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Navigating the digital and artificial intelligence revolution in Arab labour markets

Trends, challenges and opportunities

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Executive summary

Labour market conditions across the Arab States remain challenging, with less than half of the region's working-age population employed in 2024 and youth and women facing some of the highest exclusion rates globally. This reality, however, masks wide disparities within the region, shaped by differences in resource endowments, levels of development and political stability. While the countries of the Cooperation Council for the Arab States of the Gulf (GCC) benefit from relative economic resilience and high employment rates, their labour markets remain segmented, largely influenced by a significant presence of migrant workers and a heavy reliance on oil. Countries are attempting to diversify into non-oil sectors, such as information and communication technology (ICT), tourism and renewable energy, but greater efforts are needed to accelerate progress and expand opportunities for nationals.

In contrast, most non-GCC countries face compounding challenges of conflict, instability and limited fiscal capacity, all of which erode private-sector growth and weaken labour market performance, resulting in high levels of labour underutilization and informality. Premature de-industrialization and limited structural transformation have further hindered decent job creation.

Digital transformation presents both a critical opportunity and a mounting risk for the region. If managed inclusively, it could serve as a catalyst for economic diversification, innovation and job creation, especially for women, youth and vulnerable groups. However, without strong foundations in infrastructure, skills and governance, digitalization risks reinforcing existing inequalities and deepening labour market fragmentation.

So far, progress has been notably uneven across the region. The GCC countries are actively leveraging digital transformation to reduce oil dependency, supported by substantial investments in technology, infrastructure and innovation ecosystems. These nations benefit from near-universal internet access, strong cybersecurity systems and widespread adoption of e-government services. Advanced technologies such as artificial intelligence (AI) are increasingly shaping sectors like e-commerce, healthcare, education and fintech, while driving innovation in smart city development and advancing green technologies. Yet, GCC countries are progressing at different levels, with some emerging as global digital leaders while others advance more gradually.

Meanwhile, non-GCC countries see digitalization as a potential driver of growth and inclusion, particularly through support for small and medium-sized enterprises (SMEs), entrepreneurship and integration into regional and global value chains. Yet most of these countries face significant barriers, ranging from inadequate infrastructure and cybersecurity gaps to political and economic instability. While overall digital adoption remains limited, there are promising examples, particularly in Jordan and Lebanon, as well as encouraging developments in areas such as e-commerce, digital payments and public digital services.

Looking specifically at the labour market, technological change has long reshaped employment, creating new jobs while displacing others. Today, rapid digitalization – driven by advances in AI, including generative AI and large language models – is accelerating these transformations globally. Such shifts are not only affecting the number of jobs but also transforming their nature and quality, with growing implications for the Arab States.

While definitions vary, digital employment can be generally understood as work that relies on or is enabled by digital technologies. Using a sector-based approach, it can be measured by the degree of digital intensity in different industries. Available data from select Arab States show that digital employment is highest in the United Arab Emirates, while, non-GCC countries have far lower levels of employment in sectors with high digital intensity. Notably, across the region, much of the workforce remains concentrated in sectors with medium digital intensity, suggesting that while digital transformation is under way, further efforts are needed to expand high levels of digital employment and gradually shift away from low-intensity digital sectors, which continue to account for a significant share of jobs.

In recent years, generative AI has become a central focus in research on the future of work. Global evidence suggests that, while this advanced technology may lead to the replacement of some jobs, its more significant impact lies in augmenting existing roles – automating specific tasks rather than entire jobs – to potentially enhance workers' productivity and efficiency. This dynamic is evident in the Arab States, where only 2.2 per cent of total employment, or around 1.2 million jobs, face high risks of full automation. Meanwhile, a much larger proportion – 14.6 per cent, that is nearly 8 million jobs – stand to benefit from generative AI-driven augmentation, offering significant opportunities to boost productivity and improve job quality.

From a gender perspective, women appear to hold more than three times the share of jobs at risk of automation (5.3 per cent) compared to men (1.6 per cent), largely due to the occupational structure of employment, with many women concentrated in administrative and routine roles more prone to automation. Yet, women also stand to benefit most from augmentation, with 22.7 per cent of female-held jobs having potential for digital enhancement, compared to 13 per cent of male jobs.

Importantly, and while the threat of widespread job losses appears limited, the effects of generative artificial intelligence (GenAI) will likely be uneven across countries. Global trends indicate that high-income countries are more exposed to the impacts of GenAI than lower-income countries. Accordingly, GCC states, with their higher levels of digital readiness and income, are likely to experience greater effects from both automation and augmentation, while non-GCC countries may see slower adoption and impacts that are more limited.

Beyond the potential automation and augmentation effects of GenAI, digitalization and AI present significant job opportunities that warrant thorough investigation. To explore these dynamics, a macro-level econometric analysis was undertaken in collaboration with Cambridge Econometrics, employing the E3ME model to quantify the economic and employment effects of digital transition scenarios across the Arab States from 2024 to 2035. Two scenarios were assessed against a business-as-usual baseline. The first envisages near-universal broadband coverage (at least 90 per cent of the population) by 2030 across the region (the "broadband expansion scenario"), while the second builds upon this foundation by incorporating investments in AI and GenAI, examining their transformative potential (the "AI integration scenario").

Both scenarios reveal distinct trajectories of economic and employment growth. Under the broadband expansion scenario, steady GDP gains would amount to US$4.6 billion by 2035. Employment would correspondingly rise, with net job creation reaching nearly 186,000 by 2035. On the other hand, the AI integration scenario delivers substantially larger GDP growth, reaching US$14.1 billion by 2035, reflecting AI's profound capacity to drive innovation and competitiveness. Employment outcomes are more nuanced. In the model, early job losses emerge from automation of vulnerable occupations, but from 2028 onwards, AI-driven augmentation and sectoral expansion fuel net employment gains, reaching roughly 118,000 additional jobs by 2035.

It is critical to emphasize that the analysis identifies potential trends rather than producing exact forecasts. However, the overarching conclusion is clear: both scenarios project positive impacts on employment and GDP. Consequently, the region should not fear AI and digital transformation but instead proactively prepare, implementing enabling policies to ensure that the Arab States capitalize on the opportunity to digitally transform and diversify their economies and foster the creation of more, better-quality jobs.

From a sectoral perspective, results show that the broadband expansion scenario yields steady, broadly distributed net job creation with minimal sectoral losses. The AI adoption, on the contrary, drives transformative sectoral shifts, with some industries seeing significant net gains and others substantial losses. “Construction” and “transport and storage” record the largest employment gains by 2035, whereas sectors such as “public services”, “basic manufacturing” and “retail” experience job contractions from the disruptive effects of AI. This implies the need for proactive, sector-specific policies to support workforce transitions and promote equitable employment outcomes.

At the occupational level, similar trends hold. No major job losses or disruptions are projected under the broadband expansion scenario, indicating an almost stable, inclusive employment growth path. On the other hand, the AI integration scenario leads to a dynamic reshaping of occupations, with significant job creation in high-demand, tech-oriented, managerial and human-centric roles, alongside substantial losses in others. Employment gains are expected among “personal service workers”, “teaching professionals”, “drivers and mobile plant operators”, as well as jobs in “building and related trades”. High-skilled professionals in science, engineering and management will also likely see growth due to AI deployment. Conversely, occupations involving routine, repetitive tasks, such as general clerical staff and keyboard operators, sales workers and customer service clerks, face significant declines from automation.

Employment impacts from digital transformation also vary across age and gender groups. Under the broadband expansion scenario, job growth is broadly inclusive, benefiting all ages almost equally in relative terms, with prime working-age individuals (25–54) gaining the most in absolute terms. In contrast, the AI integration scenario favours younger workers (15–24), who gain most from tech-driven roles, while prime-age workers initially face job losses due to automation but recover and experience net positive gains by 2035. Older workers (55+) are disproportionately disadvantaged under AI adoption, struggling to adapt to new technologies and reskilling demands, which calls for well-designed policies to support their participation and adaptation in digitally transforming labour markets.

Gender disparities are pronounced under both scenarios. Broadband expansion generates relative employment gains for both men and women, but men benefit more in absolute terms because of existing labour market inequalities and sectoral segregation. The AI integration scenario, on the other hand, intensifies these gaps, with women facing significant job losses in clerical and routine roles vulnerable to automation, while men gain jobs in AI-driven, traditionally male-dominated sectors like logistics and construction. These trends highlight the urgent need for targeted, gender-sensitive policies to ensure that digital transformation fosters equitable and inclusive employment outcomes.

Beyond gender and age considerations, it is essential to ensure that all vulnerable groups, such as low-skilled workers, persons with disabilities, migrants and refugees, are included in the benefits of AI and digital transformation. While these groups have much to gain from the opportunities the digital economy presents, they also face distinct risks that must be proactively addressed to ensure a just and inclusive transition that leaves no one behind.

In addition to the expected shifts in employment caused by AI and digitalization, including job displacement, augmentation and creation, the core challenge lies not only in the ultimate quantity of jobs, but in their quality. While digital technologies can enhance job quality through greater flexibility, innovation and efficiency, they also carry risks such as diminished worker autonomy, increased surveillance and growing job insecurity. These trends underscore the urgent need for a human-centred approach to ensure that the digital transition delivers decent, inclusive and fair work for all.

Such a transition should also clearly benefit employers and enterprises, including micro, small and medium-sized enterprises (MSMEs), which form the backbone of regional economies. While these technologies can open access to new markets, streamline operations, boost productivity and foster resilience, MSMEs face persistent barriers such as limited financing, digital skills shortages, inadequate infrastructure and insufficient government support. Addressing these challenges will be essential to ensure that smaller enterprises are not left behind in the digital transition and that they have the opportunity to benefit from AI and other digital technologies.

Interestingly, although boosting productivity is often cited as a key benefit of AI and digitalization, evidence suggests that such gains are neither automatic nor evenly distributed across firms, sectors or countries. Realizing productivity improvements depends on the deep integration of technology into core business processes, strong digital leadership and a trained workforce, active worker engagement and other enabling factors. At the sectoral and macroeconomic levels, structural challenges in the Arab States, including limited digital skills, inadequate infrastructure and high levels of informality, have constrained productivity growth despite increasing digital adoption. This disconnect, often referred to as the “productivity paradox”, highlights the urgent need for a comprehensive and inclusive digital transformation agenda that is closely aligned with the region’s broader economic and labour market context.

Beyond all else, the success of AI and digital transformation in the Arab region hinges on the availability of relevant skills. While the region is experiencing a gradual shift in skills demand driven by digitalization, the pace and scope of this transition remain uneven. In Saudi Arabia, the United Arab Emirates and Bahrain, demand is rising for digital and technological skills, data analysis, coding and cybersecurity, alongside “soft” skills such as problem solving, adaptability and leadership. Real-time labour market data confirms early signs of this shift across the region.

Nonetheless, persistent challenges remain, with widespread skills mismatches stemming from outdated curricula, weak education–industry linkages and underdeveloped technical and vocational education and training (TVET) systems. Even in the more advanced economies of the Gulf, gaps in science, technology, engineering and mathematics (STEM) education, a shortage of AI specialists and continued reliance on expatriate talent persist. In lower-income and fragile states (e.g. Yemen), weak infrastructure and limited investment further hinder digital skills development.

Notably, and despite the varying development levels, all Arab countries, GCC and non-GCC alike, must work diligently to modernize their skills systems to close gaps and prepare their current and future workforce for the demands of AI and the digital era.

Policy recommendations

AI and digital transformation offer significant opportunities, but they also present considerable challenges. While risks exist, these technologies can drive job creation, improve work quality and increase productivity, if supported by proactive and inclusive policies. National strategies must be tailored to each country's broader context, taking into account the varying development stages and challenges within the region. Importantly, building a comprehensive framework grounded in social justice and dialogue, with a strong emphasis on skills development, social protection and fair labour practices, is vital to ensuring that the benefits of digital transformation are shared equitably and that labour markets across the region become more resilient.

The following points summarize the report's policy recommendations, which are aimed at helping policymakers better prepare for the digital world of work and the AI revolution, while maximizing benefits and mitigating potential risks:

1. **Invest in digital infrastructure and narrow the digital divide between and within countries.** A critical first step for an inclusive digital transformation is to ensure universal access to reliable, affordable digital infrastructure. Large disparities in connectivity, especially in low-income, rural and conflict-affected areas, must be addressed through targeted public investments in broadband, electricity, data centres and renewable energy, treating digital connectivity as a public good. Given limited budgets in many non-GCC countries, governments should also mobilize diverse financing sources, including multilateral development funds, regional infrastructure partnerships and innovative blended-finance mechanisms tied to inclusive access and job creation.
2. **Build a digitally skilled workforce and promote lifelong learning.** Bridging the digital divide requires not only infrastructure but also a digitally skilled workforce, supported by inclusive, forward-looking skills strategies. Arab countries must embed digital literacy and STEM subjects from early education and reform TVET and higher education to reflect the full range of skills needed in the digital economy, including technical, soft and transferable skills. Lifelong learning must be prioritized, with targeted efforts to reach marginalized groups. Employers also play a key role and should invest in upskilling and reskilling, particularly in sectors undergoing technological disruption. Overall, a coordinated, multilevel approach is essential to a digital economy in which all workers can thrive.
3. **Invest in quality employment services and effective social protection systems.** To ensure a just transition amid digital disruption, Arab countries must invest in quality employment services and robust social protection systems. This includes expanding responsive job placement support, career guidance, wage subsidies and other employment support measures to workers in the digital economy, including those affected by job displacement. Strengthening social protection coverage in the region is also vital for safeguarding livelihoods. Together with reskilling and lifelong learning, these measures are essential to help workers adapt, avoid long-term unemployment and prevent deepening inequalities, particularly among vulnerable groups.
4. **Invest in labour market information systems and leverage data-driven labour market insights for strategic planning.** Investing in a robust labour market information system (LMIS) is essential for Arab countries to respond effectively to the changing demands of the digital economy. Reliable, timely data enables governments to reduce skills mismatches, anticipate future trends and align education and training with labour market needs. Advanced tools such as AI, big data and predictive analytics can enhance forecasting and inform proactive, data-driven policymaking. Leveraging these tools and strengthening LMIS can inform the development of effective, inclusive and sustainable employment and skills development strategies across the region.

5. **Support digital transformation and AI application in MSMEs and promote innovation and digital entrepreneurship.** MSMEs in the Arab region often struggle to adopt digital technologies because of limited resources, low digital readiness and weak support systems. To enable their digital transformation, a phased and strategic approach is needed at the enterprise level, aligned with their capacity and needs. Governments should also invest not only in infrastructure but also in targeted support, such as financing mechanisms, adoption incentives and innovation programmes, to encourage uptake of digital tools, including AI. Promoting financial inclusion, facilitating access to tailored credit and fostering entrepreneurship ecosystems are critical. Equally essential are scalable training and upskilling initiatives for MSME owners and workers to ensure long-term competitiveness and inclusive participation in the digital economy.
6. **Create a favourable policy environment to effectively govern the digital transition and ensure creation of decent work for all.** To ensure digital transformation promotes decent work, Arab countries must align employment and digital strategies through coordinated, whole-of-government approaches. Digital policies should explicitly aim to generate quality jobs, promote inclusion and reduce inequality, while employment policies must clearly address the roles of AI and digitalization and outline measures for a fair and inclusive transition. Importantly, labour institutions and social partners must be actively involved, and strategies should be tailored to national contexts and regularly reviewed in order to remain responsive to evolving technology and changes in the labour market.
7. **Strengthen legal and regulatory frameworks for a just and inclusive digital transition.** Arab States must develop inclusive, forward-looking legal and regulatory frameworks that balance innovation with protecting workers' rights and promoting decent work. This includes updating labour laws to address digital work risks, regulating AI-driven decisions with transparency and accountability, strengthening data privacy and cybersecurity, supporting innovation-friendly policies and extending social protections to platform and gig workers. Such frameworks are essential to ensure a fair and inclusive digital transition aligned with ILO standards.
8. **Promote social dialogue for inclusive and equitable digital transformation.** Effective digital transformation requires inclusive social dialogue involving governments, employers and workers at national, sectoral and enterprise levels. Tripartite dialogue helps anticipate labour market changes, balance innovation with social justice and design fair policies. At the workplace, involving workers in digitalization efforts fosters trust, improves working conditions and supports the successful adoption of technology, ensuring that digital transitions are just and equitable for all.
9. **Foster regional and international cooperation on AI and digital transformation.** With significant disparities in digital readiness and growth between Arab States, regional and international cooperation is essential for an equitable digital transformation. Arab countries should strengthen coordination through regional bodies, such as the GCC and the Arab League, to share policies and best practices, as well as mobilizing financial and technical support, especially to less advanced economies. Prioritizing technology transfer, workforce upskilling and ethical AI governance would help foster inclusive growth and labour market resilience. At the international level, active engagement with global frameworks, such as the ILO's Global Coalition for Social Justice, can help align strategies and promote decent work and social inclusion in the digital era.

Abbreviations

AI	artificial intelligence
FGD	focus group discussion
GCC	Cooperation Council for the Arab States of the Gulf
GDP	gross domestic product
GenAI	generative artificial intelligence
HDI	high digital intensity
ICT	information and communication technology
IDI	ICT Development Index
ILO	International Labour Organization
IoT	internet of things
ISIC	International Standard Industrial Classification of All Economic Activities
ISCO	International Standard Classification of Occupations
ITU	International Telecommunication Union
LDI	low digital intensity
LLM	large language model
MDI	medium digital intensity
MSMEs	micro, small and medium size enterprises
MOOC	massive open online course
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PWDs	persons with disabilities
R&D	research and development
SoP	State of Palestine
STEM	science, technology, engineering and mathematics
TFP	total factor productivity
TVET	technical and vocational education and training
UAE	United Arab Emirates
WEF	World Economic Forum

Introduction

The global shift towards a digital economy, driven by rapid advancements in digitalization and artificial intelligence (AI), is emerging as a key engine of economic growth. Digital technologies are fuelling innovation, improving efficiency and opening new avenues for creating value across sectors. AI, in particular, is expected to contribute substantially to global GDP, with projections estimating the market could reach US$900 billion by 2026, and exceed US$1.5 trillion by 2030. Generative AI (GenAI) alone is projected to boost global GDP by 7 per cent over the next decade (OECD 2024).

At the same time, the integration of digital technologies is reshaping labour markets, offering opportunities for economic diversification, job creation, job augmentation and related productivity gains and improved working conditions, while also introducing significant challenges. These include job displacement from automation, growing skills mismatches, precarious employment, digital exclusion and widening inequalities. The recent surge in public attention to GenAI, driven by the launch of tools like ChatGPT and Gemini, has further intensified concerns about the impact of these technologies on employment. Issues such as algorithmic biases in hiring, increased workplace surveillance and threats to data privacy further complicate the evolving digital landscape.

These trends are particularly relevant for the Arab States, where digital transformation presents a vital opportunity to diversify economies and tackle persistent labour market challenges, including high rates of youth unemployment and low female labour force participation rates. However, while the potential is significant, the region's readiness to adopt AI and other digital technologies is highly uneven, with most countries facing considerable obstacles. A large share of jobs continue to rely on traditional skills; digital adoption remains uneven and persistent gaps in infrastructure, policy and regulations threaten to widen existing inequalities if left unaddressed. With already high levels of informal and vulnerable employment, poorly managed digitalization and AI adoption could further exacerbate labour market vulnerabilities across the region.

Against this backdrop, this study seeks to examine the trends in digitalization in the Arab States, evaluating the region's digital landscape and its potential to promote productive, decent and inclusive employment opportunities. By analysing existing policies, programmes and skills gaps, the study aims to provide actionable recommendations that can help the Arab States harness the power of digitalization while ensuring that no one is left behind.

The methodology adopted for this report follows a mixed approach, beginning with extensive secondary research drawing on internationally recognized sources, including the International Labour Organization (ILO), the World Economic Forum (WEF), the International Telecommunication Union (ITU) and many other United Nations (UN) bodies. National policy documents and strategies related to economic and digital transformation were also thoroughly examined, in addition to studies conducted by trusted think tanks and consulting firms.

This desk research was complemented by qualitative data collected through surveys and focus group discussions (FGDs) with key tripartite stakeholders across the region. These aimed to address, to the extent possible, data and information gaps. Quantitative analyses, building on modelling undertaken by Cambridge Econometrics for the ILO, was used to assess and quantify the economic and employment implications of different digital transition scenarios, examining how these could shape job numbers, as well as sectoral and occupational transformations by 2035. While the model does not provide exact estimates (because of the difficulty in obtaining reliable and comprehensive data from national sources, particularly regarding investments and initiatives related to digital technologies), it illustrates potential trends and shifts, offering valuable insights to support policymakers in anticipating and responding to the opportunities and challenges of digital transformation.

It is also worth noting that, while digital labour platforms play a substantial role in shaping modern labour markets, this report has only briefly referenced their impact, without extensive analysis. This approach allows the report to maintain a manageable scope and focus on broader aspects of digitalization and AI and their impacts on employment. Further, although the report is based on the most recent and reliable data available, the fast-evolving nature of digitalization means that some ongoing developments may not be fully reflected.

The report begins with a concise overview of the region's diverse economic and labour market structures, highlighting key disparities, structural challenges and emerging opportunities. By distinguishing between countries of the Cooperation Council for the Arab States of the Gulf (GCC) and non-GCC countries, it sets the stage for understanding how varying levels of economic and labour market development shape the region's ability to leverage digital technologies and AI.

Chapter 2 then assesses the state of digital infrastructure and ecosystem readiness across the Arab States. While the data, where they exist, are not meant to capture the full breadth of digital economic activity, they are particularly useful in situating the different countries in the broader context of the key factors underpinning the digital economy.

Chapter 3 explores the policy and regulatory frameworks that have influenced digitalization in the region and examines how governments are adapting, or leading, the digital shift through strategies that both respond to and drive technological change.

Chapter 4 summarizes emerging trends and contrasts the trajectories of GCC and non-GCC countries, shaped by differences in investment levels, technological adoption and consumer behaviour.

Chapter 5 analyses the impact of digitalization on employment, focusing on changes in job quantity and quality. It explores projections of job displacement and creation, identifies groups most at risk, and discusses how digitalization affects working conditions and labour market inclusion. This chapter further examines the opportunities and challenges of digital and AI adoption at the level of the firm, with a focus on the role of MSMEs, the barriers they face and the potential of entrepreneurship and innovation ecosystems to drive inclusive digital transformation and job creation. In addition, the chapter includes a subsection on the impact of digitalization on productivity, addressing the so-called "productivity paradox" – the phenomenon where rapid technological advancement does not necessarily lead to anticipated gains in productivity.

Chapter 6 examines the region's evolving skills landscape, identifying key gaps and challenges along with the main approaches used to assess current and future skills needs.

Finally, the concluding chapter offers a cohesive set of policy recommendations, aimed at guiding the Arab States towards a more equitable, inclusive and sustainable digital future that works for all.

1 Overview of Arab labour markets and economic structures

The Arab States present a diverse range of economic structures and labour markets, shaped by differences in natural and financial resources, economic development and geopolitical stability. The GCC countries, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE), are highly dependent on the oil and gas sector, which has historically driven their economies. This resource-based economic model has led to segmented labour markets, where nationals have, predominantly, been employed in the public sector while expatriates continue to make up the majority of the private-sector workforce. Recent trends indicate a growing shift towards non-oil sectors as key drivers for economic diversification and growth, driven in part by global oil production cuts, such as the OPEC+ agreements, and the increasing shift towards green and clean energy sources. Efforts have been made to expand sectors such as retail, services, renewable energy, information and communication technology (ICT) and digital technologies, tourism and manufacturing, among others. However, significant work remains to accelerate growth in non-oil sectors, prioritize high-value-added industries that foster decent job creation and prevent potential contraction in overall GDP.

On the other hand, non-GCC countries, namely Iraq, Jordan, Lebanon, the State of Palestine (SoP), Syria and Yemen, face considerable challenges, driven primarily by relatively lower levels of stability and financial resources. These middle- and low-income nations often rely on sectors like services, tourism and agriculture. Limited resources, political instability and conflicts have severely undermined private-sector growth and job creation while also weakening public institutions, limiting their capacity to set and implement effective development plans. Syria and Yemen have been grappling with protracted conflicts for many years, while recent outbreaks of war in the State of Palestine and Lebanon have further destabilized the region. These conflicts have exacerbated labour market issues, which have long been marked by high levels of unemployment, widespread informality and working poverty, and limited access to social protection and decent work.

As of 2024, less than half of the region's working-age population was employed, with an employment-to-population ratio of 44.4 per cent, suggesting serious deficiencies in labour demand. But beneath this average lies a tale of two very different worlds. In the GCC, employment levels are markedly higher, with 67.2 per cent of working-age individuals in employment. In stark contrast, non-GCC countries lag far behind, with only 32.0 per cent of their working-age populations employed. This divide is also reflected in labour force participation rates, standing at 69.2 per cent in the GCC and only 38.3 per cent in non-GCC countries. Unemployment further amplifies this story. Though the overall regional unemployment rate stands at 9.7 per cent, the burden is not shared equally. In non-GCC states, unemployment stands at 16.5 per cent, reflecting limited job creation and labour market absorption. In contrast, unemployment rates in the GCC remain notably low, largely because of the high share of migrant workers, whose residency is tied to employment through the Kafala system, along with the prevailing preference among nationals for public-sector jobs, often viewed as an entitlement.

As of 2024, less than half of the region's working-age population was employed, with an employment-to-population ratio of 44.4 per cent, suggesting serious deficiencies in labour demand.

▶ Table 1. Overview of key labour market indicators by subregion, 2024

	Arab States	GCC countries	Non-GCC countries
Employment (millions)	59.2	31.6	27.6
Employment-to-population ratio (%)	44.4	67.2	32.0
Labour force (millions)	65.6	32.6	33.0
Labour force participation rate (%)	49.2	69.2	38.3
Unemployment (millions)	6.4	1.0	5.4
Unemployment rate (%)	9.7	2.9	16.5

Source: ILO modelled estimates, Nov. 2024.

Young people face great barriers in not only accessing employment, but also in education and training, with a growing number of young people not in employment, education or training. In 2024, 11.6 million young people fell into this category, representing one third of the total youth population in the region and creating risks of long-term social exclusion and economic vulnerability, which could undermine both individual futures and broader development goals.

Gender disparities are another major issue in the Arab labour market. In 2024, only 19.2 per cent of women participated in the labour force, compared to 73.6 per cent of men, marking the widest gender gap globally. Societal norms, unequal household and caregiving responsibilities, an underdeveloped care economy, workplace discrimination and limited access to safe public transportation continue to hinder women's participation. Female unemployment rates are also high, with a 9.6 percentage point gap over men, far exceeding the global average of 0.2 percentage points. Overall, Arab women represent less than a fifth of the total employed population in the region and earn only 12.5 per cent of the total income earned by men – the lowest ratio globally (ILO 2024a). While this gender income gap reflects, in part, the wide employment gap between men and women, it is also driven by other factors, such as occupational segregation, wage discrimination and women's limited access to leadership positions.

Beyond youth and women, other vulnerable groups in the Arab region include refugees and internally displaced persons, particularly in non-GCC countries, and migrant workers, especially in the GCC states. These populations face heightened risks of exclusion and limited access to decent work, and often lack adequate legal and social protection.

Overall, while multiple factors contribute to the region's underwhelming employment outcomes, a central issue lies in the Arab region's failure to achieve successful economic diversification and structural transformation. Rather than evolving into high-productivity, high-value-added economies capable of generating decent and productive employment, the region has largely undergone premature de-industrialization. In place of a robust industrial base, regional economies have shifted towards informal, low-productivity service sectors, resulting in weak and unstable labour market outcomes. By 2024, informality accounted for 46.5 per cent of total employment in the region,1 with informal jobs lacking social protection and exposing workers to heightened risks of poor working conditions.

1 ILO modelled estimates, Nov. 2024.

Against this backdrop, digital transformation presents both promising opportunities and significant risks. On one hand, digitalization has the potential to drive job creation, particularly in fast-growing fields such as AI, financial services, e-commerce and renewable energy. These areas not only support broader economic diversification but also hold the promise of generating quality jobs with better wages, improved working conditions and stronger social protections. Moreover, AI and digital technologies can transform and augment existing roles, making them more productive and appealing to an increasingly educated workforce. Additionally, digital employment opportunities can play a crucial role in enhancing labour market inclusion, particularly for women, youth, forcibly displaced persons and other vulnerable groups who have traditionally faced exclusion from formal employment.

Yet the benefits of digitalization are not automatic. In the absence of a strong productive foundation – exacerbated by premature de-industrialization – many Arab economies are ill-prepared to channel digital innovation into high-value sectors. As a result, digital growth risks are concentrated in precarious gig and platform-based work, reinforcing patterns of informality, inequality and economic vulnerability. Compounding this are the persistent gaps in digital infrastructure, unequal access to skills and training, and weak regulatory environments, all of which limit inclusiveness and the transformative potential of digital progress.

2 Arab States' readiness for digital transformation:

Foundations for digital growth and employment opportunities

A successful digital transformation depends fundamentally on the strength of a country's digital infrastructure and its overall readiness to adopt new technologies. Reliable internet connectivity, access to digital devices and investments in broadband and data systems form the backbone of any digital economy. At the same time, human capital, institutional capacity and enabling policy environments are critical for ensuring that digital technologies translate into inclusive and sustainable development. This chapter examines key metrics of digital infrastructure and readiness across the region, highlighting existing gaps and opportunities that will shape the trajectory of digitalization and its degree of inclusiveness.[2]

The ICT Development Index (IDI) developed by the ITU, provides a benchmark for how well countries, including the Arab States, are doing in expanding and improving digital connectivity. The IDI assigns each country a score between 0 and 100, where higher scores reflect strong ICT infrastructure, high internet accessibility, frequent and widespread internet use and affordable services. Countries with high scores have more mature digital ecosystems and are typically better positioned for leveraging ICT in social and economic activities. On the contrary, lower scores indicate limited ICT infrastructure, low internet accessibility or use and generally higher costs relative to income. Lower scores often signal barriers to digital participation and may hinder broader efforts towards digital transformation, productivity growth and equitable access to emerging opportunities.

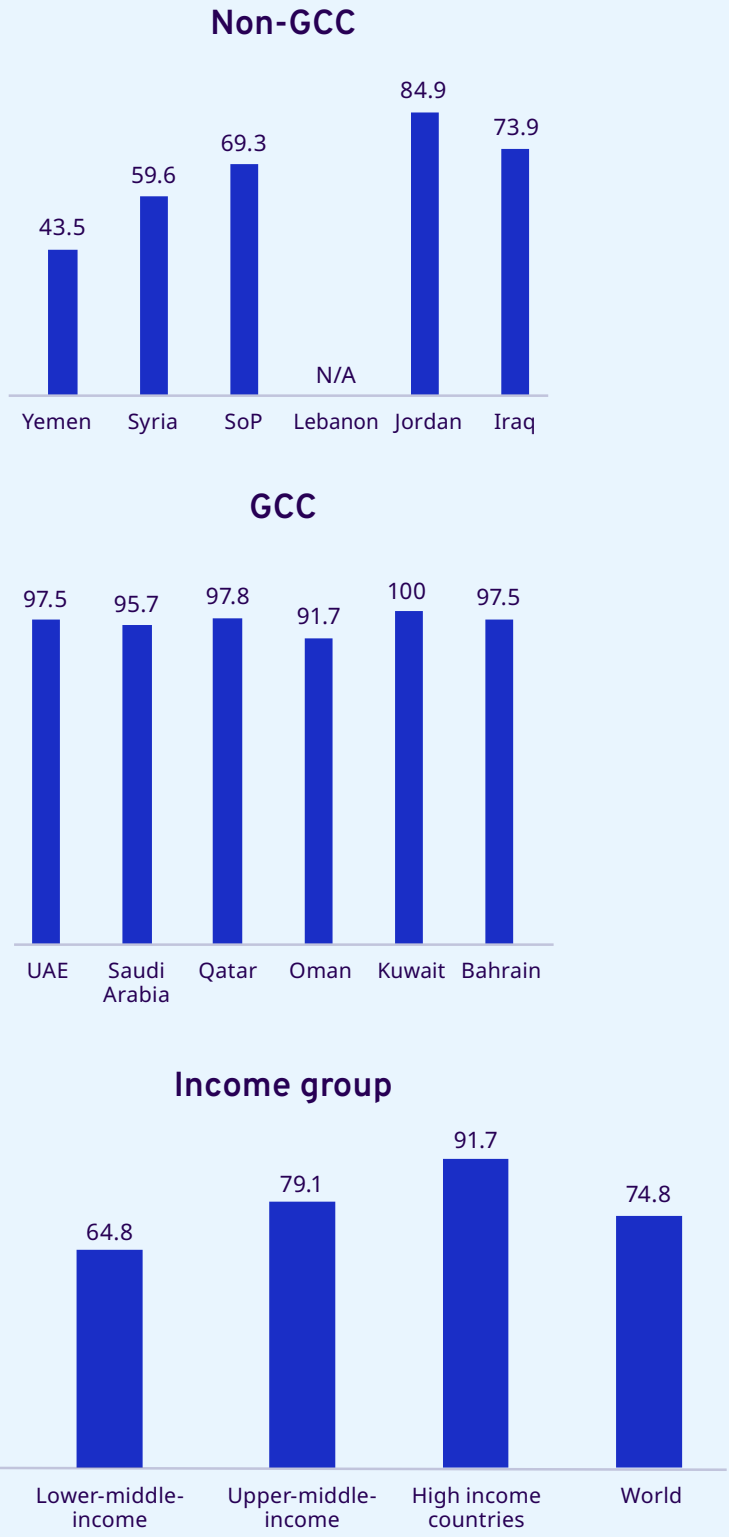
The latest IDI data, presented in figure 1, reveal a mixed landscape. GCC states demonstrate strong performance, reaching levels on par with (or even surpassing) high-income countries. The near-universal digital access achieved within these countries highlights a mature infrastructure capable of supporting advanced digital services and economies. This foundation aligns with strategic goals for economic diversification, positioning GCC economies as emerging hubs for digital innovation. In contrast, non-GCC countries continue to face substantial challenges. With the exception of Jordan, non-GCC states with available data fall below the global average, highlighting a pronounced digital divide within the Arab States as a whole, and significant challenges in accessibility and affordability among the non-GCC countries. The most acute issues appear in the conflict-affected nations of Yemen, Syria and the State of Palestine, where instability has for long hampered infrastructure development and limited digital access, thereby curtailing the broader economic and social benefits of digital inclusion.

Overall, the IDI scores suggest that, while GCC countries may have prioritized advanced digital services and digital economic integration, non-GCC states face have limited resources and face challenges in maintaining security and stability. Non-GCC states often struggle with foundational infrastructure gaps that need to be addressed before reaping the potential benefits of digitalization.

The near-universal digital access achieved within these countries highlights a mature infrastructure capable of supporting advanced digital services and economies.

2 While this section touches briefly upon issues related to digital skills and regulations, these aspects are discussed in more detail in subsequent chapters of this report.

Figure 1. IDI scores by country and income group, 2024



Note: Scores are based on ten indicators. They are normalized and should not be interpreted as percentages. A score of 100 indicates that an economy has achieved the goalpost value across all component indicators, while a score of zero represents a hypothetical situation with no ICT infrastructure or usage. For a detailed list of these indicators, along with their respective scores, refer to table 15 in Appendix I.

Source: *The ICT Development Index 2024: Measuring Digital Development* (ITU 2024c).

Importantly, although the IDI provides crucial insights into internet access, usage and affordability, it captures only part of the broader picture. These scores reflect national averages and do not account for disparities within countries, such as those between regions or demographic groups. Moreover, a high IDI score does not necessarily imply comprehensive digital inclusion, as it overlooks critical elements such as advanced digital skills, safety and security. Therefore, examining a wider range of indicators is essential to fully assess a country's digital infrastructure and its readiness for economic transformation through digitalization. Cybersecurity, for example, is critical for ensuring the safety and reliability of digital services, protecting users from threats and fostering trust in online transactions. Digital skills are equally important, as a competent workforce is a prerequisite for engaging with technology and driving innovation. Other factors, such as AI readiness, the adoption of e-commerce and the use of digital payments, also play a significant role in shaping a country's digital landscape. The latest data available on these factors, presented in table 2, reveal significant disparities across countries and between GCC and non-GCC subregions, mirroring trends in core digital infrastructure.

▶ Table 2. Digital readiness and capability indices in the Arab States, latest year available

Country	Global Cybersecurity Index [a] (1–100)	Digital skills among active population [b] (1–7)	AI Preparedness Index (AIPI) [c] (0–1)	E-Commerce Index [d] (1–100)	Digital payments [e] (%)
GCC					
Bahrain	97.94	4.9	0.52	59.7	77% (1)
Kuwait	60.73	4.2	0.46	68.7	75%(1)
Oman	97.00	4.9	0.53	70.6	60%(3)
Qatar	100	5.3	0.53	72.1	-
Saudi Arabia	100	5.3	0.58	72.3	76%(3)
UAE	100	5.3	0.63	78.2	77%(2)
Non-GCC					
Iraq	53.07	-	0.27	25.4	25%(3)
Jordan	98.60	4.9	0.48	54.7	38%(3)
Lebanon	32.38	5.0	0.42	60.4	20%(3)
SoP	37.64	-	-	-	21%(3)
Syria	51.55	-	0.30	21.1	-
Yemen	7.19	3.5	-	18.5	9%(2)

Notes: [a] Scores are based on 20 indicators across five pillars: legal measures, technical measures, organizational measures, capacity development and cooperation (Global Cybersecurity Index 2024; ITU 2024a). [b] Scores reflect responses from the Executive Opinion Survey (WEF 2019). [c] Scores are based on four dimensions relevant for smooth AI adoption: digital infrastructure, human capital, technological innovation and legal frameworks (IMF n.d.). [d] Scores are based on four indicators related to online shopping: account ownership at a financial institution or with a mobile-money-service provider, individuals using the internet, postal reliability index and secure internet servers (UNCTAD B2C E-Commerce Index 2020; UNCTAD 2020). [e] Scores reflect the percentage of respondents who reported making or receiving digital payments (Global Findex Database 2017, and 2025; World Bank n.d.). (1) Data from 20217; (2) Data from 2021; and (3) Data from 2024.

The GCC countries generally demonstrate strong performance across key digital indicators, with high scores on the Global Cybersecurity Index, reflecting robust frameworks for safeguarding digital assets. In Kuwait, however, cybersecurity threats have persisted, despite the establishment of the National Cybersecurity Centre in 2022 and oversight by the Central Information Technology Regulatory Authority, prompting the government to intensify its efforts to address regulatory gaps and enhance public awareness.

Digital skills among the active population in the GCC are relatively strong compared to global averages, with Qatar, Saudi Arabia and the United Arab Emirates ranking among the top 15 out of 141 economies. While the data referenced may be somewhat outdated, they still provide a useful snapshot of the region – likely further advanced in recent years given growing governmental recognition of the importance of developing digital skills. Despite this positive outlook, challenges remain in ensuring equitable access to digital skills for both nationals and migrant populations, as well as in addressing the full spectrum of competencies required to navigate the complex and evolving future of work (see Chapter 6 for a deeper exploration of skills for the digital transition).

When it comes to AI preparedness, the GCC countries exhibit moderate to high levels of preparedness. While none reach the top tier (defined as scores above 0.8, where Singapore leads), the United Arab Emirates scored 0.63, putting it close to the advanced economies' average of 0.68. Other GCC countries score at or above the emerging market average of 0.46, showcasing the regional momentum in laying the groundwork for AI adoption and integration (IMF n.d.).

The GCC's digital advancement also extends to e-commerce and digital payments. These rankings reflect strong digital infrastructure, secure transaction systems and growing consumer trust in online platforms.

In stark contrast, non-GCC Arab countries face more acute and persistent digital development challenges. Lebanon, the State of Palestine and Yemen report notably low cybersecurity scores, raising concerns about their vulnerability to digital threats. While Jordan and Lebanon perform well on digital skills, ranking 31st and 23rd respectively, Yemen ranks 115th, pointing to a serious skills gap and limited digital inclusion.

Digital payments in non-GCC countries remain notably limited, with all reporting usage rates below 40 per cent, highlighting serious deficits in financial inclusion, trust and digital infrastructure.

Performance in AI readiness among non-GCC states is similarly uneven. Jordan and Lebanon show promise, with scores nearing the emerging market average of 0.46, suggesting a foundation for future development. However, Syria and Iraq significantly lag behind, hindered by conflict, underinvestment and institutional weaknesses that curtail their capacity to harness AI technologies effectively (IMF n.d.).

The disparities are further reflected in e-commerce and digital payment ecosystems. While Lebanon (64th) and Jordan (76th) outperform their non-GCC peers on the e-commerce index, they still trail behind the GCC. Digital payments in non-GCC countries remain notably limited, with all reporting usage rates below 40 per cent, highlighting serious deficits in financial inclusion, trust and digital infrastructure.

Overall, the disparities revealed by various indices underscore a dual-speed digital transformation across the Arab States. While GCC countries continue to advance in cybersecurity, digital skills, AI preparedness and e-commerce adoption, non-GCC countries face persistent barriers rooted in structural, institutional and socio-economic constraints. Key challenges include the high cost of critical infrastructure – broadband and data centres – and limited public and private investment because of inadequate regulatory frameworks, unreliable energy supplies and frequent outages in rural and conflict-affected areas, as well as political instability and fiscal pressures. Additionally, monopolistic or fragmented telecommunications markets and reliance on imported technologies further inflate costs and complicate digital advancement.

Bridging these digital divides among Arab States requires targeted investments, inclusive policy frameworks and enhanced regional and international cooperation to ensure that the digital economy becomes a shared engine for growth and resilience in the region.

3 Policy and regulatory frameworks for digital transformation

In addition to the baseline conditions discussed above, digitalization trends in the Arab States have been significantly shaped by regulatory and policy frameworks that have either responded to or proactively steered digital innovation.

In many countries, particularly within the GCC, national visions have emphasized economic diversification, positioning digitalization as a central enabler in achieving this goal. These efforts are often supported by dedicated digital strategies and complementary policy documents (table 3). In contrast, non-GCC countries display uneven progress in digital transformation, often lacking comprehensive national visions that prioritize and drive digitalization. However, there is increasing recognition of the critical role digitalization plays in keeping pace with global megatrends and technological advancements. Many of these countries have begun formulating strategies and policies to advance digital development, though effective implementation continues to pose a major challenge.

▶ Table 3. National plans and digital and AI strategies across the Arab States

Country	National visions and plans	Digital and AI strategies
GCC countries		
Bahrain	Vision 2030	Digital Economy strategy
Kuwait	New Kuwait 2035	Kuwait National AI Strategy 2025–2028
Oman	Vision 2040	National Digital Economy Programme National Programme for AI and Advanced Technologies
Qatar	National Vision 2030	Digital Agenda 2030 Qatar Artificial Intelligence Strategy
Saudi Arabia	Vision 2030	Digital Economy Policy National Strategy for Data and AI (NSDAI)
UAE	We the UAE 2031 UAE Centennial Plan 2071	UAE Digital Economy Strategy National Artificial Intelligence Strategy 2031
Non-GCC countries		
Iraq	Iraq Vision 2030	National Strategy for AI and Big Data Integration
Jordan	Economic Modernization Vision 2033	National Digital Transformation and Implementation Plan (2021–2025) Artificial Intelligence Strategy and Implementation Plan
Lebanon	N/A	Lebanon Digital Transformation National Strategy 2020–2030
SoP	N/A	Palestine Digital Agenda 2030 AI National Strategy
Syria	N/A	Digital transformation strategy
Yemen	National Vision for the Modern Yemeni State	N/A*

Note: *While a strategy does not yet exist in Yemen, the Prime Minister launched a strategic digital transformation project in March 2025 with the aim to develop ICT and postal infrastructure, achieve comprehensive digitalization across sectors and build a digital economy driven by innovation and entrepreneurship. It also aims to strengthen national cybersecurity, enhance digital skills and modernize legal frameworks for ICT and the postal sector.

Source: Authors' compilation.

The ITU has developed a conceptual framework (ITU 2023), classifying countries into five generations of ICT and digital transformation regulation. This can be used to understand trends and track progress as policy and regulatory environments develop. Generations 1 through 4 reflect the evolution and maturity of legal and regulatory frameworks concerning ICT and telecom markets, moving from the least developed and most centralized (Gen 1) to the most advanced and enabling (Gen 4). On a parallel track, the fifth generation (Gen 5) is designated as a "collaborative digital regulation", and focuses on policy and regulation broadly related to digital transformation. Gen 5 involves collaborations beyond the ICT sector, aiming to accelerate digital development across various other sectors, strengthen markets and enhance long-term economic and developmental prospects.

While the ICT Regulatory Tracker allows associating countries to Generations 1 through 4, the G5 Benchmark measures a country's progress towards fifth generation regulations, charting the digital transformation journey, from its inception to building a thriving digital economy and society.

Interestingly, in order to take a holistic view of the enabling environment for digital transformation, the ITU built a unified framework that combines ITU's established tools for assessing policy, regulation and governance in telecom and in digital markets. That is, the ICT Regulatory Tracker and G5 Benchmark3 offer global assessments of national capacities and readiness for digital transformation (ITU 2023). Information on all Arab States is included in the ITU database (table 4).

▶ Table 4. Policy, regulation and governance frameworks enabling digital transformation, 2023–2024

	ICT regulation [a]		Collaborative digital governance, policy and regulation [b]		Digital transformation readiness [c]
Country	**Score (0–100)**	**G1-G4**	**Score (0–100)**	**Maturity level**	**Score (0–100)**
GCC countries	**85.0**		**67.7**		**76.3**
Bahrain	87.5	G4	50.9	Transitioning	69.2
Kuwait	76.0	G3	63.6	Advanced	69.8
Oman	90.0	G4	67.3	Advanced	78.7
Qatar	73.2	G3	66.8	Advanced	70.0
Saudi Arabia	96.0	G4	80.4	Leading	88.2
UAE	87.0	G3	77.2	Advanced	82.1
Non-GCC countries	**44.6**		**30.1**		**37.3**
Iraq	64.5	G2	34.0	Transitioning	49.3
Jordan	86.0	G4	47.2	Transitioning	66.6
Lebanon	20.3	G1	38.6	Transitioning	29.5
SoP	38.5	G2	30.9	Transitioning	34.7
Syria	43.0	G2	21.6	Limited	32.3
Yemen	15.0	G1	8.3	Limited	11.7

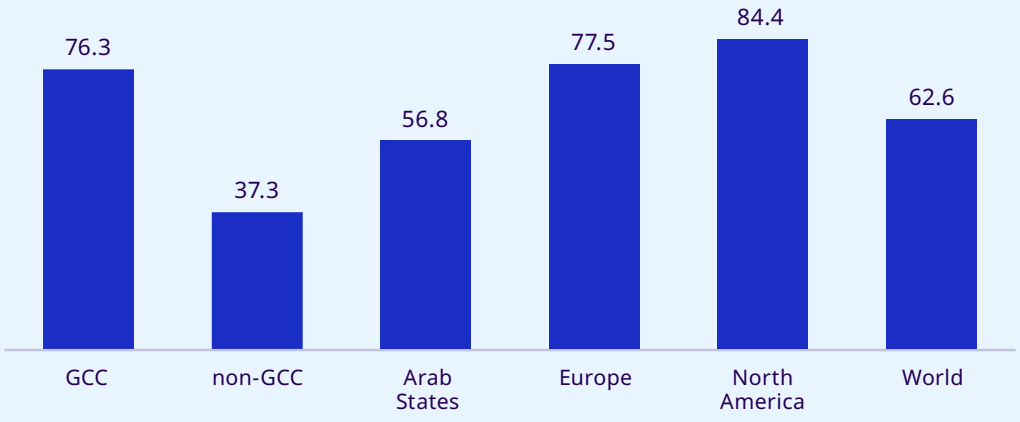
Notes: [a] Scores are based on 50 indicators across four pillars: regulatory authority, mandates, regime and competition framework for ICT for the year 2024 (https://app.gen5.digital/tracker/metrics). [b] Scores are based on 70 indicators across four pillars: collaborative governance, policy design, development toolbox and digital economy for the year 2023 (https://app.gen5.digital/benchmark/metrics). [c] Scores are calculated as the average of the ICT regulation and collaborative digital governance and regulation scores, in line with the approach outlined in *Global Digital Regulatory Outlook 2023* (ITU 2023).

3 For more details on the ICT Regulatory Tracker, G5 Benchmark tools, their respective pillars, indicators, methodology and the Unified Framework, refer to https://app.gen5.digital/unified-framework/about.

Certain observations can be made regarding the following:

- The **ICT/ telecom regulation scores** reveal significant differences in regulatory maturity between GCC and non-GCC countries in the region. In 2024, GCC countries averaged 85.0, with Saudi Arabia, Oman and Bahrain achieving G4 status, indicating integrated regulation, led by economic and social policy goals. The remaining GCC countries (Kuwait, Qatar and UAE) are among the advanced with a G3 status, indicating enabling investment, innovation and access with a focus on stimulating competition and consumer protection. In contrast, non-GCC countries lag behind, with the exception of Jordan reaching G4. The others fall into G2 or G1, indicating early stages of regulation and reform. This underscores the challenges non-GCC countries face in fostering a competitive digital environment.
- The **collaborative digital governance, policy and regulation scores** show even larger disparities between the two country groups. GCC countries have an average maturity level of 67.7, indicating an overall advanced framework for digital governance. Saudi Arabia, with a score of 80.4, is classified as "leading", indicating a strong commitment to effective digital policies. On the other hand, non-GCC countries exhibit lower maturity levels, with an average score of just 30.1 – the "transitioning" category. Syria and Yemen remain in the "limited" category, indicating minimal capacity for effective digital governance.
- In line with previous findings, GCC countries demonstrate significantly stronger overall **digital transformation readiness**, while non-GCC countries require considerable progress to catch up. In fact, non-GCC countries lag behind the world average, with a pronounced gap for Yemen. Figure 2 illustrates how both country groups and the region as a whole compare to the world average and the more advanced regions of Europe and North America. The Arab States fall below the world average score of 62.6, primarily because of the non-GCC countries. Conversely, GCC countries demonstrate national capacities and readiness for digital transformation comparable to those of Europe, though they still lag behind counterparts in North America. While the GCC has made significant strides in reshaping policies and governance mechanisms, much work remains to unlock the full potential of digital transformation. For non-GCC countries, where substantial readiness gaps persist, urgent attention from governments is required, coupled with regional and international support.

Figure 2. Digital transformation readiness by region, 2023–2024



Source: Adapted from Global Digital Regulatory Outlook 2023 (ITU, 2023) based on most recent data from the ICT Regulatory Tracker and G5 Benchmark.

Although many Arab States have established some digital strategies, only some effectively cover important sectors of the economy (e.g. health and education), or address specific technological advancements such as AI and smart cities. Also, very few consider implications for the world of work or take into account decent work elements. Table 5 provides an overview of the policy and regulatory frameworks across the Arab States, focusing on key elements that promote digital transformation, as well as their contribution to employment and the inclusion of vulnerable groups.

▶ Table 5. Scope of policy and regulatory frameworks in fostering digital transformation across the Arab states, 2023

	Bahrain	Kuwait	Oman	Qatar	KSA	UAE	Iraq	Jordan	Lebanon	SoP	Syria	Yemen
Foundational elements of the digital policy ecosystem												
Overarching digital strategy	Yes	Yes	Yes	Yes	Yes	Yes	Specific plans	Yes	Yes	Yes*	Yes	No
Digital identity framework	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	No	No	No
E-government strategy (development level)	Very high	Very high	Very high	High	Very high	Very high	Medium or Low	High	High	Medium or Low	Medium or Low	Medium or Low
Cybersecurity legislation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Data protection rules	Law & agency	Law & agency	Law & agency	Law & agency	Law & agency	Law & agency	Law	Law & agency	Law & agency	Law & agency	No	No
Cross-sectoral and development-oriented digital policy features												
Digital strategy is SDG-oriented OR has mention of SDGs or other international development goals	Yes	Yes	No	Yes	No	Yes	No	No	No	Yes*	No	No
Digital strategy is multi-sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No	No
Digital strategy includes the educational sector	No	No	Yes	Yes	No	Yes	No	-	Yes	Yes*	-	No

	Bahrain	Kuwait	Oman	Qatar	KSA	UAE	Iraq	Jordan	Lebanon	SoP	Syria	Yemen
E-commerce regulations	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes
E-health or smart health policy	Yes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Regulatory sandboxes for financial inclusion	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes	-	No	No	No
Smart cities policy	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No
Digital innovation and advanced technology												
Holistic innovation policy ICT/ digital sector-specific	No	-	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
IoT strategy & spectrum management policy	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
Cloud computing policy	Yes*	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
AI strategy or policy	No	Yes*	Yes	Yes	Yes	Yes	No	Yes*	No	No	No	No
Enabling environment for digital markets												
Competition policy for digital markets	No	No	No	No	No	No	No	No	No	No	No	No
Regulatory incentives for digital market players	Only some	Only some	Yes, for all	Yes, for all	Yes, for all	Only some	Yes, for all	Yes, for all	Yes, for all	Yes, for all	No	No
Codes of conduct	Yes	No	No	Yes	Yes	Yes	No	-	No	No	No	No

	Bahrain	Kuwait	Oman	Qatar	KSA	UAE	Iraq	Jordan	Lebanon	SoP	Syria	Yemen
Employment and decent work objectives												
Integration of job goals in digital strategy*	-	-	No	Yes	Yes, broadly	-	NA	Yes	No	Yes, broadly	-	n/a
Explicit mention of decent work standards in digital strategy*	-	-	No	No	Yes	-	NA	No	No	No	-	n/a
Strategies for targeted groups												
Broadband plan for women and girls	No	Yes	No	Yes	Yes	Yes	No	No	-	No	No	-
Broadband plan- youth	No	Yes	No	Yes	Yes	Yes	No	No	-	-	No	-
Broadband plan for persons with disabilities	No	Yes	Yes	Yes	No	Yes	No	No	-	No	No	-
ICT accessibility for persons with disabilities	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	-
Stakeholders' engagement and policy review												
Public consultation processes	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	No	Limited	No
Accessible legal frameworks	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No
Public access to information & freedoms	No	Yes	No	No	Yes	No	No	Yes	Yes	No	No	Yes
Ex-post policy reviews by ministries/ regulatory agencies	-	No	-	-	Yes	-	No	No	Yes	No	-	No

Notes: ITU data is based on self-reported surveys; datasets compiled by international organizations; desk research using official government sources, supplemented by direct outreach to national and ICT regulatory authorities (https://app.gen5.digital/benchmark/metrics). * Denotes data informed by authors' review of policy documents, resulting in additions or adjustments where direct evidence was identified.

Source: Authors' compilation.

Mapping countries' digital strategies and supporting policies is crucial to understanding the complex and evolving impacts of digitalization on employment. Strengthening digital policies and regulatory frameworks can help create a virtuous cycle where digital transformation fuels job creation and broader economic development. However, without clear linkages between these digital strategies and employment-related interventions, the transition to decent work, inclusive labour markets and sustainable growth will not happen automatically. Deliberate, coordinated action is essential to ensure that digital innovation translates into tangible labour market benefits.

Countries should focus on incorporating job creation goals into their digital strategies, address job displacement and promote digital entrepreneurship and innovation-driven employment. They also need to align these policies with decent work standards (e.g. fair wages, job security, occupational safety and health, worker protections, etc.) to ensure job quality is not compromised in the transition. Interestingly, only Jordan and Qatar have explicitly incorporated clear employment targets into their digital strategies, with Jordan aiming to create 50,000 jobs by 2025 and Qatar targeting 26,000 jobs by 2030 (Jordan 2021; Qatar 2023). In contrast, the State of Palestine and Saudi Arabia acknowledge employment creation as a broader objective of digitalization but do not specify concrete targets. Additionally, Saudi Arabia mentions, though briefly, some aspects of decent work in its four-page Digital Economy Policy. These include commitments to creating valuable and productive jobs, improving workplace conditions, upskilling national talent to meet future job requirements and providing justice and protection for workers (Saudi Arabia, n.d.). However, across the region, most existing policies linked to digital transformation tend to overlook key dimensions of decent work, such as occupational safety and health, social protection, wages and working time, raising concerns about the quality of jobs brought about by digital transformation.

Importantly, strategies beyond dedicated digital agendas can also play a vital role in linking digitalization to employment, helping to ensure that investments in the digital economy translate into positive labour market outcomes. Increasingly, countries are recognizing the role of digitalization within their national employment strategies. Some 22 out of 75 national employment policy documents available on the ILO's Employment Policy Gateway explicitly reference digitalization, including three of the four Arab States reviewed (ILO 2025a). Again, even when addressed within a broader national employment policy, AI and digital transformation should be used as a pathway not only to create more jobs but also to promote better jobs for all.

The concept of work quality has evolved amid rapid technological advancements and evolving forms of employment, with the protection of workers' personal data emerging as an important concern in the modern world of work. In this context, data protection frameworks demand immediate attention, particularly in countries like Yemen and Syria, where formal regulations remain absent. Even in states that have enacted personal data protection laws, explicit provisions that address labour-specific concerns and uphold principles of decent work are often limited. This regulatory gap exposes workers to potential abuses, including algorithmic biases, excessive surveillance and misuse of personal data. Notably, Qatar has been proactive in recognizing these risks in its digital strategy, Digital Agenda 2030, which highlights the importance of data privacy for remote workers and proposes amending labour laws to address the legal dimensions of remote work, such as protecting personal privacy and clearly defining employers' supervisory rights. Such forward-looking measures remain less common in other countries, where greater efforts are needed to ensure the protection of workers' personal data in an increasingly digital work environment.

Moreover, to achieve equitable outcomes from digitalization it is essential to focus on vulnerable groups, who may be less able to benefit from new digital opportunities. The targeted strategies adopted by various states aim to promote inclusivity in the digital space. While such efforts offer an insight into how countries are addressing inclusiveness, they are not sufficient to fully assess a country's commitment to digital inclusion. Interestingly, many countries have integrated digital inclusion into their broader national digital strategies. For instance, the Digital Economy Policy of Saudi Arabia emphasizes increasing labour force participation among women and people with disabilities. It also aims to provide digital opportunities for all segments of society, including rural residents and people of all ages. Similarly, Bahrain is committed to digital inclusion, ensuring that every citizen and resident, regardless of background, age, gender or social status, can benefit from the digital world. The UAE has launched several digital inclusion initiatives, particularly targeting women, children, persons with disabilities and the elderly. Overall, GCC countries are developing intentional and structured transformation strategies that incorporate elements of digital inclusion. However, more must be done to reach other marginalized groups, especially migrant workers, who are often overlooked in digital inclusion efforts.

In non-GCC countries, many vulnerable groups continue to face barriers to digital inclusion, despite growing efforts to promote greater inclusiveness. For instance, Jordan has introduced a digital inclusion policy that prioritizes people with disabilities, women, the elderly and residents of remote areas. However, other groups, particularly refugees, are still being left behind. As in Lebanon, refugees in Jordan face significant barriers to accessing digital tools and fully benefiting from digital transformation initiatives. Existing policies and strategies often overlook their specific needs, limiting their inclusion in the digital economy.

However, more must be done to reach other marginalized groups, especially migrant workers, who are often overlooked in digital inclusion efforts.

Furthermore, stakeholder engagement and policy review mechanisms – the cornerstones of any policy design and regulatory decision-making – are weak across the region. While most of the Arab States have public consultations to gather feedback from national stakeholders, such processes often lack formal requirements and clear timelines; neither are decision-makers obliged to consider and respond to all comments. This indicates that while consultations occur, their effectiveness and transparency in shaping regulatory decisions may be limited. Meaningful engagement with stakeholders, particularly employers' and workers' organizations, is essential to ensure policies are inclusive, responsive to diverse needs and lead to fair and equitable labour market outcomes. FGDs conducted for this research highlighted that social partners are frequently excluded from the formulation of digital transformation strategies. Participants stressed the importance of their involvement to ensure that these strategies reflect the challenges and priorities of both workers and employers.

Beyond consultations, nearly half of the countries across both groups have made their laws accessible through government-managed websites and ensure that the public have access to information and fundamental freedoms, in line with national legislation and international agreements. However, others have yet to establish such mechanisms, raising concerns about transparency, accountability and the equitable enforcement of legal rights.

Alarmingly, when it comes to policy reviews, only a couple of countries confirmed conducting ex-post policy reviews, which reflect a commitment to assessing the effectiveness of policies after implementation. In contrast, the absence of such reviews in many other countries limits their ability to learn from experience and enhance future policymaking. This is particularly critical given the rapid evolution of the digital landscape, which demands flexibility and timely adjustments to policies in order to remain relevant and effective. Without these reviews, countries may struggle to adapt to new challenges and opportunities, ultimately hindering their digital transition efforts.

FGDs also identified a disconnection between policy development and implementation as a major barrier to the successful execution of digitalization strategies. While many countries have adopted national strategies, they often lack concrete implementation plans that clearly define roles, responsibilities, timelines and accountability mechanisms. This gap undermines the effectiveness of these strategies and limits their ability to deliver tangible outcomes, particularly in relation to employment and the labour market.

Digital and AI transformation policies are increasingly gaining the attention of policymakers across the Arab region, but regulatory development has not advanced at the same pace. Progress remains uneven, with substantial gaps in legal frameworks, particularly with respect to labour regulation. In many cases, especially in the non-GCC subregion, countries continue to operate under outdated labour laws in need of significant reform. Focus group participants highlighted that Lebanon and the State of Palestine are in urgent need of updating labour legislation, irrespective of the added pressures brought by AI and digitalization. Iraq, meanwhile, has taken steps to introduce general labour law reforms, yet still lacks specific AI- and digital-related regulations.

Overall, even where digital-related regulations do exist, they tend to focus primarily on data protection and, more recently, regulatory responses to emerging forms of employment (freelancing, platform work and remote or non-standard work). These evolving work modalities offer important opportunities for flexibility, innovation and entrepreneurship. However, they also pose significant regulatory challenges, particularly with respect to job security, access to social protection and safeguarding workers' rights.

In response, several Arab countries have begun adapting their legal frameworks to better reflect the realities of a digital and platform-based economy. These reforms aim to not only support employment and entrepreneurship, but also reduce informality and ensure decent working conditions for all workers.

Saudi Arabia, the UAE, Bahrain and Jordan have introduced new laws and regulations to facilitate flexible, freelance and platform-based work, setting important precedents in the region (box 1). While these initiatives vary in scope and target populations, they collectively signal a broader shift towards more inclusive and adaptable labour regulation across parts of the Arab region.

Box 1. Flexible work regulations in the Arab States: Examples from Saudi Arabia, UAE and Jordan

Saudi Arabia has significantly advanced its freelance and flexible work ecosystem as part of Vision 2030 and the drive to diversify its economy. Over 2.25 million individuals, mostly aged 25–34 years, were registered on the national freelance platform by late 2024, contributing approximately 72.5 billion Saudi riyals (US$19 billion), or around 2 per cent of GDP. The Ministry of Human Resources and Social Development (MHRSD) introduced the official Freelance Program, which issues freelancers with licences across over 120 professional fields, enabling them to work independently, open bank accounts and voluntarily enrol in social insurance. The Government supports freelancers through initiatives like Future Work Company, Reef, the Social Development Bank and the Human Resources Development Fund, which offer training and financial aid, as well as integration with existing labour regulations. By early 2025, more than 220,000 freelance licences were active, with projections suggesting that freelancers could contribute nearly 5 per cent to non-oil GDP by 2030. However, eligibility for freelance licenses is currently limited to Saudi nationals and GCC citizens. Expatriates are largely restricted from participating unless they obtain premium residency or formally register a business entity. Freelancing without authorization may expose them to penalties.

The UAE has also taken steps to formalize flexible work and has introduced freelance visas and flexible work permits that allow individuals, including digital workers, to operate independently across various sectors, fostering innovation-driven employment and attracting a diverse talent pool. These schemes, offered across Emirates such as Dubai and Abu Dhabi, allow individuals, particularly in sectors like technology, media, education and design, to operate without the need for traditional employer sponsorship. By enabling greater labour mobility and supporting non-standard forms of work, the UAE is fostering a more dynamic and inclusive labour market aligned with its broader vision of becoming a leading hub for the digital and knowledge economy.

Similarly, in 2024, Jordan enacted Flexible Work Regulation No. 44, revising the Labour Law to support remote, part-time, flexible-hours, compressed-week and annualized work models. The regulation explicitly permits flexible contracts for university students, caregivers (including those with family responsibilities or disabilities), pregnant or nursing women and any employee whose role is compatible with such arrangements. Agreements must be formalized in a written contract specifying hours, duties, equipment, compensation, rights and obligations and are eligible for conversion from standard employment by mutual consent. Employers are required to register these contracts and ensure non-discriminatory treatment and social security coverage. By targeting individuals with caregiving duties, students and persons with disabilities, Jordan's framework enhances labour force inclusion and responsiveness to evolving digital-era workforce trends.

Overall, despite positive trends in establishing policies and frameworks to foster digital transformation in the Arab States, significant gaps remain, particularly in regulatory consistency, consideration of the world of work, their contribution to social justice and stakeholders' engagement. While some countries have made progress in developing holistic approaches, others still treat ICT as a separate economic sector, restricting their ability to fully leverage digital advancements (ITU 2021). Compounding these issues are the limited levels of institutional capacity and financial resources in many countries. Addressing these challenges will be crucial for activating the digitalization multiplier effect on economic transformation and labour market development across the region.

4 Mapping digitalization trends in the region

As the Arab States increasingly recognize the importance of digitalization in driving economic growth and social development, various trends are emerging that reflect the different paths of GCC and non-GCC countries. These trends are driven by increased investments in digital infrastructure and innovation, advancements in technology, shifts in consumer behaviour and evolving regulatory environments. Considering the varying contexts between GCC and non-GCC states, and the differing capabilities of each country group, a nuanced understanding requires exploring digital trends separately to achieve deeper insights into their unique trajectories.

Trends shaping digital transformation in the GCC

In the GCC countries, major trends transforming the digital landscape include the following:

- **Advancements in digital infrastructure.** One of the key developments is the substantial investment in digital infrastructure, including the roll-out of 5G networks and the establishment of advanced data centres. The region is home to global leaders in 5G, reflecting the ambitious plans of operators such as Etisalat, STC and Ooredoo, supported by enabling regulations and strong consumer demand for new services. Currently, 5G networks cover 75 per cent or more of the GCC population (GSMA Intelligence 2023). Coverage is projected to reach 95 per cent of the population by 2030 (GSMA Intelligence 2024). Additionally, the GCC is witnessing a surge in data centre development, with key operators like Equinix, Digital Realty and Gulf Data Hub establishing facilities to support cloud computing and digital services. These data centres are critical for enabling businesses to leverage advanced technologies and ensure reliable, secure data storage and processing capabilities.
- **Expansion of e-government services.** GCC countries have made significant strides in leveraging e-government platforms to modernize labour market governance and improve public service delivery. These platforms play a pivotal role in streamlining employment procedures, enhancing transparency, reducing administrative burdens and fostering more inclusive and efficient labour markets. They enable governments to better manage work permits, monitor labour standards, facilitate job-matching and provide support services for both employers and workers, including vulnerable groups such as low-skilled migrants and persons with disabilities. Wage protection systems have become a cornerstone of labour market regulation in all GCC countries, designed to ensure timely and transparent payment of wages to workers, particularly in sectors employing large numbers of migrant workers. These systems require employers to pay workers through bank transfers that are monitored electronically by government authorities, providing real-time oversight and enabling prompt intervention in cases of non-compliance. Other examples include the Qiwa platform in Saudi Arabia, e-services provided by the Ministry of Human Resources and Emiratisation in the UAE, the Labour Market Regulatory Authority in Bahrain; the As-hal online platform in Kuwait; the Ministry of Labour's e-services in Oman and the Hukoomi portal in Qatar.
- **Investments in smart city projects.** Significant investments are made in smart cities to enhance urban living and promote sustainability. In the UAE, Dubai's Smart City initiative and Abu Dhabi's urban development plans focus on integrating advanced technologies in transportation, energy management and public services, creating efficient and connected urban environments. In Saudi Arabia, the NEOM project aims to redefine city living through the incorporation of cutting-edge innovations, renewable energy and smart infrastructure, positioning it as a global hub for technology and sustainability. The TASMU Programme in Qatar is central to its smart city

efforts, leveraging data-driven solutions to improve public services and enhance the quality of life for residents. Additionally, projects like Lusail City and the broader Qatar Smart City initiative emphasize eco-friendly design and smart solutions to improve quality of life for residents. Bahrain, Kuwait and Oman are advancing smart city initiatives, although these are still in early stages of development.

- **Growth of fintech**. The rise of fintech start-ups, digital banking services and blockchain applications in the GCC, particularly in the UAE and Bahrain, marks a significant transformation in the region's financial landscape. Bahrain is positioning itself as a leader in fintech, through initiatives like the Bahrain FinTech Bay, which serves as an innovation hub for collaboration among start-ups, financial institutions and technology companies. The UAE has established pivotal hubs such as the Abu Dhabi Global Market (ADGM) and the Dubai International Financial Centre (DIFC). These hubs facilitate the advancement of fintech through initiatives like regulatory sandboxes and innovation frameworks, providing companies with access to investors and customized regulatory support. Similarly, Saudi Arabia is making strides with its National Fintech Strategy 2030, aiming to become one of the top ten global fintech hubs, with a target of 500 active fintechs by that year. Some of the GCC fintech hubs are now so large that they are on the global fintech map. Despite the momentum, GCC countries face challenges in building a sustainable fintech ecosystem. A critical gap exists in attracting experienced talent, which is essential for enhancing the sophistication and delivery of fintech services. Moreover, the regional market remains fragmented, necessitating efforts to strengthen private-sector involvement and foster collaboration across the fintech landscape (Camarate et al. 2022).
- **Investments in AI and advanced technologies.** The GCC region is witnessing significant advances in AI, the internet of things (IoT) and cloud computing technologies across various sectors. Bahrain seeks to position itself as a hub for AI development in the Middle East. To this end, the country is focusing on enhancing its R&D capacity and improving its ability to create AI models that address challenges within key industries and the public sector. Ultimately, Bahrain aims to develop solutions that can be exported to other countries in the region (Oxford Insights 2023). In Oman, the Government is planning a programme to support AI-enhanced economic activities, with projected investments in AI technologies reaching US$250 million, which is expected to improve the country's AI Readiness Index score. Qatar is making significant strides in AI through initiatives like the Qatar Computing Research Institute and the Qatar Center for Artificial Intelligence, which promote collaboration between academia, industry and government to develop innovative AI solutions. The Government has allocated a substantial AI incentive package worth $2.47 billion to support these efforts as it moves towards comprehensive digital transformation (Abi Farraj 2024). Saudi Arabia has also unveiled a plan to create a fund of around $40 billion to invest in AI, aiming to become a leading player (New York Times 2024). Similarly, the UAE has been proactive in advancing AI by establishing the non-profit Falcon Foundation, which develops open-source generative AI models and creates sustainable ecosystems for technology projects, supported by $300 million in funding (Technology Innovation Institute 2024). Additionally, Microsoft is investing $1.5 billion in Abu Dhabi's G42, the leading UAE-based AI company, to accelerate AI development and strengthen the country's position as a global AI hub, fostering new opportunities for innovation and growth (Microsoft 2024).

- **Sectoral transformation.** Digitalization is significantly transforming various sectors in the GCC, driving innovation, reshaping how services are delivered and consumed and enhancing overall efficiency. From a labour market perspective, these changes are not only creating new job opportunities but also redefining skill requirements across sectors, some of which are further discussed below.

    - The UAE and Saudi Arabia boast some of the most advanced e-commerce markets in the region, fuelled by high internet penetration, widespread smartphone usage and robust digital payment systems. This growth fuels demand for jobs in areas like digital marketing, logistics, data analytics and customer service, requiring workers to acquire new digital and customer interaction skills. The expansion of online shopping platforms and digital marketplaces is also increasingly enabling small businesses and freelancers to enter the market, creating flexible work arrangements and contributing to a more diverse labour market.
    - The healthcare sector is undergoing significant digital transformation, with telemedicine, electronic health records and AI-driven diagnostics becoming more widespread. This ongoing shift improves access to medical services, streamlines patient care and is generating demand for tech-savvy healthcare professionals skilled in managing digital health tools. Initiatives like the Malaffi health information exchange in the UAE, the SEHA Virtual Hospital in Saudi Arabia, Nesma'ak in Qatar, and the Al-Shifa system in Oman are not only enhancing patient care but also creating new roles in health IT, digital health coordination and telemedicine, while encouraging the upskilling of traditional roles to adapt to digital workflows and data management.
    - Digital transformation in education across the GCC is also reshaping traditional learning environments into smart education systems, fostering demand for educators skilled in digital tools and smart classroom technologies. Initiatives like Madrasati in Saudi Arabia, Madrasa in the UAE, EduNet in Bahrain and the e-education portal in Oman are integrating digital content and virtual classrooms into education. This approach is not only improving access to information but is also emphasizing the importance of digital literacy from a young age, preparing students for a technology-driven future (Deloitte 2017).
    - Transportation is also reaping the benefits of digital innovations, with smart mobility solutions and high-speed connectivity increasingly used to optimize traffic management and enhance public transport systems. Proactive strategies, such as the Smart Transport Strategy and the Autonomous Transportation Strategy 2030 in the UAE, the Smart Transportation Plan under TASMU in Qatar and smart transport systems in Saudi Arabia are developed to enhance digital infrastructure and mobility solutions, potentially creating demand for roles in urban mobility planning, data science and autonomous vehicle operations.

- Support for digital entrepreneurship is another key trend in the GCC's digital transformation agenda, with vibrant start-up ecosystems driving innovation and economic diversification. Initiatives such as the Misk Hub in Saudi Arabia and the Saudi Venture Capital Company provide funding, mentorship and resources to tech start-ups, fostering a culture of entrepreneurship and technological advancement. The UAE is also leading the way with its Hub71 in Abu Dhabi and Dubai's Area 2071, which serve as innovation hubs offering incubators, accelerators and access to global networks for start-ups in fintech, AI and other emerging sectors. The Start-up Bahrain initiative and the National Fund for SME Development in Kuwait are similarly focused on supporting digital entrepreneurs through funding, training and networking opportunities.

In summary, GCC countries benefit from several competitive advantages that have fuelled their digital transformation, including strong government investment and advanced infrastructure. These assets, coupled with proactive policies and supportive regulations, have accelerated the adoption of emerging technologies across multiple sectors. However, sustaining this progress will require addressing the growing need for specialized talent. Developing a robust pipeline of skilled nationals is essential to maintaining the region's competitive edge, reducing reliance on expatriate labour and advancing the broader goal of economic diversification while transitioning towards more knowledge-based, but less oil-dependent, economies.

Digitalization developments in non-GCC countries

The digitalization landscape in the non-GCC Arab countries presents a complex picture marked by both challenges and opportunities. While political instability, economic constraints and inadequate infrastructure hinder progress, the following emerging digital trends hold the potential to transform labour markets and contribute meaningfully to broader socio-economic development:

- **Growth of e-commerce and digital payments.** Although still in the early stages of development, e-commerce is gradually gaining traction in countries like Jordan and Lebanon, driven by local start-ups and platforms and growing consumer demand for online shopping. The expansion of digital payment solutions, such as mobile wallets and online banking, supports this growth by enabling secure transactions. Among other things, these developments are creating new jobs in logistics, customer service and digital marketing, while leading to growing demand for skills in digital platform management and cybersecurity, and facilitating the expansion of markets for businesses, especially small and informal economic units.
- **Adoption of digital communication platforms**. Social media and digital communication tools are widely adopted across the region, serving as key channels for information dissemination, social interaction and business marketing. Platforms like Facebook and Instagram are not only used for personal communication but also play a significant role in supporting small businesses and entrepreneurs by providing a cost-effective means of reaching customers and promoting their products and services. This trend is also leading to increased demand for digital marketing and content creation skills.
- **Development of e-government services.** In non-GCC countries, e-government services are gradually enhancing public service delivery and improving governance. Examples include tax filing and business registration portals in Jordan, a digital tax submission platform in Lebanon, and efforts in the State of Palestine, Iraq and Yemen to digitalize civil services. These initiatives not only help improve efficiency and promote formalization but also increasingly drive demand for tech-savvy workers in public administration.
- **Emergence of digital health initiatives.** E-health is becoming increasingly important, especially in areas with limited medical facilities and in regions affected by conflict. For example, in the State of Palestine, e-Health is replacing paper records in United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) health centres as part of ongoing efforts to improve patient monitoring and data management, potentially allowing a more accurate analysis of disease patterns and trends. Additionally, one of the region's leading digital health platforms, Altibbi, based in Jordan but operating in several countries, provides telemedicine and health information services to users throughout the Middle East, enhancing access to healthcare and creating jobs in digital health.

- **Development of e-education.** The COVID-19 pandemic accelerated the development of digital education and e-learning platforms, transforming the way education is delivered. To address the disruptions caused by school closures, governments and organizations have launched various online courses, digital classrooms and remote learning initiatives. In Jordan, the Ministry of Education introduced the Darsak platform to deliver educational content. Similarly, Edraak, a regional non-profit massive open online courses (MOOC) platform, continues to offer free online courses for school and university students, equipping learners with essential skills in collaboration with international partners.
- **Digital entrepreneurship and innovation.** A burgeoning ecosystem of digital entrepreneurs is emerging in the region, driven by supportive policies, access to incubators and venture capital. Despite challenges, entrepreneurs are leveraging digital technologies to create innovative solutions that stimulate income generation and economic growth. This trend has fostered a vibrant start-up ecosystem, particularly in sectors such as e-commerce, fintech and technology-enabled services. While still in its early stages, digital entrepreneurship and innovation offer significant potential for these countries to diversify their economies, create jobs and enhance the quality of life for their citizens. In Jordan, initiatives like the National Center for Innovation and various tech incubators are promoting growth in fintech, e-commerce and health tech. Similarly, Lebanon is experiencing a rise in digital entrepreneurship, with numerous start-ups harnessing technology to address local challenges. The SoP and Iraq are witnessing a rise in tech-driven initiatives, as young entrepreneurs innovate solutions for social and economic issues.

In summary, and while non-GCC countries are witnessing growth in various digital trends, there is still considerable room for improvement to elevate digital transformation efforts. These countries face structural challenges that hinder widespread digitalization, including limited access to funding, underdeveloped infrastructure, regulatory barriers and insufficient government capacity coupled with skill shortages. Additionally, political instability and economic constraints further complicate the landscape. Collectively, these factors restrict the ability of non-GCC nations to achieve the maturity necessary to trigger the digital and AI multiplier effect on development, exacerbating the digital divide between them and their more advanced and digitally enabled GCC counterparts.

5 Employment challenges and opportunities

Technological change has long influenced the size and structure of the global workforce, creating jobs in some sectors while displacing them in others. Historically, evidence suggests that technology has been a net creator of employment, though often accompanied by considerable workforce shifts within and across countries, regions and industries (Autor and Salomons 2018; Kogan et al. 2017).

In the current era of rapid digitalization, these dynamics are accelerating. Labour markets worldwide are experiencing changes not only in the number of jobs available but also in their nature and quality. Digital technologies are simultaneously displacing some jobs, enhancing existing ones and generating entirely new forms of employment. The emergence and rapid advancement of AI, including machine learning, deep learning, GenAI and large language models (LLMs), is proving particularly transformative. These technologies are pushing automation beyond routine physical tasks to complex cognitive functions, increasingly affecting white-collar and knowledge-based roles.

Understanding these trends is essential to anticipate challenges, harness opportunities and design policies that support workforce adaptation and resilience. While much of the research on the impact of digitalization and AI has focused on advanced economies, there is a noticeable gap in region-specific analysis on the Arab States. This lack of local evidence underscores the need for a deeper inquiry into how these global trends are unfolding within the region and what strategies are needed to navigate the transition.

A snapshot of digital employment in the Arab States

Digital employment, although not universally defined, generally encompasses any work that relies on or is supported by ICT. Because of its broad and evolving nature, measuring digital employment presents significant challenges, with methods and definitions often varying across national contexts and depending on the availability of data. Acknowledging this complexity, further amplified by the rapid advancement of digital technologies, the ILO (2023a) has outlined key approaches for understanding and measuring digital employment. These are categorized into output-based and task-based methods, supplemented by other qualitative and mixed-method approaches (see Appendix II).

For the purpose of this section, digital employment is captured using the output-based approach, specifically the digital intensity method. The analysis consolidates the OECD's four-level digital intensity index, to classify sectors into either low- (LDI), medium- (MDI) or high-level digital intensity (HDI).[4] Digital employment is then broadly understood to comprise all jobs performed in HDI sectors. Figure 3 offers a snapshot of the region's digital employment landscape, illustrated by the distribution of employment by sex and digital intensity level.

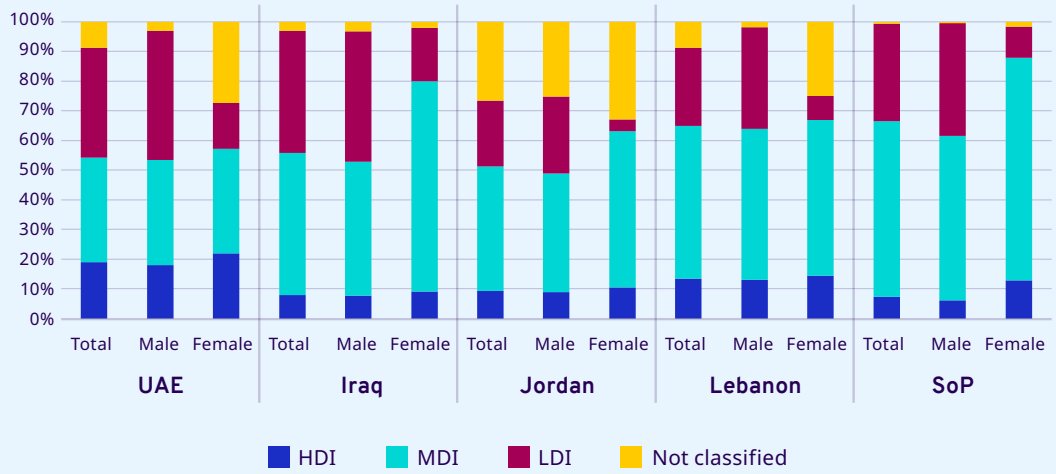
Across the five states for which sectoral employment data are available (based on the two-digit ISIC Rev.4 classification), the UAE recorded the highest share of digital employment, with 18.9 per cent of its workforce employed in HDI sectors. This reflects the relatively advanced digital economy of the UAE compared to its regional peers. In contrast, HDI employment remains limited in the non-GCC countries studied. With the exception of Lebanon, less than 10 per cent of the workforce in these countries is engaged in HDI sectors, indicating relatively low integration of advanced digital activities into their labour markets.

4 See Appendix II for a detailed correspondence between digital intensity categories and ISIC Rev. 4 sectoral categories (International Standard Classification of Occupations).

A notable trend across all five countries is the substantial share of employment in MDI sectors. This suggests that digital transformation is under way but remains concentrated in sectors with moderate technological adoption. To accelerate progress, further efforts are needed to expand employment opportunities in HDI sectors while gradually reducing reliance on LDI sectors, which still account for a significant portion of the workforce.

From a gender perspective, women are generally less engaged in LDI sectors but more concentrated in MDI and HDI sectors, compared with their male counterparts. In countries like Iraq, Jordan, Lebanon and the State of Palestine, over 50 per cent of female employment is in MDI sectors. In the UAE, women's share in HDI sectors is particularly high, standing at 21.9 per cent of female employment, far exceeding the levels seen in other countries. Although traditionally underrepresented in STEM and tech-heavy fields, Arab women may be slightly more likely than Arab men to be engaged in digital employment because of the broad and diverse nature of the digital economy. However, this trend does not necessarily mean gender equality in digital employment has been achieved. Women may still be overrepresented in lower-paid, less secure or informal segments of digital work, while men remain dominant in higher-paid technical roles like software engineering or AI development.

Figure 3. Employment distribution by country, digital intensity and sex, latest year available



Note: Data for the five countries are from different years: Iraq (2021); Jordan (2023); Lebanon (2019); SoP (2024); and UAE (2023).

Source: Authors' calculations based on the ILOSTAT database.

The impact of generative AI on jobs: Automation and augmentation potential

The impact of AI on labour markets has been widely debated, with most researchers agreeing that AI will significantly influence occupations and drive growth. Yet, empirical findings remain inconclusive regarding the net effects on employment and productivity (Comunale and Manera 2024). The literature has primarily focused on assessing "task exposures" – the share of tasks that AI could potentially replace – to estimate the risks and opportunities for workers (Acemoglu and Restrepo 2019; 2022). Higher task exposure is linked to greater displacement risks. However, studies following the rise of GenAI are increasingly separating task exposure and employment risk, emphasizing the augmentation potential of AI technologies. Based on task exposure, certain occupations may be only partially automated, enabling workers to focus on other responsibilities, thus complementing and "augmenting" their roles rather than replacing them entirely.

In line with the growing body of post-GenAI research, Gmyrek, Berg and Bescond (2023) leveraged task exposure analysis to explore the nuanced dynamics of AI's influence on workers. It emphasized the dual impact of AI, whereby task exposure does not necessarily equate to job displacement but may instead offer opportunities for workers to shift towards other more creative or value-added activities. This study provides insights into the potential exposure of occupations and tasks to LLMs with capabilities similar to GPT4[5] on jobs and the possible implications of such exposure. Jobs are considered to have a high automation potential if technology can replace most associated tasks, leading to job losses. On the other hand, when technology can only automate some tasks within a job, requiring human input for overall performance, such jobs have high augmentation potential.[6] This partial automation can enhance efficiency, allowing workers to focus more on other responsibilities, thereby "augmenting" their role. The study suggests that the most significant impact of GenAI will likely be augmenting work rather than fully automating occupations. This will result in a transformation of task structures and the roles within various occupations.

Among major occupation groups, clerical support workers have the highest exposure to GenAI, with 24 per cent of clerical tasks highly exposed and 58 per cent moderately exposed. In comparison, other occupational groups are less exposed, with fewer than 5 per cent of tasks having high automation potential and moderately exposed tasks not exceeding 25 per cent. Unsurprisingly, occupations with high automation potential are predominantly found in the "clerical support workers" group (e.g. typists, travel consultants, bank tellers). In contrast, occupations with high augmentation potential, where GenAI could lead to productive transformations, are mainly concentrated in the groups labelled "professional" (e.g. vocational education teachers, software developers, computer network professionals) and "technicians and associate professionals" (e.g. real estate agents, pharmaceutical technicians, interior designers).

The study also highlighted the varying employment effects across income groups, driven by differing occupational structures. High-income countries are more exposed to automation risks: while less

5 GPT refers to Generative Pre-trained Transformer, which belongs to the family of LLMs, a type of machine learning model based on neural networks. GPTs generate output in the form of sentences, paragraphs or entire text structures that are often indistinguishable from human-produced content.

6 Jobs were classified based on task-level scores into high automation potential or high augmentation potential job categories. A third category comprises occupations that, depending on GenAI advancements and adoption, may shift towards either automation or augmentation, or even evolve into entirely new occupations. As the direction of this evolution remains uncertain, this group is referred to as "the big unknown" and is estimated to represent approximately 9 per cent of global employment (Gmyrek et al. 2023).

than 0.5 per cent of total employment in low-income countries is potentially exposed to automation, this figure rises to 2.5 per cent in upper-middle-income countries and 5.5 per cent in high-income countries. The findings further revealed a gender effect, with women being more susceptible to automation than men across all income groups, likely because of their greater representation in clerical jobs.

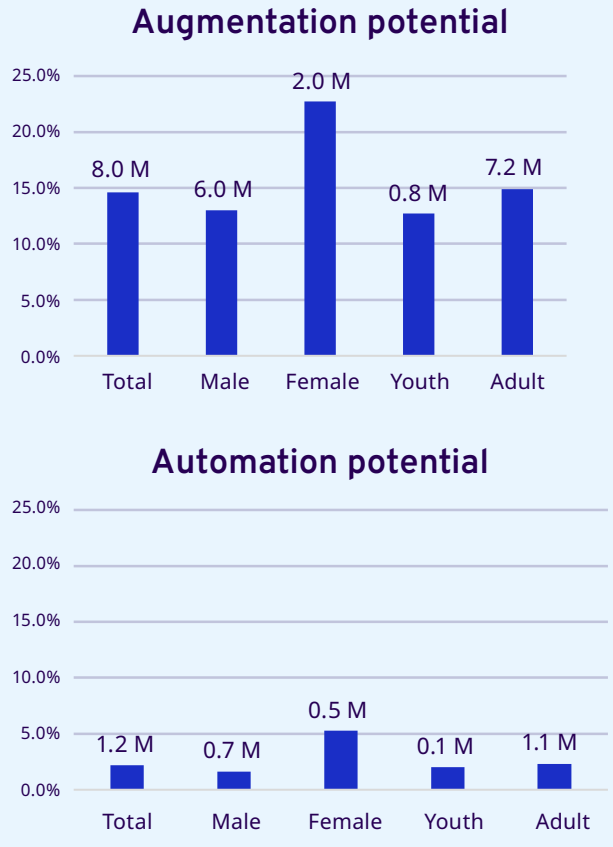
A regional lens: Potential effects on jobs in the Arab States

Building on the methodology used by Gmyrek, Berg and Bescond (2023), this report relies on the ILO's database of harmonized microdata and uses advanced statistical methods to derive a regional estimate that is representative of the 12 Arab States, with further disaggregation by sex and age group (figure 4). Employment numbers and shares highlight the potential for automation and augmentation across different segments of the workforce.

In the Arab region overall, jobs with high automation potential – those at risk of being replaced by GenAI – account for 2.2 per cent of total employment, equivalent to roughly 1.2 million jobs. This relatively modest share suggests that, while automation is a concern, its immediate disruptive effect across the entire labour market may be limited.

Conversely, the potential for job augmentation, where technologies enhance workers' capabilities rather than replace them, is much greater. Approximately 14.6 per cent of jobs in the region, or about 8 million jobs, have high augmentation potential. This finding underscores the significant opportunities available to harness digital technologies and GenAI to improve productivity, efficiency and resilience, provided that appropriate investments in skills development, training and technological infrastructure are made.

Figure 4. Automation and augmentation potential by sex and age group



Source: ILO calculations based on labour force survey microdata

From a gender perspective, labour market trends in the Arab States mirror global patterns but are even more pronounced. The share of female-held jobs at high risk of automation stands at 5.3 per cent, more than three times the share of male-held jobs (1.6 per cent). This disparity is even starker among youth: among young women, 5.9 per cent of jobs are at risk of automation, compared to just 1.2 per cent for young men – nearly a fivefold difference. This significant gap reflects the types of occupations in which women in the region are traditionally concentrated. Women are disproportionately represented in roles that involve repetitive, rules-based and administrative tasks – categories highly susceptible to automation. These include positions such as secretaries, accounting and bookkeeping clerks, bank tellers, cashiers and various retail sales jobs. As technological advancements increasingly enable the automation of standardized and routine tasks, women in these roles face a heightened risk of displacement.

At the same time, however, women in the Arab States potentially stand to benefit more than men from opportunities associated with job augmentation. An estimated 22.7 per cent of female employment is in roles with high augmentation potential, compared to 13.0 per cent of male employment. This is largely because women are more heavily concentrated in sectors that blend technical skills with human interaction. Examples of such roles include vocational education teachers and schoolteachers who increasingly incorporate digital tools into classroom settings, education specialists designing technology-integrated curricula, healthcare professionals (dietitians, nutritionists, nurses and community health workers) who use health technologies to enhance patient care, and personal service workers such as hairdressers, restaurant servers and travel attendants, whose work involves skills that are difficult to automate, such as empathy, communication and complex interpersonal interaction (Gmyrek et al. 2023).

Globally, the Arab States region exhibits the highest proportion of female jobs with high augmentation potential (ILO 2023b). This dynamic highlights a critical opportunity to drive both productivity gains and job quality improvements for women. It also presents an avenue to promote gender equality in the workforce, enabling women to not only adapt to the changing world of work, but to thrive within it. Strategic investments in sectors such as education, healthcare and personal services, combined with greater adoption of digital technologies and AI, could transform these occupations into sources of decent and rewarding employment for women (UN Women and ILO, 2024). Targeted efforts to improve job quality, expand training and reskilling opportunities, and provide income support during sector transitions are critical to this process. Such investments would not only empower women but also meet the evolving needs of societies and foster a more inclusive and resilient labour market, especially at a time when inadequate care systems remain a major barrier to closing gender gaps globally (WEF 2023b).

From an age perspective, the data reveal that young people are less likely than adults to benefit from augmentation opportunities. While automation risks are comparable, affecting 2.0 per cent of youth employment and 2.3 per cent of adult jobs in the Arab States, jobs held by young people have a generally lower augmentation potential, with 12.7 per cent of youth jobs considered augmentation-friendly, compared to 14.9 per cent per cent for adult jobs. This disparity could reflect the fact that adult workers are more frequently employed in established, higher-skilled roles or managerial positions where digital and AI technologies augment tasks without replacing the human contribution. In contrast, youth often have more limited access to such roles because they lack experience or specialized skills. Young workers are also more likely to be concentrated in temporary, task-based jobs or in sectors such as retail and hospitality, which typically offer lower augmentation potential. Limited access to training and reskilling opportunities, as well as biases favouring older workers for more advanced roles, may further compound the lower augmentation prospects for youth.

Further to the above, global research indicates that AI-driven automation is more likely to impact higher-income countries, where 5.1 per cent of employment is considered at high risk of automation, compared to just 0.4 per cent in low-income countries. Likewise, the potential for AI to augment jobs also increases with income level, rising from 10.4 per cent of jobs in low-income countries to 13.4 per cent in high-income countries (Gmyrek et al. 2023). Assuming these patterns hold within the Arab States region, it can be expected that the GCC countries - typically higher-income and more technologically advanced - will face greater exposure to both automation and augmentation. In contrast, less resource-rich non-GCC countries may experience slower adoption and more limited impacts.

While such analysis does not account for new jobs that will be created to accompany investments in GenAI, existing data and evidence reveal that the digital transition is "not an employment apocalypse, but a shift" (ILO 2023b). This shift offers opportunities to redefine work, improve productivity and hopefully bridge gender and generational gaps in the labour market. To fully harness these benefits, governments, employers' and workers' organizations and other stakeholders must proactively address the unique vulnerabilities and opportunities faced by different workforce segments. Achieving an inclusive and just transition will require policies that mitigate job displacement impacts while maximizing productivity gains, supported by social protection measures, targeted training programmes and comprehensive skills development initiatives.

Projecting the digital shift: Employment and growth trajectories

This section attempts to understand the scale of employment creation and loss driven by digitalization and AI through modelling various scenarios in collaboration with Cambridge Econometrics. The quantitative impacts of digital transformation on employment and economic output were modelled using the E3ME model, described in detail in Appendix III. This macroeconomic model is widely employed for policy evaluation and research, especially to analyse the economic and employment effects of green and digital transitions. The model produced several estimates of the economic and employment impacts for the period 2024–2035 across three scenarios. It compares two "what-if" scenarios against a baseline scenario, which reflects a business-as-usual trajectory without significant policy or technological shifts.

The two alternative scenarios, briefly outlined in table 6 and table 7, represent different levels of ambition in digital transformation in the Arab States:

- **The broadband expansion scenario.** This scenario assumes near-universal broadband coverage (at least 90 per cent) by 2030, in alignment with Sustainable Development Goal (SDG) 9.
- **The AI integration scenario.** Building on the broadband expansion foundation, this scenario further incorporates the potential impacts of adopting AI across various economic sectors.

Together, these scenarios show how advancing digital infrastructure and AI integration could reshape economic growth and employment across the Arab region. As with the task-based approach described earlier, this model is not intended to provide a precise representation of the future, but rather to highlight potential trends and shifts, serving as a guide for developing appropriate policies.

▶ Table 6. The broadband expansion scenario

Main assumption		Universal broadband coverage achieved by 2030
Other key assumptions	Investment and funding	Investment level is determined by the size of the coverage gap
		Investment allocation (sectors building the infrastructure): 50% construction, 15% electronics, 15% electrical equipment, 10% communication, 10% computer services
		Investment begins in 2024, financed by private broadband firms, with costs repaid over 20 years with a 5-year grace period
	Productivity	Increased broadband coverage enhances digitalization and boosts productivity
		Productivity gains estimated using elasticities linking broadband coverage to productivity, based on the size of the gap to be closed by 2030
		Regional productivity increases are estimated based on the reduction in broadband coverage gaps, with sectoral impacts allocated according to sector size and potential to benefit from expanded coverage
		A 1% increase in mobile broadband penetration is assumed to yield a 0.182% increase in GDP per capita, based on ITU (2020b)
	Shifts in consumer behaviour	Enhanced internet access improves access to financial services, healthcare and information related to health and education
		Shift in expenditure patterns towards internet-enabled services relative to the size of the coverage gap (for regions with largest gaps, spending is assumed to increase by up to 50% above baseline)

Source: Cambridge Econometrics.

▶ Table 7. The AI integration scenario

Main assumption		Universal broadband coverage achieved by 2030 and AI adopted
Other key assumptions	Job losses	Assumptions are based on occupations with automation risk from Gmyrek et al. (2023)
		Losses occur linearly from 2024 to 2035
	Productivity impact	AI adoption enhances productivity, linked to occupations with augmentation potential as identified by Gmyrek et al. (2023) (see Appendix III)
		Full productivity gains realized by 2035, allocated by sector based on occupational composition and augmentation potential
	Employment demand	Increased employment demand in sectors with high computer use (over 60%)
		Gains calculated based on the share of occupations with high augmentation potential in the sector according to Gmyrek et al. (2023)

Other key assumptions	**Investment in AI**	Oman, Qatar, Saudi Arabia and the UAE announce substantial AI investments
		For Bahrain and Kuwait, AI investments as a share of GDP are assumed equal to the average ratio of AI-related expenditure to the GDP level observed in GCC countries with announced investments
		For non-GCC countries, AI investment is assumed half of the GCC average ratio to GDP
		Investment allocation is based on the announced timeline When no timeline is provided, the investment is assumed to be evenly distributed over the 2025–2035 period
		In Lebanon, the SoP, Syria and Yemen, investment is assumed to start 1 year later (2026 instead of 2025), gradually increasing until 2035 and reaching an annual level consistent with half the average ratio to GDP over the period
		AI investment distributed to sectors receiving expenditure, based on Eurostat data on sectoral AI development
	Financing	Investments primarily funded by central governments, incurring debt repaid post-2035

Source: Cambridge Econometrics.

▶ Macroeconomic impact on GDP and employment

Comparing the two scenarios with the baseline reveals distinct macroeconomic dynamics shaped by different assumptions and levels of digital ambition. The projections for both GDP and employment show how digital expansion and AI adoption could influence the region's economic and labour market trajectory, including net job creation.

Understanding the potential employment impacts requires an examination of the underlying mechanisms that drive job growth and structural shifts. Across both scenarios, job creation is driven by three key effects:

- **Direct effects** refer to jobs directly associated with the development, deployment and operation of digital technologies. Examples include network infrastructure engineers under the broadband expansion scenario and AI system developers in the AI integration scenario.
- **Indirect effects** emerge in sectors that support or are enabled by digital infrastructure and AI technologies, such as supply chain roles in hardware manufacturing or logistics jobs linked to the expansion of e-commerce.
- **Induced effects** are generated by broader economic ripple effects, as higher levels of income and consumption by workers in direct and indirect roles stimulate demand for goods and services. For example, higher disposable incomes may boost employment in retail, hospitality and other service sectors.

These dynamics, together with the potential job loss effects, underpin foundational employment shifts, which are explored later across sectors and demographics. Table 8 summarizes the forecasted differences in GDP and total employment impacts for key years (also illustrated in figure 5).

▶ **Table 8. Projected GDP and employment absolute differences by scenario relative to baseline**

	GDP (US$2010bn)			Employment (thousand jobs)		
	2024	2030	2035	2024	2030	2035
Broadband expansion scenario	2.6	4.1	4.6	72.8	150.6	185.9
AI integration scenario	2.2	11.6	14.1	- 4.6	37.0	118.4

Source: ILO, based on modelling analysis by Cambridge Econometrics.

The **broadband expansion scenario** leads to consistent economic and employment gains, above the baseline trajectory. Under this scenario, GDP rises from an additional US$2.6 billion in 2024 to $4.6 billion in 2035, compared to the baseline. This growth reflects the compound effects of higher levels of broadband investment and productivity enhancements across sectors. It is fuelled by significant improvements in internet connectivity, which enable greater access to digital services and information. Enhanced broadband coverage fosters financial inclusion, social inclusion and improved access to healthcare and education-related information. These benefits translate into higher consumer expenditure on internet-enabled services, such as financial, recreational and communication services, significantly driving economic activity.

The employment impacts are similarly positive, with net job creation increasing steadily over the period. Compared to the baseline scenario, broadband expansion yields 72.8 thousand additional jobs in 2024, reaching 185.9 thousand additional jobs by 2035. This robust employment growth is driven initially by the labour-intensive nature of broadband infrastructure development, generating demand in sectors such as construction, electronics and communications. Over time, increased digitalization can potentially foster productivity gains across a wide range of industries, further reinforcing job creation and economic dynamism.

On the other hand, the **AI integration scenario** demonstrates remarkable economic gains alongside more complex employment dynamics. Compared to the baseline, GDP increases sharply, rising from an additional $2.2 billion in 2024 to $14.1 billion by 2035. This significant growth highlights the transformative potential of AI technologies to reshape economies, drive innovation and enhance competitiveness across sectors.

Employment outcomes, however, present a more nuanced picture. Initially, this scenario produces job losses relative to baseline, reflecting the displacement of roles in occupations highly vulnerable to automation. The labour market begins to recover in 2028, as job creation accelerates in sectors benefiting from AI-driven augmentation (figure 5). By 2035, a net gain of 118.4 thousand jobs are created compared with the baseline scenario. The employment gains in this scenario are shaped by several key mechanisms, including:

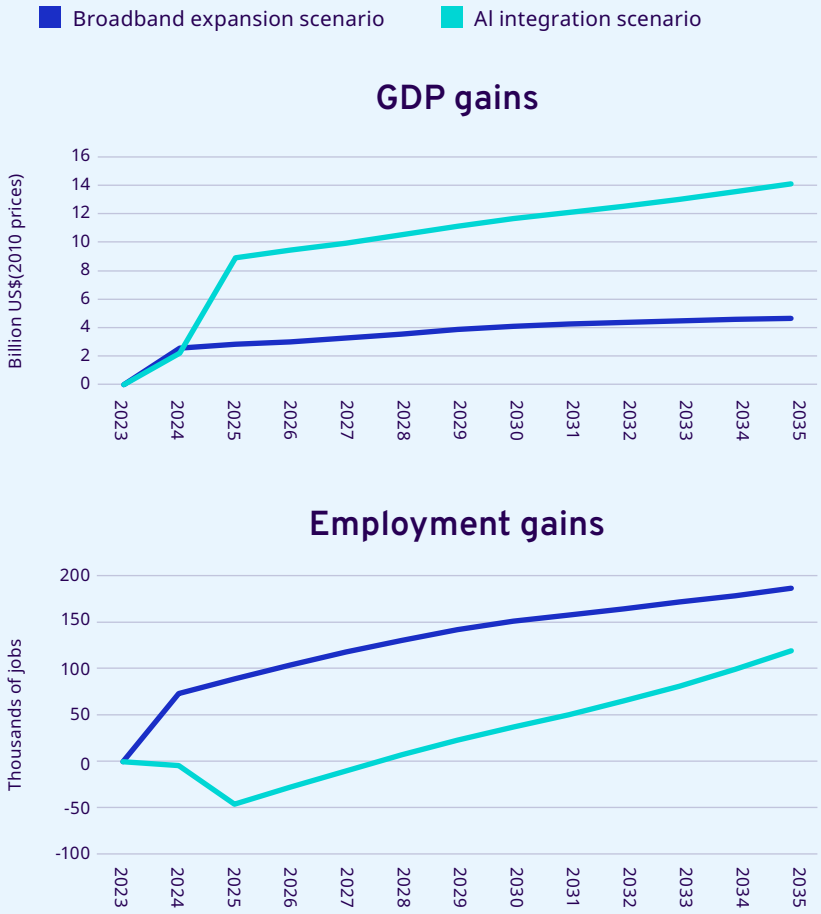
- **Sector-specific growth in labour demand.** Sectors with high computer use and augmentation potential benefit from task enhancements enabled by AI technologies, driving demand for specialized and skilled labour.
- **Investment activity effects.** AI-related investments generate demand for goods, services and labour in targeted sectors and across supply chains.

- **Productivity-driven competitiveness.** AI adoption enhances efficiency and reduces production costs, enabling higher output, reduced imports and increased exports, further boosting labour demand.
- **Multiplier effects.** The combined impact of direct and indirect activities leads to induced effects, where increased economic activity stimulates broader demand for goods and services, supporting job creation across various sectors.

Naturally, the scale of AI investment under the AI integration scenario is broader than in the broadband expansion scenario. While the latter focuses investments in countries addressing broadband coverage gaps, the AI integration scenario assumes region-wide investment activity across all the Arab States, amplifying economic activity and labour demand. These mechanisms operate simultaneously with job displacement from automation, leading to net gains or losses at different stages and across sectors. In the early phase, substantial job losses dominate as automation displaces jobs in high-risk occupations at a pace that exceeds job creation. Over time, however, this trend reverses as job creation driven by increased labour demand, enhanced productivity and economic expansion outweighs losses, culminating in significant net employment by 2035.

Overall, while the AI integration scenario presents transitional challenges, it ultimately offers significant opportunities for higher productivity, net job creation and enhanced economic resilience, provided that appropriate policies are in place to support worker transitions and skills development.

▶ Figure 5. Employment and GDP gains by scenario, absolute difference from baseline, 2023–2035



Source: ILO, based on modelling by Cambridge Econometrics

Key considerations for scenario results interpretation

While these scenarios provide valuable insights into possible future outcomes, they offer stylized representations rather than definitive forecasts. Given the inherent uncertainties surrounding the future of work, driven by such factors as technology adoption, funding availability and institutional readiness, the results require cautious interpretation.

► Balancing employment and competitiveness

Comparing the 185,000 jobs created under the broadband expansion scenario with the 118,000 jobs created under the AI integration scenario could lead to the mistaken conclusion that broadband expansion alone is sufficient for the Arab States. While broadband expansion indeed generates substantial and consistent employment gains, focusing solely on this area would risk undermining long-term competitiveness. Without embracing AI adoption, countries could fall behind global technological advancements and miss critical productivity gains associated with AI-driven efficiencies. Such gains are vital for reducing costs, improving output quality, developing cutting-edge industries and sustaining economic growth. AI integration has the potential to transform economies by driving

innovation, attracting foreign investment, significantly boosting GDP and productivity and fostering the creation of higher-quality, higher-paying jobs.

► Regional diversity and tailored strategies

The Arab States region is highly diverse, with substantial differences in countries' readiness and financial capacity for AI investment. Some countries, particularly within the GCC, already have widespread broadband coverage and are well-positioned to pursue large-scale AI adoption, supported by strong financial resources and institutional capabilities. In contrast, many non-GCC countries facing financial or institutional limitations may prioritize broadband expansion as a more immediate and impactful strategy. Expanding broadband access can improve digital inclusion, create jobs and foster social and financial integration. For these countries, investing in broadband infrastructure offers a practical foundation to bridge digital divides, stimulate economic development and lay the groundwork for future AI integration when conditions allow.

The key takeaway is not to compare the two scenarios against each other, but rather to recognize their shared potential for job creation and to underscore the critical importance of advancing digitalization as a pillar of economic and labour market growth. AI adoption is no longer a question of "if", but "when". Each country will need to progress at its own pace, according to its unique capacities. However, it is essential to recognize that AI will fundamentally transform economies and labour markets, bringing significant risks of job displacement alongside new and better employment opportunities.

This analysis, further developed below by sector, occupation and other demographic characteristics, underscores the urgency for countries to prepare for the changes ahead. It is a call to action: proactive measures such as reskilling programmes, robust social protection systems and strategies to support workforce adaptation are essential for ensuring that the transition to AI-driven economies will lead to inclusive and sustainable growth. Policymakers must recognize that AI adoption is inevitable, and act decisively to mitigate the risks for the most vulnerable while ensuring that opportunities are equitably distributed, leaving no one behind.

▶ Employment impacts across sectors and occupations

To fully grasp the implications of AI and digitalization, it is crucial to examine how effects vary across sectors and occupations. Digital technologies are not reshaping the world of work uniformly. Instead, their influence is highly differentiated, often amplifying existing disparities and creating new dynamics within labour markets. This section offers a detailed analysis of employment outcomes, comparing projected changes against the baseline scenario, across sectors and occupations.

Sectoral employment shifts

The employment estimates highlight significant sectoral shifts under both broadband expansion and AI integration scenarios. Figure 6 and figure 7 provide a comprehensive visualization of these employment shifts by scenario and sector for the year 2035.

Under the broadband expansion scenario, employment gains by 2035 are distributed unevenly across sectors, reflecting the varying sensitivity of industries to improvements in digital infrastructure. The **distribution and retail sector** sees the largest employment gains in 2035, driven by the sector's high responsiveness to consumer demand, which rises with improved connectivity and access to online markets. Digital infrastructure facilitates new business models such as e-commerce, expands market reach for small and medium-sized enterprises (SMEs) and creates additional demand for labour-intensive retail services.

The **transport and storage sector** is also projected to add jobs, benefiting from the broadband-enabled growth in logistics, delivery services and supply chain management. Enhanced digital networks improve route optimization, inventory tracking and customer service, driving a need for expanded human resources in logistics hubs and last-mile delivery. **Manufacturing**, particularly advanced manufacturing, will experience growth as broadband enhances connectivity across production facilities and supply chains. Improved digital infrastructure enables manufacturers to adopt more efficient digital tools, streamline operations and participate in digital marketplaces. This can lead to higher productivity and create new demand for skilled technical workers, engineers and IT specialists.

In **public services**, although the sector's growth is modest compared to retail or logistics, there is still net job creation, as digital expansion enhances the delivery of education, healthcare and government services, requiring additional personnel, including IT support, digital administration, tele-health and online learning platforms.

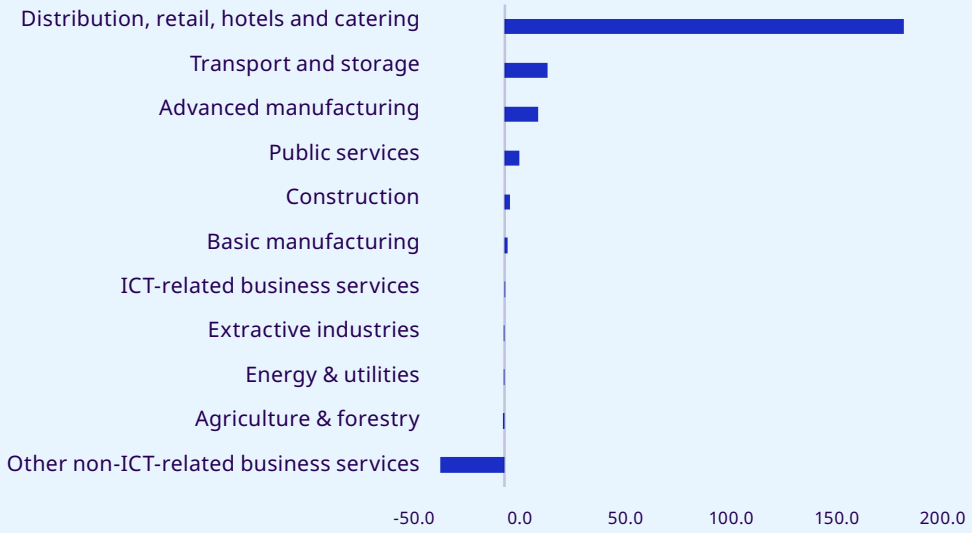
Finally, **construction** sees early employment gains, peaking by 2030. This front-loaded growth reflects the immediate labour demand associated with broadband infrastructure deployment, such as network installation, civil works and related support services. Once the initial infrastructure is established, employment levels taper off as maintenance replaces large-scale construction projects.

Overall, the distribution of employment gains reflects sector-specific differences in digital intensity and labour demand elasticity. Retail, logistics and advanced manufacturing are highly sensitive to improvements in connectivity because they integrate digital technologies into both core operations and customer engagement. In contrast, public services, while increasingly digitized, face structural limitations in scaling employment because of funding, regulation and slower adoption of new service models. Construction, on the other hand, experiences temporary gains linked to infrastructure roll-out, but does not sustain long-term digitally driven employment growth.

Another notable observation concerns **ICT-related business services**. Initially, this subsector benefits from broadband expansion, as firms require experts to install, customize and deploy new digital systems. However, by 2035, the net employment gains diminish. As companies complete the expansion of their digital infrastructure, many roles shift from supporting growth to focusing on maintenance and optimization, leading to a slowdown in job creation.

Meanwhile, in other sectors, employment levels decline relative to the baseline. Among these, **non-ICT-related business services** experience the largest losses, driven by a shift in demand away from traditional roles. As businesses increasingly adopt technologies that streamline workflows, automate routine tasks and enhance operational efficiency, many conventional business-support functions become either redundant or significantly reduced.

Figure 6. Projected jobs growth ('000) by sector, broadband expansion scenario, 2035



Source: ILO, based on modelling by Cambridge Econometrics.

Similar to the broadband expansion scenario, employment impacts relative to the baseline under the more ambitious AI integration scenario highlight important sectoral shifts (figure 7), with **construction** and **transport and storage** emerging as the biggest winners by 2035. In **construction**, the use of AI tools will enable faster and more accurate planning, reducing project delays and cost overruns. Additionally, an AI-driven economy requires new physical infrastructure, including data centres, smart cities and logistics hubs, fuelling demand for construction workers, civil engineers, electricians and related trades. It is also worth noting that many tasks in construction are hard to fully automate. Instead, AI complements tasks (optimizing planning and site management) while people still carry out much of the physical work.

Similarly, in the **transport and storage sector**, while some jobs may be displaced, a net increase in employment is expected. AI is transforming the sector by creating new roles, including the supervision of autonomous vehicles and warehouses, managing logistics data, maintaining smart fleets and ensuring cybersecurity. As tasks shift from manual work to more technical and supervisory functions, growing demand driven by e-commerce, urban deliveries and global supply chains continues to generate new employment opportunities. Despite greater automation, many activities (e.g. loading, last-mile delivery, customer service and inventory management) will still require human oversight. Rather than replacing workers, AI is reshaping jobs and driving workforce upskilling across the sector.

The **agriculture and forestry** sector also sees positive employment gains, influenced by shifts in consumer expenditure patterns driven by AI-driven productivity gains and economic growth, which, in turn, increase demand for goods and services, favouring agriculture-related products. It is also worth noting that AI is reshaping agriculture by automating routine tasks like planting, harvesting and irrigation, which may reduce some manual labour jobs. However, it is also creating new employment opportunities in areas such as machine maintenance, programming, data analytics and farm management. As farms adopt AI-driven tools to monitor crops, optimize resources and enhance sustainability, there will be growing demand for workers with technical, digital and financial skills. Overall, AI is expected to make farming more efficient and profitable, while transforming – not eliminating – the agricultural workforce and driving the need for new types of expertise.

For **extractive industries** and **advanced manufacturing**, a net positive employment impact is expected under the AI integration scenario. These gains reflect opportunities in skilled roles for technology implementation and oversight, which, complemented by demand from broader economic activity and supply chain linkages, drive employment growth beyond the job losses expected from automation in these sectors.

ICT-related business services, on the other hand, exhibit a dynamic trajectory under the AI integration scenario, initial job experiencing losses but later transitioning into significant growth. The sector experiences declines in employment between 2024 and 2028, reflecting the short-term displacement of workers as businesses implement AI systems and automate traditional tasks. From 2029 onwards, the sector shifts into a growth phase, with greater demand for ICT-related expertise as AI adoption becomes more widespread across industries. Roles in system implementation, data analytics, AI infrastructure maintenance and cybersecurity drive this growth. This pattern contrasts sharply with **non-ICT business services**, which exhibit employment declines relative to baseline because of the substantial displacement of traditional administrative and operational roles. The divergence between ICT and non-ICT within business services reflects the broader restructuring driven by AI, where technology-oriented roles gain prominence while traditional ones are phased out.

Public services are also projected to face employment losses, relative to the baseline scenario, because of automation and AI-enhanced administrative efficiencies. AI technologies are being introduced to streamline administrative functions, digitize public services and automate tasks in areas like licensing, records management and citizen services. These efforts reduce the need for large administrative workforces, especially in roles involving repetitive clerical tasks. At the same time, governments are shifting their focus towards private-sector development, digital transformation and economic diversification, which further redirects employment growth away from the public sector. While AI can enhance the quality and responsiveness of public services, it contributes to a leaner state workforce, particularly in contexts where public employment has historically served as a social buffer for job creation.

Basic manufacturing and **distribution, retail, hotels and catering** face significant contractions. These declines reflect the disruption of traditional manufacturing processes and service models by innovations and operational shifts driven by AI, where substantial job losses outweigh any gains in these sectors.

Figure 7. Projected jobs growth ('000) by sector, AI integration scenario, 2035

Source: ILO, based on modelling by Cambridge Econometrics.

Overall, the analysis highlights a stark contrast: while broadband expansion provides steady net job creation across almost all sectors, with minimal negative impact across a few others, AI adoption brings transformative shifts, leading to either significant net gains or losses across sectors. The findings underscore the importance of proactive policies to support transitioning workers and ensure equitable outcomes across sectors.

Employment shifts by occupation

Occupations, and the tasks they involve, represent the primary channel through which digitalization and AI exert their influence. Table 9 provides a detailed breakdown of the effect on employment by 2035 for various occupations in both scenarios compared to the baseline. Under the broadband expansion scenario, consistent positive employment growth is seen across a broad spectrum of occupations. The largest gains are in labour-intensive and consumer-facing roles requiring human interaction, such as personal service workers and sales workers. This reflects how broader digital access stimulates consumer demand, boosts local economic activity and supports inclusive participation in the workforce. While increases in high-skilled occupations (e.g. science and engineering professionals and ICT professionals) are more modest, the scenario does not produce major employment disruptions or large-scale job losses. Instead, the model suggests a stable and inclusive pathway for employment growth.

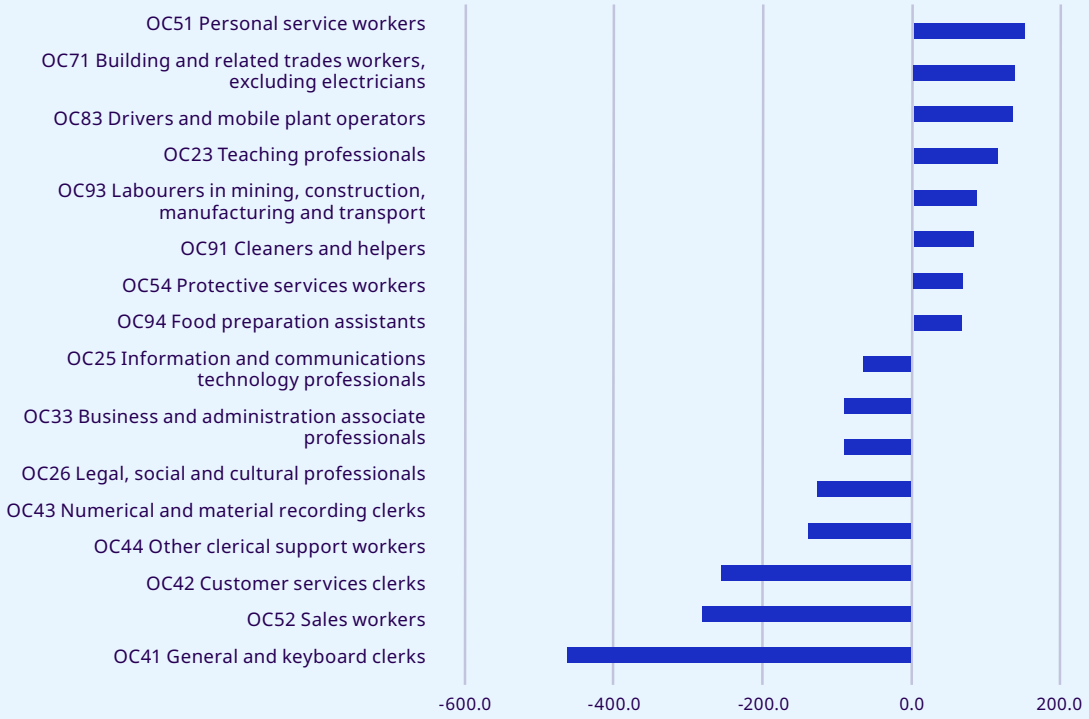
▶ **Table 9. Projected jobs growth ('000) by scenario and occupation, relative to baseline, 2035**

Occupation group	Broadband expansion scenario	AI integration scenario
OC11 Chief executives, senior officials and legislators	2.4	18.6
OC12 Administrative and commercial managers	1.9	17.7
OC13 Production and specialized services managers	2.1	25.5
OC14 Hospitality, retail and other services managers	6.6	23.9
OC21 Science and engineering professionals	1.1	44.4
OC22 Health professionals	2.9	20.3
OC23 Teaching professionals	0.2	114.9
OC24 Business and administration professionals	2.3	52.5
OC25 Information and communications technology professionals	0.7	-64.8
OC26 Legal, social and cultural professionals	-0.5	-91.1
OC31 Science and engineering associate professionals	1.8	32.6
OC32 Health associate professionals	1.9	17.4
OC33 Business and administration associate professionals	2.2	-90.4
OC34 Legal, social, cultural and related associate professionals	1.1	22.8
OC35 Information and communications technicians	1.4	19.0
OC41 General and keyboard clerks	1.1	-462.9
OC42 Customer services clerks	2.3	-256.0
OC43 Numerical and material recording clerks	1.2	-126.6
OC44 Other clerical support workers	0.9	-139.6
OC51 Personal service workers	52.9	150.8
OC52 Sales workers	22.9	-280.4
OC53 Personal care workers	13.3	49.9
OC54 Protective services workers	13.2	69.2
OC61 Market-oriented skilled agricultural workers	-0.2	57.6
OC62 Market-oriented skilled forestry, fishery and hunting workers	-0.1	17.4
OC63 Subsistence farmers, fishers, hunters and gatherers	-0.1	23.0
OC71 Building and related trades workers, excluding electricians	2.0	138.1
OC72 Metal, machinery and related trades workers	1.1	43.1
OC73 Handicraft and printing workers	0.7	17.5
OC74 Electrical and electronic trades workers	1.6	39.4
OC75 Food processing, wood working, garment and other craft and trades workers	0.9	33.0
OC81 Stationary plant and machine operators	2.6	30.3
OC82 Assemblers	2.5	19.4
OC83 Drivers and mobile plant operators	12.4	134.0
OC91 Cleaners and helpers	1.9	82.7
OC92 Agricultural, forestry and fishery labourers	1.6	59.7
OC93 Labourers in mining, construction, manufacturing and transport	2.8	86.7
OC94 Food preparation assistants	16.3	66.8
OC95 Street and related sales and service workers	1.7	43.3
OC96 Refuse workers and other elementary workers	2.2	58.4
All occupations	**185.9**	**118.4**

Source: ILO, based on modelling by Cambridge Econometrics.

In contrast, the AI integration scenario displays a dynamic reshaping of the occupational landscape, characterized by substantial employment creation in several high-demand occupations, but this is offset by significant job losses in others, reflecting the disruptive yet transformative nature of AI. Figure 8 illustrates the top occupational gains and losses under the AI integration scenario for the year 2035. Substantial employment growth is witnessed in occupations aligned with the technological, managerial and human-centric demands of an AI-driven economy.

Figure 8. Top occupational gains and losses ('000), AI integration scenario, 2035



Source: ILO, based on modelling by Cambridge Econometrics.

Personal service workers lead employment gains, reflecting not only the resilience of people-oriented roles that AI struggles to replicate, but also the broader dynamics of AI-driven economic change. As AI enhances productivity and generates gains in high-skilled and technology-intensive sectors, consumer spending increasingly shifts towards services that emphasize personal care, human interaction and experiential value, driving job creation in these occupations. **Teaching professionals** also see major growth, reflecting increased demand for education and training systems capable of supporting a rapidly evolving labour market. As AI reshapes the skills required across sectors, formal education systems, as well as vocational and adult learning programmes, are expected to expand. This drives demand for teachers and trainers, particularly in STEM fields, digital literacy and technical education, along with other new fields needed in the digital economy. Additional employment gains also appear among **drivers and mobile plant operators**, as well as **building and related trades workers**, tied to increased infrastructure and logistics activity supported by AI.

High-skilled roles such as **science and engineering professionals** and **production and specialized services managers** also expand, driven by the need for technical expertise and leadership in AI deployment. Meanwhile, roles like **cleaner and helpers**, **protective services workers and food preparation assistants** remain vital because of their interpersonal and service-focused nature.

Conversely, significant job losses occur in occupations with routine or repetitive tasks that are highly automatable. **General and keyboard clerks, sales workers,** and customer service clerks face consistent and steep declines as AI-driven systems automate administrative processes and retail operations. Unlike personal service workers that involve physical presence, emotional intelligence and context-sensitive tasks that AI cannot easily replicate or automate, sales and customer service roles are more digitally replicable, and have also seen a major shift towards e-commerce, self-checkouts and automated service channels, which reduces the demand for traditional customer-facing roles.

Beyond these occupations, it is worth noting that even some specialized roles, such as **ICT professionals** and **business and administration associate professionals**, are projected to experience employment losses, reflecting efficiency gains that reduce the need for certain technical and administrative positions.

These occupational shifts underscore the dual impact of AI adoption: the creation of high-quality, future-oriented jobs in education, management and technical fields, counterbalanced by the displacement of routine and clerical roles. The sharp contrasts across occupations highlight the urgency for targeted interventions, including reskilling programmes focused on equipping these vulnerable workers for emerging roles, and social protection systems to support those unable to transition immediately, ensuring an inclusive and equitable adaptation to the evolving labour market.

▶ Employment effects across demographic groups

Age dynamics in employment outcomes

Employment projections under the two scenarios were disaggregated by age group to assess the differential impacts of broadband expansion and AI integration. As summarized in table 10, the analysis seeks to identify age groups that may be disproportionately affected by each scenario, thereby informing targeted policy interventions to ensure inclusive and equitable labour market outcomes.

▶ Table 10. Jobs growth by age group and scenario, 2030 and 2035

Age group (years)	Broadband expansion scenario		AI integration scenario	
	2030	2035	2030	2035
	Difference from baseline (thousand jobs)			
15–24	27.2	33.6	36.6	69.2
25–54	112.7	139.2	13.0	65.2
55–64	8.6	10.6	-11.6	-15.4
65+	2.1	2.6	-1.0	-0.5
Total	**150.6**	**185.9**	**37.0**	**118.4**

Source: ILO, based on modelling by Cambridge Econometrics.

Under the broadband expansion scenario, employment gains, relative to baseline, are widely distributed across all age groups, underscoring the scenario's inclusive growth orientation. While all demographic groups benefit almost equally in relative terms, prime working-age individuals (25–54) see the largest absolute employment gains, reflecting their central role in the economy and their higher likelihood of participating in newly created jobs, particularly in sectors like retail, personal services and logistics, which respond quickly to greater digital access and consumer demand. Youth (15–24 years) also benefit substantially, supported by broadband-enabled opportunities in

entry-level service roles and digital entrepreneurship opportunities. Older workers, aged 55 years and above, experience smaller employment increases, but the gains remain positive, suggesting that broadband can help sustain labour market engagement. Overall, the scenario underscores how investments in digital infrastructure not only spur job creation but also advance demographic inclusion, especially when coupled with skills access and supportive policies.

On the other hand, the AI integration scenario presents a more uneven landscape. Younger workers (15–24 years) are the clear beneficiaries, experiencing the highest employment gains both in absolute and relative terms, reflecting the demand for adaptable, tech-savvy workers in AI-driven roles. Prime working-age individuals (25–54 years) face an initial decline in employment, primarily due to the automation of routine tasks and the immediate displacement of workers in roles that are highly susceptible to AI-driven efficiencies. However, as businesses integrate AI and new opportunities emerge, the losses progressively diminish, eventually leading to a recovery and net positive employment gains by 2035. This recovery highlights the transitional nature of AI adoption, as displaced workers gradually adapt to new roles through reskilling and redeployment. Conversely, older workers are disproportionately affected, with employment declining for those aged 55–64 and those aged 65+. This underscores the challenges older workers face in adapting to the demands of an AI-driven labour market, ranging from difficulties in using new digital tools and technologies (Cazzaniga et al. 2024), to age-related biases and limited employer willingness to invest in their retraining. Additionally, older workers often have fewer opportunities and less flexibility to transition into new career paths compared to their younger counterparts.

Gender dimensions of employment shifts

While the preceding section examined how employment projections vary across age groups, understanding the labour market impacts through a gender lens is equally critical. Gender remains a key axis of labour market inequality, especially in the Arab States, shaping access to opportunities, sectoral participation and exposure to technological change. This section presents employment projections by sex, with the aim of identifying gendered patterns in job creation and potential disparities.

Under the broadband expansion scenario, men and women register nearly equal employment gains in relative terms, compared to the baseline scenario, highlighting the broadly inclusive potential of expanded digital infrastructure. However, in absolute terms, men benefit more substantially, a reflection of pre-existing structural challenges, including women's lower baseline employment and labour force participation rates, as well as persistent occupational and sectoral segregation, which together limit women's ability to fully seize new job opportunities. While women experience employment growth in consumer-driven and service-oriented sectors, where they are often well-represented, men see significantly larger absolute gains, driven by expansion in employment in labour-intensive sectors such as construction and transport, which remain predominantly occupied by men.

▶ **Table 11. Jobs growth by sex and scenario, 2030 and 2035**

Gender	Broadband expansion scenario		AI integration scenario	
	2030	2035	2030	2035
	Difference from baseline (thousand jobs)			
Female	28	35	-80	-132
Male	122	151	117	250
Total	**151**	**186**	**37**	**118**

Source: ILO, based on modelling analysis by Cambridge Econometrics.

In contrast to the relatively balanced outcomes of the broadband expansion scenario, the AI integration scenario reveals pronounced gender disparities in employment impacts. By 2035, women are projected to experience significant job losses relative to baseline, signalling a reversal in labour market gains. This decline is primarily driven by the automation of clerical, administrative and routine-intensive roles – occupations in which women are disproportionately concentrated, highlighting the vulnerability of female-dominated occupations. Conversely, under the AI integration scenario, men are projected to see significant employment gains, particularly in logistics, construction and technical fields.

These findings underscore the contrasting gender implications of the two scenarios. If left unaddressed, the broadband expansion scenario facilitates broad-based employment growth but does little to close existing gender gaps, while the AI integration scenario exacerbates these imbalances, amplifying the risks and vulnerabilities faced by women in the workforce. Whether countries pursue AI adoption or prioritize broadband infrastructure, the evidence points to an urgent need for gender-sensitive strategies to ensure equitable outcomes for both men and women.

Digital employment: Opportunities and challenges for at-risk populations

While the analysis above refers to some groups that might be at a disadvantage when it comes to AI and digitalization, namely women and older people, this section analyses in more depth the channels through which the digital economy affects the employment prospects for six groups often marginalized in traditional labour markets: women, youth, older people, people with disabilities, low-skilled workers, and migrant workers and refugees. It explores both opportunities and risks for each group, highlighting areas for inclusive policy interventions.

However, employment outcomes in the digital economy are not determined by group identity alone. They are also shaped by broader national contexts and job-specific characteristics that influence who is more vulnerable to displacement and who is better positioned to benefit from emerging opportunities.

Key job-related factors include:

- **Occupational exposure to automation.** Certain occupational groups, particularly clerical support workers, face a high potential for automation and, consequently, an elevated risk of job substitution, as also discussed earlier in this report. WEF (2023a) also found that clerical and administrative roles were among the fastest-declining occupations, indicating a greater likelihood of displacement for workers in these roles.
- **Sector-specific vulnerability.** The quantitative modelling exercise identified sectors particularly prone to disruption. Workers in basic manufacturing and non-ICT-related business services, for instance, may face significant jobs losses as automation becomes more prevalent, especially those with limited access to reskilling or career mobility.
- **Employment type.** Temporary, part-time and irregular positions are generally more unstable and prone to layoffs, compared to permanent roles. Additionally, jobs in the informal economy often lack stability and protection. Workers in these types of employment are often at higher risk during economic or technological shifts.

- **Firm size.** Smaller businesses face greater risks because of their limited financial resources and slower digital adoption. While this can mean less immediate exposure to automation, the lack or delay of digital adoption may ultimately harm competitiveness and jeopardize the entire workforce if the business struggles to keep up with the market.

Below is an overview of the six at-risk groups, highlighting the main challenges and opportunities they face. Some of these stem from the job-related factors discussed above, while others are shaped by broader conditions that either facilitate their participation in the digital economy or create barriers to equitable access to emerging employment opportunities.

Women

Risks

Women face a range of structural and systemic risks as the world of work transitions to a more digital and AI-driven landscape. In the Arab States, women are more than three times as likely as men to face job displacement due to automation. Additionally, despite the growing demand for digital and AI-related skills, women remain underrepresented in STEM fields, limiting their participation in emerging, high-growth sectors. While some progress has been observed, particularly in the GCC, expanded efforts are needed across the board to fully realize the potential of women in STEM, including addressing gender stereotypes and encouraging women's employment in cloud computing, data-driven roles, AI and ICT sectors. Gender-specific barriers, including financial constraints, disproportionate unpaid care responsibilities and limited access to childcare, further exacerbate the skills mismatch problem, often hindering women's ability to upskill or reskill, further reducing their adaptability to technological change (ESCWA 2022).

Inequitable access to digital infrastructure also poses a significant obstacle. In lower-income and rural areas, women are less likely than men to own digital devices or have reliable internet connectivity, leaving them at a disadvantage in an increasingly digital labour market. The integration of AI and algorithmic systems into workplace decision-making introduces additional risks. When these systems are trained on biased or non-representative data, they can replicate and intensify existing gender inequalities, leading to discriminatory outcomes in recruitment, promotions and access to opportunities, and reinforce structural employment barriers.

Opportunities

While Arab women are more exposed to the risks of automation, they are also more likely than Arab men to hold jobs with high augmentation potential (22.7 per cent versus 13.0 per cent, respectively), indicating promising avenues for increased productivity and role transformation. The growth of the digital economy can help overcome long-standing barriers to women's employment by enabling more flexible work arrangements that align better with women's unpaid care responsibilities. Remote work, freelancing and platform-based jobs offer alternatives to traditional employment structures, which often exclude women because of rigid working hours, mobility restrictions or sociocultural norms.

The expansion of digital activities, such as e-commerce, online education, digital services and tech-enabled entrepreneurship, creates new entry points for women to participate in the workforce. These activities typically require lower initial capital investment and can be accessed from home, making them especially attractive for women in rural areas or conflict-affected settings, provided that such women have access to infrastructure, equipment and tools.

In parallel, the rise of online learning and digital skills training opens new pathways for women to acquire market-relevant competencies at their own pace. With the right investments in inclusive digital infrastructure and targeted skills development, the digital economy could enable more

women to transition into higher-skilled, better-paying roles and reduce gender gaps in employment. Ultimately, gender-responsive policies and strategies will be crucial to maximizing the benefits of digital transformation while mitigating its risks. Applying a gender lens to these efforts can help ensure more inclusive and equitable labour market outcomes.

▶ Youth

Risks

While youth are often viewed as well-positioned to leverage digital technologies, many face significant barriers to securing stable, high-quality employment. Young workers are frequently overrepresented in the gig economy. These kinds of jobs offer flexibility and new income-generating opportunities, but typically lack job security, adequate wages and social protections. Such precarious employment can deepen financial instability and restrict opportunities for career development in the long term.

Moreover, in many Arab countries, education systems do not adequately prepare youth for the demands of the digital economy. School curricula often lack comprehensive digital literacy training, resulting in wide disparities in students' digital competencies. This gap disproportionately affects youth from socio-economically disadvantaged backgrounds, who have fewer opportunities to develop essential digital skills or engage meaningfully with technology through formal education. Even where education systems provide some digital skills training, the rapid pace of digitalization and AI adoption often overtakes the skills young people currently possess. This underscores the critical need for ongoing, accessible training and reskilling opportunities. However, access to such programmes is far from equal. Youth from low-income or remote areas frequently face limited exposure to digital tools and fewer opportunities to acquire relevant skills, leaving them at a disadvantage in an increasingly digital labour market.

In addition, many young people lack the work experience typically required to access high-quality and technology-enabled jobs. This puts them at a further disadvantage in labour markets where employers prioritize candidates with proven technical skills, industry exposure and job readiness. As a result, youth may struggle to fully benefit from the employment opportunities emerging from digital transformation. Without targeted and inclusive interventions, these challenges risk exacerbating existing inequalities and undermining the potential of digital transformation to create equitable and inclusive employment opportunities for young people.

Opportunities

Youth stand to benefit positively from both broadband expansion and AI integration. The rapid growth of digital sectors, including e-commerce, fintech, digital marketing and the creative industries, is opening new pathways for youth employment beyond traditional job markets. Equipped with the right skills, young people can find jobs that provide greater flexibility and potential for career advancement.

As with women, digital platforms have lowered the barriers to entrepreneurship, enabling youth to launch start-ups, freelance or monetize their talents on a global scale. This democratization of opportunity is particularly valuable in contexts where formal employment is limited, allowing young people to potentially generate income independently and foster innovation within their communities. The rise of remote work and digital platforms further expands access to global job markets. Youth in the Arab region can engage with international clients, earn foreign income and gain valuable experience without the need for physical migration, an important advantage given the economic and social challenges in many Arab States.

Access to digital learning platforms also provides youth with flexible, cost-effective opportunities to develop skills. Online courses, coding boot camps and digital apprenticeships help bridge gaps left by traditional education systems, enabling young people to adapt continuously to evolving labour market demands.

▶ Older workers

Risks

Older workers confront significant challenges in adapting to the rapidly evolving digital economy and AI-driven labour markets. Many are at a distinct disadvantage because of their limited level of digital literacy and scarce opportunities for upskilling or reskilling, particularly in a region where lifelong learning initiatives remain underdeveloped. The accelerating pace of technological change has exacerbated skills mismatches, making it increasingly difficult for older employees to compete. Compounding these challenges, social stereotypes and age-related biases persist in hiring and promotion processes, often marginalizing older workers within technology-driven sectors. Such biases restrict their access to emerging employment opportunities and hinder career advancement. Moreover, older workers are disproportionately vulnerable to displacement by automation, especially in routine or manual occupations, with limited support to transition into new roles. As previously noted, workers aged 55 years and above are projected to experience a decline in employment prospects under the AI integration scenario, relative to the baseline.

In the Arab States, social protection systems are often underdeveloped and comprehensive social protection floors are largely absent. Thus, the lack of targeted support compounds the vulnerability of older workers, placing them at heightened risk of unemployment and economic insecurity. This effectively excludes them from the benefits of digital transformation, deepening existing labour market inequalities.

Opportunities

While older workers face well-documented disadvantages in the digital economy, these very challenges illuminate where the most meaningful opportunities for intervention and inclusion lie. With thoughtfully designed policies and targeted support, digital transformation can evolve from a disruptive force into a powerful enabler, opening new pathways for older adults to remain active participants in the changing world of work. The growing adoption of remote and flexible work models, for example, can help dismantle long-standing structural barriers, enabling older workers to engage in employment on terms that align with their circumstances, capacities and preferences.

At the same time, the relentless pace of technological change underscores the urgent need for robust and inclusive lifelong learning systems. When tailored to the specific needs of mature learners, digital training and reskilling programmes can bridge critical competency gaps, foster adaptability and restore confidence in navigating unfamiliar technological landscapes. Viewed through this lens, the challenges that older workers face are not just problems to be solved, but opportunities to be leveraged. Strategic investment in their inclusion can transform the risks of digital and AI-driven labour market shifts into shared, intergenerational gains, ensuring that no age group is left behind in the future of work.

Low-skilled workers

Risks

Low-skilled workers are particularly vulnerable. Their roles often involve routine or manual tasks and are among those most susceptible to automation. Nearly 57 per cent of workers with only a high school education or less are at risk of displacement, compared to just 22 per cent among those with higher education (McKinsey & Co 2018b). In addition, the rise of online services and the growing potential to outsource tasks across borders has further eroded the bargaining power and job security of many low-skilled workers, particularly in sectors with weak labour protections.

Opportunities

The digital economy also creates new openings for low-skilled workers, especially when accompanied by targeted skilling, support services and inclusive policies. The growth of e-commerce, platform-based work and digital logistics has increased demand for roles that require basic digital literacy and operational skills, such as delivery coordination, warehouse operations and customer service. Moreover, mobile and online platforms can enable low-skilled individuals to engage in micro-entrepreneurship, informal digital services or home-based businesses, offering alternative income streams and greater economic inclusion. However, realizing these opportunities requires expanded access to foundational digital training, connectivity and tailored support that bridges existing educational and infrastructure gaps.

Persons with disabilities

Risks

Persons with disabilities often face distinct and compounded barriers in accessing opportunities in the digital economy, despite the transformative potential of technology to enhance their inclusion. Inaccessible digital platforms, inadequate infrastructure and the absence of accommodating disabilities in digital tools and services, including the lack of inclusive design in online job portals, continue to restrict meaningful engagement.

Many people with disabilities also have lower levels of formal education and limited access to the internet and digital devices, increasing their risk of exclusion (Charles, Xia and Coutts 2022). The lack of inclusive and accessible training programmes further limits their ability to acquire essential digital skills and benefit from emerging opportunities in the digital economy.

Job postings that explicitly target or accommodate persons with disabilities are rare. Most listings do not indicate whether roles are inclusive or accessible, compounding the challenges that they face in finding suitable employment (ESCWA 2022). Negative social attitudes and biases in the workplace also continue to limit the options for persons with disabilities to grow and advance in technology-related fields, even when they have the necessary skills and qualifications.

Opportunities

Nonetheless, the digital economy still offers considerable potential to improve employment outcomes for persons with disabilities, particularly when supported by inclusive digital design and targeted policy action. Advances in assistive technologies, such as screen readers, voice-to-text tools and adaptive input devices, can enable more equitable access to digital work environments. Digital platforms also offer flexible work arrangements, including remote and freelance opportunities, which may help overcome physical and mobility-related barriers.

Moreover, when online training programmes and digital tools are designed with accessibility in mind, they can serve as powerful enablers of skill development, autonomy and inclusion. With the right investments and policy frameworks, digital transformation can be harnessed to foster a more inclusive labour market, empowering persons with disabilities across the Arab States to participate more fully in the evolving world of work.

Migrants and refugees

Risks

Migrants and refugees face distinct vulnerabilities in the digital economy, as they are concentrated in sectors that are highly exposed to automation and digital disruption. Workforce automation is primarily affecting migrant workers who are heavily involved in services activities, administrative and support work (McKinsey & Co 2018a).

Digital exclusion remains a major concern because migrants and refugees often have limited access to digital infrastructure, tools and internet connectivity. Barriers to the digitally-driven labour market includes language differences, lack of digital literacy and minimal access to local professional networks. In particular, refugees may experience interrupted educational and career pathways, which significantly reduce their chances of securing meaningful employment. In many cases, systemic challenges, legal restrictions, insecure residency status and discriminatory hiring practices compound these barriers. The lack of cross-border systems for recognizing and validating qualifications further impedes many displaced individuals from leveraging their skills in new labour markets (Lyons, Kass-Hanna and Molena 2021).

Opportunities

Despite these challenges, the digital economy also presents meaningful opportunities for migrants and refugees, particularly when inclusive policies and targeted interventions are in place. Digital platforms offer flexible and remote employment options, which are especially valuable for individuals with restricted mobility or legal status. Online freelancing, remote customer service and digital entrepreneurship can help bridge access to the labour market, especially when traditional avenues are closed.

E-learning platforms and mobile-based training programmes can facilitate the acquisition of digital skills and language proficiency, helping migrants and refugees adapt to local job markets and global digital trends. With the right support, these tools can enable displaced individuals to build new career pathways and increase their economic resilience. Moreover, expanding recognition systems for skills and prior learning, including portable certifications, is essential to unlocking their full potential

Digitalization and job quality: Potential enhancements and challenges

Based on the analysis presented thus far, it is evident that AI and digitalization are poised to bring about significant shifts in the labour market. While these technologies are expected to result in some job losses, particularly in routine and automatable roles, they are also projected to generate new employment opportunities, ultimately outweighing the number of jobs displaced.

However, the central challenge lies not solely in the quantity of jobs created, but in ensuring the quality of these jobs. As organizations increasingly adopt advanced technologies, the nature of work and overall working conditions will change significantly. Job quality can be improved by automating

routine tasks, fostering innovation and providing more flexible working arrangements. However, the impact of digitalization on job quality is not uniformly positive. The effects across key job quality dimensions – pay, working time, career prospects, skills and autonomy, work intensity, social environment and physical environment – remain uncertain (Berg et al. 2023).

While digital technologies can enhance various aspects of work, they may also harm job quality. For instance, algorithmic systems, which enable task allocation and monitoring of performance and productivity, are extending their influence beyond digital labour platforms. They have been increasingly used in logistics, warehousing and manufacturing, and are expected to extend to fields such as banking, insurance, customer service and social services. This raises concerns that AI may further restrict workers' autonomy and intensify surveillance and control (Charles et al. 2022; Gmyrek et al. 2023).

Table 12 presents some of the dual effects of AI and digitalization on job quality by highlighting potential improvements and challenges across various aspects of job quality.

▶ Table 12. Dual impact of digitalization on selected aspects of job quality: Potential benefits and risks

Aspects	Potential enhancements	Potential challenges
Earnings	Higher wages in tech-intensive and AI-related roles, especially for those with digital skills in demand Remote work access to higher-paying international markets, allowing workers to earn more without migrating	Wage polarization, with middle-income jobs declining and low-skill jobs stagnating Downward pressure on wages due to increased labour supply from cross-border competition Fragmented and unpredictable income in gig and platform-based work, lacking minimum wage guarantees or collective bargaining Risk of algorithmic wage setting, potentially leading to non-transparent or exploitative pay structures
Working time	Flexible working arrangements and increased work-life balance (remote work, flexible hours and hybrid work models) Reduction of excessive working hours driven by automation of routine tasks	Erosion of work-life balance, because of blurred boundaries between work and personal life Expansion of irregular or on-demand work schedules, often with limited worker control, as seen in gig and platform-based work Significant unpaid working time for platform workers

Safety and health at work	Reduction in exposure to hazardous environments through automation and robotics in high-risk sectors (e.g. construction, mining, logistics) Enhanced hazard detection and prevention via AI-powered monitoring systems and predictive analytics (e.g. early warning for equipment failure or unsafe behaviour) Ergonomic improvements through wearable tech and smart equipment that support posture, reduce strain, and track fatigue levels Remote operations that remove workers from physically dangerous sites, particularly in extractive or industrial sectors	Work intensification and surveillance, increasing psychosocial risks like stress, anxiety, and burnout from constant connectivity and digital monitoring "Always-on" expectations driven by remote work and digital communication tools, eroding boundaries between work and rest Isolation and reduced social interaction in remote or platform-based work, which can affect mental health and social wellbeing Algorithmic management limiting worker autonomy and increasing pressure to meet automated performance targets, contributing to strain and increased levels of stress
Employment security	Shift away from seasonal or volatile work and creation of new, long-term roles in emerging sectors, contributing to more stable employment in industries where digitalization drives sustained growth Digitalization can enhance a firm's competitiveness and financial stability, thus reducing job loss risk during crises	Job insecurity driven by rapid technological change, causing anxiety about skill obsolescence and potential displacement Task-based fragmentation of work, where automation breaks jobs into smaller components, increasing reliance on short-term, freelance or gig work lacking traditional job protections Growth of platform work without employment contracts or job security
Work efficiency and job satisfaction	Automation of routine and repetitive tasks frees up time for workers to engage in more productive, meaningful, creative and strategic activities	Work intensification due to higher expectations for output and responsiveness Pressure from algorithm-driven performance tracking, which may undermine autonomy and contribute to job dissatisfaction
Access to social protection	Formal digital employment contracts in some tech-based companies and high value-added jobs in the digital economy can offer access to social protection benefits, particularly for high-skilled workers Digitalization facilitates more efficient and targeted delivery of benefits, enabled by data analytics and AI, which can reduce fraud and ensure timely support to those in need	Exclusion of non-standard workers (e.g. gig workers, freelancers, platform-based labour) from formal social protection, as workers are typically classified as independent contractors rather than employees Work paid per task or project often does not include entitlements like unemployment insurance, sick leave, or retirement contributions

Skills development and career progression	Digitalization can support career advancement opportunities as routine tasks are automated, allowing workers to develop new skills and create opportunities for career progression	Short-term, task-based digital work often lacks clear career pathways, offering limited opportunities for skill accumulation, mentorship, or advancement into higher roles Platform and gig work typically exclude access to structured professional development, performance feedback, or employer-sponsored training, key enablers of career progression Skill stagnation risk, as some digital jobs focus on narrowly defined tasks that do not encourage broader learning or the development of transferable competencies
Freedom of association and right to collective bargaining	Digital technologies provide new avenues for employers and workers' organizations to engage with their members Platform-based worker associations and informal digital collectives (e.g. ride-share driver alliances, freelancers' networks) are emerging as alternative forms of representation, particularly in contexts where formal unionization is restricted	Legal and regulatory gaps in many countries fail to adequately protect collective rights for platform and gig workers, reinforcing structural power imbalances between workers and digital employers Lack of a clearly defined employer in many digital platforms (especially with algorithmic intermediaries) makes it difficult to identify whom to negotiate with or hold accountable
Fairness and equality of opportunity and treatment	Algorithmic recruitment systems, when well-designed and audited, can reduce subjectivity and implicit human bias in hiring decisions, promoting merit-based evaluation Expanded opportunities for marginalized groups, including women, youth, persons with disabilities (PWDs), and people in remote or underserved areas, through remote work and digital platforms	Algorithmic bias in recruitment, in the sense that AI systems trained on historical data can reproduce and even magnify existing gender, racial, or class biases, leading to discriminatory outcomes Lack of transparency and accountability in algorithmic decision-making can make it difficult for applicants to challenge unfair or opaque hiring processes The digital divide remains a major barrier – older adults, rural populations, low-income groups, and people with low digital literacy may be excluded from digital job opportunities Accessibility gaps in online platforms and tools can disadvantage PWDs if inclusive design is not prioritized

Source: Adapted from Charles et al. (2022), ILO (2024b) and ILO (2025b).

In summary, and given the dual impact of digitalization, the creation of quality jobs hinges on adopting a human-centred approach – one that places workers at the core of technological change, considers its implications for working conditions and ensures the meaningful involvement of both workers and employers throughout the processes of innovation and implementation.

Digitalization and AI adoption: Firm-level opportunities and challenges

Beyond its impact on workers, the adoption of digital and AI technologies is becoming increasingly essential for enterprises across the globe to enhance productivity, drive innovation and remain competitive. For businesses in the Arab region, these technologies offer a pathway to address inefficiencies, access new markets and drive economic growth. However, the ability to leverage these opportunities varies significantly across enterprises, influenced not only by sector, but also by size and available resources.

In the Arab world, MSMEs are especially critical, as they account for around 90 per cent of businesses and are a major generator of new jobs (Stepanyan et al. 2019). Enhancing the capacity of MSMEs to adopt digital solutions is, therefore, essential not only for their growth and competitiveness, but also for expanding decent employment opportunities and fostering inclusive economic growth across the region.

Unlocking potential: Opportunities for MSMEs in digitalization and AI transformation

MSMEs stand at the threshold of a transformative era where digitalization and AI offer unprecedented opportunities to innovate, compete and grow. Despite their smaller size, compared with large corporations, MSMEs can harness digital tools and AI technologies to unlock value across their operations. One of the most significant opportunities lies in enhancing productivity and operational efficiency. By adopting AI-powered automation, MSMEs can streamline labour-intensive processes, such as inventory management and customer service, enabling them to allocate resources more strategically. For instance, chatbots and customer relationship management systems powered by AI can enhance customer engagement while reducing response times and operational costs.

Digitalization also opens new markets for MSMEs, allowing them to compete on a global scale. E-commerce platforms, combined with AI-driven marketing tools, provide MSMEs with access to international customers and personalized advertising capabilities. These tools empower them to identify customer preferences, predict market trends and design targeted campaigns, offering a competitive edge over rivals that rely on traditional methods. Moreover, digital and AI technologies can facilitate innovation within MSMEs, enabling them to develop new products or services tailored to emerging customer needs. With AI's predictive capabilities, businesses can conduct rapid prototyping and gain insights from big data, fostering creativity and reducing time-to-market. This agility is particularly advantageous for MSMEs, which often rely on their ability to adapt quickly to changing market conditions. Additionally, the adoption of digital and AI tools can strengthen MSMEs' resilience in a volatile economic environment. Predictive analytics allows businesses to anticipate disruptions, optimize supply chains and reduce waste.

By seizing these opportunities, MSMEs can bridge the gap with larger enterprises and establish themselves as key players in the digital economy. However, unlocking this potential hinges on overcoming significant challenges that hinder their ability to fully embrace digital and AI technologies.

Key challenges faced by MSMEs in digital adoption

Despite their importance in the Arab States, MSMEs face unique barriers to digital adoption, often lagging behind larger firms in implementing technology. Digital adoption among SMEs varies widely, with smaller firms typically beginning with digitalizing basic administrative or marketing functions. However, they tend to encounter substantial obstacles when attempting to integrate more sophisticated technologies, such as data analytics or enterprise resource planning (OECD 2021a). With respect to sectoral differences, knowledge-intensive industries generally adopt digital tools more readily than businesses involved with accommodation, food services and retail sales, where technology gaps persist.

Although some progress has been made – accelerated by the COVID-19 pandemic – MSMEs around the world continue to face entry barriers to digitalization. This exacerbates economic inequalities, with early adopters gaining a competitive edge and increasing market concentration, while slower adopters fall behind. In the Arab region MSMEs face a range of challenges, including:

- **Financial challenges**. One major hurdle is the high cost of acquiring new technology. Many MSMEs lack the financial resources to invest in advanced digital tools and infrastructure. This is further compounded by limited access to capital, as financial institutions perceive MSMEs as high-risk borrowers.
- **Lack of digital skills.** Without adequate training or expertise in digital tools and processes, MSMEs are often unable to integrate new technologies into their operations effectively. This digital skills gap exacerbates their competitive disadvantage relative to larger firms, which tend to have more resources to invest in employee training and upskilling.
- **Unequal access to digital infrastructure.** Reliable internet connectivity is essential for most digital tools, but is not universally available. This hampers the adoption of new technologies, particularly in rural and other less developed areas, hindering the ability of such businesses to engage in ecommerce, digital marketing or other online business activities.
- **Insufficient government support.** While larger firms often benefit from government programmes, tax incentives or public–private partnerships that facilitate digital adoption, many MSMEs lack such access. As a result, smaller firms are at a competitive disadvantage, widening income and productivity gaps.
- **Unfair competition.** Larger firms have better access to digital tools and often dominate the market, stifling innovation and economic growth in sectors previously led by MSMEs, such as retail and agriculture. Such market concentration limits opportunities for smaller firms to innovate and integrate digital solutions.

Without addressing these issues, MSMEs risk falling further behind in the digital economy, exacerbating structural inequalities, productivity gaps and competitive disadvantages.

In addition to addressing the direct challenges faced by MSMEs, enhancing support for start-ups and entrepreneurship ecosystems can play a crucial role in overcoming broader issues. Start-ups often act as catalysts for innovation and can drive digital adoption across various sectors. Effective support mechanisms, such as incubators, accelerators and access to venture capital, are essential for nurturing these new ventures. In the Arab region, targeted support for start-ups and entrepreneurship can significantly enhance digital adoption and foster a more vibrant business environment. In Oman,

the Government has actively supported MSMEs and entrepreneurship through Riyada, the Public Authority for Small and Medium Enterprises Development. Riyada provides business development services, advice, training and access to finance, particularly in the ICT sector. While young Omanis are increasingly engaging with these opportunities, the transition remains challenging. The local talent pool for tech-related positions is still developing, and current digital MSMEs have not fully met the youth employment needs, underscoring the necessity for targeted skill development to prepare future workers for the ICT labour market (Oxford Business Group 2023).

Jordan has also been proactive in fostering entrepreneurship through special funds and incubators supported by public and private sources. Oasis 500,[7] the region's first start-up incubator, offers intensive training, mentorship and funding, taking a 10 per cent equity stake in promising technology start-ups. The Jordanian Government's $69 million investment in the Jordanian Entrepreneurship Fund aims to support innovative projects, with 42 per cent of Jordanian SMEs being technology-based (Fardoust and Nabli 2022). The Government hopes that increased digitalization will enhance self-employment and create job opportunities for young adults through emerging digital platforms.

The start-up ecosystem in Lebanon has also shown impressive growth with a 24 per cent compound annual growth rate for tech start-ups (Mulas, Kanty and Henry 2017). However, despite a highly educated and multilingual founder base and numerous accelerator programmes, the ecosystem is still developing in terms of quality and network density. While Lebanon benefits from a strategic location and a relatively free market economy, geopolitical instability, currency depreciation and a lack of essential services have significantly hindered its growth. Moreover, convoluted bureaucratic processes make it difficult to establish or expand a start-up. Compounding these challenges are the lack of funding and the complexity of money transfers, which have led many start-ups to either shut down or relocate to GCC countries. Without comprehensive reforms, Lebanon risks losing its potential as a vibrant hub for innovation and entrepreneurship.

Various start-up incubators and funding programmes in the United Arab Emirates illustrate how focused support can foster a more dynamic entrepreneurial ecosystem. Dubai, in particular, is emerging as a powerful regional entrepreneurship hub, attracting ambitious entrepreneurs from across the Middle East and North Africa (MENA) region. With a high concentration of technological innovation, start-ups in Dubai have raised about 96 per cent of funds in the UAE since 2017, playing a crucial role in the country's digital economy (StartupBlink 2024). According to the Global Start-up Ecosystem Index, the UAE stands out as the leading country in the Arab League in terms of start-up and innovation ecosystem development. The country's dominance is reflected in its consistently high rankings across multiple indicators, including economic performance, innovation capacity, digital infrastructure and the overall vibrancy of its entrepreneurial ecosystem.

Strengthening these ecosystems can bridge the digital divide, stimulate economic growth and create opportunities for smaller firms to thrive in a competitive environment. This not only benefits start-ups but also supports MSMEs across the Arab States, resulting in a more resilient and dynamic business landscape.

7 https://oasis500.com/.

The effect of digitalization on productivity: Inconclusive evidence across firms, sectors and economies

The relationship between digitalization and productivity is neither automatic nor uniform; rather, it is shaped by a complex interplay of factors, including firm-level capabilities, sectoral characteristics and broader structural, macroeconomic and institutional conditions. At the enterprise level, digital technologies can generate significant productivity gains by improving operational efficiency, lowering transaction costs and enabling firms to scale more effectively. However, realizing such gains depends on the presence of key internal enablers: robust digital uptake, strong digital skills, a culture of innovation and flexible, adaptive management practices. Indeed, firms that adopt digital tools in a piecemeal or superficial manner rarely achieve meaningful efficiency gains. Deep integration into core operations is essential. Additionally, the presence of digitally literate managers and workers is critical. Firms with strong digital leadership and a workforce capable of using and adapting to new technologies are more likely to unlock productivity benefits. It is also expected that firms that already invest in R&D, experiment with new products and processes and exhibit adaptive management styles are better positioned to leverage digital tools effectively.

Importantly, the process through which digital technologies and AI are introduced also matters. Involving workers in decision-making around digital adoption and organizational change can significantly enhance both the effectiveness and inclusiveness of digital transformation. Worker participation through collective bargaining, consultative mechanisms and other workplace innovation practices ensures that new technologies are introduced in ways that align with operational realities and workforce needs. Employees often bring valuable frontline insights into workflows and customer interactions, helping firms optimize the implementation of digital tools and improve overall productivity outcomes.

The relationship between digitalization and productivity is neither automatic nor uniform; rather, it is shaped by a complex interplay of factors, including firm-level capabilities, sectoral characteristics and broader structural, macroeconomic and institutional conditions.

Beyond its impact at the firm level, the scope and extent of digitalization varies significantly across sectors, with some industries experiencing more transformative changes than others. First, sectoral composition plays a major role. In sectors dominated by MSMEs, digital adoption may remain fragmented and shallow. As discussed earlier, many MSMEs lack the financial, technical or managerial capacity to implement digital tools in a way that meaningfully improves productivity. As a result, even if a few leading firms in the sector become more efficient, the broader productivity impact may be limited by the sector's low average level of digital maturity.

Second, the level of formalization within a sector affects its ability to absorb and benefit from digital transformation. Informal enterprises often operate outside regulatory frameworks, have weak access to finance and limited incentives or capacities to invest in technology. High informality limits the reach and effectiveness of sector-wide digital policies and prevents the aggregation of firm-level gains into sector-level improvements.

Third, coordination failures within a sector, such as lack of shared standards, weak value chain linkages or poor collaboration between firms, regulators and technology providers, can dilute the impact of digital initiatives. Productivity-enhancing technologies often require complementary adoption across supply chains or entire ecosystems to yield full returns. Without such alignment, isolated improvements may not translate into sector-wide progress.

Finally, policy and institutional readiness at the sector level matters. Sectors with clear digital transformation strategies, strong regulatory oversight, investment incentives and tailored skills development programmes are better positioned to scale digital adoption and improve performance.

When viewed at the aggregate or national level, the anticipated productivity boost from digitalization has largely fallen short of expectations. This phenomenon, often referred to as the "modern productivity paradox", describes the puzzling coexistence of widespread digital technology diffusion and stagnant or even declining productivity growth across many economies (Brynjolfsson, Rock and Syverson 2019; Anghel and Bunel 2024). Empirical evidence from the Arab region supports these insights. A recent report by the United Nations Development Programme (UNDP) and the Economic Research Forum (ERF) sought to quantify the impact of digitalization in the Arab region (Fardoust and Nabli 2022). The report examined both total factor productivity (TFP) and labour productivity growth but found limited evidence of digitalization's effect on TFP at the firm or macroeconomic level. When focusing on labour productivity as a simpler indicator, the analysis failed to identify any clear correlation between digitalization progress and labour productivity growth across countries. For example, despite significant digital adoption, Saudi Arabia averaged negative labour productivity growth of -0.9 per cent between 2011 and 2019. This might have been due to the large proportion of low-skilled, low-productivity jobs, primarily held by foreign workers in sectors like construction, retail and services, rather than in manufacturing, which tends to respond better to capital investments in technology and education. Similarly, case studies from Jordan and Lebanon provided limited evidence of digitalization's impact on productivity. During the 2011–2019 period, annual labour productivity declined by 3.6 per cent in Lebanon and 0.8 per cent in Jordan, despite relatively high levels of digital adoption.

Several factors help explain this paradox, many of which echo dynamics observed at the firm and sector levels. First, the slow and uneven diffusion of digital technologies significantly limits their macroeconomic impact. When adoption is concentrated in a small number of leading firms or sectors, it creates "islands of excellence" that do not translate into system-wide gains. In economies with a pronounced dual structure, where a few large, formal enterprises coexist with a vast base of smaller, often informal firms, the aggregate effects of digital transformation tend to be muted. Thus, the structural composition of the economy and characteristics of its labour market are critical in shaping national productivity outcomes, the latter not solely dependent on the use of technology.

Second, productivity gains from digital technologies are not immediate. As with previous technological waves, such as the adoption of personal computers, the full benefits often emerge only after firms and sectors undergo significant adaptation. These include process reengineering, organizational restructuring and the development of complementary innovations. For technologies like AI, a lag of 2–4 years may occur between technological development and effective deployment (ILO 2025c). Realizing productivity gains requires integration across systems and sectors (Brynjolfsson et al. 2019).

Third, the institutional and governance environment plays a decisive role in enabling or constraining productivity growth. Weak institutions, fragmented regulatory frameworks and limited coordination between public and private actors can hinder the development of supportive digital ecosystems. Digital transformation depends on a range of complementary investments in digital infrastructure, cybersecurity, skills and education, innovation systems and public services. In many economies, particularly across the Arab region, these institutional foundations are still emerging or remain unevenly developed.

A further challenge lies in measuring productivity gains in the digital economy. Typical productivity indicators often fail to capture the value generated by digital services, which may obscure the real, though difficult-to-measure, contributions of digitalization to growth and productivity.

Taken together, these realities suggest that digitalization and AI, on their own, will not automatically translate into productivity gains. Unlocking their full potential depends on a robust enabling ecosystem – one that combines complementary investments, inclusive approaches, sector-specific strategies and structural reforms that facilitate the broad diffusion of innovation across firms, industries and societies. Rather than succumbing to pessimism based on the limited promising outcomes of past technological waves, it is essential to recognize that the current generation of technologies, including AI, holds significantly greater promise. Realizing this promise, however, requires that policymakers and business leaders anticipate the delayed productivity payoff and invest proactively in complementary capabilities, including infrastructure development, workforce reskilling, regulatory adaptation and organizational restructuring.

6 Skills for the digital transition

Successful digital transformation requires a broad interconnected set of skills that extend far beyond the mere ability to operate digital tools. According to the ILO (2021), these skills can be categorized into several key groups that together form the foundation for effective participation in the digital economy. At the most fundamental level, basic literacy and numeracy skills are essential for any interaction with digital tools. Without these, even basic technological functions like reading instructions or entering data can become significant barriers.

Building on this foundation are digital skills, which exist on a continuum from basic to advanced. At its most basic level, digital literacy involves using everyday technology such as smartphones, computers and the internet. This is sometimes referred to as "button knowledge". These basic skills are widely transferable across jobs and daily life. Beyond this basic level, digital skills expand to include more job-specific abilities such as digital marketing, data analysis or managing e-commerce platforms. Intermediate and advanced digital skills, on the other hand, involve specialized technical expertise such as software development, cybersecurity and AI. These tend to be less transferable and more closely tied to particular sectors or professions.

Importantly, digital proficiency alone is not sufficient. Higher-order cognitive skills – analytical thinking, research capabilities, creativity and complex problem-solving skills – are equally vital. These skills enable individuals to apply digital tools effectively, adapt to new challenges and drive innovation. Complementing these are social and emotional skills, also known as soft skills, including communication, teamwork, adaptability and emotional intelligence. Such skills are essential for navigating the human and collaborative dimensions of digital work environments and for sustaining continuous learning in the face of rapid technological change. In addition, occupation-specific technical skills remain a fundamental component of readiness for the digital economy. These are the specialized capabilities required to perform tasks unique to particular jobs, including those performed in the digital economy.

In sum, digital transformation demands a holistic skillset. This includes foundational abilities, a spectrum of digital competencies, advanced cognitive interpersonal skills and job-specific skills. Together, these skills empower individuals not only to use technology effectively but also to innovate, adapt and succeed within an evolving digital economy.

Skills trends in the Arab States

Skills for digital transition: A growing but uneven demand

The uneven pace of digital and economic development across the Arab region has resulted in significant disparities in the demand for and development of digital competencies. The more digitally advanced economies are moving towards knowledge-intensive and high-tech sectors, while others remain anchored in traditional employment structures, with a continued reliance on conventional skillsets. To better understand these dynamics, the ESCWA Skills Monitor – an AI and machine-learning tool that tracks job vacancies across online job-posting platforms – offers real-time insights into evolving skills demand in the Arab region.

Analysis of job postings between June 2020 and March 2022[8] shows that employer demands across the region remained heavily skewed towards traditional competencies, in contrast to global patterns (ESCWA 2022). Jobs requiring advanced digital skills, such as cloud computing, blockchain, machine

8 Over this period, the Skills Monitor leveraged big data and machine learning to analyse the skills demanded in 1.7 million online job openings from over 100 platforms across 19 ESCWA Member States.

learning and augmented or virtual reality, were rare. Instead, the most sought-after hard skill during that period was accounting, a field with high potential for automation. Other top-demanded hard skills included business administration-related competencies in the areas of finance, business development, auditing and customer satisfaction. Similarly, the most demanded soft skills remained concentrated in areas related to sales, management, operations and customer service, as well as communication and problem solving.

These findings pointed to labour markets that are still shaped by consumer-facing sectors and service-based employment, rather than innovation-driven or technology-intensive production. ESCWA warned that continuing along this trajectory and prioritizing skills vulnerable to automation would expose Arab economies to heightened risks of technological unemployment and stall long-overdue structural transformation.

Encouragingly, however, recent data suggest that this situation is beginning to shift. ESCWA's 2024 update reveals early but notable signs of growing demand for digital competencies across the region. Hard skills such as computer science, data analysis and programming languages are gaining traction, with coding skills like SQL and JavaScript entering the top 20 most sought-after skills. Soft skills have also evolved. Problem solving, for instance, has moved from 11th to fourth place, suggesting a closer alignment with global labour market trends that emphasize adaptability, critical thinking and innovation (ESCWA 2024b).

The latest Future of Jobs report (2025) surveyed employers in Saudi Arabia, the UAE and Bahrain, who identified a number of core skills required of workers. Among the top five are technological literacy and competencies related to AI and big data, alongside key soft and interpersonal skills such as analytical and creative thinking, resilience, adaptability leadership and social influence (figure 9). This combination underscores the growing demand not only for digital and technological proficiency, but also for the ability to navigate complex, rapidly changing work environments. It highlights the value employers place on a workforce that is not only tech-savvy but also agile, innovative and capable of working collaboratively in an increasingly digitalized economy.

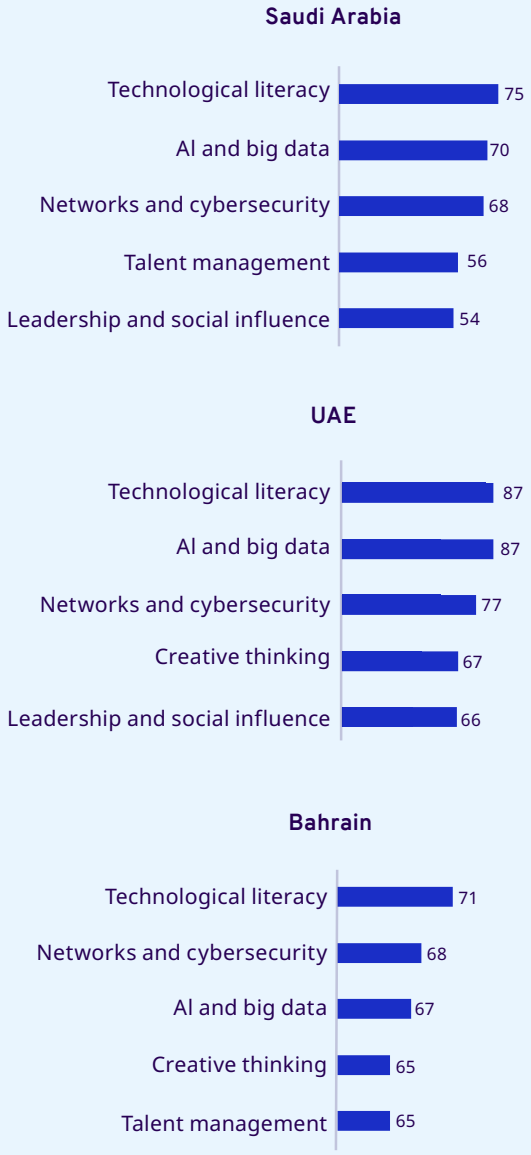
Figure 9. Top core skills demanded in Saudi Arabia, UAE and Bahrain (%), 2025

Note: Percentages represent proportion of employers who considered the stated skills to be "core skills".

Source: WEF (2025).

As employers in the Arab region accelerate their investments in technology, demand for digital skills is projected to grow in importance more rapidly than any other type of skills (figure 10). Among these, technological literacy tops the list as the fastest-growing skill, followed closely by skill in AI, big data, networks and cybersecurity. Alongside these technical skills, employers are increasingly placing value on human-centric capabilities such as creative thinking, leadership, social influence and talent management, highlighting the need for a workforce that is both digitally proficient and capable of driving innovation and managing change in dynamic organizational environments.

Figure 10. Skills with projected increased use by 2030 in Saudi Arabia, UAE and Bahrain (%)



Note: Percentages represent proportion of employers expecting skills to increase in importance.

Source: WEF (2025).

Still, this positive momentum is not shared equally across the region and remains closely tied to each country's level of digital and economic development. For example, in Yemen, political instability and limited financial resources constrain investment in technology and broader digital infrastructure, so demand for future-oriented skills remains weak. This perpetuates a cycle in which low digital investment leads to limited workforce capabilities, further reducing incentives and capacity for technological advancement.

Digital talent and readiness: Addressing the risk of a widening skills gap

As countries invest in their digital economies, ensuring sufficient talent to support this transformation becomes critical. Globally, the shortage of skills remains a major concern. At the most recent Global Symposium for Regulators (GSR) held in July 2024, telecommunication and ICT regulators identified this shortage as one of the twelve key global challenges (ITU 2024b).

In the Arab region, assessing the availability and readiness of digital talent is essential for understanding the region's capacity to drive and sustain digital transformation. In this context, data from the WEF's Executive Opinion Survey and ITU digital skills indicators provide valuable benchmarks to understand talent availability and highlight areas for targeted policy action.

Table 13 presents selected indicators from the WEF Executive Opinion Survey, gathered over two waves (2019 and 2023). Across all three indicators, Qatar, Saudi Arabia and the United Arab Emirates lead the Arab region, while Yemen scored particularly low. These intraregional differences are not surprising given that the pace of digital adoption varies across countries, influencing talent availability.

Table 13. Digital skills availability in the Arab States

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Jordan	Lebanon	Yemen
Digital skills among active population [a]	4.9	4.2	4.9	5.3	5.3	5.3	4.9	5.0	3.5
Technology skill level of the workforce [b]	5.19	3.90	5.20	5.70	5.52	5.57	5.42	-	3.40
Talent availability for digital transformation [b]	4.93	3.62	5.13	5.51	5.43	5.57	4.91	-	3.92

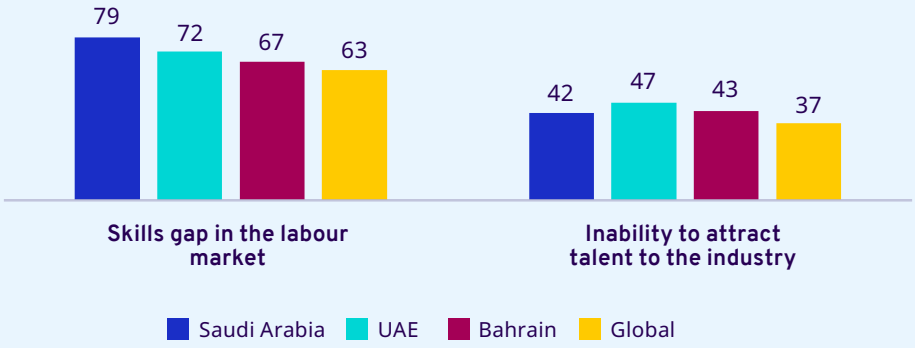
Note: Scores represent survey averages, scaled from 1 ("not at all") to 7 ("to a great extent"). Data are not available for Iraq, SoP and Syria.

Sources: [a] *Global Competitiveness Report 2019* (WEF 2019); [b] Executive Opinion Survey 2023 (WEF 2024).

Despite the GCC's relatively strong performance on ICT-related indicators, the region as a whole faces substantial talent gaps. Most GCC countries produce relatively few graduates in STEM subjects and tend to underperform in the Programme for International Student Assessment (PISA) when compared to advanced economies IMF (2025). Additionally, the number of PhDs in AI across the region remains low at approximately two per million people, compared with an average of 25 per million in OECD countries.

These gaps limit the subregion's ability to fully diversify its economies and meet the demands of advanced digital sectors. As a result, governments in the Gulf continue to rely heavily on expatriate professionals to bridge the skills shortfall. Notably, skills gaps in the labour market are viewed as the most significant barrier to business transformation over the 2025–2030 period, according to respondents of the Future of Jobs Survey in selected Gulf economies. In Saudi Arabia, 79 per cent of employers cited this as a key constraint, followed by 72 per cent in the United Arab Emirates and 67 per cent in Bahrain – all notably higher than the global average of 63 per cent (figure 11). Employers in these countries also report considerable difficulties in attracting talent, with over 40 per cent identifying this as a challenge – again exceeding the global average of 37 per cent. This is particularly concerning given that these countries are among those most actively pursuing digital transformation in the region. It highlights the point that challenges related to reskilling and talent acquisition are not limited to lower-income or less technologically advanced economies, but are shared across digitally ambitious and resource-rich countries.

Figure 11. Barriers to business transformation by country, 2025–2030 (%)



Note: Percentages represent proportion of employers expecting the stated barrier will hinder their organizational transformation.

Source: WEF (2025).

Further reinforcing this concern, employers were also asked which public policy interventions they believed would most effectively improve access to talent over the coming years. Across Saudi Arabia, the United Arab Emirates and Bahrain, the majority identified increased funding for reskilling and upskilling as the top priority (72 per cent, 63 per cent and 62 per cent, respectively) (WEF, 2025). This strong consensus underscores the private sector's call for continued and expanded public investment in skills development to ensure that workforce capabilities keep pace with evolving labour market demands and technological change.

Beyond the GCC, misalignment of education and skills development systems with market needs seems to greatly influence outcomes. Education and training systems often fall short in preparing learners for modern labour markets. This is largely due to outdated curricula, weak engagement between education providers and the private sector and the lack of a labour market information system (LMIS) to guide programme design – factors confirmed by FGDs conducted for this study. According to ESCWA and ILO (2021), nearly 40 per cent of firms cite an inadequately educated workforce as a barrier to growth.

A more recent study by ESCWA (2024b) highlighted pronounced gaps between education and labour market demand at the higher education level and in TVET systems. Although these systems constitute the backbone of workforce development, they remain weak in many low- and middle-income Arab countries. Curricula struggle to keep pace with technological advancements, leaving graduates with insufficient skills and often requiring further training or retraining to secure employment. This concern was particularly raised by Lebanese representatives during the FGD, where they expressed limited confidence in the relevance and effectiveness of the country's TVET system.

Unfortunately, in many countries of the region, even among universities that teach computer engineering, AI or data science, there remain significant mismatches between the skills taught and those actually required by employers. In some cases, there is minimal or no overlap between university curricula and the competencies required in the labour market, highlighting a deep disconnect between education systems and economic realities (ESCWA 2024b).

As digital technologies advance at an unprecedented pace, the workforce may face an increasingly severe skills crisis if it is not adequately prepared for emerging roles in rapidly evolving fields (AI, big data analytics, cloud computing, IoT and robotics). Additionally, future digital skills requirements will be influenced by the growing trend towards "green jobs", including smart grids, smart transport and smart buildings, already taking shape in some Arab countries.

Review of existing approaches to skills analysis and forecasting

Although no single model fits all contexts, several key principles and approaches have consistently proven effective in assessing and anticipating skills mismatches. These approaches are discussed in the joint work of the ILO, the European Training Foundation (ETF) and the European Centre for the Development of Vocational Training (Cedefop). A collection of methodological guides, implementation processes and insights from country case studies is presented in six volumes.[9] According to these guides, the most frequently used approaches include:

- surveys of employers (establishment and enterprise surveys);
- quantitative models (referred to as "forecasts");[10]
- qualitative methods (e.g. focus groups, round tables, expert interviews, foresights, scenario development), some of which may include some quantitative aspects; and
- tracer studies of graduates (higher education or TVET) and school-to-work transition surveys.

These methods can be applied at the national level and, where national data permit, disaggregated to the sectoral or regional level (ETF et al. 2016b). A combination of both quantitative and qualitative approaches is recommended to gain a comprehensive understanding of current and emerging trends. Table 14 offers an overview of key methods, outlining their advantages and disadvantages.

Table 14. Overview of key approaches for assessing and anticipating skills mismatches

Approach	Data requirement	Technical expertise	Advantages	Disadvantages
Employer-employee skills surveys **Enterprise/establishment skills surveys (ESSs)**	A firm registry from which the sample frame will be formed No further data needed for the primary data collection survey	Survey design and implementation Analysis of survey results Methods to ensure representativeness	Direct user involvement Focus on behaviours rather than perceptions Relatively easy to develop and implement	Response rates are often too low Large samples are needed, thus may be expensive May be very subjective and inconsistent

9 Each volume covers a specific aspect of anticipating and matching skills and jobs (see https://www.ilo.org/skills-anticipation-and-matching). Notably, case studies from Jordan are featured in Volume 1, which focuses on using labour market information, and in Volume 2, which addresses sectoral-level work.

10 These include macroeconomic models that provide quantitative employment projections by sector and occupation. One such model is E3ME, a well-established tool for analysing the European economy and labour market.

Quantitative forecasting models/ projections[a] **Usually implemented at national level**	Reliable and consistent time series on labour markets (sector, occupation, qualification) and population (age, gender, labour market participation)	Extensive expertise in modelling Statistical and programming experience	Comprehensive system Consistency allowing for better comparability over time Transparency Quantitative/ measurable	Data hungry Costly Not everything is quantifiable Limited number of quantifiable aspects May give a misleading impression of precision
Qualitative methods involving experts (focus groups, roundtables, expert workshops and opinion surveys and "Delphi" style methods)	No specific data requirements	Preparation of (structured) interviews, focus groups, Delphi methods, etc. Synthesizing qualitative outcomes can often be challenging in new contexts	Holistic approach Direct user involvement Potential to address problems in greater depth Useful mechanisms for exchanging views	Risk of being non-systematic Risk of inconsistency Risk of subjectivity Risk of non-representativeness and providing a partial view. Risk of being anecdotal
Foresight and scenario development a (using one or several of the other methods such as quantitative forecasts, LMI, sector-specific data)	May use a number of input data and reports, such as results of quantitative forecasts, labour market information, sector studies, but it is not compulsory	Skilful moderators Compilation of diverse qualitative information into a report Engagement of all stakeholders	Holistic approach Direct user involvement Potential to address problems in greater depth Useful mechanisms for exchanging views. Greater depth Consideration for uncertainties	Risk of being non-systematic Risk of inconsistency Risk of subjectivity Risk of and providing a partial view
Graduate tracer studies	Primary data collection Contact details of recent graduates Potential use of additional administrative data from the education institutions	Survey design and conduct Analysis of survey outcomes Methods to ensure representativeness	Potential provision of useful information for improving quality of training programmes Relatively easy implementation Relatively low cost	Limited insights into specific skills needs Limited to early market experience and findings may be biased and subjective Risk of low response rates

Sectoral or occupational studies (using various quantitative and qualitative tools)	Some data requirements (depending on methods used within sector) Sector-specific data from different sources (surveys) and expert inputs	Understanding sector based labour markets, occupations and skills requirements. Analysis of primary and secondary data. Survey methodology skills (in case of primary data)	Holistic view on the sector Detailed information on sector specificities (incl. detailed information on capabilities, competencies and skills)	Partial Risk of bias Risk of inconsistencies across sectors
Vacancy surveys[b]	Primary data Either existing administrative data or processes of PES or employer surveys Administrative data usage requires adequate processes ensuring consistency and representativeness	Survey design and conduct Analysis of administrative data and survey outcomes Methods to ensure representativeness	Direct user involvement Targeting of jobs actually available –demand proxy Objectivity	Partial coverage, limited representativeness Short-term demand only Data processing takes time while part of vacancies may be already taken
Data mining tools for vacancy studies[b]	Big data from online job postings, often sourced from job boards, company websites and social media platforms	Advanced skills in data mining, big data analytics and machine learning algorithms. Knowledge of programming, data processing and statistical analysis	Analysis of vast amounts of data quickly Real-time or near-real-time insights Identification of patterns that might not be visible through traditional methods Capture of a broader range of vacancies, incl. emerging roles	Need for sophisticated technology and infrastructure Potential data privacy and ethical concerns Can be complex to implement and interpret Data quality and consistency issues may affect results

Notes: [a] Both quantitative forecasting models/projections and foresight and scenario development qualitative methods are typically used for anticipating future skill mismatches. [b] While both traditional and big data-driven vacancy studies are frequently discussed within skills anticipation and forecasting methods, they are more relevant to assessing and addressing current skills mismatches. A notable example of the data mining method is the *ESCWA Skills Monitor*.

Source: Adapted from ETF et al. (2016a; 2016b) and ILO and OECD (2018).

Several challenges arise in developing skills anticipation systems, including ensuring the availability of adequate and coherent data, selecting the most suitable methodologies and having institutional capacity and expertise. These challenges are particularly pronounced in developing and emerging economies (ILO 2015).

Current skills needs assessments are typically conducted on an annual basis to address immediate labour market demands. In contrast, future skills anticipation exercises occur less frequently and generally span a period of 5–10 years. These exercises can be scheduled either concurrently with current needs assessments or at separate intervals, depending on the specific focus and timing of the analysis (ILO & OECD 2018; ITU 2020a). For the Arab States, the broader context of the twin transitions (digital and green), and other emerging trends, needs to be considered.

Box 2 presents selected examples of methods used to assess skills availability and gaps in a number of Arab countries. Ultimately, all skills needs assessments and anticipation systems should serve as inputs into the design of forward-looking, evidence-based skills development policies and programmes. These efforts must be tailored to national contexts and priorities and aim to build the talent and capabilities required to support the region's digital transformation. Appendix IV provides illustrative examples of programmes and policies implemented by countries in the region to enhance the supply of skills needed for the digital economy.

Box 2. Skills needs assessments in the Arab region: Selected examples

Different countries use different approaches to assess skills mismatches and identify current and future labour market needs. Two commonly used methods in the region are **Establishment Skills Surveys** and **Sectoral Skills Studies**.

Establishment Skills Surveys

These surveys gather data directly from employers to understand workforce skills gaps, hiring challenges and training needs.

In **Oman**, with the ILO's technical support, the Ministry of Labour, in collaboration with national stakeholders, particularly the National Center for Statistical Information, undertook a sector-wide Establishment Skills Survey in 2023–24. The survey aimed to anticipate future needs, the outcomes of which will affect the higher education system, its academic programmes and the specializations required for future jobs in the context of the Fourth and Fifth Industrial Revolutions.

In **Qatar**, the Ministry of Labour also decided to conduct the country's first Establishment Skills Survey in 2025 with the ILO's technical support. The survey aims at identifying gaps, anticipating future skill requirements and informing labour market policies by aligning education and training systems with current and future demands. The Ministry of Labour plans to implement the survey regularly with ILO support, and integrate it into the LMIS to enhance workforce planning and policy development.

In **Saudi Arabia**, the MHRSD, with the support of the World Bank, and in collaboration with other national stakeholders and institutions, agreed to undertake a Skills Demand Survey. This will complement labour force surveys, aiming to capture private-sector demand for specific competencies and inform TVET and higher education reform.

Box 2. (continued)

Sectoral Skills Studies

These are in-depth analyses focused on specific economic sectors to identify skills shortages, training gaps and future workforce needs.

In **Lebanon**, several sectoral skills studies have been conducted in healthcare, printing/ packaging and public infrastructure through collaboration with the ILO and national partners. These studies have helped identify skills needs and gaps and provided recommendations for better alignment between skills demand and supply.

In **Saudi Arabia**, the ILO has also been involved in a number of sectoral studies, together with relevant national bodies (e.g. sector skills councils) to identify skills mismatches and needs, anticipate future skills requirements and inform sector-specific training programmes.

In **Jordan**, the ILO has conducted sector-focused labour market and skills assessments to guide policy reforms in training and education. Several studies have been carried out, including on the pharmaceutical and food processing sectors - both identified as critical for boosting economic competitiveness and employment.

Conclusion and policy recommendations

For decades, Arab countries have faced persistent labour market and employment challenges, including high unemployment, informality and weak job creation. Today, megatrends – particularly digitalization and AI – are reshaping economies and labour markets worldwide, introducing both opportunities and risks that are especially consequential for the region.

Notably, the Arab States are entering this digital era with unequal levels of preparedness. While some have made impressive strides with strong digital infrastructure, ambitious AI strategies and dedicated resources, others lag behind, constrained by limited financial capacity, fragile institutions, conflict and inadequate digital ecosystems. These structural disparities are further compounded by education and training systems that often struggle to keep pace with rapid technological change.

Despite these challenging realities, our findings suggest that the overall impact of AI and digital transformation on employment across the region is likely to be positive – if approached strategically. Automation will inevitably displace certain tasks and occupations, but new roles will be created and many existing jobs will be augmented by technology. Crucially, digitalization and AI will also affect the quality, not just the quantity, of jobs. These technologies hold the potential to improve working conditions, enhance productivity and expand access to decent work. At the same time, they raise concerns about job insecurity, algorithmic bias and deepening inequality if left unregulated or unequally distributed.

With the right policy mix, digital transformation can yield significant positive impacts on both the quantity and quality of employment. This requires proactive policies and targeted investments to accelerate digital adoption and build the institutional and technological maturity needed to fully harness the region's potential for digital development. At the same time, forward-looking strategies are essential to equip the workforce with the skills required to succeed in the digital economy, while also mitigating risks such as job displacement and widening inequality, particularly for vulnerable groups including women, older workers and non-skilled individuals. A comprehensive policy framework anchored in social justice, grounded in labour rights and social dialogue, and encompassing skills development, social protection and targeted support is critical for ensuring that the benefits of digital transformation are equitably distributed and that labour markets are more resilient to future shocks.

With the right policy mix, digital transformation can yield significant positive impacts on both the quantity and quality of employment.

Importantly, a shared set of guiding principles can help Arab countries adopt development-oriented digital strategies, but national approaches, tailored to each country's unique digital landscape, economic capacity and labour market conditions, remain equally important. A one-size-fits-all model will not suffice. All countries must act, albeit from different starting points. Non-GCC countries will need to make substantial efforts to close the digital divide, while GCC countries – despite their relative advantages – have yet to fully realize the potential of their digital ambitions. They too must continue refining their strategies to strengthen employment outcomes and contribute to broader socio-economic goals.

The recommendations that follow build on the findings presented throughout this report, offering policy guidance to support an inclusive digital transition that fosters equitable employment, economic diversification and sustainable development to ensure that no one is left behind.

Invest in digital infrastructure and narrow the digital divide between and within countries

Inclusive and effective digital transformation requires universal and equitable access to digital infrastructure. As shown by the various indices presented in this report, significant disparities exist between and within the Arab countries in terms of connectivity, internet penetration, access to digital tools and the reliability of digital services. These gaps limit the ability for low-income and conflict-affected countries to fully engage in and benefit from emerging technologies such as AI.

Targeted investments are needed to strengthen broadband networks, expand access to electricity and affordable and high-speed internet, and improve digital service delivery in underserved regions, including rural and marginalized areas. Equally important are investments in data centres and renewable energy sources to address key barriers such as high costs, unreliable energy supplies and limited resources. Closing these gaps will not only enhance productivity and service accessibility, but also unlock new employment and entrepreneurial opportunities.

For inclusive and sustainable digital transformation, governments will need to prioritize public spending on digital infrastructure as a core component of national development strategies. Public investment can close the digital divide, especially in underserved rural and low-income areas where market incentives are often insufficient. Reliable, affordable digital connectivity should be treated as a public good, alongside education, healthcare and transportation infrastructure.

However, limited public funding, particularly in non-GCC countries, underscores the need to explore and mobilize alternative and diverse sources of financing, including:

- Leveraging international development finance through multilateral development banks, donor agencies and South–South cooperation. These resources can support large-scale infrastructure roll-outs, especially when aligned with broader employment and skills development goals.
- Promoting regional cooperation, particularly in smaller or resource-constrained countries, by investing in shared infrastructure (e.g. regional data centres, cross-border broadband) and interoperable digital platforms, which can reduce costs and expand reach.
- Adopting innovative financing mechanisms, such as blended finance (combining public and private capital), tied to inclusive access or decent job creation outcomes. These approaches can de-risk investment in less commercially viable areas while ensuring measurable impact.

Build a digitally skilled workforce and promote lifelong learning

Bridging the digital divide goes beyond infrastructure and hinges on digital literacy and ensuring that everyone has essential digital skills. To ensure that the workforce is equipped for the demands of the digital economy, countries must adopt comprehensive, inclusive and forward-looking skills development strategies. These strategies should span the entire learning cycle, from early education through to lifelong learning, aim to build a workforce equipped with both foundational and advanced digital capabilities (i.e. develop digital skills for ICT professionals and digital experts, as well as the broader labour force), be coordinated across education systems, employers and public institutions and be aligned with other employment and national development plans.

The foundation must begin with early integration of digital skills. Digital literacy and computational thinking should be embedded into pre-primary, primary and secondary education systems. Curricula need to be updated to include STEM subjects, programming, digital safety and the ethical use of technology. These changes must be supported by well-trained teachers who are equipped with the necessary digital tools and provided with opportunities for ongoing professional development.

Equally important is the reform of TVET and higher education. TVET systems must be adapted to deliver both foundational and advanced digital skills, particularly those aligned with emerging occupations. Digital content should be fully embedded into vocational training programmes, supported by the adoption of technology-enhanced learning tools such as simulators and virtual labs. Stronger collaboration between universities and industry is also essential to ensure curricula are responsive to labour market needs. Additionally, the development of flexible, hybrid programmes that integrate digital and non-digital disciplines can better prepare graduates for a wide range of future career paths.

A digitally prepared workforce must also be supported through inclusive and accessible lifelong learning. National strategies should promote lifelong learning as a priority, backed by public incentives that encourage continuous upskilling and reskilling. This includes expanding access to non-formal and informal learning opportunities, such as MOOCs, community-based training and open-source digital resources. Recognition of prior learning, including digital competencies gained through online platforms, is critical, particularly for individuals outside the formal education system. At the same time, addressing disparities in access to digital learning opportunities, especially among rural populations, women and other marginalized groups, is essential for promoting equity.

Enterprises also play a pivotal role in building digital skills. Employers should be encouraged to invest in on-the-job training, mentorship schemes and reverse mentoring programmes, where younger employees support senior staff in learning new technologies. In a rapidly evolving labour market, reskilling existing workers should be prioritized over layoffs, particularly in sectors experiencing technological disruption. Aligning employer-provided training with national qualification frameworks can enhance the value and transferability of skills acquired within the workplace.

This multi-layered approach to digital skills development is critical to ensuring that all workers, irrespective of their age, sex, family background, nationality or disability status, and across all sectors, are not only digitally literate but also resilient, adaptable and empowered to thrive in a digital-first economy.

Invest in quality employment services and effective social protection systems

While reskilling and upskilling are essential components of a just transition for workers displaced or disrupted by digitalization and AI, it is equally critical to provide comprehensive support systems that help these workers navigate transitions effectively and with dignity. Such systems should help cushion the short-term impacts of job loss while empowering individuals to make informed decisions about their future in the labour market.

Quality employment services and effective career guidance play a central role in helping workers understand new labour market opportunities and identify retraining or job placement opportunities. Effective employment services must be expanded and made more responsive to emerging digital labour markets. This includes the provision of tailored advice, job-matching tools, wage subsidies and individual employment plans, particularly for low-skilled, informal or vulnerable workers. By collaborating with employers and using labour market data, employment services can facilitate smoother transitions into new jobs and reduce the risk of prolonged unemployment.

At the same time, income support, such as unemployment benefits or targeted cash transfers, helps workers maintain economic security while pursuing training or job searches. Such support should be accessible, inclusive and adequate, especially during periods of labour market disruption caused by automation or other digital transitions. In contexts with limited social protection coverage, temporary measures (e.g. emergency income support or publicly funded training stipends) can be introduced as a bridge until comprehensive systems are developed.

Given the widespread weaknesses in social protection systems across the region, it is essential to not only adapt these systems to the evolving world of work, but also strengthen their foundations. They must offer comprehensive, life-cycle support to all workers (including during periods of unemployment) and be expanded to ensure universal coverage. This includes extending protections to all, regardless of contract type or employment status, with particular attention to gig workers and others in non-standard forms of employment emerging from digitalization.

Together with lifelong learning, reskilling and upskilling, these measures – employment services, income support and other social protection measures – form the social and economic foundation that allows displaced workers to navigate disruption without falling into poverty or long-term unemployment. Special attention and targeted support should be provided to vulnerable groups of workers, including older workers, women, people with disabilities, migrants and refugees.

Invest in labour market information systems and leverage data-driven labour market insights for strategic planning

Comprehensive, timely data collection and analysis are vital for driving informed policy decisions. Accurate and accessible labour market data serve as a cornerstone for reducing current and future skills mismatches and for shaping effective economic, labour market and employment policies. However, many countries in the region lack a robust LMIS or fully functioning national statistical frameworks, hampering their ability to respond effectively to rapidly changing labour market needs.

Investing in the development and modernization of an LMIS should be a top priority. A strong LMIS enables governments to continuously monitor labour market dynamics, identify emerging skills demands and align education and training systems accordingly. In the interim, countries can leverage vacancy surveys or data mining tools to assess current market demands and address skills mismatches. To anticipate future labour market needs, sectoral studies, qualitative methods and quantitative forecasting models can support the anticipation of future trends and help mitigate the risk of widening skills gaps in an increasingly digital economy.

Advanced tools, such as predictive analytics, offer a powerful way to forecast future labour market trends by simulating various scenarios based on economic shifts, technological innovations and demographic changes. This enables governments to proactively guide workforce development strategies and design training programmes that align with the evolving demands of a digital economy.

For countries with an established LMIS, these systems can incorporate advanced technologies such as big data analytics, AI and machine learning to enable governments to analyse large datasets and gain deeper insights into employment trends, workforce demographics and industry demands. By leveraging these tools, governments can forecast labour market shifts, identify critical skills gaps and design targeted education and training programmes to better prepare the workforce for future needs. This allows for the design of both corrective and preventive policies that address current and future labour market challenges, ensuring that digital transformation is inclusive, sustainable and beneficial for all segments of society.

Support digital transformation and AI application in MSMEs and promote innovation and digital entrepreneurship

MSMEs are central to job creation, economic diversification and inclusive growth. Yet, they often face systemic challenges in adopting and benefiting from digital technologies, particularly in the Arab region. Bridging this digital divide is essential for not only enhancing productivity and competitiveness, but also for ensuring that innovation and growth are inclusive and sustainable.

Digital transformation, however, is not a one-time investment, but a dynamic, continuous process that requires strategic planning, iterative learning and ongoing support. The rapid pace of technological change means that MSMEs must develop the capacity to adapt continuously, building their digital maturity incrementally over time. For most MSMEs, especially those in early or passive stages of digitalization, the key barriers include limited financial resources, low digital readiness and inadequate change management capacity. These challenges can stall or even derail transformation efforts unless met with targeted, sustained support from external actors, including governments, business associations and technology providers.

A phased and resource-conscious strategy is recommended. MSMEs should assess their current level of digital maturity, identify realistic priorities and align digital investments with their needs and capacities. As they progress, they can experiment with simple digital tools and gradually scale up to more advanced technologies, including AI. The role of enterprise owners and managers is especially critical in fostering a culture of innovation and upskilling that enables successful integration of digital solutions and supports long-term competitiveness.

The ILO's Digitize Your Business training programme is an important example of a tailored, scalable tool that helps small business owners assess their current digital practices and develop a clear plan to adopt digital tools suited to their operations. Governments also have a key role to play. While investment in digital infrastructure and affordable connectivity remains foundational, it must be complemented by policies that promote financial inclusion as a core pillar of digital transformation. Expanding access to credit and microfinance tailored to the risk profiles of MSMEs is essential. Blended finance and guarantee mechanisms can help de-risk lending, while venture capital and equity financing should be encouraged for start-ups and innovation-driven enterprises. Public subsidies, digital adoption vouchers and preferential tax incentives can also help MSMEs, particularly micro and informal firms, women- or youth-led enterprises and those in underserved sectors and rural areas.

In parallel, governments must foster innovation ecosystems that encourage entrepreneurship, particularly in emerging tech sectors. Support mechanisms, such as incubation programmes, access to financing and public–private partnerships, can help cultivate a pipeline of digital start-ups and scale innovation across the broader MSME ecosystem in the region.

Closing the digital skills gap is paramount. Governments and development partners should invest in scalable, modular training programmes that build both foundational digital literacy and sector-specific competencies. At the same time, employers have a critical role to play in upskilling and reskilling their workforce to keep pace with technological change. Empowering enterprises and their workers with the right skills not only strengthens business resilience and productivity but also encourages inclusive participation in the digital economy.

Create a favourable policy environment to effectively govern the digital transition and ensure creation of decent work for all

As digital transformation and AI reshape economies, labour markets and business models, it is essential that countries adopt integrated and coherent policy approaches. The ILO underscores the importance of aligning national employment policies with digital transformation agendas, while ensuring that digital and AI strategies explicitly promote inclusive employment and decent work.

Rather than treating digitalization as a stand-alone technology or economic strategy, it should be embedded within employment policies. This means that national employment strategies should proactively anticipate and shape the impacts of digital change. By integrating digitalization into employment planning, countries can better prepare their workforces and enterprises for evolving labour market demands, while promoting just and inclusive transitions.

At the same time, digital transformation strategies must not be driven purely by growth or innovation; they should include clear employment and social inclusion objectives. This includes fostering decent work in digital sectors, improving access to digital tools and opportunities for marginalized groups (e.g. women, youth and informal workers) and addressing new forms of vulnerability and inequality that may emerge in digital labour markets.

To achieve this, policy coherence and institutional coordination across ministries and sectors are key. Employment and labour institutions must be involved in the design and implementation of digital economy strategies, while digital and innovation authorities must consider the employment, skills and equity implications of their agendas. A whole-of-government approach ensures that policies are mutually reinforcing, with employment policies becoming digitally aware and digital strategies becoming employment-sensitive. The social partners should also contribute significantly to the planning of digital transition policies and actively participate in their development and implementation. Such policies and strategies should be inclusive and based on evidence, taking into account countries' employment and labour market contexts, as well as their digital readiness and economic priorities. They should drive decent job creation in emerging digital sectors and ensure no one is left behind.

Crucially, effective policies should be accompanied by formal policy review mechanisms, particularly ex-post evaluations that assess their effectiveness after implementation. Without such reviews, countries risk missing opportunities to learn from experience and make timely adjustments. Regular policy assessments will help ensure that such strategies remain relevant, adaptive and responsive to new challenges. Given the rapidly evolving nature of AI, mechanisms for continuous review and adaptation of these policies must also be built into the process to keep pace with technological advancements.

Strengthen legal and regulatory frameworks for a just and inclusive digital transition

In the context of AI and digital transformation, Arab States must adopt inclusive, forward-looking regulatory frameworks that support innovation while safeguarding rights, promoting decent work and ensuring inclusive growth. Regulation is not about slowing innovation, it is rather about steering it towards socially just and equitable outcomes.

To this end, labour and employment regulations must evolve to address the emerging risks of the digital era. As a starting point, comprehensive labour law reforms should be pursued to reflect the changing nature of work and the new challenges brought about by digitalization. In parallel, more targeted regulations are needed to address specific decent work deficits.

Occupational safety and health (OSH) frameworks must be adapted to protect workers in digitally enabled work environments. This includes regulating remote work conditions, introducing the "right to disconnect" and addressing psychosocial risks associated with algorithmic monitoring, hyperconnectivity and the blurring of work-life boundaries. Notably, while AI and robotics can improve safety by automating hazardous tasks, their use must be accompanied by strong safeguards, human oversight and training for safe integration.

Second, legal protections are urgently needed to regulate algorithmic management and AI-driven decision-making in the workplace. This includes ensuring transparency, accountability and the right to appeal for workers subjected to algorithmic task assignment, performance monitoring and pay decisions. The ILO advocates for a human-centric governance approach to AI, where workers' rights are respected, biases are mitigated and social dialogue plays a central role in shaping how technologies are used at work.

Third, robust data governance, privacy protection and cybersecurity regulations are essential to foster trust in digital systems. As more economic and employment activities move online, governments must implement comprehensive data protection laws, invest in cybersecurity infrastructure and ensure workers and businesses are equipped with the digital literacy necessary to avoid risks such as fraud, phishing and identity theft. The lack of such safeguards, especially in non-GCC countries, leaves economies vulnerable to data breaches and erodes trust in digital markets.

Fourth, regulatory frameworks must also be designed to support innovation. This includes enacting competition policies that prevent market concentration and monopolistic practices in the digital economy, creating space for MSMEs and start-ups to thrive. Regulatory sandboxes, incentives for research and development and flexible legal structures can help accelerate the responsible growth of such emerging sectors as fintech, e-commerce and digital platforms.

Finally, regulations must extend to platform workers and other non-standard forms of employment. Flexible and inclusive social protection systems, including health coverage, pensions and paid leave, must be expanded to cover workers who often fall outside traditional labour protections. Legal recognition of their status and rights is a key step towards ensuring that digital work adheres to international labour standards.

Promote social dialogue for inclusive and equitable digital transformation

Inclusive digital transformation requires more than just technological investment; it demands meaningful engagement and the full participation of social partners at every level. At the national level, tripartite social dialogue is central to achieving a just digital transition. It enables governments, together with employers' and workers' organizations, to collaboratively shape digital transformation in a way that balances innovation, productivity and social justice. The speed and scale of digital transformation can disrupt labour markets, affecting job quality, working conditions, employment relationships and required skills. Social dialogue allows governments, employers and workers to jointly anticipate these changes, identify risks and opportunities and design proactive policy responses, rather than reacting after harm has been done.

Involving all three parties ensures that digital transformation policies are not only technically sound, but socially legitimate, leaving no one behind. Workers' and employers' organizations bring real-world insights, helping shape policies that are both feasible and fair. This shared ownership fosters greater buy-in, compliance and long-term sustainability of reforms. Moreover, inclusive social dialogue can help mitigate the risks of technological displacement by ensuring that transitions are managed fairly and that digital technologies are introduced in ways that support and empower workers in their roles, rather than marginalize or replace them.

Beyond national policymaking and tripartite social dialogue, dialogue organized at sectoral and enterprise levels is crucial. Workers must be consulted and involved in the planning and implementation of digitalization initiatives in the workplace. Their voices are essential in shaping how new technologies are introduced, how jobs are reorganized and what support is needed to ensure a fair and just transition. As those closest to the day-to-day realities of their jobs, workers are well-placed to contribute to the effective and responsible deployment of new technologies in the workplace, helping to improve both working conditions and productivity. Promoting workplace cooperation and dialogue enhances trust, facilitates innovation and increases the likelihood of successful technology adoption. Mechanisms for information-sharing, consultation and collective bargaining on issues such as data use, algorithmic management, reskilling and OSH are fundamental to protecting workers' rights and promoting shared benefits.

Foster regional and international cooperation on AI and digital transformation

Significant disparities in digital infrastructure, AI readiness and workforce capabilities persist across Arab States, particularly between higher- and lower-income countries, and between GCC and non-GCC members. To ensure that all countries can equitably benefit from the opportunities presented by digital transformation and AI, both regional and international cooperation must be significantly strengthened.

Within the region, Arab States should intensify coordination through existing regional mechanisms, such as the GCC and the Arab League, to facilitate the exchange of policy experiences, regulatory frameworks and good practices in digital governance, AI adoption, skills development and decent work promotion. Establishing regional platforms for dialogue and sharing knowledge will enable countries to learn from each other's successes and avoid fragmented or duplicative efforts.

In addition, stronger financial and technical support, particularly from high-income Arab countries and regional development institutions, should be mobilized to help less digitally advanced economies build inclusive digital ecosystems, invest in workforce upskilling and develop effective legal and ethical AI governance. Technology transfer and regional partnerships for research and innovation should also be prioritized to enable all countries to participate in and contribute to the digital economy.

Overall, a regionally coordinated approach to digital transformation will help the Arab region collectively manage the risks and harness the benefits of technological change, supporting inclusive growth, labour market resilience and social cohesion. As demonstrated globally, such cooperation must also include ongoing monitoring and flexibility to adjust policy responses as technology and labour market dynamics evolve.

At the international level, cooperation is equally vital. Arab countries should actively engage with global frameworks and institutions that are shaping the governance and development of AI. Platforms such as the ILO's Global Coalition for Social Justice offer valuable opportunities for countries to share

lessons, align strategies and advance a more equitable digital transition. The Coalition's focus on harnessing digital transformation to promote decent work and social inclusion aligns with regional goals, offering pathways to exchange good practices on AI regulation, social protection in the platform economy and workforce upskilling.

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Appendix I. The ICT Development Index (IDI)

▶ **Table 15. Normalized indicator scores for the Arab States, 2024**

Country	Internet use by individuals	Internet access at home	Internet access via mobile broadband	Mobile network coverage	Mobile broadband use	Fixed broadband use	Mobile internet affordability	Fixed internet affordability	Mobile phone ownership
GCC countries									
Bahrain	100.0	100.0	100.0	100.0	92.7	87.3	96.6	93.9	100.0
Kuwait	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	100.0
Oman	100.0	100.0	77.3	99.4	69.2	90.5	95.1	91.8	100.0
Qatar	100.0	100.0	100.0	99.9	79.4	97.6	100.0	96.9	100.0
Saudi Arabia	100.0	100.0	84.0	100.0	97.2	96.0	98.3	89.3	100.0
UAE	100.0	100.0	100.0	99.9	74.3	95.5	99.8	100.0	100.0
Non-GCC countries									
Iraq	82.9	93.4	30.8	97.2	38.2	80.7	92.4	-	69.2
Jordan	95.3	97.1	45.1	99.8	87.8	90.4	87.5	82.3	95.9
Lebanon									
SoP	93.3	97.2	14.6	23.3	71.8	92.5	67.8	82.7	83.4
Syria	-	-	14.6	85.0	73.9	-	75.9	99.7	-
Yemen	18.6	-	19.5	56.5	37.3	79.0	74.7	90.6	36.4

Source: The ICT Development Index, 2024, measuring digital development (ITU 2024c).

Notes: The figures represent the individual scores for the ten indicators that comprise the IDI (combining 3G and 4G/LTE network coverage). These scores are normalized, with a higher score indicating stronger performance relative to established goalpost values. For example, a score of 100 in internet use by individuals or access at home indicates that a country has reached the goalpost of 95 per cent of the population, but not necessarily 100 per cent coverage. For affordability indicators, higher scores reflect lower prices.

Appendix II. Measuring digital employment

The measurement of digital employment is a complex and evolving task, reflecting the broad and dynamic nature of digital transformation across economies. Different methodological approaches have been developed to estimate the scope and scale of digital employment, each offering a distinct lens through which to analyse the impact of digitalization on the labour market. This appendix summarizes the key measurement frameworks outlined in *Digital Employment Diagnostic Guidelines* (ILO 2023a). These frameworks are categorized into four main approaches: output-based, task-based, qualitative approach (including ad hoc surveys) and mixed methods. The key methodologies used within each approach are briefly explained, highlighting both their strengths and limitations.

Output-based approach

The output-based approach focuses on classifying digital sectors and activities based on international statistical classifications such as the International Standard Industrial Classification of All Economic Activities (ISIC). This allows analysts to quantify employment in sectors that either rely on or are enhanced by digital technologies.

ICT-restricted method

This method estimates digital employment by focusing on industries primarily engaged in the production or provision of ICT goods and services. It provides a foundational way to measure digital employment, typically using the number of persons employed in the ICT sector as a proxy. According to ISIC, ICT activities span 19 different 4-digit codes covering manufacturing, trade and services. While this method is practical and manageable and provides a solid baseline for measuring levels of digital employment in a country, it is widely acknowledged that employment in the digital economy is much broader than the ICT sector alone.

Digital input and exposure methods

Other methods expand the scope to sectors where digitalization plays a supporting role. These include assessing the extent to which different sectors rely on or are enhanced by digital inputs by categorizing sectors according to their linkages with the ICT sector or their level of digital intensity:

- **Digital employment according to forward or backward linkages.** Sector linkages with the ICT sector are considered to expand the classification of digital sectors to cover:
    - Digitally enabled sectors that use goods and services provided by the ICT sector (forward linkages).
    - Enabling sectors that supply inputs to the ICT sector (backward linkages), which can be analysed using macro models like input–output tables (IOTs). These assess sectoral connections within the economy. The level of detail depends on the available ISIC classification, though increasing specificity may reduce reliability.

- **Digital employment according to levels of digital intensity.** This method categorizes each industry according to their level of digital intensity or exposure. It does not consider explicitly the supply and use of digital inputs, but rather classifies a sector as being more or less digital based on the following indicators that are calculated at the two-digit ISIC level:
    - investment in ICT equipment, software and databases;
    - purchases of ICT intermediates, services and goods;
    - robot use;
    - proportion of ICT specialists among workers;
    - share of online sales.

Based on these indicators, the OECD developed a taxonomy that ranks 2-digit sectors into four categories: high, medium-high, medium-low or low digital intensity. The OECD's work emphasizes that, given the evolving nature of digitalization; the categorization of digital intensity is likely to shift over time, which will, in turn, affect the levels of digital employment. The ILO has merged "medium-high" and "medium-low" into "medium", grouping sectors by three levels of digital intensity (table 16). Some sectors, namely T, U and X have no digital intensity classification in the taxonomy, so are not classified by digital intensity.

Table 16. Correspondence between digital intensity categories and ISIC Rev.4 sectoral categories

Sectoral group	ISIC Rev. 4 sectors	Sectors at the ISIC Rev.4 two-digit level, grouped by digital intensity			
		High	Medium	Low	Not classified
Agriculture	A	-	-	01–03	
Industry	B, C, D, E, F	29–30	13–28, 31–33	05–12, 35–39, 41–43	
Trade, transport and accommodation	G, H, I	-	45–47	49–56	
Communications, financial and professional services	J, K, L, M, N	61–66, 69–82	58–60	68	
Care services	P, Q	-	85–88	-	
Other non-market services	O, R, S, T, U	94–96	84, 90–93	-	97–99
Not elsewhere classified	X	-	-	-	0

Source: ILO (2022a).

The task-based approach

The task-based approach focuses on the nature of tasks within occupations, identifying jobs based on their digital content and skill requirements. This involves assigning a "digital score" to each occupation based on the extent to which digital skills, tasks or knowledge are required. Occupations are then categorized according to this score, either as digital or non-digital, or along a more nuanced spectrum from low to high. Commonly used methods for obtaining this information include identifying tasks through occupational profiles and conducting surveys where workers self-report their use of digital skills and tasks. In recent years, new techniques leveraging machine learning and natural language processing have emerged to analyse job postings from various sources, including corporate websites, recruitment agencies and platforms like LinkedIn, to identify digital skills and other job requirements.

Qualitative approach, including ad hoc surveys

In the absence of comprehensive national statistics on digital employment, particularly platform-based work, the ILO advocates for qualitative and ad hoc methods to fill data gaps. These include key informant interviews, focus groups and targeted surveys, which help capture insights on key groups (e.g. freelancers, gig workers, platform operators).

The ILO's research on digital labour highlights how such tools uncover challenges and opportunities in digital employment, especially where resource constraints limit large-scale data collection. Given the lack of consistent definitions and metrics for platform work, national statistics remain limited. Some countries have begun integrating relevant questions into labour force and ICT usage surveys, though these often lack depth. Complementary data can come from ad hoc surveys, platform- and user-generated sources, among others. Ultimately, qualitative methods provide a partial but valuable view of digital employment trends, and are useful for identifying priority sectors and occupations for deeper analysis of decent work opportunities in the digital economy.

Mixed methods

Mixed methods include the combination of output-based and task-based methodologies, as well as the integration of quantitative and qualitative tools. Combining output-based and task-based approaches can generate more accurate and comprehensive estimates of digital employment by identifying workers whose occupations involve digital tasks and who are employed in digital sectors. However, this approach is data-intensive and often constrained by limitations in cross-classifying industry and occupation data (e.g. ISIC and International Standard Classification of Occupations (ISCO) codes).

On the other hand, combining quantitative and qualitative methods is often necessary. Qualitative tools can help fill data gaps, validate findings from quantitative methods and provide deeper insight into the scale and characteristics of digital employment.

Appendix III. Description of the E3ME model of Cambridge Econometrics and assumptions

E3ME model

E3ME is an integrated assessment model of the world's economic and energy systems and the environment. Developed by Cambridge Econometrics under the European Commission's research framework programmes, it is now widely used in Europe and beyond for policy assessment, scenario analysis and research purposes. E3ME enables a comprehensive analysis of macroeconomic impacts, including effects on employment, the broader economy and income distribution at both macro and sectoral levels.

E3ME strengths

The key strengths of E3ME include:

- detailed disaggregation, which allows for sectoral analyses across diverse scenarios;
- an ability to capture individual country dynamics and their interaction with the global economy;
- an empirically robust econometric foundation, meaning that the model is not reliant on the restrictive assumptions common in computable general equilibrium (CGE) models;
- econometric specification, which makes the model suitable for the assessment of short-, medium- and longer-term trends;
- the green aspects of the model, which shifts away from merely determining least-cost policy paths to proactively identifying potential opportunities and trade-offs inherent in decarbonization.

E3ME limitations

Like all modelling tools, E3ME abstracts from reality, relying on a set of assumptions. While its assumptions tend to be relatively less restrictive in comparison to other macroeconomic models, this approach still has limitations. The quality of the data used in the modelling is very important. Substantial resources are invested in maintaining the E3ME database and filling gaps in the data. However, in countries such as the Arab States there is some uncertainty inherent in the data available. In addition, there is uncertainty about the investment assumptions used in the scenarios, which are formed outside of the model based on the best available information in the public domain. The

modelling results, therefore, are simulated to estimate the range of possible economic outcomes associated with modelled policies or changes in the economy, rather than forecasts of likely scenarios. Another limitation of the analysis is that it focuses on evaluating the socio-economic impacts of increased digitalization. It does not quantify the cost of inaction or the broader advantages that enhanced digitalization may offer.

E3ME baseline

The E3ME baseline includes historical data for broad macroeconomic variables (e.g. GDP) up to 2022 for most model regions. Short-term GDP projections are based on IMF macroeconomic forecasts (for 2022–24, particularly where limited historical data are available), with medium-term (up to 2030) GDP trends aligning with *World Energy Outlook 2022*, thus aligning population and GDP growth projections with policy developments and ongoing energy and climate policies around the globe. Table 17 summarizes the E3ME GDP trends resulting from these assumptions. For Arab States, population projections align with the IIASA SSP2[11] population forecast, which (up to 2035) aligns with the UN Population Division projections 2024 for population aged 15+ for the Arab States.

Average annual GDP growth over 2025–30 is assumed to be 2.7 per cent, while employment is expected to grow by around 0.4 per cent per annum, reflecting the assumptions around population growth and the share of working-age people in the total population.

Table 17. E3ME global baseline trends and annual growth rates (%)

	2023	2024	2025	2025–30	2030–35
GDP	2.0	2.5	2.8	2.7	2.4
Employment	0.3	0.3	0.4	0.4	0.7
Population	0.9	0.9	0.9	0.9	0.8

Notes: Values for 2025–30 represent average annual growth rates.

Source: E3ME.

Table 18 summarizes the main macroeconomic and employment trends in the Arab States in E3ME. Overall, GDP growth in the Arab States is expected to grow faster compared to the global average. However, employment growth is expected to slow down towards the global average in the medium term.

Table 18. Baseline trends and annual growth rates, Arab States (%)

	2023	2024	2025	2025–30	2030–35
GDP	3.5	3.0	3.0	3.2	3.2
Employment	0.6	0.5	0.4	0.4	0.4

Notes: Values for 2025–30 columns represent average annual growth rates.

Source: E3ME.

11 https://dataexplorer.wittgensteincentre.org/wcde-v3/

Table 19 summarizes the employment distribution by sector for the Arab States in the E3ME baseline. Generally, the sectoral structure remains stable between 2025 and 2030, with manufacturing, distribution, retail, hotels and catering, and public services expected to see a slight increase in their share of employment. The share of employment in ICT is expected to increase slightly over 2025–30 in the baseline.

Table 19. Share of total employment by sector and year, Arab States (%)

	2025	2030	2035
Agriculture and forestry	4.7	4.8	4.9
Extractive industries	1.3	1.4	1.4
Basic manufacturing	5.5	6.4	6.4
Advanced manufacturing	3.7	4.1	5.6
Energy and utilities	1.2	1.4	1.4
Construction	16.2	13.4	11.7
Distribution, retail, hotels and catering	17.9	18.8	19.5
Transport and Storage	4.9	5.2	5.5
Business services	20.0	19.4	19.3
of which ICT	1.5	1.7	1.9
Public services	24.7	25.2	24.2

Source: E3ME

What-if scenario designs and assumptions

The objectives of the econometric analysis were to produce scenario results for the Arab region as a whole for two scenarios that can be compared to the baseline scenario described above. The first scenario assessed the impact of digitalization as developed for GET Youth 2022 report, while the second scenario built on the first, but included aspects of automation and AI using a similar design as the one employed for Cedefop's skills forecast digitalization scenario (Cedefop 2024).

Scenario 1: Broadband scenario

Scenario 1 aligns with the digital scenario developed for the *GET Youth 2022* report. Below is a summary of the scenario narrative and assumptions. Additional information can be found in the main GET Youth 2022 report. The GET Youth 2022 digital scenario modelled the impact of increased investment needed to expand and improve broadband internet coverage within and across countries. The target for higher levels of coverage is universal broadband coverage (defined as at least 90 per cent of the population) by 2030, in line with SDG Goal 9. It is expected that this increased coverage will lead to improved productivity and changes in consumer behaviour.

Investment, funding, timeline and repayment assumptions

The investment level is determined by the size of the coverage gap and is allocated to the sectors that build new infrastructure. The allocation of purchases of investment goods is as follows: 50 per cent to construction, 15 per cent to electronics, 15 per cent to electrical equipment, 10 per cent to communication and 10 per cent to computer services.

It is assumed that implementation of the necessary investments starts from 2024 onwards. The money needed for investment is assumed to be paid back over a 20-year period, with an initial 5-year grace period. The levels of necessary investment and their distribution by broad region can be found in the GET Youth 2022 report. The assumption is that the necessary investment is financed through private sources (i.e. broadband firms pay the costs). Each sector decides if the payment of the investment is passed on to prices or through reduced profits according to econometrically estimated cost pass-through rates.

Productivity assumptions

The increase in broadband coverage is expected to lead to increased digitalization. For companies, digital technologies are expected to lead to an increase in productivity, which, in turn, will lead to an increase in productive capacity, which can have widespread effects in terms of competitiveness, pricing and job quality.

The productivity gains by sector and ILO geographical region are estimated by applying an elasticity that relates broadband coverage to productivity. First, an increase in productivity is estimated by region, based on the extent to which the current gap in coverage will be reduced. This overall regional productivity impact is allocated to sectors, based on the relative size of the sectors and their likelihood of benefiting from the extended coverage. The productivity effect is thus related to the size of the gap to be closed by 2030. Additional information on the elasticities used, size of the sector estimates and the size of the gap can be found in the GET Youth 2022 report.

Assumptions regarding changes in consumer patterns

The increased coverage and digitalization are expected to lead to changes in consumer expenditure patterns. Increased internet access could lead to better financial services accessibility (e.g. online payments, savings, insurance or loans), better healthcare and health- and education-related information. An assumption about the change in expenditure patterns was added to the scenario, reflecting increased expenditure on internet-enabled services, such as financial, recreational and communication services and away from other consumer goods and services. The extent of the shift in expenditure is relative to the size of the coverage gap in the region.

▶ Scenario 2: AI integration scenario

Scenario 2 is based on Scenario 1, but includes additional assumptions related to AI impacts. The assumptions for AI impacts draw on Gmyrek et al. (2023) and a short literature review on investment in AI adoption in the Arab States.

The additional assumptions included in Scenario 2 include:

1. number of job losses resulting from automation risk of AI;
2. increase in productivity resulting from AI adoption;
3. increased employment demand in sectors with high computer use/augmentation potential;
4. investment in AI adoption;
5. financing the investment.

Assumptions regarding job losses

Assumptions with respect to job losses by region and sector are based on the occupations with automation potential, and the occupation composition of a sector within a region for the year 2023.

Table 20 lists the occupations that are expected to have a high risk of automation from greater AI adoption. The risk of automation mean is assumed to represent the percentage of people in the occupation who may be replaced by AI.

▶ Table 20. List of occupations with automation potential

ISCO_08	Description	Risk of automation mean
2514	Applications programmers	0.62
2622	Librarians and related information professionals	0.65
2641	Authors and related writers	0.68
3311	Securities and finance dealers and brokers	0.67
3354	Government licensing officials	0.63
4120	Secretaries (general)	0.64
4131	Typists and word processing operators	0.77
4132	Data entry clerks	0.7
4211	Bank tellers and related clerks	0.72
4221	Travel consultants and clerks	0.74
4222	Contact centre information clerks	0.72
4224	Hotel receptionists	0.68
4225	Inquiry clerks	0.72
4227	Survey and market research interviewers	0.71
4311	Accounting and bookkeeping clerks	0.69
4312	Statistical, finance and insurance clerks	0.66
4414	Scribes and related workers	0.72
4416	Personnel clerks	0.71
4419	Clerical support workers not elsewhere classified	0.72
5244	Contact centre salespersons	0.69

Source: Gmyrek et al. (2023).

Table 21 summarizes the assumed number of jobs lost because of AI adoption, shown as a percentage of employment losses by broad sector with respect to baseline employment projections. By 2035, 3.5 per cent of total baseline employment in the Arab States is assumed lost because of AI adoption. This equates to around 1.4 million jobs from the baseline that will no longer materialize. The losses vary by sector, determined by the size of the sector in the economy, as well as the sector's occupational composition. Services are generally expected to see a larger proportion of employment reduction, compared with the baseline scenario, than construction, agriculture and forestry.

▶ Table 21. Assumed employment losses due to AI by sector (%)

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Agriculture and forestry	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4
Extractive industries	-0.1	-0.3	-0.5	-0.7	-0.8	-1.0	-1.2	-1.3	-1.5	-1.6	-1.8	-1.9
Basic manufacturing	-0.2	-0.6	-0.9	-1.2	-1.4	-1.7	-1.9	-2.2	-2.4	-2.6	-2.7	-2.9
Advanced manufacturing	-0.2	-0.5	-0.8	-1.0	-1.3	-1.5	-1.7	-1.9	-2.1	-2.3	-2.5	-2.6
Energy and utilities	-0.3	-0.8	-1.3	-1.7	-2.1	-2.5	-2.9	-3.3	-3.7	-4.1	-4.4	-4.8
Construction	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.5	-0.6	-0.6	-0.7
Distribution, retail, hotels and catering	-0.2	-0.6	-1.0	-1.4	-1.7	-2.1	-2.4	-2.8	-3.1	-3.4	-3.7	-4.0
Transport and storage	-0.2	-0.5	-0.8	-1.2	-1.5	-1.7	-2.0	-2.3	-2.6	-2.8	-3.1	-3.3
Business services	-0.2	-0.6	-0.9	-1.3	-1.7	-2.0	-2.4	-2.8	-3.1	-3.5	-3.8	-4.2
Public services	-0.3	-0.7	-1.1	-1.5	-1.9	-2.3	-2.7	-3.1	-3.6	-4.0	-4.4	-4.9
Total	**-0.2**	**-0.5**	**-0.8**	**-1.1**	**-1.4**	**-1.7**	**-2.0**	**-2.3**	**-2.6**	**-2.9**	**-3.2**	**-3.5**
Total losses (thousand jobs)	-70	-192	-314	-436	-557	-679	-801	-923	-1 044	-1 166	-1 288	-1 409

Source: Cambridge Econometrics calculations, based on Gmyrek et al. (2023).

A sensitivity analysis, where the employment losses from AI are calculated by reducing the mean score by one standard deviation was also run to test the sensitivity of results around this assumption.

Productivity assumptions

AI adoption is expected to lead to increased productivity. Using Gmyrek et al. (2023), information on occupations that were classified as having augmentation potential and information on the occupational structure of each sector, assumptions on productivity can be generated by sector and region. Looking at the occupations with augmentation potential, the high exposure to AI of the task content is assumed to lead to increased productivity. The productivity gains were linked to sectors by looking at the occupational composition of sectors. Again, it was assumed that the full productivity gain is realized by 2035. Table 22 lists all the occupations expected to contribute to higher productivity because of AI.

▶ Table 22. Occupations with augmentation potential

ISCO_08	Description	Mean score
1113	Traditional chiefs and heads of villages	0.33
1322	Mining managers	0.36
1324	Supply, distribution and related managers	0.39
2111	Physicists and astronomers	0.35
2131	Biologists, botanists, zoologists and related professionals	0.35
2161	Building architects	0.39

2162	Landscape architects	0.38
2163	Product and garment designers	0.38
2165	Cartographers and surveyors	0.38
2212	Specialist medical practitioners	0.29
2230	Traditional and complementary medicine professionals	0.36
2262	Pharmacists	0.33
2265	Dieticians and nutritionists	0.39
2320	Vocational education teachers	0.39
2330	Secondary education teachers	0.33
2341	Primary school teachers	0.32
2351	Education methods specialists	0.35
2519	Software and applications developers and analysts not elsewhere classified	0.39
2523	Computer network professionals	0.39
2652	Musicians, singers and composers	0.38
2655	Actors	0.31
3116	Chemical engineering technicians	0.37
3122	Manufacturing supervisors	0.35
3131	Power production plant operators	0.34
3133	Chemical processing plant controllers	0.37
3141	Life science technicians (excluding medical)	0.37
3152	Ships' deck officers and pilots	0.35
3212	Medical and pathology laboratory technicians	0.3
3213	Pharmaceutical technicians and assistants	0.38
3253	Community health workers	0.3
3256	Medical assistants	0.38
3315	Valuers and loss assessors	0.39
3334	Real estate agents and property managers	0.38
3351	Customs and border inspectors	0.32
3411	Legal and related associate professionals	0.39
3422	Sports coaches, instructors and officials	0.36
3423	Fitness and recreation instructors and programme leaders	0.38
3431	Photographers	0.35
3432	Interior designers and decorators	0.38
3521	Broadcasting and audio-visual technicians	0.36
3522	Telecommunications engineering technicians	0.35
4321	Stock clerks	0.35
5111	Travel attendants and travel stewards	0.31
5112	Transport conductors	0.37
5131	Waiters	0.32
5141	Hairdressers	0.22

5153	Building caretakers	0.36
5165	Driving instructors	0.38
5211	Stall and market salespersons	0.39
5245	Service station attendants	0.28
5312	Teachers' aides	0.36
6123	Apiarists and sericulturists	0.33
8132	Photographic products machine operators	0.31
8171	Pulp and papermaking plant operators	0.36
8211	Mechanical machinery assemblers	0.31
8212	Electrical and electronic equipment assemblers	0.36
8219	Assemblers not elsewhere classified	0.35
8321	Motorcycle drivers	0.26
8344	Lifting truck operators	0.32
9510	Street and related service workers	0.28
9621	Messengers, package deliverers and luggage porters	0.28
9623	Meter readers and vending-machine collectors	0.36
9629	Elementary workers not elsewhere classified	0.38

Source: Gmyrek et al. (2023).

Assumptions regarding higher employment demand

Greater adoption of AI is expected to lead to higher levels of employment demand in some sectors. The OECD suggests a positive relationship between exposure to AI and employment in occupations where computer use is high (Georgieff, A. and R. Hyee 2021).

Table 23 summarizes data on the routine use of computers by country and sector. It is assumed that, in sectors where routine computer usage is above 60 per cent, demand for employment will be higher. For countries and sectors where data are missing, an average of available figures was used. While computer use predicts those sectors and regions where an increase in employment demand would be expected, such increases are calculated based on the share of occupations with high augmentation potential.

▶ **Table 23. Proportion of persons employed who routinely use computers (%)**

	Bahrain	Iraq	Jordan	Kuwait	Lebanon	SoP	Oman	Qatar	Saudi Arabia	Syria	UAE	Yemen	Average of data available
All activities					**39**	**48**	**21**	**41**	**89**		**99**		**56**
Agriculture, forestry and fishing							9	61	81				51
Mining and quarrying							52	49	95				65
Manufacturing	97				22	15	19	39	90				47

Electricity, gas, steam and air-conditioning supply							58	18	95				57
Water supply, sewerage, waste management and remediation activities								51	82				66
Construction	100				32		9	38	89				54
Wholesale and retail trade and repair of motor vehicles and motorcycles	82				39	56	24	60	86				58
Wholesale trade, except motor vehicles and motorcycles								41					41
Retail trade, except motor vehicles and motorcycles								50					50
Transportation and storage						54	59	46	90				62
Accommodation and food service activities					18		16	24	84				36
Information and communication								82	90				86
Financial and insurance activities						85	95	75	88				86
Real estate activities					54		32	41	96				55
Professional, scientific and technical activities					54			28	96				59
Administrative and support service activities					45	43	8	46	88				46
Education							63	71	88				74
Human health and social work activities							51	42	11				35

Year of data collection	2011				2011	2011	2011	2018 (except sectors highlighted in purple for which only 2015 was available)	2016		2015		

Note: For Bahrain, data represent percentages of enterprises using computers.

Source: UNCTAD core indicators on ICT use in business by industrial classification of economic activity.

Investment in AI

While most Arab States have announced targets and objectives around AI adoption and development, limited information seems to be available on the financial commitments allocated to support such objectives and targets. A literature review collated several investment commitments towards AI in a limited number of countries, the majority of which are high-income countries. For those that have announced investments in AI, allocations assumed in the present study are based on the announced timeline. If no timeline is available, the investment is assumed to be evenly spread over the 2024–2035 period.

For countries where no investment activity in AI was announced, investment was estimated as below:

- For Bahrain and Kuwait, AI investments as a share of GDP are assumed equal to the average ratio of AI-related expenditure to the GDP level observed in GCC countries with announced investments
- For non-GCC countries, AI investment is assumed half of the GCC average ratio to GDP

It is assumed that investment levels are enough to cover all infrastructure developments needed to support the scale of AI deployment, consistent with the other assumptions.

It is assumed that the majority of investment in AI is instigated by central governments, with the governments incurring higher debt (if applicable) until 2035 and repaying any debt following 2035.

Appendix IV. Selected digital skills strategies, programmes and initiatives in the Arab States

	Type	Name	Description	Link
Bahrain	Government initiative	Tamkeen	An initiative aimed at enhancing the skills of the Bahraini workforce and supporting the development of local businesses	https://www.tamkeen.bh/en/skills-bahrain/
Kuwait	Government initiative	National Kuwait Initiative for Digital Skills Development	A programme aimed at enhancing digital literacy and the technical skills of Kuwaiti citizen	https://www.cait.gov.kw/en/media-center/news-events/national-kuwait-initiative-digital-skills-developm/
Oman	Government initiative	Makeen	A programme aiming to provide Omani youth with the most modern digital skills in demand in the labour market	https://makeen.gov.om/
Qatar	Government initiative	Qatar Digital Government Training Programme (QDGTP) and Qatar Digital Academy	A training programme to boost ICT professional capacity in the public sector	https://www.mcit.gov.qa/en/qdgtp
	Collaborative initiative (PPP)	Qatar Digital Center of Excellence	A partnership between the Ministry of Communications and Information Technology, Microsoft, and Elev8 to provide digital skilling programmes for students, professionals, and business leaders.	https://digitalcenterofexcellence.qa/

Saudi Arabia	Government initiative	Saudi Cybersecurity Higher Education Framework (SCyber-Edu)	A guide for developing, evaluating, and accrediting cybersecurity higher education programmes	https://nca.gov.sa/en/regulatory-documents/frameworks-and-standard-list/199/
	Government initiative	Adoption of SFIA Framework	Adopted as the country's Digital Skills Framework under a countrywide licence	https://sfia-online.org/en/tools-and-resources/standard-industry-skills-profiles/sfia-isco-08-mapping
UAE	National strategy	Advanced Skills Strategy	A national framework aimed at consolidating lifelong learning targeting students in schools and universities, new graduates, and experienced employees	https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/human-resources-development-and-education/advanced-skills-strategy
	Government initiative	Dubai Future Academy	A capacity-building programme developing learning opportunities in collaboration with world-class education	https://www.dubaifuture.ae/initiatives/capacity-building/dubai-future-academy
	Government initiative	One Million Arab Coders (OMAC)	A digital platform that provides online programming courses accessible by Arab youth around the world	https://www.dubaifuture.ae/initiatives/capacity-building/one-million-arab-coders
Iraq	Collaborative initiative	Jousour	Partnership between WFP and the Ministry of Higher Education to provide youth with marketable digital skills and English to enhance their employability	https://reliefweb.int/report/iraq/wfp-and-iraqi-ministry-higher-education-and-scientific-research-launch-jousour-youth-initiative-digital-skills-enar
Jordan	Government initiative	One Million Jordanian Coders	A digital platform that provides online programming courses	https://jordaniancoders.com/
	Collaborative initiative	REACH2025: Digital Economy Action Plan		
Lebanon	International collaborative initiative (Beirut Digital District and World Bank)	Skilling Up Lebanon	A programme that aims to provide around 9,500 young individuals over a three-year period with the digital skills needed to prepare them for local, regional and global jobs of the future	https://www.worldbank.org/en/news/press-release/2022/04/07/beirut-digital-district-and-the-world-bank-launch-skilling-up-lebanon

SoP	Private initiative (Google)	Palestine Launchpad Programme	A capacity-building programme targeting Palestinian graduates, app developers and tech entrepreneurs to advance their digital skills and employability	https://www.wamda.com/2023/08/google-launches-new-initiative-support-palestinian-tech-entrepreneurs
Syria	International collaborative initiative (Télécoms Sans Frontières (TSF) and Zoom In)		2-month digital training targeting 200 women from northwest cities affected by the earthquake of 2023, and training them in internet safety, digital security and protection from electronic blackmail	https://blog.tsfi.org/c2c-059/
Yemen	International collaborative initiative (IRC)	Safe Space to Learn	20-week digital training programme targeting 50 adult women, leading to significant improvements in digital literacy	https://gbvresponders.org/wp-content/uploads/2024/04/Digital-Literacy-Learning-Brief-1.pdf
Regional level	Regional collective initiative	Arab Digital University	A digital platform for vocational education and training for the MENA region	https://arab-digital-economy.org/language/en/the-arab-digital-university

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