to replace human labor in routine tasks. At the same time, this is beneficial for corporate balance sheets, but it does not help create new value or high-quality jobs for the broader economy and societal welfare. The majority of SMEs, which lack the capacity for strategic AI integration, will remain excluded entirely, unable to adopt either automation or the more desirable **labor-complementing AI** that could make their workers more productive. The result is a self-reinforcing cycle: **superstar firms transition to automation and solidify their market power, while the SME base stagnates or contracts.**
- If not controlled, **Labor-Substituting** automation in these key sectors will further deepen the economic divide. While export figures rise and superstar firms break productivity records, productivity across the country will stagnate, and middle-skilled jobs will disappear. Therefore, bridge programs such as the "Digital SME Starter Packages" recommended in the report are not only digital inclusion tools; they are also anti-monopoly, pro-productivity

interventions capable of directing AI adoption toward complementing labor. This can help, for example, by enabling SME-employee technicians, quality controllers, and logistics operators to take on new tasks rather than disappear.

- **Risk, Governance, and Further Concentration:** This divide deepens further with the challenge of AI governance. Globally, as AI adoption increases, the focus on mitigating risks such as cybersecurity and privacy also increases. A 2024 McKinsey survey shows that companies are working increasingly to reduce these risks. However, effective risk management and data governance are generally centralized functions. In Türkiye's SME-dominated economy, where such sophisticated functions are rare, this represents another significant barrier that further strengthens the advantage of large, well-resourced companies, making it even more difficult for SMEs to adopt AI safely and effectively.

3.2 Human Divide: A Fragmented and Unequal Society

Without comprehensive policy change, the divide within this dual structure formed by the digital elite and SMEs will only widen. As superstar firms capture all the gains from AI and widen the gap, SMEs risk becoming unable to compete, shutting down, and facing mass layoffs that primarily affect low- and medium-skilled workers. For example, a study by Revelio Labs indicates that companies in the United States may adapt to AI, leading to severe job losses **in positions vulnerable to AI**. This effect is felt more acutely, particularly in entry-level job categories, making it even more difficult for young people to enter the labor market.

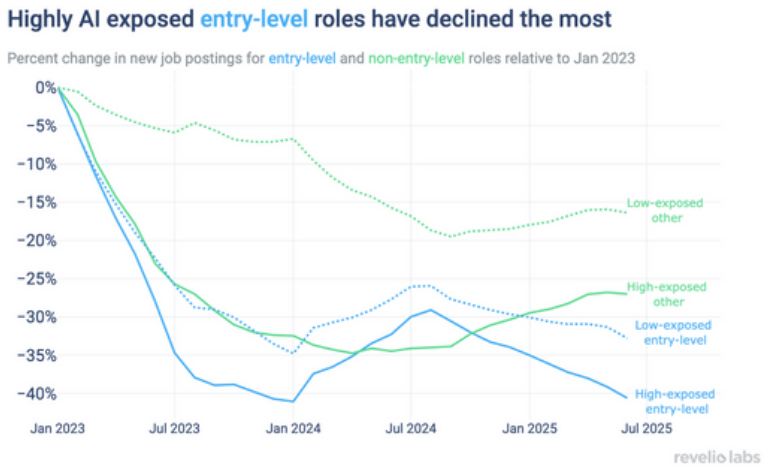


Figure 13: Decline in Entry-Level Jobs
Source: Revelio Labs

Section 3: Risks and Deepening Digital Inequality

Therefore, the economic divide between firms directly transforms into a deep and damaging fragmentation within the population. The human capital gaps identified in Section 2 indicate that the workforce is unprepared to manage labor market disruptions caused by AI, leading to three forms of inequality.

Pursuing an AI strategy without addressing this fundamental gap means allowing a ruthless two-tier economy to emerge. The following are the separations likely to be seen in the future economy.

1. **Worker Divide:** The labor market will become sharply polarized. A small elite group of employees in digitized companies will develop in-demand AI collaboration skills and receive high-premium salaries. In contrast, millions of workers employed in SMEs that cannot digitize will see their existing skills and capabilities become outdated, and their wages stagnate. They will be trapped in a dead end with no opportunity to develop their skills within firms. This creates a skills-based form of income inequality that pushes a large portion of the population into insecure, low-wage jobs.
2. **Urban-Rural Divide:** The benefits of the AI economy will not be distributed equally across the country. Digitized companies and the high-paying jobs they offer will continue to concentrate in a few metropolitan centers such as Istanbul and Ankara. Traditional SMEs spread across Anatolia will suffer from this brain drain and lack of investment. This will deepen the economic and social divide between a few emerging "metropolitan cities" and the rest of the country.
3. **Social Divide:** AI carries the potential to be unable to remain a neutral technology; it can absorb and even strengthen existing social biases. The AI transition poses two specific threats to gender equality in Türkiye: (i) if hiring and promotion algorithms are trained with historical data reflecting past gender biases, they can systematically discriminate against qualified female candidates, reinforcing "glass ceilings." (ii) In many medium-skilled, routine administrative and office roles that are most vulnerable to automation, the rate of female employment is high. Therefore, the automation of these jobs disproportionately affects women's economic security and carries the threat of potentially reversing the progress made in workplace gender equality.

Section 4: Future Scenarios for Türkiye

The previous analyses have presented a picture of the current situation: Türkiye faces a paradoxical combination of a digitally curious population and profound structural weaknesses in its institutional and human capital foundations during the AI revolution. The country is not on a predetermined, fixed, and predictable path. On the contrary, it stands at a critical crossroads. The policy choices made or avoided over the next 10-20 years will determine which of three possible futures will emerge. This section summarizes these scenarios, ranging from inaction to decisive, strategic intervention.

Scenario 1: "Deepening Inequality" (Pessimistic Scenario)

This scenario emerges if Türkiye continues a passive policy approach toward AI developments. It assumes that no major strategic interventions will be made to address the fundamental digital gap among SMEs or the systemic skills mismatch in the workforce. The state allows the market to evolve on its own, assuming that the benefits of AI will somehow “trickle down” from the top.

- **Labor Market:** The “dual economy” may turn into a severe divide. Firms that can digitize take the lead in AI adaptation and shift aggressively toward automation, displacing workers in manufacturing, textiles, and administrative fields. Without opportunities for reskilling/learning, these displaced workers cannot transition into new jobs. At the same time, as the education system continues to produce graduates with outdated skills, chronically high youth unemployment becomes a permanent feature.
- **Inequality:** A small, extremely high-paid tech and executive elite concentrated in Istanbul and Ankara may reach globally competitive salary levels. The vast majority of the country, however, is pushed into a low-wage, insecure service economy or the informal sector. The fact that the proportion of people earning minimum wage or close to it has increased over the years can be considered an indicator of this. Income, wealth, and geographic divides become extreme and entrenched. The “middle pillar” of the economy disappears entirely.

- **Social Impact:** Brain drain accelerates. Social frustration increases, confidence in the future declines, and the population's "demographic advantage" turns into a demographic disaster. Widespread unemployment and lack of opportunity fuel social and political instability. The brain drain of Türkiye's best talent accelerates as they seek a future abroad, further eroding the country's innovation capacity. This is the possible future of a society that has lost control of its economic trajectory.

Scenario 2: "A Divided Future" (Most Likely Scenario)

This scenario arises from a fragmented and reactive policy approach. The state takes some positive steps, but from a broader perspective, they are not holistic. It may support the high-tech sector through grants and the creation of "technoparks," but it fails to address broader, systemic issues such as SME digitalization and comprehensive education reform.

- **Labor Market:** Türkiye's export-oriented manufacturing sector (for example, automotive) successfully integrates AI and robotics, becoming more globally competitive but with a much smaller, higher-skilled workforce. In major cities, a vibrant tech startup environment develops, creating high-paying jobs for a select minority. However, for the majority, the labor market remains relatively tight.
- **Inequality:** The "dual economy" becomes institutionalized. Those in modern, digitized sectors can earn high wages. At the same time, workers in small-scale retail, services, and trade face intense pressure from automation and global competition. They are pushed toward the informal economy as a form of social safety net. Digital competence has become a fundamental determinant of an individual's living conditions, shaping access to high-value jobs, quality education, and even healthcare.
- **Social Impact:** While residents of emerging technology hubs feel that they are part of the global economy, those in other regions feel left behind, creating a deep-rooted regional and cultural resentment. Although not as unstable as the first scenario, this future represents a managed decline for a large portion of the population and a permanent ceiling on Türkiye's overall potential. It is a scenario in which Türkiye struggles to escape the middle-income trap.

Section 4: Future Scenarios for Türkiye

Scenario 3: "Digital Leap" (Optimistic Scenario)

This optimistic scenario is possible only through proactive and systematic policies. It requires the state to recognize the scale of the problem and to launch a coordinated national mission focused on two fundamental pillars: basic SME digitalization and comprehensive human capital reform.

- **Labor Market:** A national skills transformation agenda, such as the proposed “Skill Acquisition Program” initiative, successfully retrains workers displaced from traditional industries for new roles in advanced manufacturing and in the digitized sector. By directly addressing the SME digitalization gap, it ensures the necessary investments are made and that millions of new, high-value-added jobs are created in these newly competitive firms. Türkiye uses its young, digitally literate population as a strength for technology services, software development, and digital content creation.
- **Inequality:** By modernizing the social safety net to include “gig” workers and freelancers, the condition of being precarious is reduced. Effective policies to increase female labor force participation reveal a massive new talent pool, boosting growth and closing the gender gap. Targeted investments in digital infrastructure and education in underdeveloped regions transform these areas into special economic centers, countering the “superstar city” effect and reducing regional inequality.
- **Social Impact:** Lifelong learning becomes a cultural norm supported by accessible public programs. Entrepreneurship is encouraged through a simplified regulatory environment, venture capital is supported, and the formal economy grows. This dynamism creates a positive externality in the real sector and further supports entrepreneurship. In this future, Türkiye successfully manages the AI transition, leading to a virtuous cycle of inclusive growth, increased social mobility, and a stronger, more resilient society. In this way, the likelihood of seeing a Türkiye that has escaped the middle-income trap becomes highly likely.

Section 5: Policy Recommendations for an Inclusive Future

The analysis presented in this report points to an unavoidable conclusion: inaction is not a viable option. Leaving the AI transition to unfold on its own without strategic intervention will, by default, push Türkiye toward the pessimistic scenario. To achieve the prosperous and fair future envisioned in the optimistic scenario, a generic "invest in AI" policy is insufficient and, given the potential technological trends mentioned above, perhaps even dangerous.
Türkiye needs a comprehensive, multi-dimensional national mission that directly confronts the structural weaknesses identified in this report. This roadmap is organized around three principal axes designed to work in synergy with one another: **(A) Building the Digital Foundation for Our Firms, (B) Restructuring Human Capital, and (C) Minimizing the Informal Economy.**

A. Building the Digital Foundation – A National Mission for SME Transformation

Problem: The most critical bottleneck identified in the report is the fact that our country's SMEs are "data-poor." Their low adoption of basic digital tools (ERP, CRM, SCM) renders them inadequate for the AI revolution and leaves them vulnerable to falling behind the competition. A massive state-led program is necessary to bring the SMEs, which form the backbone of the economy, into the 21st century.

1- SME Digitization Transformation Program: The "Digital Transformation Program," implemented as of 2021, should not remain limited to firms operating in the manufacturing sector; it must go beyond small grants and become a nationwide program that transforms into the state's flagship economic initiative.

- **Policy:** To offer SMEs "Digital Starter Packages" that include heavily subsidized (for example, 90% for the first two years) licenses for cloud-based, Turkish ERP, CRM, and SCM software from approved providers. To support this financial decision, incentives such as "First-Time Digitalization" tax super-deductions should be made to make it attractive. To address internet speed issues and complete

the transition to 5G technology as quickly as possible, prepare infrastructure suitable for firms' digitalization.

KOSGEB today provides interest and loan support for investment and software purchases within the **SME Digital Transformation Support Program**; when a training-certificate requirement is added to this structure, learning and incentives can be directly linked, enabling a more permanent transformation. Training should not be limited to a single session; renewal modules should be made mandatory every two years. SMEs that complete these modules should be rewarded with tax and **social security (SGK) incentives** and, in addition, strengthened through technological support such as cloud software grants and cybersecurity packages.

- **Objective:** To rapidly overcome the cost and knowledge barriers of hundreds of thousands of enterprises and provide the basic data infrastructure needed for them to survive and ultimately thrive.

2-Establishing a "Digital Consultancy" System: It is not possible to use technology effectively without knowledge and vision. Even applying to digital transformation programs requires a certain level of knowledge and awareness.

- Policy: To create a digitally trained and state-funded force of digital consultants. To increase awareness that AI will not only provide digitalization but also digital transformation. These mentors, potentially with university students in relevant fields participating through paid internship programs, will work directly with SMEs in the "Digital SME" program, assisting with implementation, data management, and training personnel to use these new tools in business decisions (an opportunity for university-industry-state cooperation). To develop solutions for SMEs' lack of competent personnel in the field of AI.[1]

[1] As of 2023, Türkiye joined the Digital Europe Program, and coordination is carried out by the Presidential Digital Transformation Office and the Ministry of Industry and Technology; when the opportunities offered by this participation are delivered to SMEs through the National Technology Alliance, enterprises will more easily access international calls and increase their project development capacities. Singapore's Smart Nation Initiative model, which brings together the public sector, private sector, and academia in joint R&D projects, shows that Türkiye can create a similar synergy through the National Technology Alliance.

- AI, data analytics, e-commerce, CRM, automation, and cybersecurity should be included. Participants should be given **micro-certificates,** which should provide an advantage when applying for **KOSGEB and Digital Transformation Program** support. The Ministry of Industry and Technology today conducts SME maturity assessments using TÜBİTAK-TÜSSİDE's DDX Digital Transformation model; the training mobilization can strengthen transformation by continuously updating these assessments.
- **Publicly led** ERP solutions can be implemented. The widespread adoption of cost-effective, scaled versions of ERP solutions, such as Kovan, developed by organizations like HAVELSAN (Aviation Electronics Industry) and tailored for the SME market, can support digital transformation.
- Similarly, MEXT AI, one of the European Digital Innovation Hubs (EDIH) implemented by the Ministry of Industry and Technology under the Digital Europe program, provides services in the field of artificial intelligence for industry. Within this structure, the components of academia, development agencies, financing, infrastructure, training, and consultancy act jointly. Its purpose is to support the digitalization transformation of SMEs.

- **Objective:** To solve the problem of "We bought the software, but we don't know how to use it" and to embed a data-focused, optimization-centered mindset into the management culture of Turkish SMEs. For example, Finland's **"Elements of AI"** program, which offers free artificial intelligence training to all its citizens, shows that digital literacy can become widespread across society; in Türkiye, the micro-certificate approach should be expanded with the same vision.

3- Creating a National "Digitality Index"

- **Policy:** To task KOSGEB with offering every firm a free, 30-minute online diagnostic. This diagnostic can score five dimensions: (i) data collection, (ii) workflow automation, (iii) cybersecurity, (iv) use of data analytics, and (v) readiness for AI. Grant sizes, tax deductions, and mentorship priority can be determined based on each firm's initial score.

- **Objective:** To create a transparent metric and a live dashboard for policymakers.

4-Launching "Cloud Credits" to Remove Capital Expenditure Barriers

- **Policy:** In partnership with leading cloud providers (AWS, Azure, Google, Turkcell), to give eligible SMEs significant amounts of compute and storage credits for two years. To ensure that the credits are activated after the firm uploads 12 months of billing data, thereby encouraging correctly targeted usage. To provide effective solutions with AI-supported financial technologies.
- **Objective:** To enable ERP/CRM/SCM tools to generate immediate value by moving essential business data to secure, scalable platforms. This breakthrough will also contribute to enterprise data management.

5-Digitalization in SMEs Across the Value Chain

- **Policy:** A national co-investment program that accelerates digitalization and AI adoption together with the SMEs in the value chains of large firms. To offer large-scale companies grant and loan opportunities for co-financed digitalization and AI projects with their SME suppliers/customers. Capacity transfer: to prepare 3-6 month mentorship/rotation programs and sector-specific trainings from large firms to SMEs. To provide non-repayable support once SME project outputs (data quality, automation, and degree of digitalization) are verified. Fintech solutions such as C2FO facilitate access to financing in the supply chain at this point while also helping firms in their digitalization.
- **Objective:** To rapidly increase digital maturity across the value chain; to reduce the fixed-cost barriers of SMEs; and to achieve significant gains in reduced supply errors, increased delivery performance, improved traceability/compliance, and enhanced **efficiency and resilience.**

Section 5: Policy Recommendations for an Inclusive Future

6-Digital SME Mission Office

- **Policy:** A Digital SME Mission Office should be established under the Presidency or the Ministry of Industry and Technology. This structure should work with KOSGEB, TÜBİTAK-TÜSSİDE, Development Agencies, universities, and NGOs to develop a live dashboard that monitors SME digitalization scores, training participation rates, and registered employment data in real time. Today, within the scope of the Digital Transformation Program, the Ministry measures the digital maturity of enterprises and receives support applications through the portal; when this data is transferred to the Mission Office, regional targeting will become more effective.
- **Objective**: To facilitate the monitoring of SMEs through the creation of integrated data. For example, the fact that 99% of public services in Estonia are delivered digitally through the X-Road infrastructure demonstrates that such integrated data sharing can be successfully implemented; in Türkiye, the Mission Office should be the pioneer of a similar integration.

7-Digital Anatolia Program

- **Policy:** Province-based **Technology Centers** should be established for SMEs in Anatolia; smart agriculture, renewable energy, water management, and IoT solutions should be prioritized in these centers. This structure, to be implemented with co-financing support from Development Agencies and KOSGEB, will accelerate regional development by increasing local innovation capacity. India's Digital India Program increased access to digital services in rural areas, while Brazil's Agro 4.0 initiative increased agricultural productivity through IoT-based solutions; Türkiye, with a similar vision, should establish digital centers in Anatolia to both reduce regional inequalities and support sustainable growth.
- **Objective:** Today, the Ministry of Industry and Technology operates the Digital Transformation Program mostly in major cities; the **Digital Anatolia Program** will extend this impact to rural areas, expanding the inclusiveness of digitalization.

B. Restructuring Human Capital – From Demographic Advantage to Talent Advantage

Problem: Section 2 identified a profound "talent paradox." The workforce suffers from weak basic education (low PISA scores), a broken school-to-work transition (high NEET rates), an underdeveloped lifelong learning culture, and the massive underutilization of female talent (low FLFPR). This situation leaves the population vulnerable to social inequality. A serious national mission is required to revise the skills chain from primary school to retirement fundamentally.

1-Fundamental Reform of the Curriculum

- **Policy:** To revise the national curriculum starting from primary school, prioritizing **critical thinking, creativity, digital literacy, and collaborative problem solving** instead of memorization. AI provides a tangible contribution only when combined with human creativity. This should not remain on paper; it must also translate into concrete changes in pedagogy and assessment processes.
- **Objective:** To intervene directly in the root cause of the skills mismatch and equip all children with the fundamental, future-oriented skills defined in Section 1.

2-Modernizing Vocational and Technical Education (Vocational High Schools):

- **Policy:** To transform vocational schools from a neglected track into high-tech training centers focused on advanced manufacturing, renewable energy systems, data analytics, and cybersecurity. To prepare AI-supported, customizable training programs and make them available for disadvantaged students (EBA application). This transition should be made in a deep and binding partnership with the private sector to ensure that curricula are continuously updated to meet real-world demands.[2]
- **Objective:** To prevent the erosion of the middle class by offering prestigious and high-paying pathways for young people.

[2] Recent studies in the literature show that a 6-week AI-supported personalized training program can be equivalent to 1.5-2 years of conventional education.

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3-Launching the "Skill Acquisition Program" Initiative

- **Policy:** To create a state-supported lifelong learning platform that provides every citizen with an individual "skills wallet." This will provide access to a marketplace of accredited online and in-person courses for skill development and reskilling throughout their careers. Through regional partnerships, NGOs, and technology clusters, entrepreneurship and digital education opportunities should be provided to the poor and disadvantaged groups. Micro-credential programs should be encouraged for young people who are not in education, employment, or training (NEET).
- **Objective:** To make continuous learning accessible and affordable for everyone, especially mid-career workers in industries at risk. For example, Singapore's **SkillsFuture** model, which provides every individual with lifelong learning credits, sets a strong example for the continuous updating of digital skills; in Türkiye, access to this opportunity should also be guaranteed for SME managers.

4-Training Information Technology Specialists

- **Policy:** Inspired by the European Union's goal of training 20 million IT specialists by 2030, Türkiye should set its own concrete and measurable target. In this context, **at least 1 million new information technology specialists, of whom at least 50% should be women**, should **be trained within the next 5 years**. This target should be declared a national mission, supported by state incentives and private funds, and integrated with the "Skill Acquisition Program," modernized Vocational High Schools, and the "Digital Consultancy" systems. The program should focus on specific fields such as data analytics, cybersecurity, cloud computing, and AI specialization.
- **Objective: To close the supply-demand** gap that is critical for Türkiye's digital transformation; to proactively train the skilled workforce that the "Digital SME" program will require; to increase women's employment in the technology sector with a concrete target, thereby directly contributing to gender equality, and to bring this field onto the state agenda as a strategic priority.

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5-Encouraging Female Labor Force Participation

- **Policy:** This is not only a social goal but also an economic necessity. To invest in affordable, high-quality childcare, which is the single most effective facilitator for women's employment. This should be paired with campaigns encouraging women into STEM fields and the strict enforcement of equal pay legislation. Special funds and tax incentives should be developed for **women entrepreneurs;** accelerator programs should allocate quotas **for women-led SMEs**. Free **artificial intelligence and digital literacy** courses should be expanded at the middle and high school levels to encourage girls to engage with technology at an early age. The Ministry of Industry and Technology runs training modules and competitions under the talent development axis of the National Artificial Intelligence Strategy; within this framework, it should be made more inclusive with special programs for women and girls. Canada's **Women in Tech Fund** provides funding for women entrepreneurs, while Sweden organizes summer camps to guide girls into STEM fields; similar national programs in Türkiye should strengthen women's roles in the digital transformation. At this point, the fact that **the Women in Technology Association** has reached more than 20,000 young people to date, with a 93% employment rate, and that it carries out academy and research programs for women entrepreneurs and students constitutes a critical example. It is of great importance for the Ministry's policies to reach broader audiences by being supported with the field experience of such civil society pioneers for an inclusive digital transformation.
- **Objective:** To directly address gender inequality, identified as a significant structural weakness, and to unlock Türkiye's largest unused economic resource.

6- Digital Rights Constitution

- **Policy:** A **Digital Rights Constitution** should be prepared, and data privacy, algorithmic transparency, and digital well-being indicators should be legally guaranteed. The Ministry of Industry and Technology includes "ethical and trustworthy artificial intelligence" among the actions of the National Artificial Intelligence Strategy; this framework, to be prepared in constitutional form, will lend social legitimacy

to existing efforts and increase citizens' trust in the digital world. Canada's Digital Charter initiative guarantees citizens' digital rights, while New Zealand's Wellbeing Budget approach measures development not only through GDP but also through indicators of social equality and well-being.

- **Objective:** Türkiye should secure digital rights and well-being indicators, making digital transformation not only an economic but also a social achievement.

C. Combatting the Informal Economy – A Social Safety Net for the 21st Century

Problem: The insecurity of the large informal sector and the threat of mass labor turnover mean that Türkiye's 20th-century social safety net is inadequate for the 21st-century labor market. Social protections must be proactively modernized to ensure stability and justice.

1- Formalizing the Informal Economy Through Digitalization

- **Policy:** To use the "Digital SME" program as a lever for formalization. To make access to subsidies and support conditional on official registration. By simplifying business registration and tax codes for micro-enterprises and freelancers, to offer them subsidized access to social security benefits (health, retirement) if they become formally registered.

Using blockchain-based identity verification and AI-supported risk analysis, the goal should be to reduce informal employment by 25%. Registered employers should be incentivized with premium support and tax reductions; deterrent sanctions should be applied to those who persist in informal jobs. The Ministry of Industry and Technology is developing data integration and AI-focused inspection solutions within the 2024-25 actions of the National Artificial Intelligence Strategy; when SGK reform is integrated with these infrastructures, the transparency and effectiveness of the system will increase significantly.

- **Objective:** To expand the social safety net for millions of vulnerable workers and improve the state's tax base, creating a virtuous cycle between formalization and improved public services. For example,

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South Korea's ability to connect 60% of its SMEs to digital management tools thanks to its 5G investments shows how concrete results can be achieved in combating informality when technology is applied effectively; similarly, Türkiye should rapidly deploy technology in social security to reduce informality.

2- Introducing Portable Social Rights

- **Policy:** To separate social security from traditional full-time employment. By creating a system in which rights such as retirement and health insurance are tied not to the employer but **to the individual**, it would allow "gig" workers, freelancers, and part-time workers to build and contribute to social security across multiple jobs.
- **Objective:** To address the growing inequality between traditional workers and the increasing number of non-standard workers.

3- Developing and Modernizing Active Labor Market Policies

- **Policy:** To strengthen the national employment agency İŞKUR with better funding and well-trained career counselors. Critically, to link unemployment benefits to mandatory participation in high-quality retraining programs offered through the "Skill Acquisition Program" initiative and adapted to local market needs.
- **Objective**: To move from passive income support to a system that actively helps displaced workers transition into new, in-demand jobs.

4- Strategic Governance for AI and Regional Development

- **Policy:** To create a national AI strategy that includes a strong regulatory and ethical framework, eliminating bias by mandating the auditing of algorithms used in recruitment and public services. At the same time, to launch a significant public investment program to ensure high-speed internet access across the country and to establish tax-free "Digital Economy Zones" in underdeveloped cities to decentralize opportunities. For issues that require such a holistic approach, it is necessary to establish a governance model that mandates coordinated communication among bodies, such as the Ministry of Industry and Technology, the Ministry of Transport, and the Digital Transformation Office.
- **Objective:** To prevent AI from perpetuating discrimination and to ensure that the benefits of the digital economy spread more widely by directly combating the "metropolitan city" effect.

Section 6: Conclusion

This report began by framing the Artificial Intelligence revolution as a global revolution. The analyses conducted have shown that Türkiye will face a paradoxical combination of strengths and weaknesses during this revolution. Türkiye has a digitally eager and young population with significant digital potential. However, this potential is severely constrained by deep structural fractures, such as a corporate sector dominated by “data-poor” SMEs and a human capital system that fails to equip its citizens with the skills required for the future.

The core argument of this report is that AI will not be a gentle tide that lifts all boats. On the contrary, it will be a powerful force that exploits these pre-existing weaknesses. Without decisive action, the AI revolution will open deep and lasting divides within Turkish society, separating the digitally capable from the digitally excluded, the skilled from the unskilled, metropolitan centers from Anatolia's heart, and men from women. The default path of inaction or fragmented policy leads directly to the “Deepening Inequality” scenario: a future marked by extreme inequality, wasted potential, and social instability.

However, this outcome is not inevitable. The future is not a fixed path to be awaited, but a phenomenon to be built. The “Digital Leap” scenario offers an alternative vision, inclusive growth, shared prosperity, and increased social mobility. Reaching this future is possible, but it requires abandoning incremental approaches and adopting a bold, integrated national mission.

The policy roadmap outlined in Section 1 is not a menu of standalone options; it is a blueprint for a synergistic strategy. The three principal axes must be advanced simultaneously:

1. **Building the digital foundation through the SME “Digital Transformation Program”** is the prerequisite for everything else. This creates an opportunity for SMEs, the backbone of the national economy, to compete.
2. **Restructuring human capital through education reform and lifelong learning** enables the Turkish people to manage these newly digitalized enterprises.
3. **Minimizing the informal economy** provides the essential social security measures needed to ensure that no one is left behind during this volatile transition and to minimize inequality.

Türkiye stands at a critical crossroads. At this point reached in the information age, the accessibility of knowledge is more important than ever. The need for an education mobilization, strategic prioritization, and the development of a digital ecosystem is clear. While the desire for adaptation to artificial intelligence is strong in Türkiye, planning, governance problems, and infrastructure deficiencies make the digital adaptation process difficult. The choices made over the next 10 years will determine the country's economic and social trajectory for generations to come. The nation can either be a passive subject of technological disruption or an active architect of its own digital destiny. The path to a prosperous and just future requires courage, strategic vision, and the will to implement profound, fundamental transformation.

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Artificial Intelligence and the Future of Working Life in Türkiye:

Digital Transformation for Inclusive Growth

ACT HUMAN

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2025



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