



# The Arab region may be missing the Fourth Industrial Revolution

Arab skills are still stuck in the past



Shared Prosperity **Dignified Life**

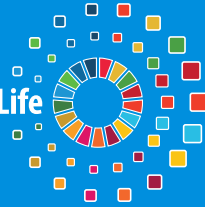


Emsi | burningglass





Shared Prosperity **Dignified Life**



## **VISION**

ESCWA, an innovative catalyst for a stable, just and flourishing Arab region

## **MISSION**

Committed to the 2030 Agenda, ESCWA's passionate team produces innovative knowledge, fosters regional consensus and delivers transformational policy advice. Together, we work for a sustainable future for all.



**The Arab region may be missing  
the Fourth Industrial Revolution**  
Arab skills are still stuck in the past



United Nations  
Beirut

© 2022 United Nations  
All rights reserved worldwide

Photocopies and reproductions of excerpts are allowed with proper credits.

All queries on rights and licenses, including subsidiary rights, should be addressed to the United Nations Economic and Social Commission for Western Asia (ESCWA),  
e-mail: [publications-escwa@un.org](mailto:publications-escwa@un.org).

The findings, interpretations and conclusions expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations or its officials or Member States.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Links contained in this publication are provided for the convenience of the reader and are correct at the time of issue. The United Nations takes no responsibility for the continued accuracy of that information or for the content of any external website.

References have, wherever possible, been verified.

Mention of commercial names and products does not imply the endorsement of the United Nations.

References to dollars (\$) are to United States dollars, unless otherwise stated.

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

United Nations publication issued by ESCWA, United Nations House, Riad El Solh Square,  
P.O. Box: 11-8575, Beirut, Lebanon.

Website: [www.unescwa.org](http://www.unescwa.org).

Cover photos:  
[@istock.com/imaginima](https://www.istock.com/imaginima)



# Report team

---

## **Task manager**

Mehrinaz Elawady (ESCWA)

## **Lead authors**

Salim Araji (ESCWA)

Sama El Hage Sleiman (ESCWA)

Mohamad Nawar El Awa (ESCWA)

Maguy Abdel Ahad (ESCWA)

## **Reviewers**

Ernst, Ekkehard (ILO)

Khalid Abu Ismail (ESCWA)

Jamal Ibrahim Haidar (AUC)

## **Data science and research support**

Belkacem Ayachi (ESCWA)

Maxim Hermez (ESCWA)

Aya Kassas (ESCWA)

Samah Abdel Rahman (ESCWA)

Wafaa El Baba (ESCWA)

Elham Housseiny (ESCWA)

## **Operations**

Nada Aoun (ESCWA)

## **Editing, presentation, formatting and design**

Conference Management Section (ESCWA)



## Executive summary

---

Technologies such as robotics, the Internet of things and artificial intelligence (AI) are providing opportunities in many places, while causing significant disruptions in others. In the next 15 to 20 years, about 14 per cent of existing jobs (or about 460 million of a global workforce of 3.3 billion) and 32 per cent of new jobs (about a billion jobs) will change in response to automation.<sup>1</sup> According to the World Bank, this increase in automation will put at risk almost 57 per cent of jobs in Organisation for Economic Co-operation and Development countries, 47 per cent of jobs in the United States of America, and 77 per cent of jobs in China.<sup>2</sup> The COVID-19 pandemic has expedited the automation of many tasks, and created a substantial shift in labour markets worldwide, where new skills will be demanded while others will become obsolete. Even though jobs in the Arab region do not yet reflect this demand for digital economy skills, known as Fourth Industrial Revolution skills, such technological changes need to be adopted so that the region can keep pace with the rest of the world and create more jobs.

The present report relies on the newly developed ESCWA Skills Monitor, which encompasses big data from almost 1.7 million online job openings in the Arab region for the period June 2020 – March 2022. Using Skills Monitor results, the present report analyses whether the type of skills and jobs demanded in the region address the needs of the Fourth Industrial Revolution and the new era of

economic development. It also investigates the type of skills and jobs needed, their interconnectedness, and opportunities for reskilling and upskilling, including those skills that are trending. The report also shows how easily employees can accumulate skills, and move from one job to another using the ESCWA Skills Forest. To better relate to the future of work, the analysis reveals whether Arab labour markets are demanding tomorrow's skills, are gender and youth inclusive, and whether demanded jobs can be linked to the Sustainable Development Goals.

The present report finds that business administration-related skills are the most demanded hard skills in Arab labour markets, while communication is the most demanded soft skill. Moreover, the report shows that people tend to accumulate proportionally less market-demanded skills when government guidance is absent. Although remote working could be a tool to boost female employment, the report finds that women are less likely to telework than men. The report concludes that unlike global trends, the Arab region has failed to attract many jobs that require future work skills, such as cloud computing, blockchain, machine learning, and augmented virtual reality. If this trend persists, the Arab region may once again be missing the opportunity for a successful structural transformation by sticking to traditional sectors and subsectors where labour substitution



may be on the rise, thus resulting in structural unemployment.

Looking closely at gender inclusion, the report establishes that online job postings unintentionally avoid gender bias in their demand for skills, but job advertisements themselves are discriminatory by explicitly mentioning the needed gender for a set of skills that can be done by either women or men. Furthermore, the majority of female-targeted job openings are in entry-level jobs, and the lowest share of jobs targeting women are in management and senior-level positions, although more senior jobs have more flexible work modalities. In addition, the data reveal that job hubs in the Arab region are inclusive of and accessible to persons with disabilities; however, that does

not mean that jobs themselves are inclusive and accessible to them.

The report also reveals that accounting and restaurant operations are the most trending skills in the Arab region. Regarding AI task augmentation scores,<sup>3</sup> the average AI scoring for the region is around 34 per cent, indicating a low level of AI augmentation for tasks conducted in the region. Lastly, the Skills Forest indicates that the Arab region has a core cluster in business administration-related skills and jobs, and is not heavily diversified in science-related jobs such as information technology and engineering, meaning that there are less opportunities to upskill or reskill in these sectors. Overall, the report reveals that the Arab region may not be keeping pace with the Fourth Industrial Revolution, as most demanded skills are traditional skills.



# Contents

Report team.....	iii
Executive summary .....	iv
Acronyms and abbreviations .....	viii
Introduction .....	ix

## **1. Demanded skills and jobs** **1**

---

A. Overview .....	1
B. Current status of skills and jobs in the Arab region.....	1
C. New era of remote and hybrid work.....	4
D. E-accessibility and remote working for persons with disabilities.....	10
E. Skills misinformation: evidence from Lebanon.....	11
F. Policy recommendations.....	15

## **2. Gender equality, inclusion and sustainability** **17**

---

A. Overview .....	17
B. Gender inclusion.....	17
C. Labour inclusion for persons with disabilities .....	21
D. Youth and career progress.....	23
E. Arab jobs and their links to the Sustainable Development Goals .....	26
F. Policy recommendations.....	29

## **3. The future of jobs and skills** **31**

---

A. Overview .....	31
B. Skills with most ascending and descending trends .....	31
C. Status of artificial intelligence in Arab labour market activities .....	33
D. Skills Forest.....	37
E. Policy recommendations.....	39

## **4. Prioritizing human centred policies** **41**

---

<b>Annex 1. Data specifications .....</b>	<b>43</b>
<b>Annex 2. Impact of technology and remote working on demanded skills .....</b>	<b>44</b>



## List of figures

---

Figure 1. Online job postings data collection process .....	xi
Figure 2. Percentage distribution of online job postings according to the International Standard Classification of Occupations .....	2
Figure 3. Skill type distribution across each first level occupation .....	2
Figure 4. Top 10 demanded soft skills in the Arab region.....	3
Figure 5. Top 10 demanded hard skills in the Arab region .....	3
Figure 6. Distribution of demand for remote work across occupations.....	6
Figure 7. COVID-19 waves and online openings for remote work.....	6
Figure 8. Top 10 demanded office jobs advertised online.....	8
Figure 9. Top 10 demanded remote jobs advertised online .....	8
Figure 10. Work modality for female-targeted vacancies.....	9
Figure 11. Work modality for male-targeted vacancies .....	9
Figure 12. Gender bias in the top five occupations advertised online in the Arab region .....	18
Figure 13. Top 10 female-targeted jobs .....	19
Figure 14. Top 10 male-targeted jobs.....	19
Figure 15. Top 10 demanded hard and soft skills for female jobs vs. male jobs.....	20
Figure 16. E-accessibility score for persons with disabilities by job hub .....	22
Figure 17. Career-level distribution of online job openings in the Arab region.....	23
Figure 18. Career-level distribution of online job openings by gender .....	24
Figure 19. Work modality distribution by career level in online job openings.....	24
Figure 20. Top five demanded hard skills by career level .....	25
Figure 21. Top five demanded soft skills by career level.....	26
Figure 22. Percentage of online job openings targeting each Sustainable Development Goal in the Arab region .....	28
Figure 23. Ascending (left) and descending (right) trends of hard skills in the Arab region .....	32
Figure 24. Most 10 AI-augmented jobs in the Arab region .....	34
Figure 25. Least 10 AI-augmented jobs in the Arab region.....	34
Figure 26. Skills Forest .....	37
Figure 27. Number of online job postings by occupation categories .....	38

## List of boxes

---

Box 1. Case of Lebanon: a non-balanced reskilling and upskilling approach.....	11
Box 2. Future technologies and the status of their adoption in the Arab region .....	35

<b>References.....</b>	<b>48</b>
<b>Endnotes.....</b>	<b>49</b>

# Acronyms and abbreviations

---

<b>AI</b> artificial intelligence	<b>MIS</b> management information system
<b>API</b> application programming interface	<b>ODK</b> Open Data Kit
<b>B2C</b> business-to-consumer	<b>OECD</b> Organization for Economic Co-operation and Development
<b>CSR</b> corporate social responsibility	<b>OT</b> operational technology
<b>CSS</b> Cascading Style Sheets	<b>PHP</b> Hypertext Preprocessor
<b>DHIS2</b> District Health Information Software 2	<b>PISA</b> Programme for International Student Assessment
<b>DIP</b> digital intermediation platform	<b>QCRI</b> Qatar Computing Research Institute
<b>ERP</b> enterprise resource planning	<b>SAP</b> System Applications and Products
<b>ESCWA</b> Economic and Social Commission for Western Asia	<b>SDG</b> Sustainable Development Goal
<b>GCC</b> Gulf Cooperation Council	<b>SME</b> small and medium enterprise
<b>GDP</b> gross domestic product	<b>SQL</b> Structured Query Language
<b>ICT</b> information and communication technology	<b>TIMSS</b> Trends in International Mathematics and Science Study
<b>ILO</b> International Labour Organization	<b>TVET</b> technical and vocational education and training
<b>IMF</b> International Monetary Fund	<b>UNCTAD</b> United Nations Conference on Trade and Development
<b>iOS</b> iPhone Operating System	<b>UNICEF</b> United Nations International Children's Emergency Fund
<b>IoT</b> Internet of things	<b>VBA</b> Visual Basic for Applications
<b>ISCO</b> International Standard Classification of Occupations	<b>WCAG</b> Web Content Accessibility Guidelines
<b>IT</b> information technology	<b>WHO</b> World Health Organization
<b>KPI</b> key performance indicators	
<b>LDCs</b> least developed countries	



## Introduction

---

Previous industrial revolutions started with incredible inventions that created a large-scale and cross-border impact, causing productivity to grow exponentially while restructuring existing skills and jobs. The first revolution started when water and steam were used as an energy source for machine production. The second brought electricity to humanity, and launched the mass production of goods and services, thus creating wealthy entrepreneurs and a well-off middle-class, while most workers were villagers and migrants. The third revolution was a turning point for current generations: information and communication technologies (ICT) enhanced productivity and growth, especially where ICT complemented other factors of production.

The world is currently experiencing the Fourth Industrial Revolution, where gaps and differences

between the physical, biological and digital worlds are shrinking. It builds on the Third Industrial Revolution, with ICT as its cornerstone. However, the velocity of change and the increasing number of innovations during the Fourth Industrial Revolution are unprecedented. This revolution is making many jobs obsolete, while creating new sets of jobs. This has pushed companies worldwide and across all sectors to rush to capture in their business models the growth potential associated with adopting new technologies. For instance, it is expected that by 2022, 85 per cent of companies based in the United States of America will adopt user and entity big data analytics, while 70 per cent plan to integrate the Internet of Things (IoT), explore web and app-enabled markets, and take advantage of machine learning and cloud computing.<sup>4</sup>

### Purpose and scope of the present report

---

The commitment of the Economic and Social Commission for Western Asia (ESCWA) to leaving no one behind places it at the forefront of efforts to pioneer creative initiatives and unique technical assistance, so as to assist Arab countries in creating sufficient new and innovative jobs, updating their citizens' skill set, and reducing labour market mismatches. To do so, ESCWA started an initiative to investigate the future of work in the Arab region. Part of this initiative was to develop the ESCWA Skills Monitor: a new and up-to-date assessment tool

that is granulated enough to focus mainly on the quantity and quality of skills. This state-of-the-art tool will help countries with low dynamic data capacity to formulate advanced policies and strategies that tackle changes in skills, sudden shocks to labour markets, including those related to the Fourth Industrial Revolution, Pandemics and conflicts among others. Using the Skills Monitor, the present report focuses on the unique skills, jobs and job families demanded in the Arab region's job markets and matches them with global trends.<sup>5</sup> This includes skills and

jobs related to the Fourth Industrial Revolution, traditional skills, and jobs modalities dictated by the COVID-19 pandemic over the period June 2020 – March 2022.

The ESCWA Skills Monitor will enable member States to swiftly monitor demand for newly needed skills, thus adapting existing skills. The Skills Monitor uses big-data mining to ensure a more dynamic and agile monitoring platform for countries to assess their demanded skills and allow them to develop suitable upskilling and reskilling programmes. The Skills Monitor is extended to capture all demanded skills, including those in the informal sector. In addition to the demand for skills, the ESCWA Skills Monitor also assesses the level of inclusiveness

(gender, young people and people with disabilities) in private sector employment, sector development, job growth predictions, and SDG mapping, among others.

Data analysed in the present report was collected during the COVID-19 pandemic, in the midst of the world's efforts to digitize tasks and job activities, thus pushing the global demand of related skills to record highs. The report aims to assist member States in identifying ways to promote sustainable technological diffusion, productive and inclusive employment and decent work, as stipulated in SDG 8. The report examines the current status of skills and shows the kind of skills demanded in 1.7 million online job openings in the Arab region.

## Overview of the ESCWA Skills Monitor

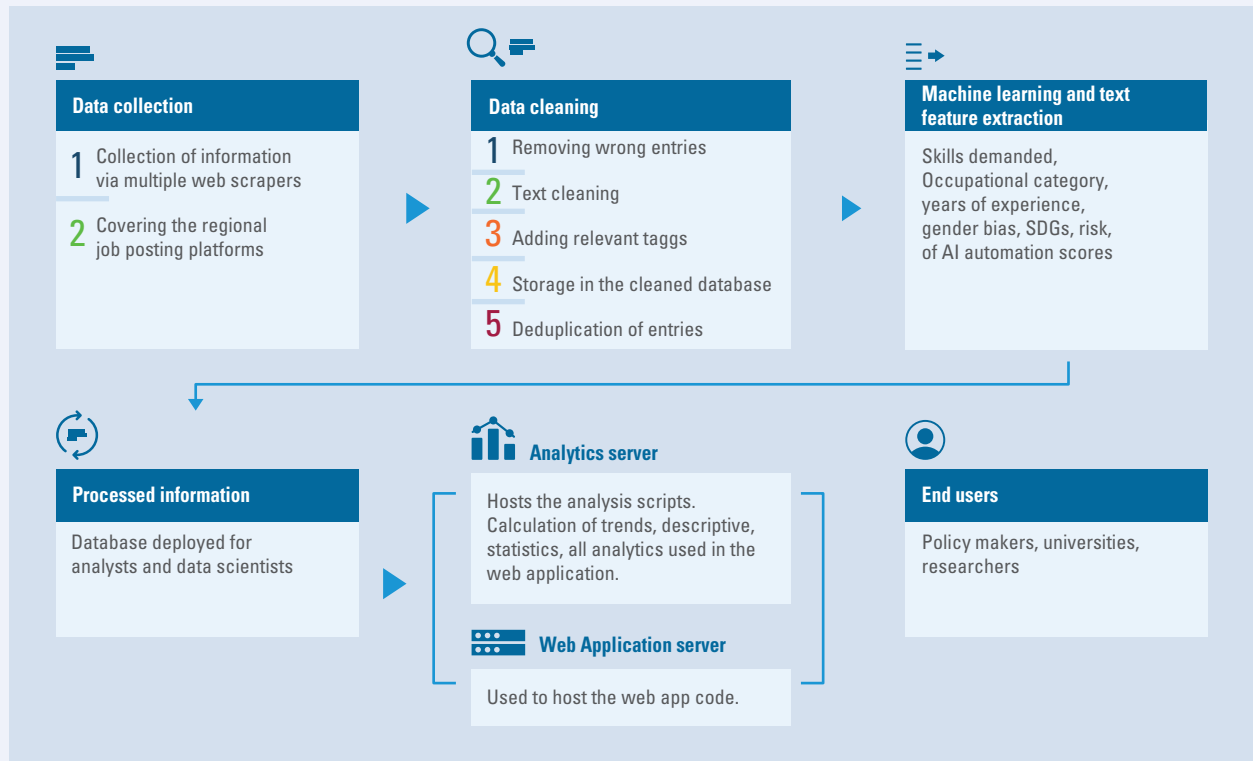
The present report relies on a wealth of data collected by the ESCWA Skills Monitor, a data- and AI-driven tool built inhouse for the collection, processing and analysis of online job openings in the Arab region.<sup>6</sup> To ensure the most complete coverage of the online job market, information from over 100 platforms was collected, covering 19 ESCWA member States. Gulf Cooperation Council (GCC) countries, Egypt, Jordan and Lebanon have the highest number of collected online jobs. The collection process, also referred to as data pipeline, is illustrated in figure 1.

The data collection, done on a once a week basis, captures the latest job postings in the Arab region from the list of platforms. The newly collected postings are cleaned of unusable characters, tagged by language, and then compared with previous data in our existing database of jobs to ensure their uniqueness across the various platforms, so as to make them “unique job openings”. Machine learning and natural language processing techniques are then leveraged to extract the relevant

features from the job opening, starting with the different skills mentioned and their types (hard or technical/soft or human skills). The years of required experience are extracted using a set of regular expressions. Gender bias in the language of the posting, or explicit gender specification from the employer, are tagged. The job title text is used to classify the occupational category according to the International Standard Classification of Occupations (ISCO) framework.<sup>7</sup> A comprehensive SDG dictionary<sup>8</sup> is used to match and tag the job description to relevant SDGs. The Skills Monitor is in continuous development: information collected to make better classifications, expand skills coverage, and provide more timely information.

The present report covers the period from June 2020 to March 2022. Over this period, the skills library of the Arab online job market reached around 12,500 unique hard skills,<sup>9</sup> which requires the development of an Arab skills taxonomy in the near future to better assess the quality of skills in the region.

**Figure 1.** Online job postings data collection process



## Technological advancements in Arab countries

In the Arab region, most employment opportunities are in traditional jobs. Recently, unemployment across the Arab region has been increasing. Moreover, labour force participation is the lowest worldwide for women and young people, and the skills mismatch between demanded skills and attained education is considerably high. Furthermore, machine share in production in many Arab countries is dominating labour share, leading to lower average wages and increasing inequality.<sup>10</sup> The outbreak of the COVID-19 pandemic came at the disadvantage of regional employment-creation efforts, putting 39 million of the region's employees at risk of losing their jobs.<sup>11</sup> In addition, many Arab jobs may soon be at risk of automation, since most jobs are in the mid-skill and low-skill categories. Consequently, some Arab countries have begun reacting to changes in the workplace, and have started developing new policies to cope with the technological changes dictated by the COVID-19 pandemic and the Fourth Industrial

Revolution. For instance, a set of coherent policies and strategies that cover the following dimensions should be formulated and updated in several Arab countries to cope with the new dynamics in the job market.

**Education policies** are required to upgrade education curriculums, train instructors, and provide graduates with the needed skills for the labour market. For example, in Saudi Arabia, the pioneering Misk Schools in Riyadh will become the first in the country to introduce AI into the classroom.<sup>12</sup> The school uses CENTURY, an AI-based platform to adapt learning to each student's individual strengths, weaknesses, behaviours and habits. Moreover, in Egypt, a draft law for establishing technological universities was approved by the cabinet in 2018.<sup>13</sup> The legislation aims to improve technical and vocational education and training (TVET), and boost the youth employability. As per the draft law, graduates of technical education will have the chance to apply to

technological universities, complete the postgraduate studies and secure better jobs.

**Training plans and initiatives** are needed to ensure that all individuals who are willing to acquire new (hard or soft) skills have the right opportunities to do so and to cope with labour market dynamics. For example, in 2018, the United Arab Emirates launched an advanced skills strategy, based on a forward-thinking approach that sets out a national framework aimed at consolidating the concept of life-long learning for citizens and residents to achieve Centennial 2071 goals.<sup>14</sup> The strategy identifies the following four main categories for future skills: basic skills, competencies, personality traits, and specialized skills to provide life-long learners and students with flexible skills applicable along various professions and sectors. A programme to help individuals acquire advanced soft and technical skills was also launched.<sup>15</sup> Soft skills cover the following aspects: foundational literacies in science, technology and finance; critical thinking, creativity, communication and collaboration; and adaptability, leadership, social and cultural awareness, empathy and growth mindsets. This programme targets the following three main segments: students of the K-12 education system, graduates, and employees with more than 15 years of experience. The National Programme for Advanced Skills has an interactive self-assessment game called Future Fit, which enables individuals to assess themselves and discover which skills they are most proficient and to improve their other skills. Moreover, in 2017, the “One million Arab coders” initiative provided free online training to 1 million young Arabs, to equip them with coding and programming skills, and prepare them for job opportunities in a knowledge and ICT-based economy.<sup>16</sup> Furthermore, to prepare young people for future jobs, the Abu Dhabi Centre for Technical and Vocational Education and Training initiated Emirates Skills, whose activities are focused on raising the awareness of career-based technical and vocational education among young Emiratis by organizing competitions, events, training programmes and technical career activities.<sup>17</sup> In Oman, royal decree No. 48/2016 established the National Training Fund to bridge the gap between available skills and the talent needs of the private sector and national projects,

and to fund training programmes aligned with the national vision and priority sectors.<sup>18</sup> In 2018, the Omani Government adopted a strategy to equip young Omanis with the capabilities and skills to keep pace with the Fourth Industrial Revolution. In this context, the National Youth Program for Skills Development was launched to provide young Omanis with the skills of the future.<sup>19</sup>

**Remote working regulations and frameworks** are also needed to adapt the labour market in the Arab region to global trends imposed by the COVID-19 pandemic. Such regulations and frameworks are empowered by the use of digital platforms in all sectors, such as education, health and public administration. For example, in Jordan, a defence order was issued in 2020 to regulate remote work.<sup>20</sup> Workers who perform their work remotely in full for institutions and establishments are entitled to their full wages. In Morocco, a draft law to formalize remote working was prepared by the Ministry of Economy, allowing administrations to permit officials to work remotely for a maximum period of one year.<sup>21</sup> It indicates that the concerned administration should bear the costs of work-related facilities, including Internet, electronic devices, software, programmes, and other related tools. Remote workers also benefit from the same rights as other employees who maintain their duties from the office, including medical insurance in case of a work accident, or medical leave when indicated by a doctor's certificate.

**AI strategies and policies** should be developed to encourage the use of AI applications in critical sectors, while preparing the needed skills and legal frameworks, and ensuring respect for international AI principles and ethics. In 2018, Tunisia issued a national AI strategy to highlight its capabilities, ambitions, and vision of AI as a knowledge-intensive sector and a lever of sustainable and equitable development, while underscoring the ethical and economic challenges posed by this emerging technology.<sup>22</sup> In 2020, the Lebanese Ministry of Industry issued the National Artificial Intelligence Strategy in Lebanese Industry (2020-2050) for the industrial sector and other entities in various economic fields pertaining to the industrial sectors. Furthermore, in 2020,

Algeria announced its first national strategy for research and innovation in AI, aimed at building an innovative society and a generation of digitally skilled citizens.<sup>23</sup> The strategy aims to improve Algerian skills in AI through education, training and research, and to strengthen these capacities as a tool for development. In the United Arab Emirates, a national AI programme was launched that includes several training activities for government employees; summer and spring camp programmes for high school students, university students and government executives; and internship programmes aimed at bridging the gap in skills required in the technology sector, and supporting young people to enable them to meet future challenges in the rapidly changing technology sector.<sup>24</sup>

In the COVID-19 era, the delivery of public services through electronic channels gained an exceptional importance globally and in the Arab region. The availability of digital government policies and strategies is critical to develop such services. For example, in Kuwait, an e-government payment system, the Tasdid platform, has been established to facilitate the payment of electricity and water bills and of traffic and immigration fines.<sup>25</sup> In the United Arab Emirates, a unified e-portal for the self-employment of skilled personnel was launched to connect national talent with various programmes and services in the private and public sectors.<sup>26</sup> Companies can also use the portal to hire national talent. Moreover, the United Arab Emirates has developed multiple mobile apps to facilitate service provision, including Wajehni which provides professional guidance for fresh graduates to identify work and internship opportunities,<sup>27</sup> and the Salamah app targeted at employers, workers and doctors to instantly report any work-related injuries.

**An innovation and entrepreneurship ecosystem** is required to enable young people and fresh graduates to establish their own businesses, create more job opportunities, and harness new technologies in producing innovative solutions and applications. For example, in 2016, Jordan launched a financial education programme to deliver financial and entrepreneurial skills training to students in grades 7 to 12 across all public, private and refugee schools.<sup>28</sup> In addition to building competence in

economics and accounting, the programme promotes twenty-first century skills such as critical thinking, negotiation and teamwork. Egypt has established many incubators, providing a stepping stone for local entrepreneurs. In 2010, the Egyptian Technology Innovation and Entrepreneurship Center was established to support young entrepreneurs in starting their own businesses.<sup>29</sup>

**Including gender and other inclusion aspects** in policies and plans is necessary to offer equal opportunities to all individuals. Such plans include digital accessibility plans for persons with disability to allow them to benefit equally from digital technologies. For example, in Tunisia, the European Bank for Reconstruction and Development established the Tunisia Women in Business Programme in 2018 to promote women entrepreneurship in the country and, more broadly, women's participation in business, by helping women-led small and medium enterprises (SMEs) access finance, know-how and non-financial business development services.<sup>30</sup> In 2021, Mauritania launched a project entitled "Vulnerable youth employability and socioeconomic integration support" to support Government efforts to ensure that women, young people (aged 15 to 24) and low-skilled primary and secondary school leavers were primarily targeted by the country's employment policy.<sup>31</sup> The project's main objective is to improve the quality of life for people aged 15 to 24 and belonging to the "not in education, employment, or training" group, especially young women, in the Brakna Region, one of the country's most disadvantaged regions, through skills development and entrepreneurship. In Lebanon, the Ministry of Education and Higher Education, with the support of the United Nations Children's Fund (UNICEF), launched a programme<sup>32</sup> to promote the development of inclusive education and ensure quality education for all children, including children with disabilities and learning difficulties. This programme targets 30 public schools in all governorates of Lebanon. Furthermore, both Oman and Qatar have invested in national e-accessibility strategies and programmes, enabling them to score high on the Digital Accessibility Rights Evaluation Index.



# 1.

## Demanded skills and jobs

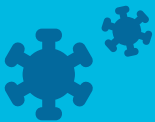
### Key messages



Unlike global trends, the Arab region shows a large gap in technological adoption reflected in high demand for traditional skills in **1.7 million jobs**. Business administration-related skills are the most demanded hard skills in Arab labour markets, while communication is the most demanded soft skill.



Almost **55 per cent** of Arab employees work in sectors that have low potential for remote work. Moreover, **women are less likely** to have the option of teleworking than men, and are mainly demanded in entry-level positions.



The **abrupt closure of several workplaces** as a result of the COVID-19 pandemic did not accelerate the adoption of teleworking in the Arab region to match global trends.



Based on a country pilot exercise, people in Lebanon accumulated only a **small portion of the market's demanded skills** after being given the option to upskill without policy guidance.

# 1. Demanded skills and jobs



## A. Overview

The new era of digital transformation demands a better understanding of the skills landscape in the Arab region. It is more important than ever to identify the most critical technical (hard) and human (soft) skills that employers are looking for; reveal the most in-demand skills for the future; and efficiently close skill gaps to successfully prepare those in the labour market for the future of work. Pinpointing the most sought-after and valued skills

in the wide market and across particular sectors helps promote and build the skills necessary to propel businesses forward and reduce unemployment. Undoubtedly, workers must continually develop knowledge and skills to get their desired job or keep their job, especially those that are related to the Fourth Industrial Revolution. Therefore, reskilling and upskilling workers' qualifications enable shifts in occupational categories that will become indispensable.



## B. Current status of skills and jobs in the Arab region

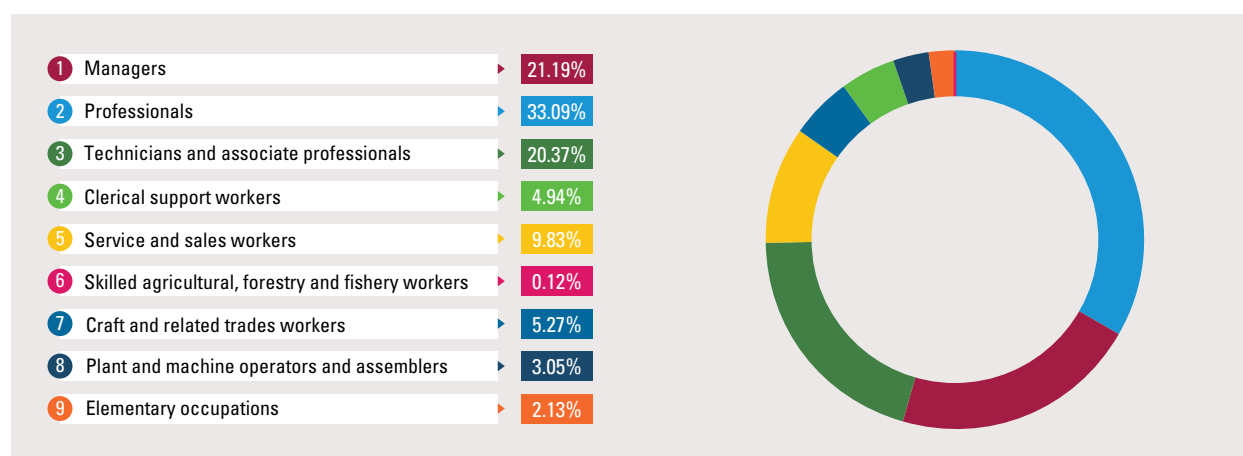
In the present report, skills are split into two types: hard skills and soft skills. Hard skills can be defined as a worker's technical knowledge, while soft skills are related to overall habits, personality traits and other interpersonal skills in the workplace. Emsi's<sup>33</sup> machine learning algorithms are used to identify the various types of soft and hard skills. Both hard and soft skills are reported according to Emsi's online corpus, which includes almost 40,000 skills extracted based on Emsi, and then

classified based on ISCO. Using the ESCWA Skills Monitor for the period June 2020 – March 2022, it is revealed that the largest number of online posted jobs in the Arab region are for professionals (33 per cent), followed by managers (21 per cent). Note that both of the aforementioned groups comprise occupations at the highest ISCO level (figure 2). This implies that a large share of current demanded occupations on the online job market in Arab countries' private sector require high skill levels.<sup>34</sup>

Analysing skill types under the first ISCO level shown in figure 3 indicates that, except for clerical support workers<sup>35</sup> for whom soft skills are demanded slightly more than hard skills, all major groups demand hard skills more than soft skills. This stresses the importance of long-life training, with specific hard skills dictating who will get jobs in the future. In contrast, soft skills may not be easily automated and may always be in high

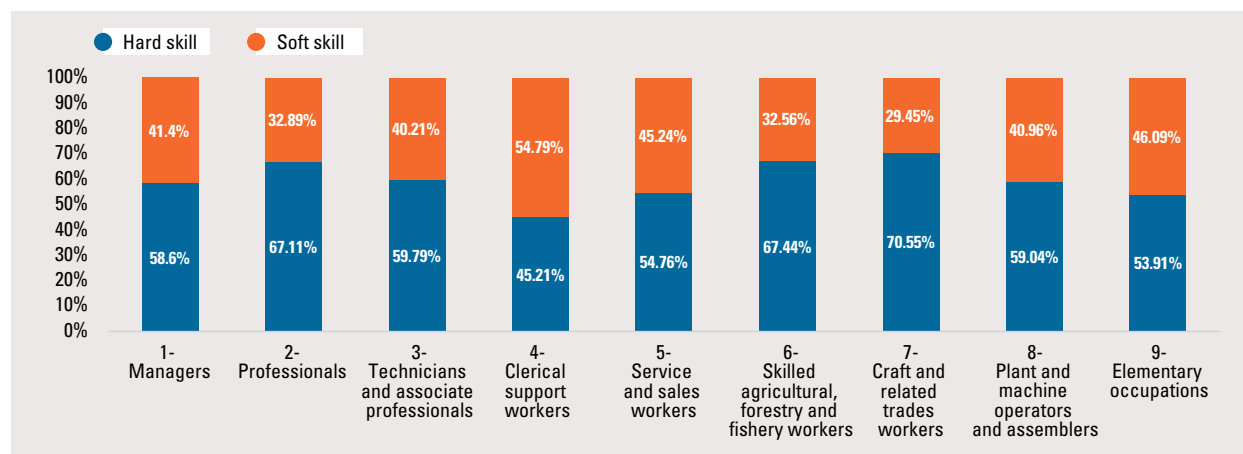
demand. State intervention in accumulating soft skills could start as early as secondary schooling. Looking at the demand for skills and without knowing whether hard skills will be demanded in the short, medium or long term, the analysis reveals that more hard skills will be demanded across almost all professions. At the same time, hard skills are more likely to change over time compared with soft skills.

**Figure 2.** Percentage distribution of online job postings according to the International Standard Classification of Occupations



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 3.** Skill type distribution across each first level occupation

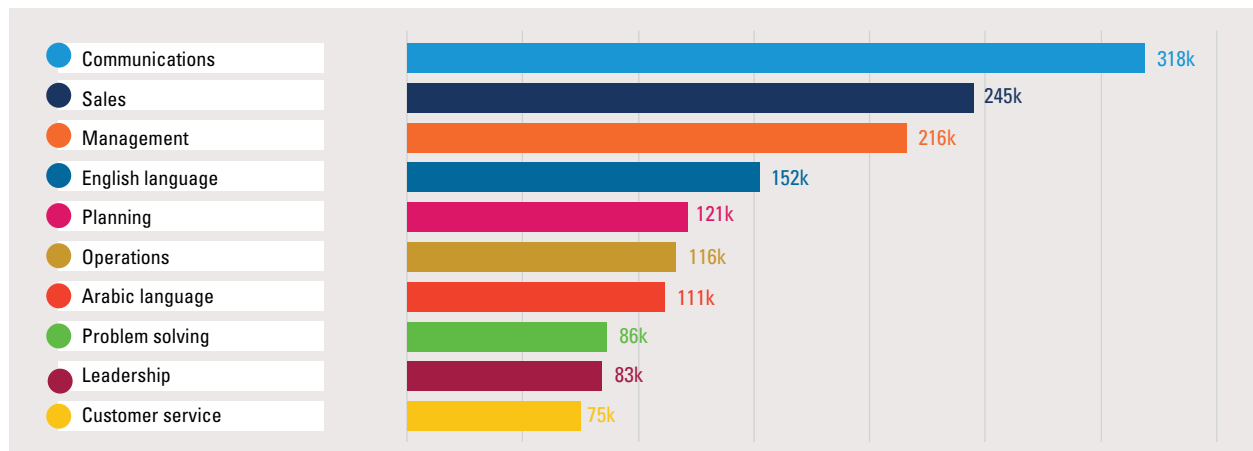


Source: ESCWA calculations based on the ESCWA Skills Monitor.

Figures 4 and 5 respectively illustrate the most in-demand soft and hard skills across the Arab region. Whereas hard skills are applicable to specific jobs, soft skills are applied not only to one specific job but also to everyday life. Figure 4 shows that communication skills are the most essential soft skills<sup>36</sup> in the Arab labour market. Good communication allows workers to not only clearly express their thoughts, but also to bridge gaps among colleagues, especially in team settings. Furthermore, communication

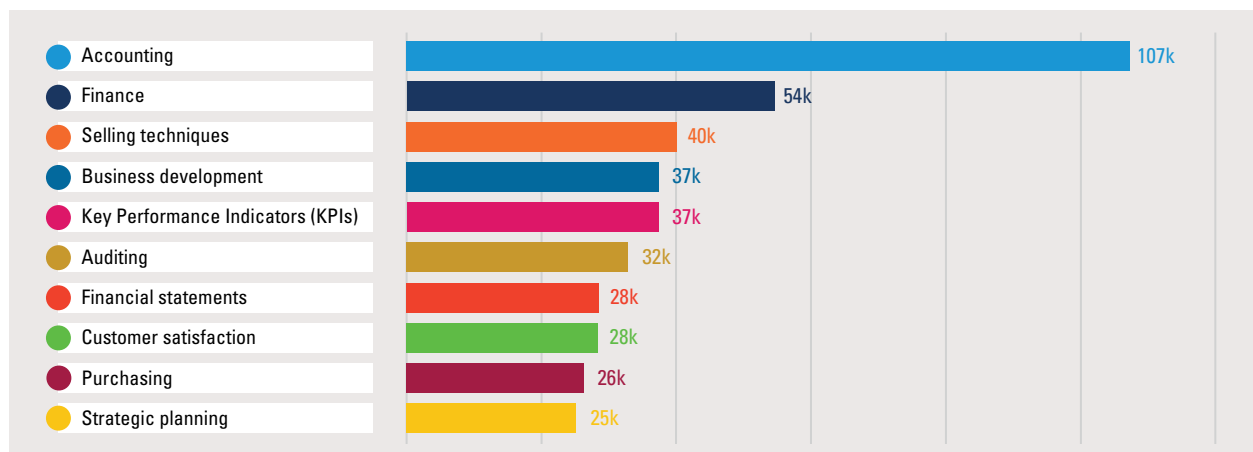
is considered a cornerstone of new work modalities, as evidenced during the COVID-19 pandemic. Nonetheless, despite its importance, communication did not make it onto the most demanded skills list globally in 2021. Observing the top five soft skills under the first ISCO classification for all major groups (except technicians and associate professionals), communication is identified as the most required soft skill, thus stressing the importance of communication as a soft skill across all occupations.

**Figure 4.** Top 10 demanded soft skills in the Arab region



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 5.** Top 10 demanded hard skills in the Arab region



Source: ESCWA calculations based on the ESCWA Skills Monitor.

Command of English also seems to be one of the most needed soft skills in Arab countries. In Arab labour markets, language skills provide workers with a competitive advantage over their monolingual peers. Employers seek candidates who are able to seamlessly communicate with overseas customers in continuously expanding markets that are interconnected with global value chains. Problem solving is also another soft skill needed most for the future of work across the Arab region. Comparing the present report's findings with the globally most in-demand hard and soft skills for 2020 (identified by LinkedIn) and 2021 (identified by Indeed), sales and management are the only two soft skills that are common between Arab demanded skills and globally demanded ones.

Regarding hard skills, figure 5 demonstrates that accounting is the most in-demand hard skill across the Arab region. Even though accounting might be one of the skills that may be automated in the near future, it is still frequently demanded in the Arab region. This is not surprising since most jobs in the region are in the services sector, and accounting as a skill and occupation is traditionally cross-cutting in most professions.<sup>37</sup> Figure 5 also demonstrates the importance of selling techniques, auditing and other business administration-related skills as core demanded skills in the Arab region.

Based on these demanded technical skills in the Arab region, a key question arises regarding whether the region is on the right side of economic development based on the most demanded skills and its connection to technological adoption. To answer this question, the present report investigates the demand for skills based on their links to the Fourth Industrial Revolution. For instance, according to Indeed, the following are the top 10 skills in demand for 2021: cloud computing, AI, sales leadership, analysis, translation, mobile app development, people management, video production, audio production, and user experience design. Figure 5 shows that skills in the Arab region do not match the most demanded skills globally. This is a clear indication that the Arab region still lags behind the rest of the world when it comes to the demanded skills that drive the Fourth Industrial Revolution. The question may arise as to why the Arab region should rush into keeping pace with the Fourth Industrial Revolution since most demanded skills are traditional ones. However, global trends have shown that labour substitution is taking place at a faster pace in developing and least developing countries, where upskilling for technological augmentation is becoming a necessity. A re-skilling and life-long learning culture is needed in the Arab region, given that many traditional jobs will be substituted by machines soon, as evidenced in the banking and tourism sectors worldwide.

## C. New era of remote and hybrid work

The idea of remote work from outside the traditional office space has been increasingly embraced over the past couple of years. This modality has been supported by advancements in Fourth Industrial Revolution technologies and trends,

powered by improved communication technologies, digitalization, and augmented or virtual realities. The pandemic has accelerated the work-from-home transition, and acted as a catalyst to a long-overdue shift in work modalities worldwide. It has



also forced several businesses globally to rethink traditional work setups and find ways to keep their employees safe, thus requiring employees to work remotely.

Globally, pre-pandemic remote working growth was mostly represented in the United States of America, where remote work growth reached 65 per cent between 2014 and 2019.<sup>38</sup> Although the pandemic entailed an unprecedented shift to remote work, today this working modality is applicable in certain sectors and unattainable in many others (table below). Currently, on a

global scale, remote work is most notable in ICT-reliant sectors, services sectors, and among professionals and managers, while other occupations, such as frontline workers and workers with lower levels of skills, have not been widely encompassed in the “new normal” transition. The abrupt closure of several workplaces as a result of the pandemic ushered in a new era of telework and accelerated its adoption in many sectors in the Arab region. However, as shown in table below, many sectors with significant numbers of employees have a lower potential for remote work.

### Potential for remote work and share of employment by economic activity in the Arab region

	Baseline potential for remote work	Impact of COVID-19 on remote work potential	Sectoral share of employment in the Arab region (percentage)
Agriculture, forestry and fishing	Low	Low–medium	19.9
Mining	Low	Medium	1.1
Manufacturing	Low	High	9.8
Utilities	Medium	Low	1.0
Construction	Low	Medium	13.0
Wholesale and retail trade,	Medium–high	High	14.9
Transport, storage and communication	Low	Medium–high	7.1
Accommodation and food service	low	High	2.9
Financial activities and insurance	High	Medium	0.9
Real estate, business and administration	Medium	High	3.8
Public administration and compulsory social security	Medium	Low	9.2
Education	Medium-High	Low	7.3
Human health and social work	Low	Low	3.0

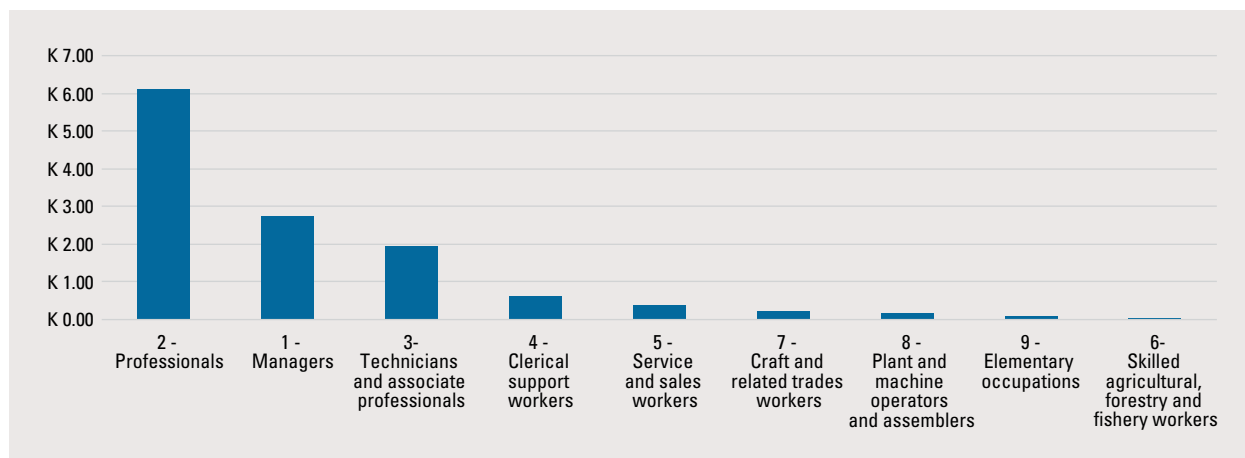
**Sources:** ESCWA calculations based on McKinsey (2020) Global Institute analysis, ILO (2019b) modelled estimates, and ILO (2020a). COVID-19: Labour Market Impact and Policy Response in the Arab States. Briefing Note with FAQs.

**Note:** The second column represents the potential for transition into remote working across each economic activity pre-COVID-19, while the third column illustrates the impact of the pandemic on the likelihood of this transition.

The table above shows that almost 57 per cent of Arab employees are working in sectors that have a low potential for remote working. At the same time, these sectors also incubate the most informal and low value-adding activities (such as agricultural and construction), which have nearly zero potential for performing tasks remotely.

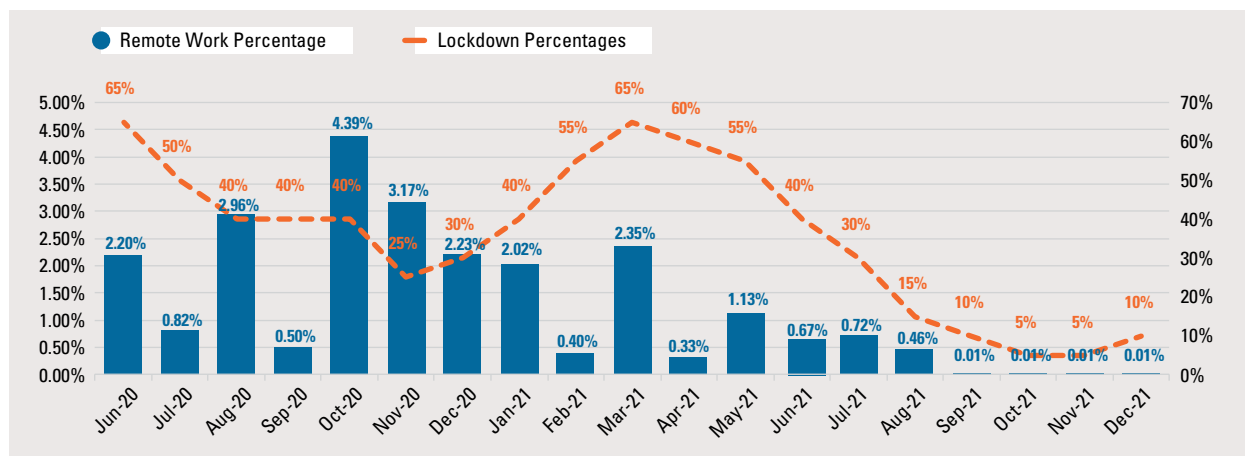
To validate the above global trends, an investigation was conducted of jobs tracked by the ESCWA Skills Monitor from June 2020 to March 2022, which found that telecommuting trends were not popular across main occupations in labour intensive sectors, such as the agricultural, forestry and fisheries sector, and the tourism sector.<sup>39</sup>

**Figure 6.** Distribution of demand for remote work across occupations



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 7.** COVID-19 waves and online openings for remote work



Source: ESCWA calculations based on the ESCWA Skills Monitor.

Note: The dotted line represents the percentage of countries in the Arab region having a complete lockdown for at least two weeks.



Although the pandemic has caused various challenges for employers and employees, the benefits and limitations of remote work are now clearer. Figure 6 shows the distribution of remote work across demanded occupations in the region. Based on the ESCWA Skills Monitor, and within the three most demanded job families, remote work seems to be offered mostly in professional job openings then in managerial job openings, and less in technician and associate professional job openings. It is not surprising that activities requiring mechanical tasks, such as machine operators, elementary occupations and agriculture activities, are among the least to demand remote work.

The pandemic has changed the way many companies operate and has altered “where” work is done. Figure 7 shows variations in job opening explicitly mentioning remote work in the Arab region, along with the lockdown rate<sup>40</sup> in each corresponding time period (from June 2020 to December 2021). We have modelled the remote jobs percentage out of the total job openings in the region over time to see how employers’ demand for remote work varied during the pandemic. Job openings that do not specify a possible remote work modality are assumed to request physical presence in the work

premises. In general, the share of remote jobs advertised online is low levels in the region. The abrupt closure of several workplaces as a result of the pandemic encouraged a shift to teleworking but did not significantly accelerate its adoption in the Arab region. The highest percentage for online job openings indicating a remote work modality was during October 2020 (4.39 per cent) when the lockdown rate was around 40 per cent. As lockdown measures began to ease (November 2020), the percentage of remote jobs started to trend downwards. However, when the lockdown rate resurged to reach a maximum of simultaneous lockdowns in the region (65.42 per cent) in March 2021, the momentum was already lost and recruiters shied away from advertising jobs featuring remote work modalities. This might signal that the region is not ready to move to remote work. The associated costs of remote work, its institutional and corporate governance, and the absence of necessary infrastructure for its success may contribute to its low adoption in the Arab region. Moreover, this market behaviour could be motivated by the availability of COVID-19 vaccinations, which make the workplace a safer environment given that the share of remote jobs records a low 0.01 per cent in September 2021 once vaccinations became widely available.

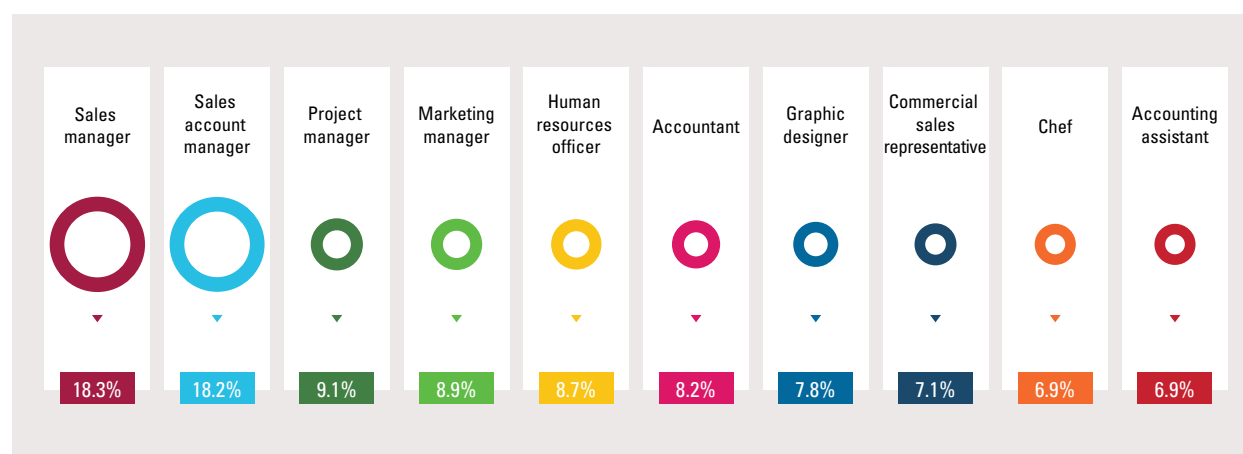


©iStock.com/Kateryna Onyshchuk

Figures 8 and 9 set out the top 10 demanded office jobs and the top 10 demanded remote jobs advertised online in the Arab region between June 2020 and March 2022. The ESCWA Skills Monitor indicated that ICT system developers, sales account managers, and software developers were among the top professions providing telework. Consequently, it could be inferred that these three occupations offer flexible work arrangements in the region. Although

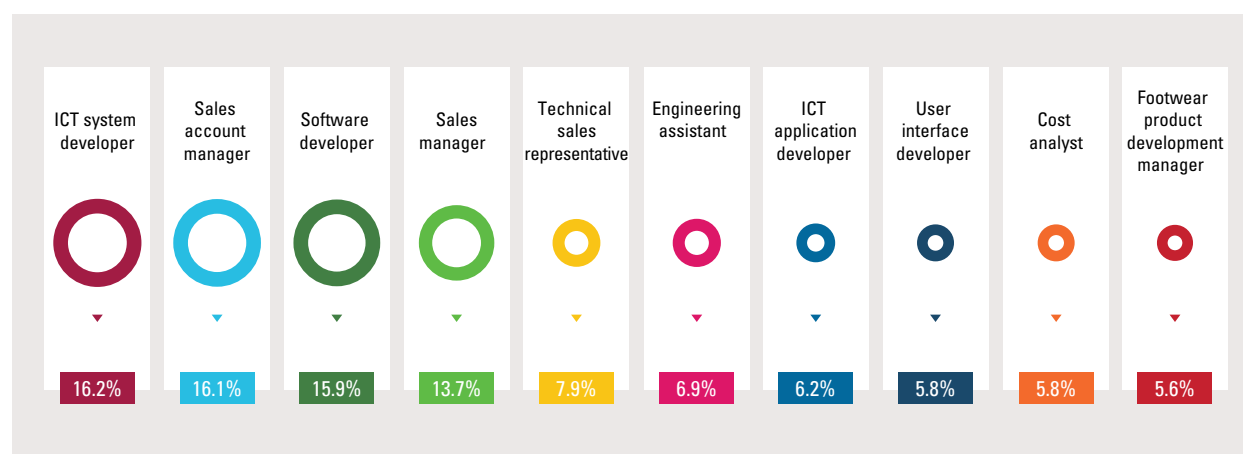
the transition to remote work arrangements is expected to gain momentum, some sectors and occupations have been slow to embrace this trend, especially since most employment in the region is in sectors that have a low likelihood of remote employment. Figure 8 shows the top 10 demanded office jobs. The responsibilities and nature of such occupations prevents them from lending themselves to remote work, whether in the region or globally.

**Figure 8.** Top 10 demanded office jobs advertised online



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 9.** Top 10 demanded remote jobs advertised online

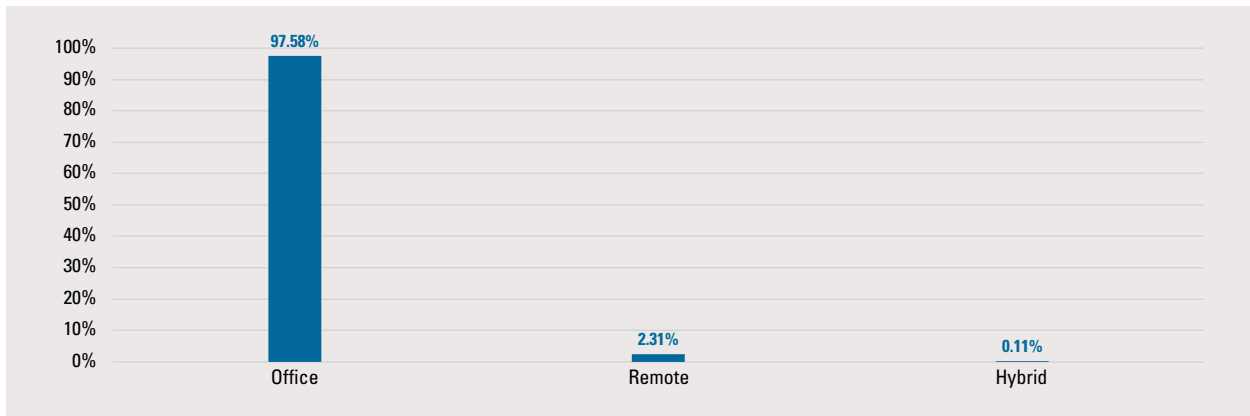


Source: ESCWA calculations based on the ESCWA Skills Monitor.

Figures 10 and 11 do not indicate stark gender differences when it comes to the type of work modality. However, based on the ESCWA Skills Monitor, job openings that specify a remote work modality are more oriented towards recruiting men. Particularly, the results convey that more male-targeted job openings (3.04 per cent) advertise for remote work modality compared with female targeted jobs (2.31 per cent). This may be because most female-targeted jobs are at the entry level, with fewer teleworking opportunities compared with other jobs with different seniority levels. As conveyed by the International Labour

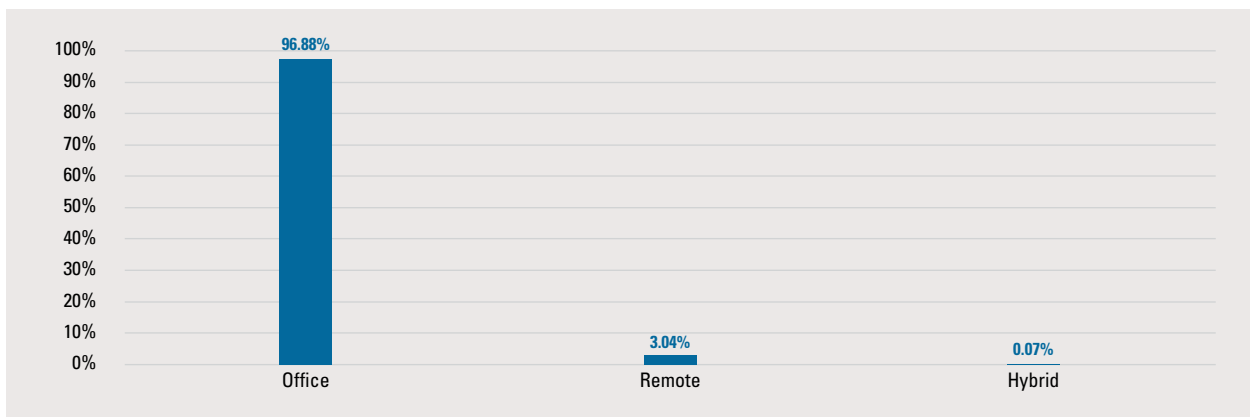
Organization (ILO) (2020b), remote working might disproportionately disadvantage women, given that women must typically undertake household chores and childcare, in addition to paid work. Since political instability and gender-biased social norms are considered the biggest hurdle facing female economic participation, promoting telework for women could better integrate them in the labour force and reduce female unemployment, which is a major issue in the Arab region. However, this cannot be attained without providing the means to telework, such as access to technology and appropriate living space with privacy to work.

**Figure 10.** Work modality for female-targeted vacancies



**Source:** ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 11.** Work modality for male-targeted vacancies



**Source:** ESCWA calculations based on the ESCWA Skills Monitor.



## D. E-accessibility and remote working for persons with disabilities

Remote working could unlock more employment opportunities for persons with disabilities. The global disability movement has long advocated for online and remote working arrangements, which would provide many job seekers with disabilities the opportunity to work from home rather than face transport and workplace barriers. Adopting remote working is not a substitute for ensuring more inclusive workplaces and advancing physical and digital accessibility. However, all these approaches can be pursued in parallel, making the workplace more accessible while providing remote-working arrangements.

Furthermore, in the age of the Fourth Industrial Revolution, automation and advanced technology, e-accessibility and digital inclusion should be at the

centre of the digital transformation. E-accessibility refers to the ease of use of ICTs, such as the Internet and online services, by persons with disabilities, and is based on the principle that websites should be developed so that all users can access the information. To promote e-accessibility, websites, tools, digital equipment, applications, web-based government services and digital content must be designed and developed so that people with disabilities, of all ages, can use them. More specifically, individuals with disabilities must be able to perceive, understand, navigate and interact with the web; and contribute to digital content and online applications.<sup>41,42</sup>

Lastly, since remote workers may or may not enjoy a more balanced work-life schedule, there are also concerns about



the skill readiness of workers to telework, especially in middle- and low-income countries with poor ICT infrastructure. The pandemic has definitely accelerated trends that previously struggled to gain traction before the outbreak of COVID-19, which has disrupted where and how work is done. Companies have been considering how to establish workspaces that enhance the safety of employees in the wake of the pandemic, so remote work

is expected to persist for the foreseeable future. The shift to virtual interactions accompanied by the surge in the use of digital platforms will most likely reshape future operation methods for a large segment of the workforce, even after the pandemic recedes. Overall, arrangements that encompass the use of non-traditional locations and job structures must consider whether operational continuity is threatened by telework.



## E. Skills misinformation: evidence from Lebanon

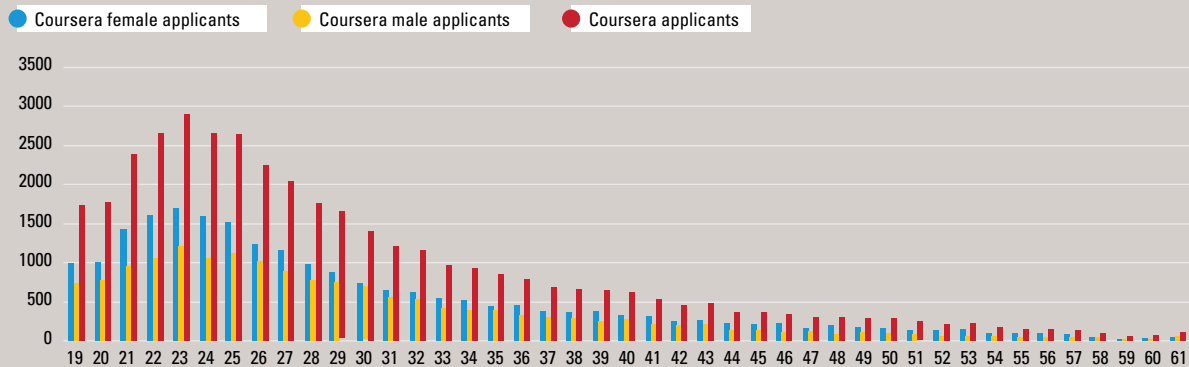
Based on PISA and TIMSS international examination results, the Arab region showed poor education quality and the irrelevance of training programmes that do not match labour market needs. This may be driven by a lack of public guidance and private sector involvement in the design of quality training and

education curriculums, and weak information sharing between employers and potential employees. According to the World Bank Enterprise Survey, around 40 per cent of firm owners claim that in the Arab region, the inadequately educated workforce is a big obstacle to firm owners.<sup>43</sup>

### Box 1. Case of Lebanon: a non-balanced reskilling and upskilling approach

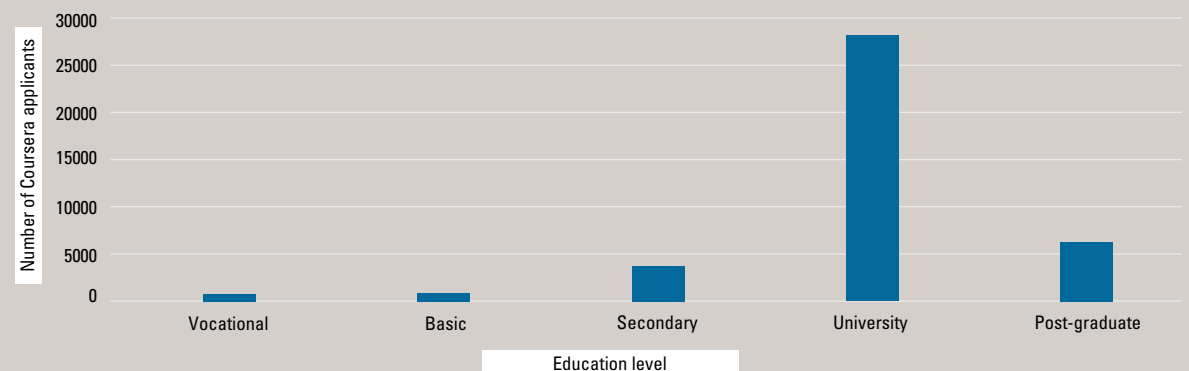
Reskilling and upskilling guidance in the Arab region has an important role to play, given the large gap between attained skills and those required in the job market. To estimate this gap, ESCWA piloted a field study in partnership with the Lebanese Ministry of Labor, and launched an initiative (“لأنّ العلم مفتاح العمل، #لازم\_نتعلم”) which offered unique free-of-charge and certified learning opportunities on the e-learning platform Coursera. This initiative provided Lebanese citizens with the chance to choose from over 3,000 online training courses. A total of 39,792 applicants registered, and 25,000 completed 44,377 courses of their choice (equivalent to 549,517 learning hours), thus accumulating various types of skills in multiple domains. Many applicants attained the needed skills, but many others several courses whose skills are not needed in the Lebanese job market. For example, of the first 260 demanded skills in the Lebanese market, only 42 per cent were taken by Coursera applicants. This percentage dropped drastically when looking at the top 1,000 demanded skills. According to the figures below, most applicants in the Coursera initiative were young people, with the post-university degree age bracket comprising the largest number of applicants. Of almost 39,792 applicants, 26,426 were between the ages of 19 and 29. The gender gap was obvious across all ages, with females outnumbering males in courses taken in all specialties.

### Coursera applicants by age



Source: ESCWA calculations.

### Coursera applicants by education level



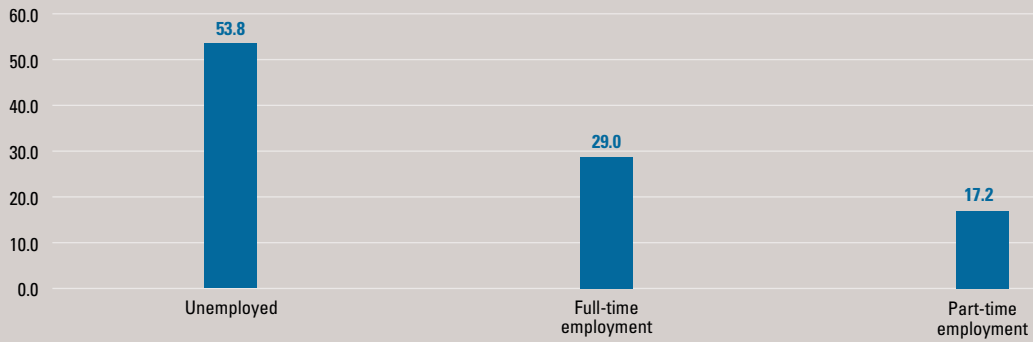
Source: ESCWA calculations.

The number of courses relating to the Fourth Industrial Revolution and the future of work increased by the level of education. The figure above shows that more applicants with higher education levels applied to participate in Coursera courses, highlighting the large gap between applicants with vocational education and those with university degrees. Regarding the future of skills, 42 per cent of higher education applicants completed courses directly related to the Fourth Industrial Revolution and the future of work. This number dropped slightly to 38 per cent among applicants with pre-secondary education.

The figure below reveals that the majority of Coursera applicants were unemployed (53.8 per cent) in 2020.<sup>a</sup> As reported by ILO, the unemployment rate in Lebanon for 2020 was 37 per cent, driven by the COVID-19 lockdowns and the Beirut port explosion. Among the unemployed Coursera applicants, 83.7 per cent belonged to the junior and mid-career age brackets, and 60.4 per cent were females (figures below, respectively).

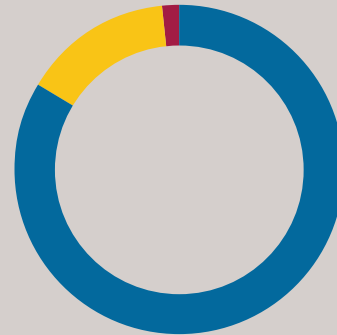
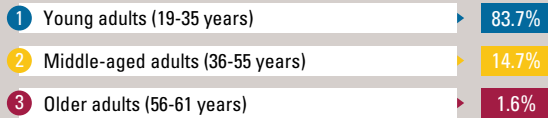
<sup>a</sup> As per the Coursera Dashboard, out of 39,792 applicants to this Coursera initiative, 21,394 were unemployed in 2020.

### Employment status of Coursera applicants age bracket



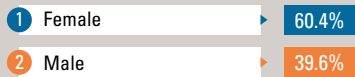
Source: ESCWA calculations.

### Unemployed Coursera applicants by age



Source: ESCWA calculations.

### Unemployed Coursera applicants by gender



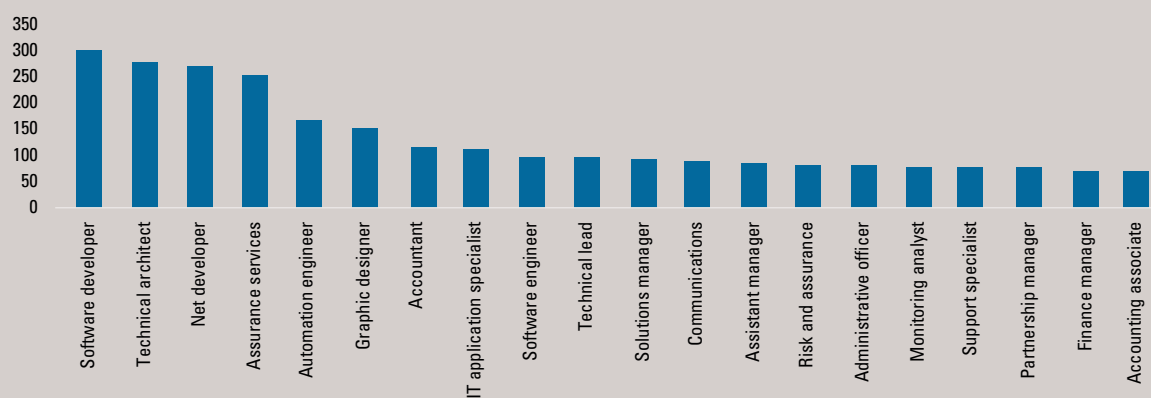
Source: ESCWA calculations.



Most courses taken by business-major applicants were business-related. However, there was a large number of business-major applicants taking courses in areas related to the future of work, such as blockchain, data science, cloud computing, digital marketing and advertising, Excel VBA, along with many demanded soft skills. Applicants who specialized in health-related topics (12.5 per cent) mostly completed health-related courses. However, applicants with arts and humanities backgrounds (10.5 per cent) took a wide range of soft and hard skills courses. Physical science and engineering majors (15.5 per cent) took various engineering and computer-related courses. They also took key soft skills courses, mainly related to leadership and project management. Information technology (IT) and computer science applicants (15 per cent) had a higher tendency to learn data science skills. Besides computer science related topics, IT and computer science applicants focused on data science, machine learning and AI.

As shown in figure below, results of the ESCWA Skills Monitor reveal that the highest percentage of online job openings in Lebanon are as follows: software developer followed by technical architect, net developer, assurance services senior associate, and graphic designer. All these areas require strong computer and programming skills.

#### Job openings for different job titles, Lebanon



**Source:** ESCWA calculations based on the ESCWA Skills Monitor.

According to the ESCWA Skills Monitor, the most demanded hard skills in the Lebanese job market are business administration, graphic design, and IT-related skills. Communication, sales and management are the most demanded soft skills. Among the most popular 20 hard skills in Lebanon, the highest in-demand hard skills are Java (programming language) and application programming.

Taking the 260 most demanded skills in Lebanon, Coursera applicants accumulated 42 per cent of these skills in addition to their baseline skill set. Only about 1,000 Coursera applicants gained the 10 most demanded skills mentioned above. Although this might imply that Coursera applicants had already acquired those skills, applicants might also not have been aware of the skills demanded in the Lebanese labour market. If the former is true, then applicants only need the tools for self-upskilling or reskilling. If the latter is true, then applicants need more guidance on the skills they are missing. Joint efforts between Governments and educational institutions are therefore required to equip labour market participants with relevant soft and technical skills. Building a labour market information system would also reduce labour market information gaps, and create the right upskilling/reskilling environment.



## F. Policy recommendations

**The following policy recommendations highlight key initiatives that could promote regional technological adoption and adaptation:**

**1**

Benefit from opportunities created by the Fourth Industrial Revolution and keep pace with the rest of the world by structurally transforming Arab economies towards more technological diffusion. Productive jobs require productive firms and vice versa. This can be done by building the right infrastructure for non-traditional sectors, such as the digital economy.

**2**

Encourage Arab Governments to guide the nationwide skill sets by reducing labour market information gaps by building labour market information systems and creating the right upskilling/reskilling/TVET programmes based on ESCWA Skills Monitor recommendations.

**3**

Build the connection between private sector research and development investments and educational research entities for better technological adaptation, adoption and innovation. This could be done through partnerships, joint research and additional research and development spending in countries with adequate research and development enabling environment, such as GCC countries.

**4**

Promote teleworking as a booster for female employment to integrate more women into the labour force, and to reduce female unemployment which is a major issue in the Arab region. This is most relevant in countries where political instability and traditional cultural norms are key issues impeding female employment. Remote working can be used as a tool to reduce female unemployment and increase their economic empowerment.

# 2.

## Gender equality, inclusion and sustainability

### Key messages



While many jobs target both women and men, many other occupations are **gender exclusive**.



Many job advertisements explicitly or implicitly target a **specific gender for a job opening**. However, the needed skills in these job advertisements are **gender neutral** by definition.



Most in-demand **female-targeted jobs** are in **entry-level jobs**, while the lowest share of jobs targeting women are in management and senior-level positions, even though more senior jobs have more flexible work modalities.



Job openings in the Arab region are inclusive of and accessible to persons with disabilities; however, **no job openings target persons with disability**. Moreover, there is no evidence that most jobs can accommodate persons with disabilities.



**Communications** and **accounting** are the **most demanded skills** at any career level, while project management, quality control, planning, and leadership are only demanded at mid and senior career levels.

## 2. Gender equality, inclusion and sustainability



### A. Overview

The gender gap is still significant in all Arab countries, where access to jobs, finance and land, and asset ownership remain low for women compared with other regions worldwide. Youth unemployment is also high, with the Arab region recording the highest level of unemployment among female youth globally. Regarding persons with disabilities, although the region has advanced significantly in promoting better access to job hubs, it still faces challenges related to incorporating people

with disabilities and accommodating them in decent jobs. According to the World Health Organization (WHO), an estimated 15 per cent of the world's population are persons with disabilities.<sup>44</sup> In the Arab region, national data on disability prevalence rates varies between 0.2 per cent in Qatar, 1 per cent in Mauritania, and 4.8 per cent in the Sudan.<sup>45</sup> Prevalence rates in the region are likely higher than reported, owing to various challenges in disability identification and data collection methodologies.<sup>46</sup>



### B. Gender inclusion

Disruptive changes in the workplace brought by the Fourth Industrial Revolution have delivered mixed signals. It is still unclear whether new work modalities worsen, reduce or sustain existing gendered inequalities. In the Arab region, many economic opportunities have been created for Arab women; however, unemployment is still significantly high and gender bias in employment (and

economic participation in general) remains widespread. The unemployment rate among Arab women was 20 per cent in 2019 compared with only 7.8 per cent among Arab men. Female youth unemployment in the Arab region is the highest worldwide. Employed women in the region are clustered in public or quasi-public firms with significant glass ceilings, as the number of women

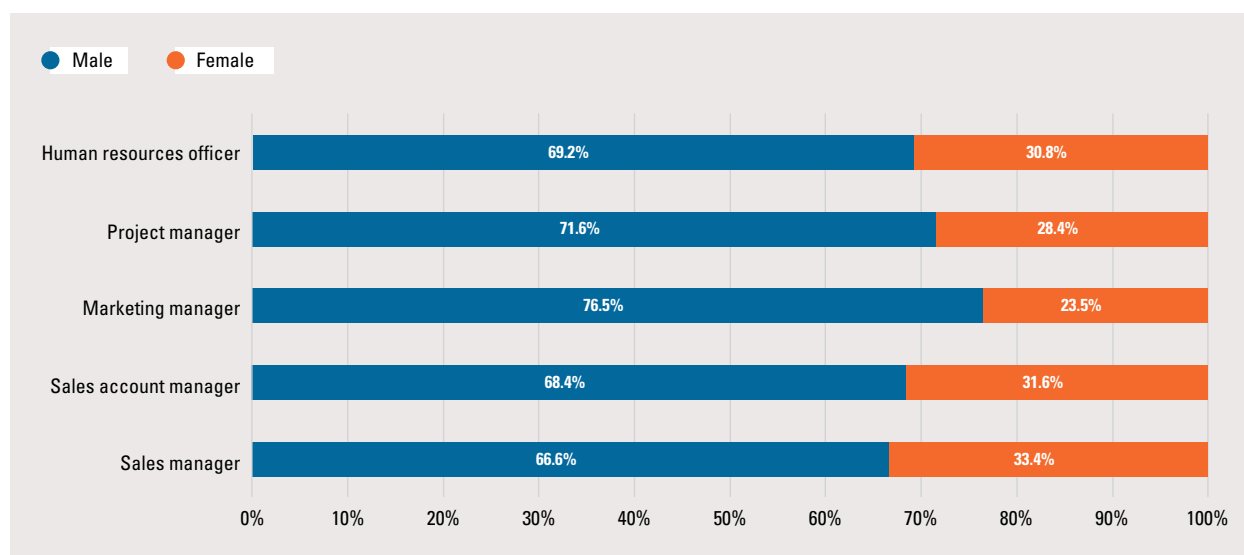
in management positions is the lowest worldwide.<sup>47</sup> For this reason, we tested how sensitive job advertisements are to gender equality in the Arab job market at different levels of seniority.

According to the ESCWA Skills Monitor, nearly 55 per cent of online job openings in the Arab region target males, whether explicitly or implicitly, while 32 per cent target females only and 12 per cent are gender neutral. This classification was based on a dictionary of masculine versus feminine wording, which assigns a gender bias label to a job description. The dictionary is developed by Gaucher, Friesen and Kay (2011) who employed experimental and archival analyses. Within a random sample of job openings, they verified the existence of indirect but systematic differences in wording. Their findings revealed that job openings for male-dominated areas used masculine wording more than openings within female-dominated areas. However,

no difference was noticed between male-dominated areas and female-dominated areas when it came to the use of feminine wording. The consequences of extreme masculine wording were later tested across three experimental studies. When job openings were created to comprise more masculine than feminine wording, these jobs became less appealing to women, and more men were perceived in these occupations.<sup>48</sup>

Figure 12 shows the top five online advertised jobs in the region (sales manager, Sales account manager, marketing manager, project manager and human resources officer) also reveal the preference for men in their job recruiting advertisements. This is alarming as it does not only affect those who apply, but also those who get hired. Such a screening process factions jobs based on gender, and entrenches the gender-biased cultural and social norms that have prevailed in the region for decades.

**Figure 12.** Gender bias in the top five occupations advertised online in the Arab region

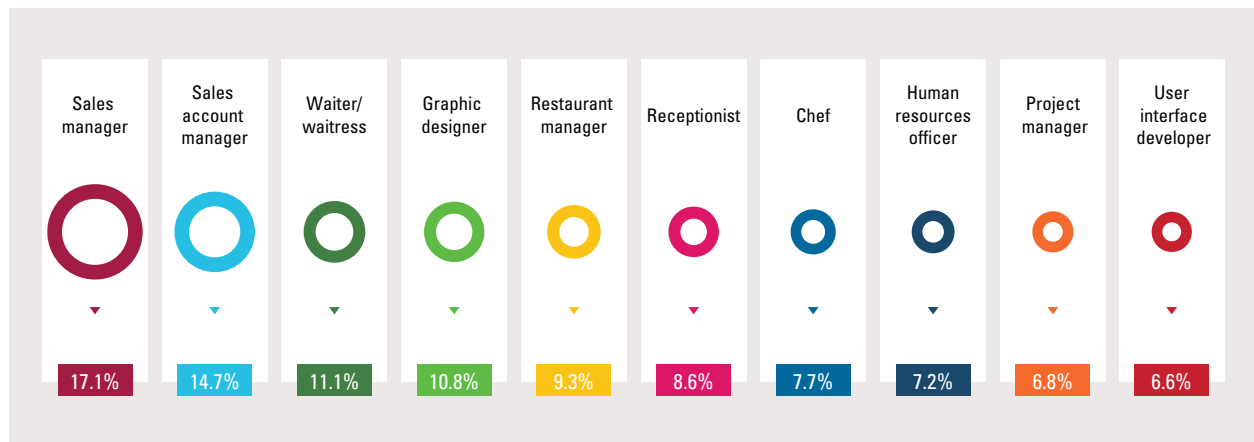


**Source:** ESCWA calculations based on the ESCWA Skills Monitor.

Figures 13 and 14 show the top 10 female-targeted jobs and the top 10 male-targeted jobs. Sales managers, sales account managers, human resources officers, project managers, and restaurant managers are among the top 10 online posted jobs for both males and females. The results do not confirm gender disparity further along the responsibility ladder across the Arab region, precisely in decision-making roles. However, as stated previously, the number of women in managerial positions is significantly lower than the number of men occupying such

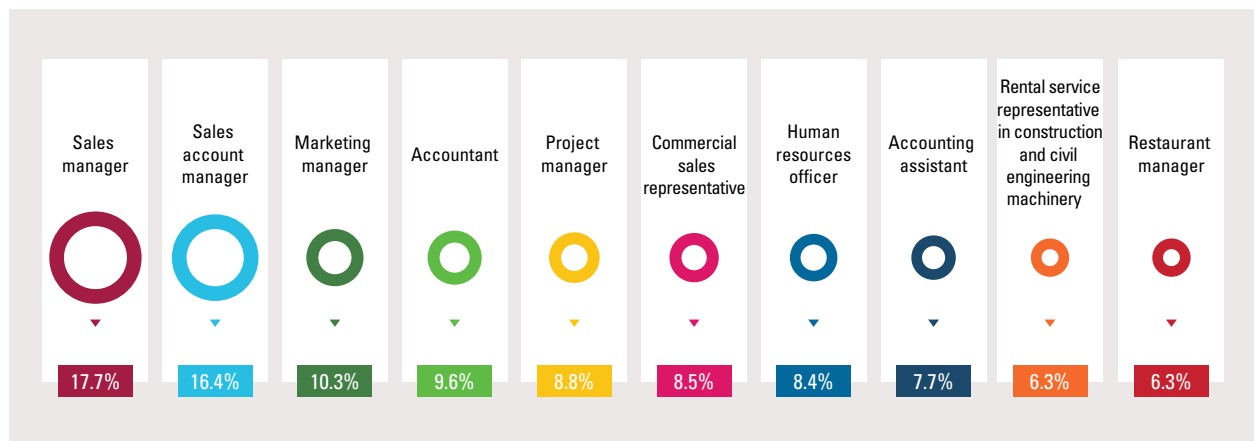
positions. ESCWA and ILO (2021) claim that the Arab region noticeably lags behind the world, with less than 5 per cent of the region’s studied enterprises having a female top manager compared with over 15 per cent worldwide. However, it can also be inferred from figures 13 and 14 that demanded jobs stress that women should have an edge over males in creative fields given the existence of two creative jobs (graphic design and user interface development) in the top 10 female-targeted jobs, while no creativity based jobs are detected in the top 10 male-targeted jobs.

**Figure 13.** Top 10 female-targeted jobs



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 14.** Top 10 male-targeted jobs

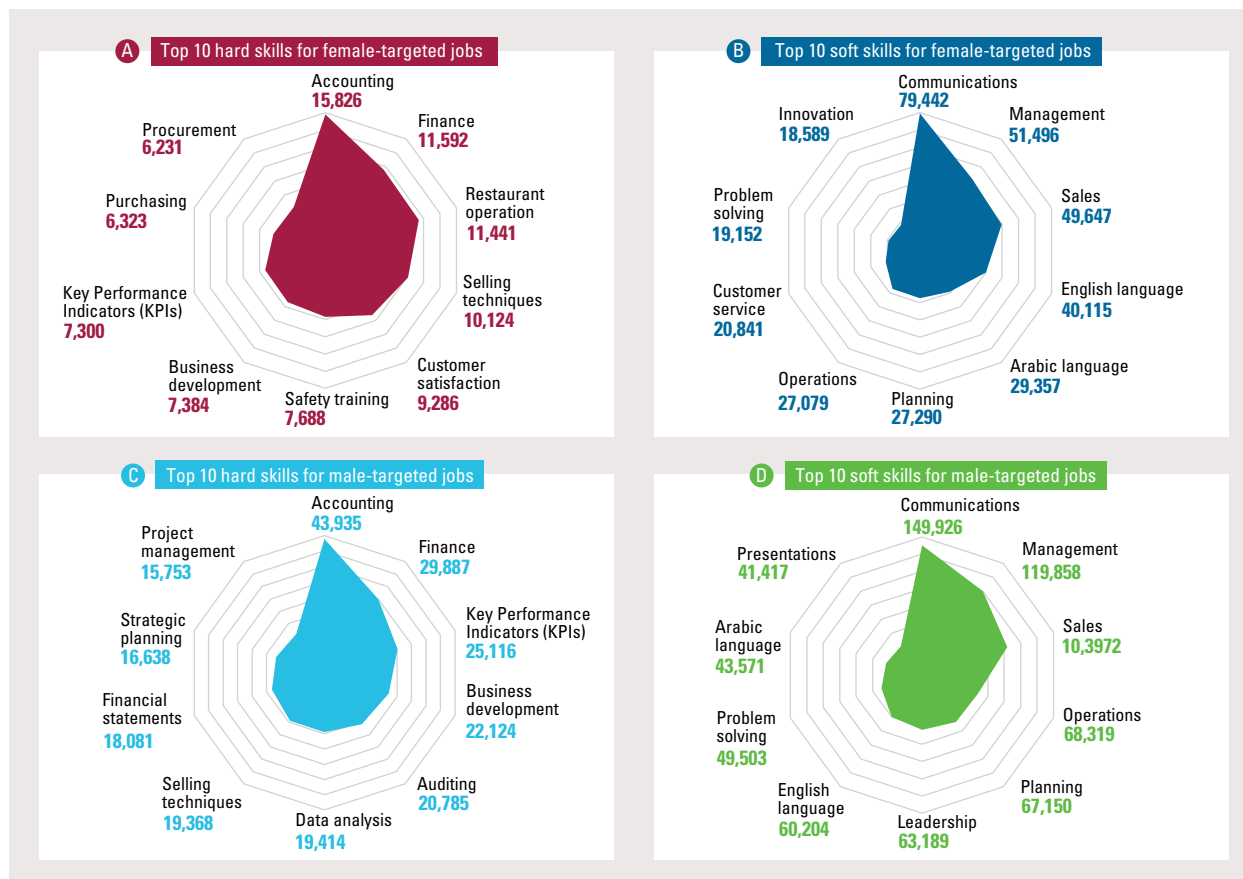


Source: ESCWA calculations based on the ESCWA Skills Monitor.

The different skills deployed by men and women in the workplace are influenced by the jobs they tend to occupy. As stated previously, in today's business world, the most sought-after skills are soft skills. Women are more often present in occupations requiring high social skills. They flourish in such jobs as most of these soft skills come naturally to women, compared with men who are usually more concentrated in occupations that require more mechanical skills.<sup>49</sup> This could be one of the reasons why women have an edge over men in jobs related to health care, education, administrative support, and sales. However, our findings (figure 15) indicate that the Arab job market demands soft and hard skills almost equally from both men and women. The ratio of demanded soft skills to demanded hard

skills is 63 per cent for men and 61 per cent for women. This implies that women are no longer more likely than men to work in jobs that require a high degree of proficiency in soft skills only. Moreover, women are not less likely than men to hold jobs that strongly require mechanical skills. One interesting observation is that 8 of the top 10 soft skills, and 5 of the top 10 hard skills are common between male-targeted and female-targeted jobs. Given this background, our data indicate that online job openings unintentionally avoid gender bias in their demand for skills, but discriminate in the wording of job advertisements. One additional observation is that innovation as a soft skills is highly demanded for jobs requesting female candidates which links to the global demand for skills.

**Figure 15.** Top 10 demanded hard and soft skills for female jobs vs. male jobs



Source: ESCWA calculations based on the ESCWA Skills Monitor.



The aim of gender inclusive policies is not only to retain women's comparative advantage in specific sectors, but also to reverse detected discrimination in other sectors. Inclusive policies limit the gender-based constraints that women entrepreneurs and employees face. Consequently, access

to job opportunities must be supported for both genders equally. Moreover, women must be involved in capacity-building, and should be given more access to finance. Enhancing gender equality will ultimately improve efficiency, productivity, competitiveness and the overall economy.



## C. Labour inclusion for persons with disabilities

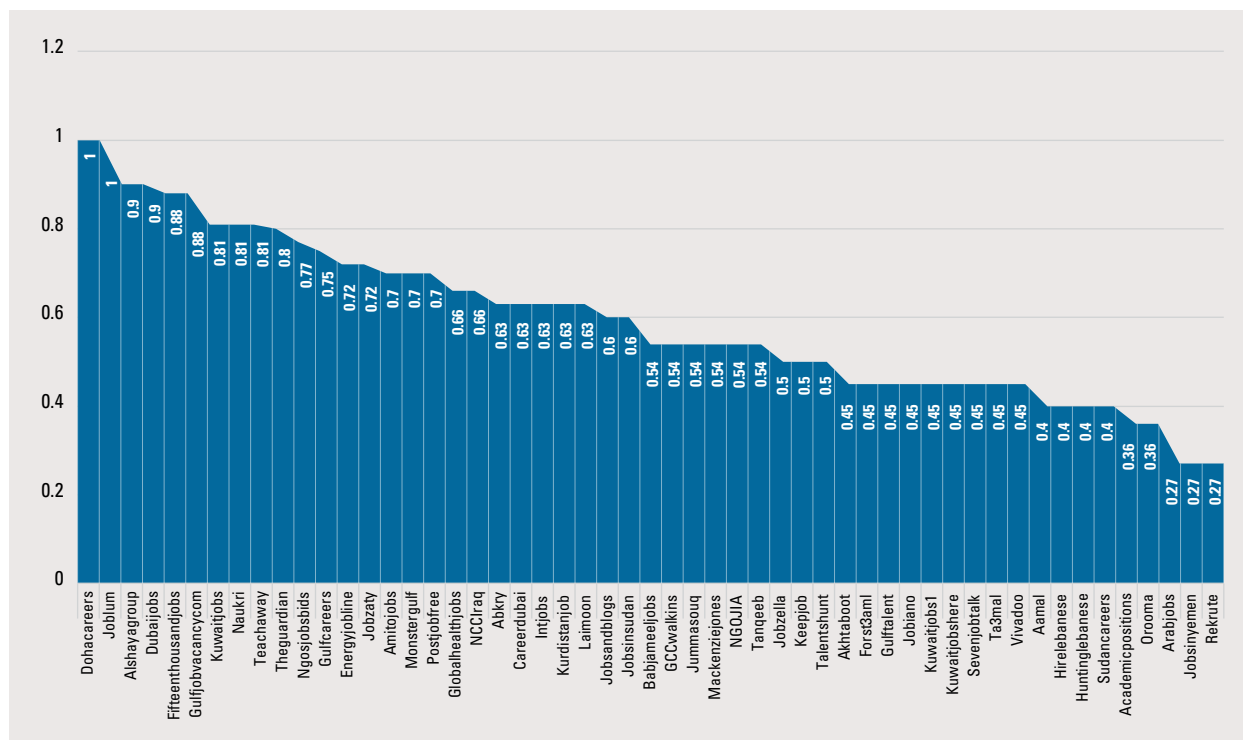
A total of 17 Arab countries have instituted employment quotas for persons with disabilities in both the public and private sectors. For example, the Algerian law stipulates that 1 per cent of workers for each employer must be for persons with disabilities. This figure varies to 2 per cent in Bahrain, 5 per cent in Egypt and Iraq, and 7 per cent in Morocco.<sup>50</sup> Inclusion and diversity are two defining issues, particularly within businesses that have long been drivers of social change. Even though some progress has been made in the Arab region when it comes to gender, improving disability inclusion lags behind owing to constraints in persons with disabilities' access to quality education and decent employment opportunities.

In Arab countries, unemployment rates for persons with disabilities are significantly higher than those of persons without disabilities.<sup>51</sup> In Lebanon, for instance, around 86 per cent of persons with disabilities are economically inactive, and therefore not engaged in the labour market.<sup>52</sup> While 43.1 per cent of persons who do not suffer from any type of disability in Lebanon are employed, only 12.4 per cent of persons with disabilities are employed.<sup>53</sup> This indicates that Arab countries should strive to build and promote more inclusive work environments where everyone feels welcome and respected, and to create environments that enable all potential candidates to equally realize their potential.



©iStock.com/AndreyPopov

**Figure 16.** E-accessibility score for persons with disabilities by job hub



**Source:** ESCWA calculations based on the ESCWA Skills Monitor.

**Note:** The e-accessibility score evaluates the ease with which persons with disabilities can use the Internet and information technologies.

On that front, e-accessibility scores were computed for the first 54 scraped hubs in the ESCWA Skills Monitor.<sup>54</sup> Figure 16 shows that of the 54 scraped job hubs, Doha Careers and Joblum are the two most accessible job hubs to persons with disabilities, with an e-accessibility score of 100 per cent each. For those that were not scraped, such as Indeed and Linked-In, the e-accessibility rate is 93 and 100 per cent, respectively. Moreover, our results indicate that of the five job hubs from which we extracted most job postings (Tanqeeb, Waseet, GCC walkins, Wuzzuf, and Energy Jobline), four job hubs have e-accessibility scores equal to or greater than 94 per cent. Given that job hubs are the most common way job candidates initially learn about

an organization, incorporating disability inclusiveness within job hubs would lessen the risk of alienating a large candidate pool from the job market. However, having an inclusive job hub or website does not mean guaranteeing inclusive jobs for persons with disabilities.

Looking at accessibility for persons with disability, the data reveal that job hubs in the Arab region are inclusive of and accessible to persons with disabilities. However, this is not the only aspect that should be assessed. Job postings normally have narrow posting windows, which might be due to companies' urgent need to fill certain vacancies, companies' limited budget, or imposed closing dates by job hubs. As reported by

Chen and Eriksson (2009), jobs targeting persons with disabilities are associated with longer recruitment processes. Consequently,

the duration of online job postings should be assessed in the Arab region, in addition to the inclusive language used in the postings.



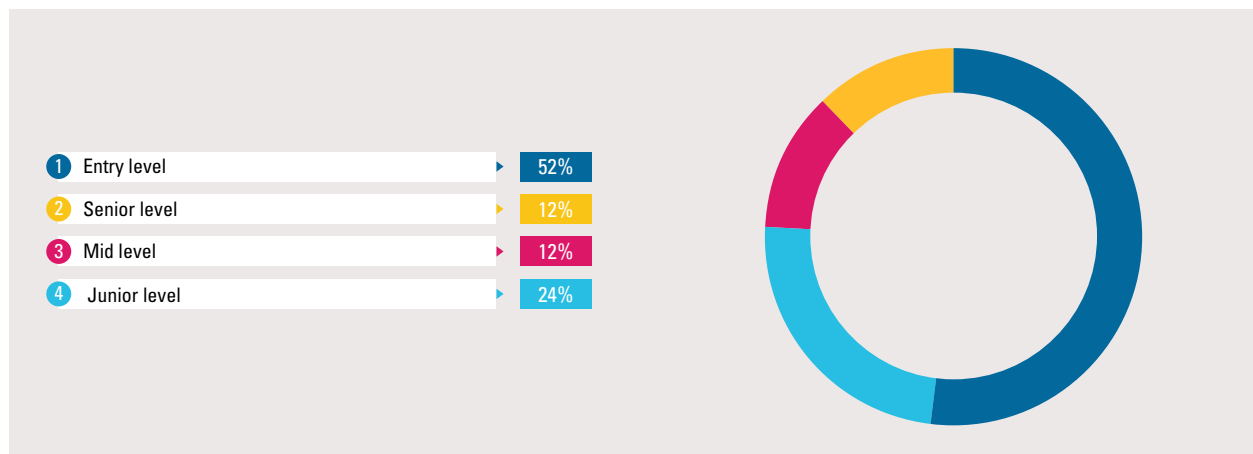
## D. Youth and career progress

Many jobs for new job market entrants have been created in 2021. Figure 17 shows that in the Arab region, around 52 per cent of online job openings that state years of experience are entry-level jobs, while only 12 per cent are senior-level positions. However, the issue is whether enough jobs are created to fit Arab demographic changes, especially for those newly entering the job market. Even though many new entry jobs are created, in the Arab region, young people (aged between 15 and 24) are three times more likely to be unemployed than adults (25 years and older).<sup>55</sup> The reason behind this high unemployment rate is high female youth unemployment and the youth bulge that

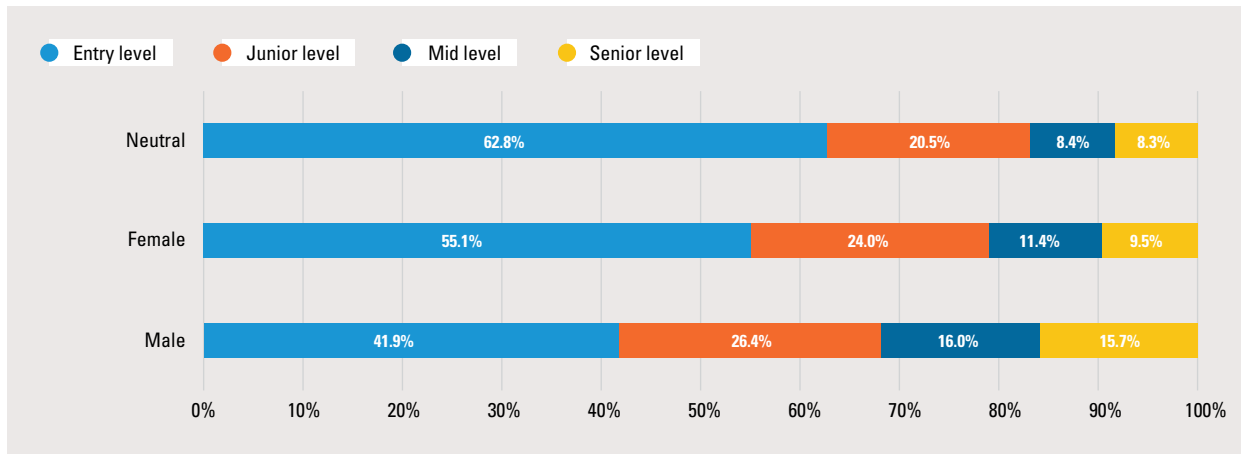
has proven to be a burden rather than a demographic dividend.

Deciphering gender disparity in career-level distribution shows similar results (figure 18)<sup>56</sup>. The share of entry-level jobs is larger for females (55 per cent) than males (42 per cent) in female- and male-targeted jobs. However, the opposite is true for senior-level positions: almost 16 per cent of online advertised jobs for senior-level positions only target men, compared with only 10 per cent that exclusively target women. Consequently, it could be inferred that while women are more likely to be hired in entry-level positions, they are less likely to reach senior management positions.

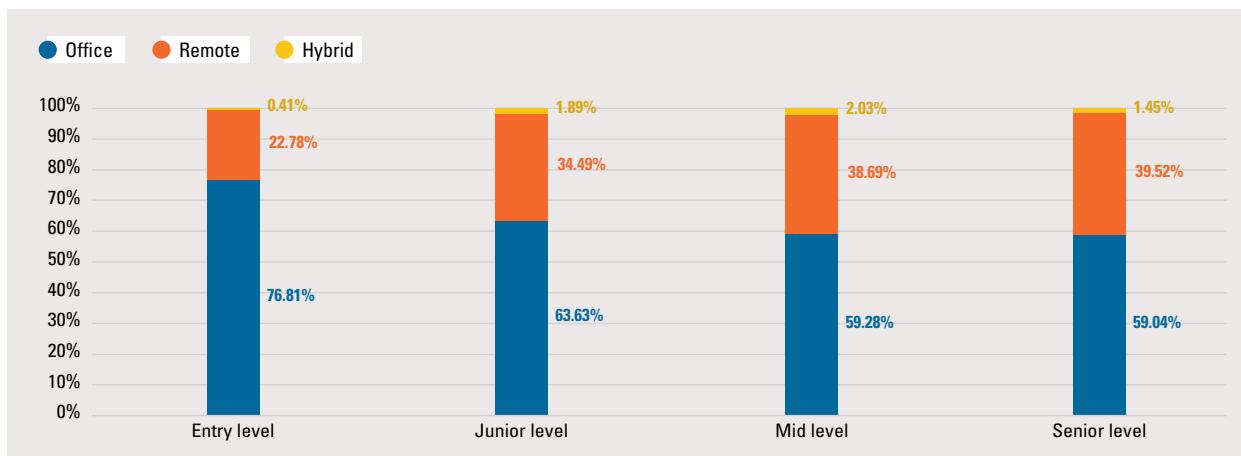
**Figure 17.** Career-level distribution of online job openings in the Arab region



**Source:** ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 18.** Career-level distribution of online job openings by gender

Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 19.** Work modality distribution by career level in online job openings

Source: ESCWA calculations based on the ESCWA Skills Monitor.

Figure 19 shows that from the jobs that mention the type of work modality, only 23 per cent of entry-level positions in these jobs are remote, compared with 40 per cent of senior-level vacancies for jobs that posted work modality requirements. Employers usually provide relative freedom and flexibility for older workers to work from anywhere. In general, managerial positions provide additional work flexibility. As per the

European Union (2020), prior to the outbreak of the COVID-19 pandemic, remote work was most common among highly autonomous workers and high-skilled workers who did most of their work on computers. Arguably, although young people are better equipped to adapt to the digital requirements of successful remote work, and even though their inability to telecommute may put their older family members at risk, young people

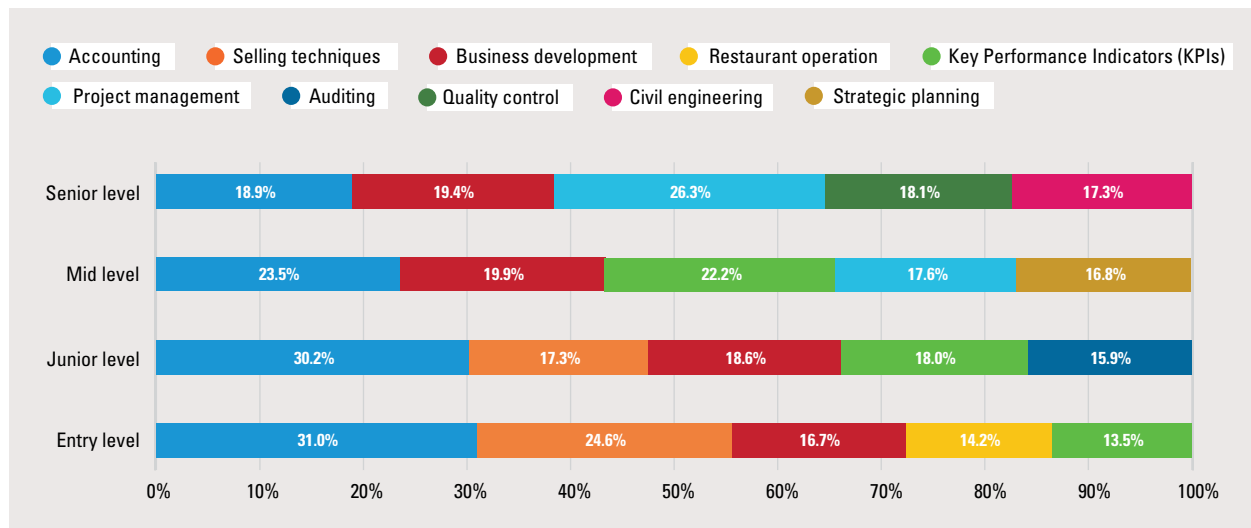
are less likely to work remotely. Among other reasons, this might be influenced by the fact that many entry-level workers have been suffering in autonomous working conditions because they lack the collaboration, support and networks that are better fostered at the office. For instance, in their examination of psychological factors that impact remote working, Grant, Wallace and Spurgeon (2013) concluded the following: relationship-building can be much more difficult for remote workers; and monitoring from a distance requires good communication. Young employees who are still attempting to make professional ties most likely suffer from a lack of face-to-face contact, especially in large companies. For those people, teleworking could be alienating.

Figure 20 shows the top five demanded hard skills from online job openings by career level. Our findings indicate that project management (26 per cent) is the top hard skill for senior professionals, whereas accounting (31 per cent) is the top hard skill for young people followed by sales and business development. Figure 20 shows that

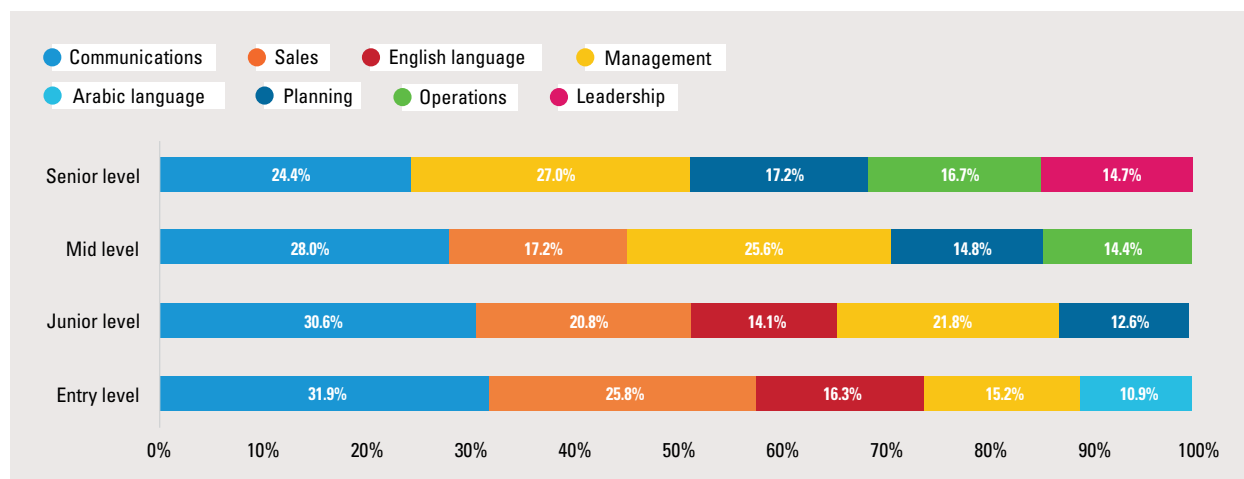
the top 5 entry level hard skills are mainly related to the business administration field. On the other hand, mid-career and senior level jobs have strategic planning and project management and quality control as their key skills.

Figure 21 shows the top five soft skills by career level. Communications (31 per cent) and sales (21 per cent) are the top soft skills for junior staff, while management (27 per cent), communications (24 per cent) and planning (17 per cent) are the top soft skills for senior employees. It is worth mentioning that communication is widely demanded at all career levels. This once again underscores the importance of communication as a soft skill. Effective communication increases overall productivity in the workplace, and promotes collaboration, teamwork and the understanding of the objective of a given task. Besides maintaining strong working relationships at all organizational levels, communication skills set candidates apart from their competitors when applying for jobs.

**Figure 20.** Top five demanded hard skills by career level



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 21.** Top five demanded soft skills by career level

Source: ESCWA calculations based on the ESCWA Skills Monitor.



## E. Arab jobs and their links to the Sustainable Development Goals

As Arab Governments joined the global community in their commitment to the 2030 Agenda, structural issues and institutional and governance deficits have negatively impacted the region's ability to achieve the SDGs by 2030. Political conflict and the COVID-19 pandemic have placed additional obstacles to the achievement of the 2030 Agenda. As stated in the 2020 Arab Sustainable Development Report,<sup>57</sup> Arab countries are home to some of the most severe humanitarian crises, with conflict destroying communities and displacing millions. Moreover, unemployment is the highest worldwide, including the globally highest unemployment rates for young people and women. Consequently, SDG 8 requires additional focus in the Arab region, where decent work and full and productive employment for all men and women should be considered a priority.<sup>58</sup>

Overall, many Arab nations have initiated steps to incorporate the SDGs into their national

plans and strategies. However, efforts to embrace the SDGs in the region still face significant challenges. A critical assessment of the region's 2030 Agenda implementation frameworks can be inferred from the extent to which job openings in the region are in line with the 17 Goals. To test the links between job openings and related SDGs, we used a dictionary of SDG wording, and then skills in every job description were checked against this SDG dictionary. The analysis is based on word-to-word matching and text recognition.<sup>59</sup>

The results revealed that advertised jobs target all SDGs; however, such targeting was disproportionate reflecting distinct private-sector priorities compared with regional ones. Figure 22 shows that SDG 11 is the most referenced SDG, with 38.17 per cent of collected online job openings containing keywords that can be attributed to sustainable cities and communities. This is followed by SDGs 4, 10 and 3.<sup>60</sup> It can therefore be inferred



that those skills in online job openings in the region consider SDGs related to sustainable cities and communities; quality education; reduced inequality; and good health and wellbeing. The jobs analysed thus indicate an economy that is responsive to those principles. The COVID-19 pandemic pushed health-care systems to their limits in 2020 and 2021, where most jobs were related to the SDGs. However, the demand for health-care services has started to subside due to a considerable decrease in COVID-19 cases across the Arab region, putting SDG 3 in fourth place.

Based on the Arab Sustainable Development Report,<sup>61</sup> urban population in the Arab region grew more than fourfold from 1970 to 2010, and is expected to more than double between 2010 and 2050. This might be an indication of why SDG 11 is the most targeted SDG in demanded jobs, where housing and transport are considered key aspects. Looking at quality education as a cornerstone for enhanced social and economic wellbeing, the Arab region's online job markets are asking mainly for jobs that require quality education and a diverse number of skills, putting SDG 4 second in the list of top SDGs. Regarding

SDG 10, many jobs in the region are asking for equal opportunities in employment, including social responsibility, corporate social responsibility and social security, putting SDG 10 in third place.

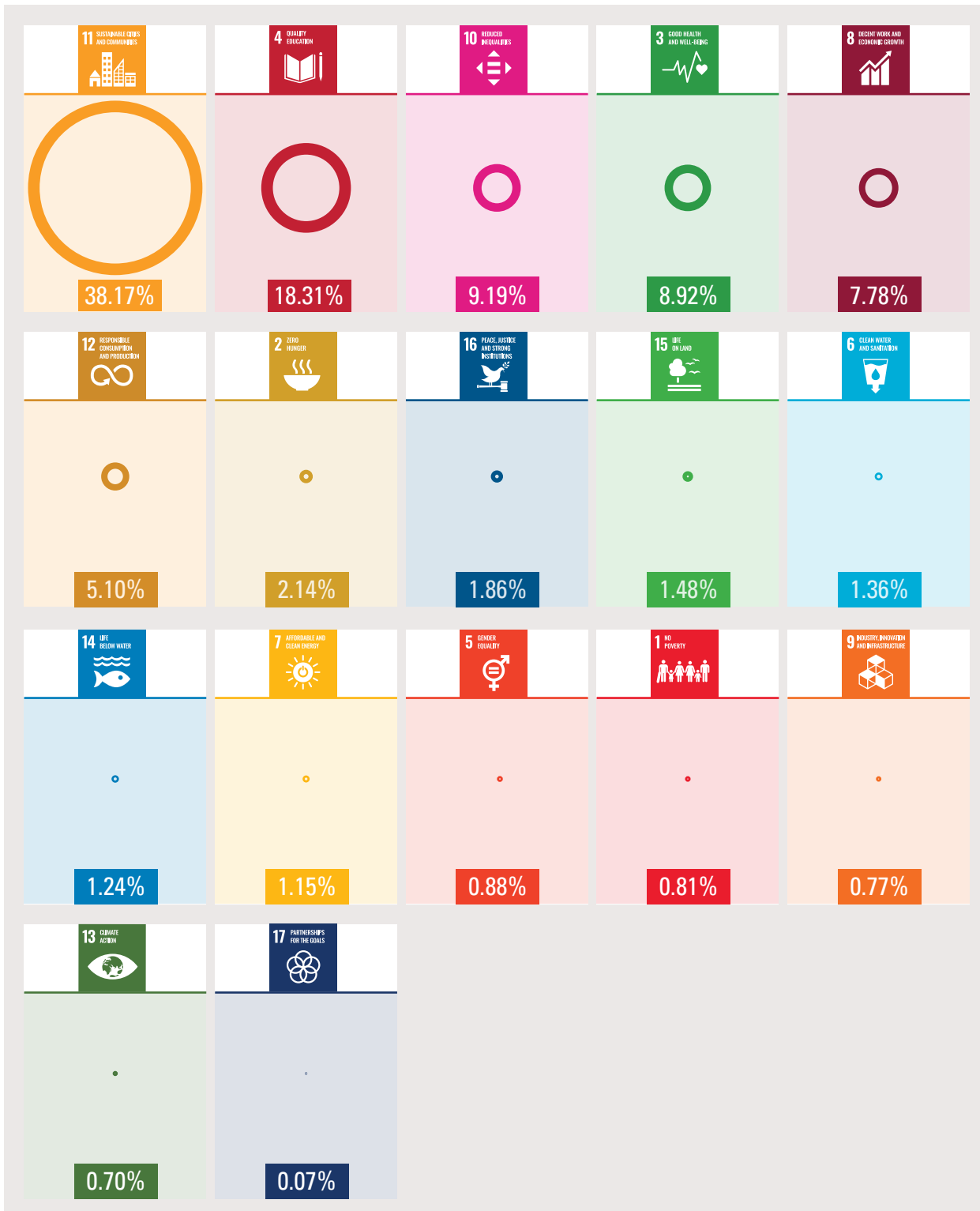
Looking at unemployment rates, it could be expected that SDG 8 would be the most prevalent Goal in the Arab region, as the region registered the highest unemployment rates worldwide, especially among young people and women. At the same time, the region has experienced subdued long-term growth, even in countries rich in natural resources, which may limit the financial resources available to implement the 2030 Agenda. Even during high economic growth periods, the Arab region failed to bring more demand for productive employment and decent work, and was limited to jobs in the informal sector and the public sector. According to ESCWA Skills Monitor, SDG 8 comes fifth, although such an SDG would be expected to be given greater priority in the region. Employment can be used as a tool to fight poverty, inequality and conflict, which have severely impacted the region over the past decade.



©iStock.com/Jeff Kingma



**Figure 22.** Percentage of online job openings targeting each Sustainable Development Goal in the Arab region



Source: ESCWA calculations based on the ESCWA Skills Monitor.



## F. Policy recommendations

**The following recommendations provide policymakers with options for additional inclusiveness in the demand for jobs:**

**1**

Enforce laws that enhance gender equality in job applications and in recruitment to enhance equal opportunity and representation in employment. Lobbying legislators, gender committees and international organizations could be effective, and enhancing gender equality may ultimately improve productivity, competitiveness, and overall economic performance.

**2**

Provide teleworking as an option to all seniority levels to create additional flexibility for employees, especially women. This can be done by equipping staff with the right tools for different work modalities, and providing the needed training. Employers' tax subsidies, tariff reductions on needed equipment, and infrastructure incentives can play a crucial role in facilitating telework.

**3**

Incorporate additional e-accessibility features for persons with disabilities within job hubs, such as ensuring a text-to-speech function and adjusting the colour contrast and font size of job descriptions. This can be ensured by following the WCAG e-accessibility standards in the design of websites, digital platforms and mobile applications to lessen the risk of alienating a large candidate pool in the job market.

# 3.

## The future of jobs and skills

### Key messages



**Accounting** and **restaurant operation** skills remain the **highest in demand**, with an increasing trend.



Several ICT skills with decreasing trends are being replaced by other **upward trending ICT skills** in the same sector.



The **average AI scoring** for the region is around **36 per cent**, indicating a low level of AI augmentation. The **highest AI augmentation score** is among data scientist positions, with around **50 per cent** of tasks AI-augmented.



**Out of 15,500 different skills** across the region, around **one third (5,100 skills)** account for more than **95 per cent** of the total frequencies of demanded skills.



The Arab region has a core cluster in **business administration-related jobs**, and is not heavily diversified in science-related jobs such as IT, manufacturing/industry, engineering and innovation, which calls for further structural transformation and greater **technology adaptation** and adoption.

## 3. The future of jobs and skills



### A. Overview

The present chapter examines positively and negatively trending skills, focusing solely on hard skills trends as they have the upper hand in determining the match between applicants' profiles and job requirements. Soft skills trends are less

imperative determinants in the job matching process, meaning that such skills do not vary significantly over time. Based on the ESCWA Skills Monitor, soft skills are stationary in the Arab region, with limited trends over time.



### B. Skills with most ascending and descending trends

For an overview of the upward trending skills, the top 10 steeper trends were related to accounting, restaurant operation, finance, computer science, invoicing, selling techniques, key performance indicators (KPIs), Kurdish (language), financial statements, and sales management (figure 23). Most upward trending skills were related to accounting and finance (accounting, finance, invoicing, financial statements) and to services and sales (restaurant operation, sales management, selling techniques, KPIs). It is worth mentioning that computer science-related skills ranked fourth in the upward trending skills.

Among the top 10 decreasing trends, several were related to construction sites (construction, civil engineering, construction management, safety training, machinery). If we expand to the top 100 decreasing trends, complement skills to the construction field have the most decreasing trend. This includes facility management and energy efficiency services, followed by electrical engineering and heavy equipment transporter systems.

The ICT skills with the most declining demand among the top 100 decreasing skills are computer engineering, cyber

security, cloud computing, software engineering and software development, unit testing, Java (programming language), Linux, automation, telecommunication, MIS, SAP applications, data engineering, remote computing, angular and SQL languages. Additional analysis shows that while demand for such skills is decreasing, the trends of other ICT skills and languages, such as software systems, Power BI, PHP (scripting language), JavaScript, IOS development, and R (programming language), are increasing

in the Arab region. A second cluster of top skills with decreasing trends, which did not show in the top 10 list, is related to the medical field, namely nursing, surgery, paediatrics, dentistry, intensive care, gynaecology, patient treatment, emergency medicine, obstetrics and gynaecology, vital signs, critical care, health sciences, personal health records and home health care, where these trends can be explained by the unusual demand increase in the baseline period owing to the pandemic.

**Figure 23.** Ascending (left) and descending (right) trends of hard skills in the Arab region



**Source:** ESCWA calculations based on the ESCWA Skills Monitor.



## C. Status of artificial intelligence in Arab labour market activities

AI is a new approach where automated machines are fed or taught human logic, based on which they act and react without errors. Recently, AI has been making verbal communication with devices a norm, with AI augmenting many daily activities and occupations. This was evident during the COVID-19 pandemic, where many jobs drifted to more advanced AI-driven systems, thus requiring a change in the way of executing job-specific tasks. To test how AI is augmenting jobs, Qatar Computing Research Institute (QCRI) built an AI-based method that measures the automation impact of AI on Jobs. ESCWA partnered with QCRI and extended their AI model to measure the AI Impact Score on over 1.7 million online job postings from 19 Arab countries.

The AI scores presented in figures 24 and 25 reflects the percentage of skills in jobs that can be automated with AI augmentation

using current technologies, or those that have been patented. In other words, to perform a job with a high AI Score in the future, the job will likely be using technology extensions to facilitate the tasks. Whereas, in order to perform a job with a low AI score in the future, the job will mostly be employing the same level of technology integration, if any, to perform the tasks. It is worth noting that the AI Score does not reflect the degree of labour capital substitution by technology. Only jobs with 100 per cent AI Score are expected to be fully automated in the future.

Our analysis has revealed that the average AI scoring for the region is around 36 per cent. The set of functions in a given position will never be 100 per cent automated, at least between now and the achievement of the 2030 Agenda. However, AI will significantly influence how activities are executed as more AI is introduced into daily tasks.

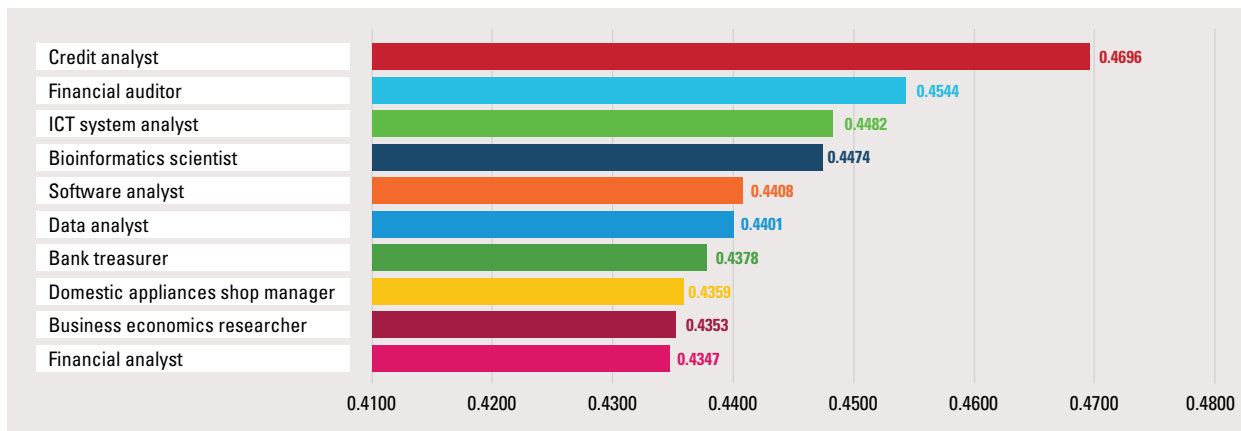


©iStock.com/ipopba

Figure 24 shows the 10 most AI-augmented jobs, and figure 25 shows the 10 least AI-augmented jobs in the Arab region's online job markets. Figure 24 indicates that the highest score of AI augmentation is among credit analyst positions, with a score close to 47 per cent of tasks being AI-augmented. Besides credit analyst jobs, the top 10 list includes mainly data-related occupations and finance jobs. One indication from the top 10 list is that it does not include mid-skilled jobs, as all 10

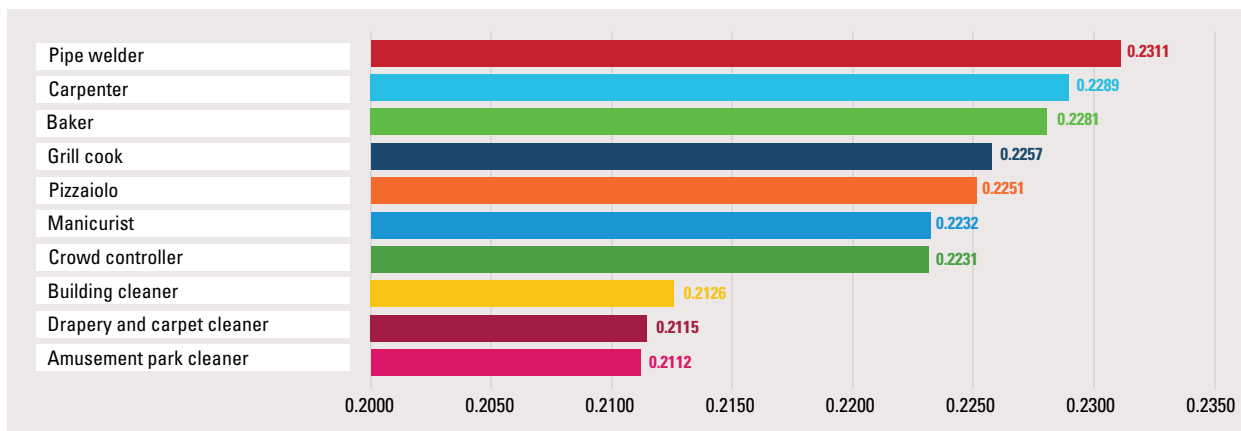
jobs belong to high-skills activities. Looking at the list of the 10 least AI-augmented jobs (figure 25), blue-collar and close to mid-skilled tasks are the jobs not heavily impacted by AI augmentation. Our findings do not negate the fact that such activities may be automated soon, with machines taking over the roles of human beings in the near future. For example, complete automation of activities was evident in recent testing of self-driven trucks and cars in many countries globally.

**Figure 24.** Most 10 AI-augmented jobs in the Arab region



Source: ESCWA calculations based on the ESCWA Skills Monitor.

**Figure 25.** Least 10 AI-augmented jobs in the Arab region



Source: ESCWA calculations based on the ESCWA Skills Monitor.



## Box 2. Future technologies and the status of their adoption in the Arab region

To assess the readiness of the Arab region to adopt and absorb new technologies, the following five dimensions are examined: AI, innovation ecosystems, public services, network readiness, and e-commerce.

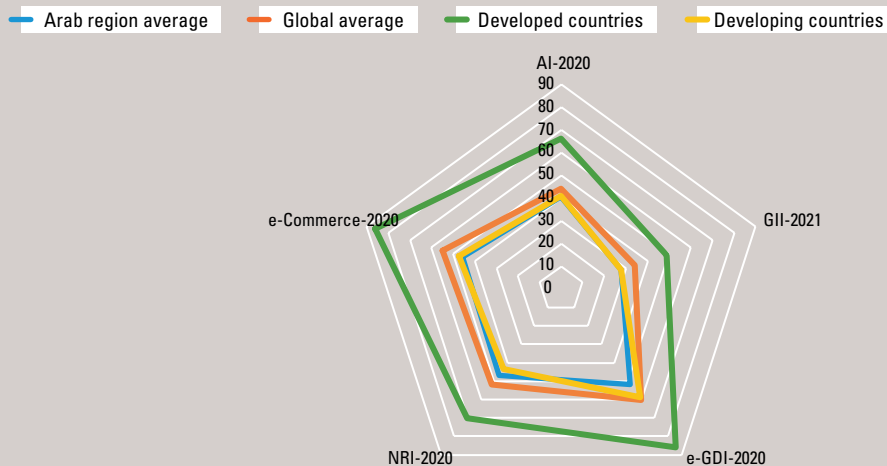
### Comparative tabulation of technology adoption by index

Index	Arab region average	Arab diversified	Arab LDCs	High income average	Upper middle income	Lower middle income	Low income	Global average	Developed countries	Developing countries
AI-2020	40.56	40.18	25.46	62.46	41.61	34.93	27.4	44.25	66.36	41.16
GII-2021	27.52	25.98	13.62	45.96	31.09	25.25	19.43	34	48.84	27.82
e-GDI-2020	52	50	29	81	62	50	29	60	86	59
NRI-2020	46.82	42.33	12.33	67.81	47.34	37.27	30.61	51.8	70.14	43.25
E-commerce-2020	45.8	44.28	19.33	82.26	57.64	39.22	19.04	54.9	85.89	47.5

**Source:** ESCWA estimations.

**Note:** AI-2020 denotes the latest AI Government Readiness Index 2020, GII-2021 denotes the Global Innovation Index, e-GDI-2020 denotes the e-Government Development Index 2020, NRI-2020 denotes the Network Readiness Index 2020, and e-commerce-2020 denotes the UNCTAD B2C E-Commerce Index 2020.

### Technology adoption between regions by index



**Source:** ESCWA estimations.

**Note:** Each region is represented by a pentagon where the score of each index increases in an outward direction.

The following observations can be deduced from the above table and figure:

- **AI readiness:** The Arab region is below the global readiness average, as per the latest AI Government Readiness Index (2020) produced by Oxford Insights.<sup>a</sup> It has one of the biggest gaps in country performance (some countries are rank high even on the global scale, while others are among the lowest category). AI readiness in the Arab region needs to be improved by strengthening strategy development and modernizing education and academic programmes to provide the labour market with required skills, and by developing the innovation and entrepreneurship ecosystem.
- **Innovation ecosystem:** Based on the Global Innovation Index, the Arab region average is far above the global average, and its score is comparable to the average of lower middle-income countries and of developing countries. This result implies the need for many Arab countries to review current innovation ecosystem, and mitigate the barriers faced by young people and entrepreneurs to help establish startups, create new job opportunities, and produce innovative and useful services.
- **Public services:** The E-Government Development Index 2020 can be used to capture the current development stage of public services that are delivered electronically. According to this index, the Arab region's average score is far behind the global average, although some GCC countries are rank high globally. Furthermore, the region's score is less than that of developing economies. Given the importance of delivering services remotely through electronic channels in the COVID-19 era, some Arab Governments need to enhance their technological infrastructure, develop their human capital, and digitize more government services to reach all individuals.
- **Network readiness:** The Network Readiness Index 2020 can assess the readiness of infrastructure in the Arab region. In this index, the Arab region scores below the global average, but above the average of developing countries. GCC countries and some upper middle-income countries in the region have developed an appropriate technology infrastructure. For the remaining countries, especially those that are affected by conflict, more efforts and investments are needed to restore basic services, and ensure minimum connectivity across their territory. Establishing such infrastructure should be prioritized in recovery agendas, as it could positively impact socioeconomic development and expedite peacebuilding process.
- **E-commerce:** During the COVID-19 pandemic, the Arab region, like other regions worldwide, witnessed a net increase in e-commerce activities. According to the UNCTAD B2C E-Commerce Index 2020, the Arab region's score is below the global average and close to that of developing economies. Arab least developed countries and conflict-affected countries are lagging far behind, owing to inappropriate technological infrastructure and unstable postal systems. To reap the benefits of e-commerce in the Arab region, national plans and strategies are required to modernize legal and regulatory frameworks, and allow innovators and entrepreneurs to seize this opportunity to develop solutions, applications and products related to e-commerce, such as portals and digital intermediation platforms.

In summary, the Arab region is lagging behind in the adoption of future technologies, except in the development of e-services where the regional average is close to the global average. National readiness assessments of the above-mentioned technologies are necessary to identify weaknesses and challenges, and to develop related policies to address them and enhance the preparedness of the region to absorb those technologies and maximize their impact on national development.

<sup>a</sup> Oxford Insights, 2020.

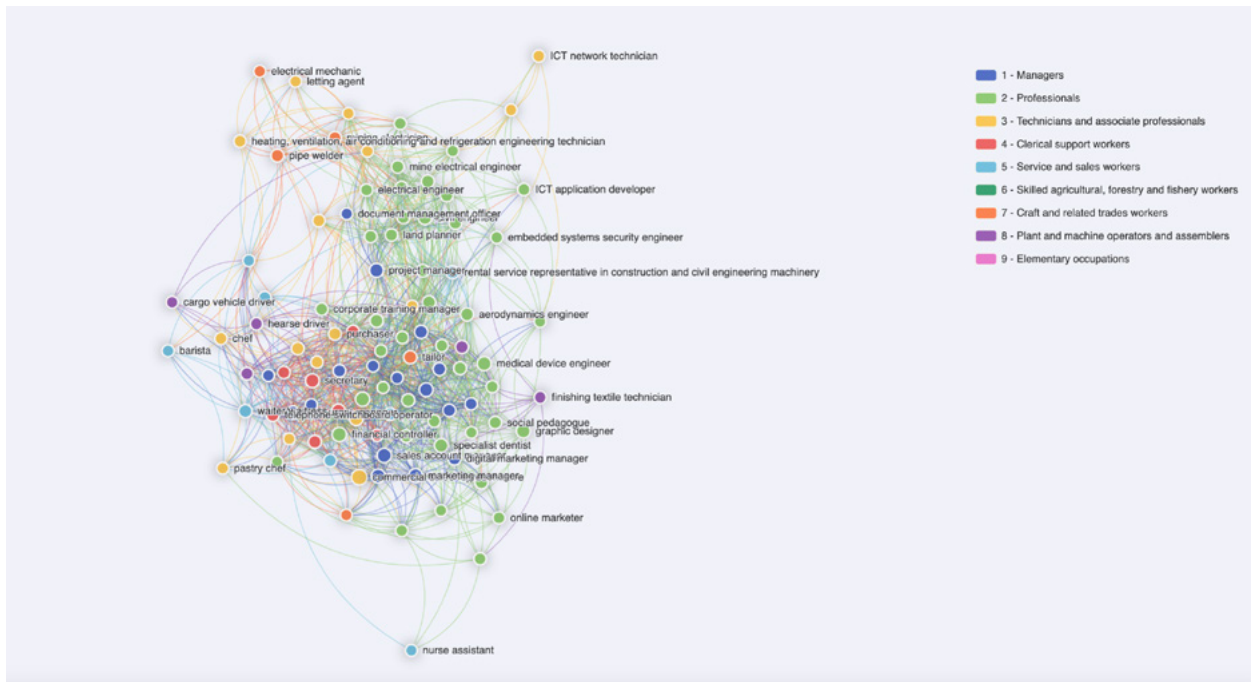


## D. Skills Forest

Inspired by Ricardo Hausmann's Product Space analysis,<sup>62</sup> the ESCWA Skills Forest showcases the structure of the economy based on online jobs postings and the skills they require. The Skills Forest unveils the interconnection between jobs as a network, based on the hard skills they share for each of the 19 studied Arab countries. Each node represents an occupation, with its size showing the frequency of postings for that occupation. The nodes are linked to the most similar occupation by means of common skills.<sup>63</sup> The resulting clusters show the most related jobs in terms of the hard/technical skills they share. For instance, on the top section of the network, we observe engineering occupations, such as ICT developer, database administrator, and

software developer; whereas the bottom left cluster shows mostly business-related occupations, such as business manager, product manager, and sales representatives. The densely populated clusters illustrate the level of interconnectedness among jobs through common skills (it is known as the core), while jobs that are on the periphery reflect a low level of connectivity with other jobs in the economy. The likelihood of a person moving from one job to another in the dense areas is significantly higher, enabled by a significant number of common skills between nearby jobs; while moving from the periphery closer to the core is less likely due to a lack of shared skills, making upskilling and reskilling in the core easier than in the periphery.

Figure 26. Skills Forest



Source: ESCWA calculations based on the ESCWA Skills Monitor.

The dense clusters also reflect the prospects of the economy based on the type of occupations that are present within it. Currently, the Arab region has its skills stock around the core set of jobs. The Arab region can re-skill and up-skill its labour force around peripheric jobs to build a more diversified skills stock. This can happen if multiple clusters in the Skills Forest are created, indicating additional jobs and skills diversification in different areas of expertise.

Figure 26 shows that the jobs belonging to the professional job family, represented by green nodes, are most in demand. The professional job family in the Arab region is dominated by job openings in business and administration, followed by science and engineering. The likelihood of creating a job in business and administration (bottom half of the figure) is higher than in sectors such as

IT or engineering, due to high activity and demand in that area.

Figure 27 reveals that Arab economies are built on consumer-based employment rather than capital production, since most activities are related to business administration fields. An empirical exercise that would add value to the present report is to look at the skills diffusion between countries, and how likely it is that countries in the region and around the globe could help each other evolve, or how one country could evolve to match a regional frontier in a specific sector. The popular approach is to move to jobs and sectors in close proximity to one another; however, the challenge is to shift to sectors that are not within reach. This is relevant in countries that are resource-dependent, where diversification to non-resource-related sectors entails a significant leapfrog to avoid natural resource dependence.

**Figure 27.** Number of online job postings by occupation categories



Source: ESCWA calculations based on the ESCWA Skills Monitor.



## E. Policy recommendations

1

Enhance technological infrastructure, facilitate human capital accumulation, digitize government services, and assist in the AI augmentation of tasks to enhance productivity and create additional employment. Additional technological adoption can create more jobs and increase wages due to higher productivity.

2

To avoid labour substitution (full automation of activities), investigate jobs that are at risk of full automation, and develop appropriate reskilling and upskilling programmes as an attempt to prepare employees at risk to move to jobs with close proximities. This can be done using the ESCWA Skills Forest by investigating jobs and their associated skills.

3

Extend diversification and structural transformation efforts to create multiple cores in the Skills Forest as a plan for long term sustainable economic development. Building infrastructure for digital economies can help keep pace with the Fourth Industrial Revolution.

# 4.

## Prioritizing human centred policies



## 4. Prioritizing human centred policies



Our data shows that in the Arab region, the links between currently demanded skills and those related to the Fourth Industrial Revolution are still weak. Nonetheless, smart technologies may soon take over traditional jobs, making many skills obsolete while creating others. Moreover, the long-term impact of the COVID-19 pandemic on the Arab region's labour markets should not be underestimated. According to the International Monetary Fund,<sup>64</sup> employment worldwide will not return to the pre-pandemic rate and is lagging behind GDP recovery. During the first quarter of 2020, working hours in the

Arab region declined by an estimated 2.2 per cent (equivalent to approximately 3 million full time jobs, assuming a 48-hour working week), compared with the pre-pandemic situation, namely the fourth quarter of 2019.<sup>65</sup> For the second quarter of 2020, estimates indicate a much sharper decline, with a loss of 19.5 per cent of the hours worked compared with the fourth quarter of 2019, equivalent to 23 million full-time jobs. As for the third quarter of 2020, 12.8 per cent of working hours are estimated to be lost, equivalent to 15 million full-time jobs.<sup>66</sup> The fourth quarter of 2020 experienced a 5.6 per cent loss in working



©iStock.com/BrianAJackson



hours, equivalent to 6.4 million full time jobs. Consequently, future technological changes and the post-pandemic era require agile human centred policies, where reskilling and upskilling options should be available for all.

Since individuals can lose their human capital over time, upskilling and reskilling programmes can refresh human capital knowledge, and increase employability for everybody, especially older employees that have a higher chance of not finding a job after being laid off. To do so, education subsidies and financial assistance for training programme must be provided and boosted further to include women, persons with disabilities, and those in rural areas. Such efforts could include transport services, childcare, and flexible class schedules. Moreover, adapting training programmes to address the constraints and obstacles facing women would improve women's labour market outcomes. Women usually face more financial constraints compared with men, which impact their ability to pay for and participate in training. Accordingly, offering cash grants and medical insurance would help women overcome those barriers. Childcare and family care is another lead barrier inhibiting women's participation in skills training, given that women in most countries bear greater responsibilities than men when it comes to household chores and childcare. Therefore, offering childcare subsidies would facilitate women's access to training, and ensure their successful completion of training programmes.

Developing an integrated approach and coordinating efforts to improve access to good quality and relevant training to those residing in deprived areas is not only central for skills development, but is also a passport to better employment and livelihood opportunities. For instance,

capitalizing on innovative delivery methods would improve training opportunities and promote skills development in the most fragile regions, which are normally characterized by high levels of joblessness. Therefore, the outreach of schools, universities and training institutions must be expanded in underserved areas, and access to outreach measures and ICT (training software and hardware, computers, and mobile phones) must be expanded.

Establishing coherence between the demand and supply of occupational skills can be achieved by developing coordination mechanisms between education providers and companies. Providing data on employability and conducting periodical market studies on local market demands are prerequisites. Concerning the provision of data on employability, a network that comprises several governmental entities (ministries, syndicates and the Chamber of Industry and Commerce) must be created to ensure a better response to the needs of Arab labour markets.

In the current era of integration at the regional and global levels, focusing on skills that could be demanded domestically, regionally and globally will increase the employability spectrum.

The new post-pandemic work modality will continue, and working remotely will be the new normal since physical presence will be trivial for many jobs. Creating better skills matching techniques and providing guidance for job searchers should therefore not be underestimated. As the labour market is changing overtime, new market entrants and existing labour forces require constant guidance on the type of skills that are required. In general, policies and programmes that reduce the skills mismatch will enhance long-term productivity and overall employment market outcomes.

# Annex 1. Data specifications

---

Data treatment for forecasting was undertaken as follows:

**1** The timeframe focused on jobs posted between 1 June 2020 and 30 March 2022.

---

**2** The timeframe was arranged in weekly/monthly intervals.

---

**3** Intervals have different numbers of jobs, thus different numbers of skills were extracted. We identified two sources for such variability: fluctuations due to the demand, and fluctuations due to the additional hubs scraped. To account for the scrapers variability, we standardized the number of jobs (and skills) by dividing the relevant frequency by the total frequency of jobs (or skills) extracted in that interval. This provides a metric that measures the share of jobs (or skills), irrespective of the total jobs scraped. This metric allows studying the change of shares over time and deducing trends.

---

**4** Time series for skills were analysed using a simple autoregressive model to deduce the trends (upwards/downwards). In addition, a moving average smoother was employed for more accurate forecasts, with a window of 10 past lags and 1 future lag for the iteration specifics.

---

# Annex 2. Impact of technology and remote working on demanded skills

---

Digital business platforms aim to converge both physical and digital spaces. They ensure an interoperable environment for different systems and services. Those platforms could be categorized in one of the following areas:<sup>67</sup>



Information system platform: to support front and back end operations, such as enterprise resource planning. Those platforms allow employees to interact with the workplace environment and offer front end users the needed applications and services.

---



Customer experience platform: that includes customer applications. Those platforms support multi-channel interactions, access to social networks, and customer analytics.

---



Data and analytics platforms: those platforms are dedicated to data-driven decision support systems.

---



Internet of things (IoT) platforms: to provide integration of core and operation systems. Those systems offer connectivity to enterprise-owned things and to customer-owned objects. They also support the provision of analytics on usage for monitoring and decision support purposes.

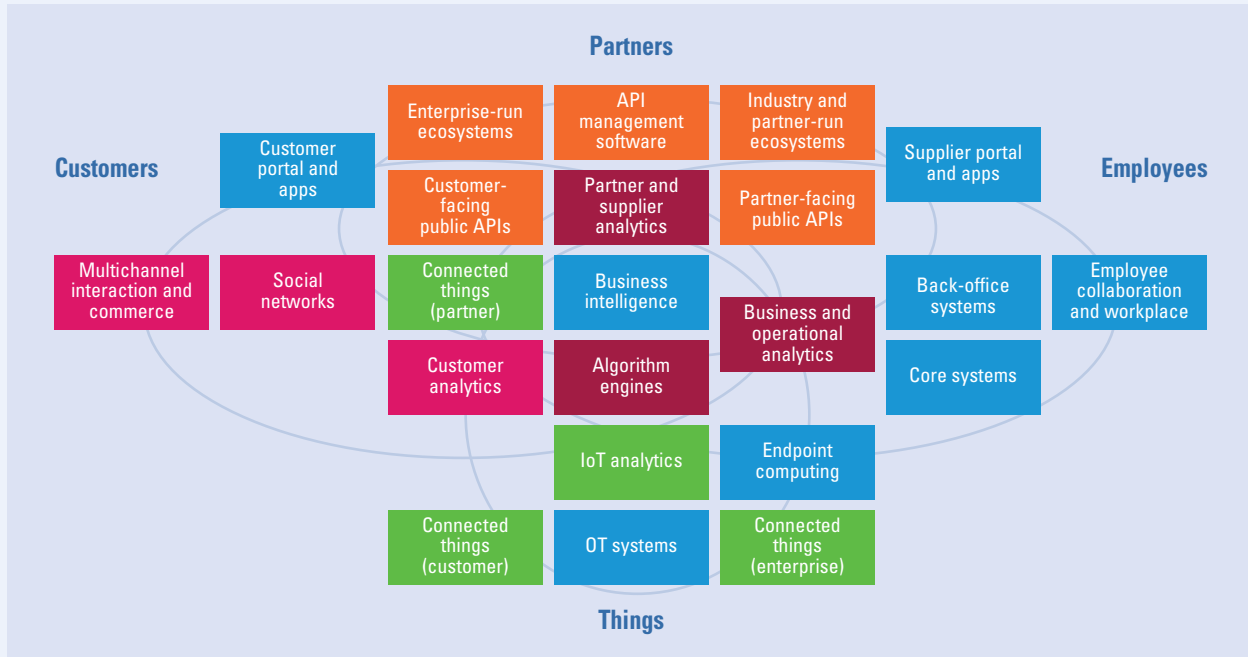
---



Ecosystem platforms: those platforms ensure connection to external actors thru application programming interfaces (APIs).

---

**Figure A2.1** Interaction among digital business platforms



Source: Panetta, 2016.

The development of those platforms is empowered by huge progress in programming tools and environments. Globally, 113 countries in 2020 were deploying real-time digital systems.<sup>68</sup> Examples of such tools are RapidPro – a global digital public good used to power messaging programmes, Kobo, Open Data Kit (ODK), Ona, Commcare and District Health Information Software 2 (DHIS2). Due to COVID-19 imposed conditions, countries are widely deploying digital platforms in several sectors:

E-learning: in order to offer distance learning to millions of out-of- school children and help children return to school. UNICEF Learning Passport platform is one example that has been developed in partnership with Microsoft.



Public admin/e-Governance: many platforms were developed to provide services such as civil registration and vital statistics systems. Primero X, launched by UNICEF in partnership with Microsoft is an example of web application that can meet the demands of the social welfare sector.



E-commerce: due to COVID-19 imposed movement restrictions in almost all countries, digital trade transactions noticed a significant increase on national and cross-border levels. The development of digital intermediation platforms played an important role in fostering those transactions.



E-health platforms to adhere to infection prevention and control measures were developed, such as immunization dashboards, using existing datasets and real-time monitoring to enable beneficiary registration, feedback and coverage analyses. It goes without saying that 4IR technologies supported the development of those platforms and offered to them additional features that were previously unimaginable. Figure A2.2 shows the distribution of those technologies among the three categories (fundamental research – market entry stage – industry adoption).



**Figure A2.2** The distribution of those technologies among the 3 categories (fundamental research – market entry stage – industry adoption)

Industry applicability	Technical maturity		
	Fundamental research	Market-entry stage	Industry adoption
<b>Cross-cutting technologies</b>	<ul style="list-style-type: none"> <li>▲ Quantum hardware</li> <li>● Knowledge graphs</li> </ul>	<ul style="list-style-type: none"> <li>▲ Augmented analytics</li> <li>▲ Quantum computing</li> <li>▶ Deep learning</li> <li>▼ Computer vision</li> <li>▼ Speech technology and NLP<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>▲ Zero-trust security/cybersecurity</li> <li>▼ Cloud computing</li> <li>▼ Supervised classical machine learning</li> </ul>
<b>Multiple industries or horizontals</b>	<ul style="list-style-type: none"> <li>▶ Explainable AI</li> <li>▼ Neuromorphic hardware</li> </ul>	<ul style="list-style-type: none"> <li>▲ 5G/connectivity</li> <li>▲ Reinforcement learning</li> <li>▶ Digital twins</li> <li>▶ Blockchain</li> <li>▼ Robots/cobots<sup>2</sup>/RPA<sup>3</sup></li> <li>▼ Autonomous things</li> <li>▼ Software 2.0/engineering analytics</li> <li>▼ RPA</li> </ul>	<ul style="list-style-type: none"> <li>▲ Edge computing</li> <li>▲ Hyperscale data centers</li> <li>▲ Vertical SaaS<sup>4</sup> apps</li> <li>▶ 3-D/4-D printing</li> <li>▶ Industrial IoT<sup>5</sup></li> <li>▼ Synthetic data</li> <li>▼ Open Process Automation systems</li> <li>▼ VR, AR, MR<sup>6</sup></li> </ul>
<b>Niche</b>	<ul style="list-style-type: none"> <li>▲ Biomachines</li> <li>▶ Biomolecules/-omics</li> <li>▶ Nanomaterials</li> </ul>	<ul style="list-style-type: none"> <li>▲ Cyberphysical systems</li> <li>▲ Generative methods</li> <li>▶ Battery/battery storage</li> <li>▼ Smart spaces</li> <li>▼ Carbon-neutral energy generation</li> </ul>	<ul style="list-style-type: none"> <li>▶ Smart distribution/metering</li> </ul>

Source: McKinsey and Company, 2020.

The following technology elements could be used for the development of platforms:

**Cloud:**

it ensures a cost-effective framework to develop platforms.

---

**Data and analytics:**

it allows to integrate data from different data sources.

---

**DevOps:**

it allows the development, scaling and maintaining platforms to ensure incremental innovation and continual improvement of its features.

---

**Agile:**

it allows to incorporate customer feedback into the project lifecycle.

---

**Partnership:**

enhancing partnership could expedite the development of platforms.

---

**Cyber security:**

combating cyber fraud in digital platforms and securing content requires efforts from all parties to ensure all technical and procedural measures are implemented.

---

# References

---

- Abu-Ismaïl, K., Araj, S., Haq, T., Nehme, M., and Jaafar, A. (2021). (publication). Towards a productive and inclusive path: Job creation in the Arab region. Available at [www.unescwa.org/publications/productive-inclusive-path-job-creation-arab-region](http://www.unescwa.org/publications/productive-inclusive-path-job-creation-arab-region).
- Burning Glass Technologies (2021). After the Storm: The Jobs and Skills that will Drive the Post-Pandemic Recovery.
- Chen, L., and Eriksson, T. (2009). Vacancy Duration, Wage Offers, and Job Requirements—Pre-Match Data Evidence. Business School Department of Economics Working Paper, 6-09.
- Economic and Social Commission for Western Asia (ESCWA) (2017). Disability in the Arab world: From charity to agency. Available at <https://archive.unescwa.org/disability-arab-world-charity-agency>.
- (2018). Disability in the Arab Region.
- (2020). Arab Sustainable Development Report 2020.
- ESCWA and ILO (2021). Towards a Productive and Inclusive Path Job Creation in the Arab Region. Available at [www.unescwa.org/publications/productive-inclusive-path-job-creation-arab-region](http://www.unescwa.org/publications/productive-inclusive-path-job-creation-arab-region).
- European Union (2020). Telework in the EU before and after the COVID19-: where we were, where we head to.
- Ferry, K. (2016). New Research Shows Women Are Better at Using Soft Skills Crucial for Effective Leadership and Superior Business Performance, Finds Korn Ferry [web log]. Retrieved from <https://www.kornferry.com/about-us/press/new-research-shows-women-are-better-at-using-soft-skills-crucial-for-effective-leadership>.
- Gaucher, D., and Friesen, J. (2011). Journal of Personality and Social Psychology. Retrieved from <https://ideas.wharton.upenn.edu/wp-content/uploads/07/2018/Gaucher-Friesen-Kay2011-.pdf>.
- Grant, C. A., Wallace, L. M., and Spurgeon, P. C. (2013). An exploration of the psychological factors affecting remote e-worker's job effectiveness, well-being and work-life balance. Employee Relations.
- International Monetary Fund (2021). Managing divergent recoveries. Available at <https://www.imf.org/en/Publications/WEO/Issues/23/03/2021/world-economic-outlook-april2021->.
- International Labour Organization (ILO) (2020a) COVID19-: Labour Market Impact and Policy Response in the Arab States. Available at [https://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/briefingnote/wcms\\_744832.pdf](https://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/briefingnote/wcms_744832.pdf).
- (2020b). Teleworking during the COVID19- pandemic and beyond: A Practical Guide.
- (2019a). World employment and social outlook: trends 2019.
- (2019b). ILO modelled estimates and projections. Retrieved from <https://ilostat.ilo.org/resources/concepts-and-definitions/ilo-modelled-estimates/>.
- Leopold, T. A., Ratcheva, V. S., and Zahidi, S. (2018). The Future of Jobs Report 2018. Available at [www.weforum.org/reports/the-future-of-jobs-report2018-](http://www.weforum.org/reports/the-future-of-jobs-report2018-).
- Lund, S., Manyika, J., Smit, S., and Madgavkar, A. (2020). What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries. Available at <https://www.mckinsey.com/featured-insights/future-of-work/whats-next-for-remote-work-an-analysis-of-2000-tasks-800-jobs-and-nine-countries>.
- McKinsey and Company (2020). The top trends in tech. Available at [www.mckinsey.com/~media/mckinsey/Business20%Functions/McKinsey20%Digital/Our20%Insights/The20%top20%trends20%in20%tech20%final/Top-trends-in-tech-executive-summary21-24-6-](http://www.mckinsey.com/~media/mckinsey/Business20%Functions/McKinsey20%Digital/Our20%Insights/The20%top20%trends20%in20%tech20%final/Top-trends-in-tech-executive-summary21-24-6-).
- Organisation for Economic Co-operation and Development (OECD) (2019). OECD Employment Outlook 2019: The Future of Work.
- Oxford Insights. AI Readiness Index 2020. Available at [www.oxfordinsights.com/government-ai-readiness-index2020-](http://www.oxfordinsights.com/government-ai-readiness-index2020-).
- Panetta, K. (2016). Gartner's Top 10 Technology Trends 2017 [web log]. Retrieved from <https://www.gartner.com/smarterwithgartner/gartners-top-10-technology-trends2017->.
- Singh, H. V., Gupta, K., Sudan, R. and Singh, R. (2018). Product Space Analysis and Industrial Policy. Brookings. Available at Retrieved from <https://www.brookings.edu/wp-content/uploads/08/2018/Product-Space-Analysis-and-Industrial-Policy.pdf>.
- World Bank (2019). World Development Report 2019: the changing nature of work. Available at <https://www.worldbank.org/en/publication/wdr2019>.
- World Health Organization (2021). Disability and health. Available at <https://www.who.int/news-room/fact-sheets/detail/disability-and-health#:~:text=Over20%201%billion20%people20%are,often20%requiring20%health20%care20%services>.
- United Nations Conference on Trade and Development (UNCTAD). The UNCTAD B2C E-commerce Index 2020: Spotlight on Latin America and the Caribbean.

# Endnotes

---

- 1 Organisation for Economic Co-operation and Development (OECD), 2019.
- 2 World Bank, 2019.
- 3 A score that measures the number of tasks per job, and how these tasks are automated using AI.
- 4 Leopold, Ratcheva, and Zahidi, 2018.
- 5 This is done through screening job descriptions posted online for jobs that are formal, informal, full-time, part-time, temporary, fixed, private and public sector.
- 6 Of the 2,941 jobs listed in the International Standard Classification of Occupations (ISCO) classification, the Skills Monitor data set includes 2,596 jobs, which account for 88 per cent of ISCO jobs. Data is sourced from online hubs at the regional and national levels, including various types of jobs in the formal and informal sectors, and in the public and private sectors when relevant.
- 7 <https://ilostat.ilo.org/resources/concepts-and-definitions/classification-occupation/>.
- 8 [www.sdgmapping.auckland.ac.nz/](http://www.sdgmapping.auckland.ac.nz/).
- 9 Their total frequency reached 2,674,420 for 1,303,043 job advertisements, averaging two skills per job. The low number of required skills for a job is mainly due to the high number of poorly drafted job descriptions/advertisements in the Arab region, where job-related tasks and skills are often not mentioned. With more elaborate job descriptions, the average number of skills extracted reaches around nine skills per job description. Despite this particularity of the Arab online job market, thousands of skills are frequently demanded, and their trends seem assertive.
- 10 ESCWA and International Labour Organization (ILO), 2021.
- 11 Ibid.
- 12 <https://miskschools.edu.sa/>.
- 13 [www.universityworldnews.com/post.php?story=#20180529143046854:-:text=Egypt's20% cabinet20% has20% approved20% a,boosting20% the20% employability20% of20% youth.](http://www.universityworldnews.com/post.php?story=#20180529143046854:-:text=Egypt's20% cabinet20% has20% approved20% a,boosting20% the20% employability20% of20% youth.)
- 14 <http://wam.ae/en/details/1395302694252>.
- 15 [http://skills.gov.ae/game/Futurefit?\\_locale=en](http://skills.gov.ae/game/Futurefit?_locale=en).
- 16 [www.arabcoders.ae/](http://www.arabcoders.ae/).
- 17 [www.actvet.gov.abudhabi/en/Pages/default.aspx](http://www.actvet.gov.abudhabi/en/Pages/default.aspx).
- 18 <http://mola.gov.om/>.
- 19 [www.youth.om/en](http://www.youth.om/en).
- 20 [www.eversheds-sutherland.com/documents/global/middle-east/Jordan\\_Defence\\_Order\\_No\\_6.PDF](http://www.eversheds-sutherland.com/documents/global/middle-east/Jordan_Defence_Order_No_6.PDF).
- 21 [www.moroccoworldnews.com/304482/06/2020/morocco-prepares-draft-law-to-formalize-remote-administrative-work](http://www.moroccoworldnews.com/304482/06/2020/morocco-prepares-draft-law-to-formalize-remote-administrative-work).
- 22 [www.anpr.tn/national-ai-strategy-unlocking-tunisia-capabilities-potential/](http://www.anpr.tn/national-ai-strategy-unlocking-tunisia-capabilities-potential/).
- 23 [www.universityworldnews.com/post.php?story=20210131063348120](http://www.universityworldnews.com/post.php?story=20210131063348120).
- 24 <https://u.ae/en/information-and-services/jobs/future-skills-for-youth/special-programmes-for-developing-future-skills>.
- 25 <https://e.gov.kw/sites/kgenglish/Pages/HomePage.aspx>.
- 26 [www.mohre.gov.ae/en/the-national-self-employment-platform.aspx](http://www.mohre.gov.ae/en/the-national-self-employment-platform.aspx).
- 27 [www.mohre.gov.ae/en/wajheni.aspx](http://www.mohre.gov.ae/en/wajheni.aspx).
- 28 [www.unicef.org/jordan/media/3481/file/Briefing20%Note20%-20%Social20%Enterprise.pdf](http://www.unicef.org/jordan/media/3481/file/Briefing20%Note20%-20%Social20%Enterprise.pdf).
- 29 <https://tiec.gov.eg/>.
- 30 [www.ebrd.com/cs/Satellite?c=Content&cid=1395276191034&d=Mobile&pagename=EBRD2%FCContent2%FCContentLayout](http://www.ebrd.com/cs/Satellite?c=Content&cid=1395276191034&d=Mobile&pagename=EBRD2%FCContent2%FCContentLayout).
- 31 [www.afdb.org/en/documents/mauritania-vulnerable-youth-employability-and-socio-economic-integration-support-project-project-appraisal-report](http://www.afdb.org/en/documents/mauritania-vulnerable-youth-employability-and-socio-economic-integration-support-project-project-appraisal-report).
- 32 [www.unicef.org/lebanon/press-releases/ministry-education-and-unicef-promote-inclusive-education](http://www.unicef.org/lebanon/press-releases/ministry-education-and-unicef-promote-inclusive-education).
- 33 ESCWA is using the EMSI Burning Glass machine learning model to detect skills.
- 34 The percentage of unique jobs from the total number of jobs as per ISCO classification is 88 per cent.
- 35 Clerical staff handle a general set of administration tasks, including typing, printing, appointments, meeting minutes, answering calls, and running office errands.
- 36 Communications is a required skill in almost 150,000 jobs from around the region.
- 37 The model underpinning the present report classifies strategic planning and customer satisfaction as hard skills (figure 5), since they require an additional layer of specialization that must be learned.
- 38 Burning Glass, 2021.



- 39 Examples of labour-intensive occupations are market gardening and crop growing, animal production, subsistence mixed crop and livestock farming, and subsistence fishing, hunting, trapping and gathering.
- 40 Of the 20 Arab countries for which data is available, the lockdown percentage is the share of Arab countries that imposed a lockdown during each of the studied months.
- 41 "National e-Accessibility Policy: Template for the Arab Region", ESCWA, 2020, p. 7, <https://e-inclusion.unescwa.org/sites/default/files/resources/national-e-accessibility-policy-template-arab-region-english.pdf>.
- 42 Ibid., p. 4.
- 43 ESCWA, 2021.
- 44 World Health Organization, 2021.
- 45 <https://e-inclusion.unescwa.org/node/1203>.
- 46 ESCWA, 2018.
- 47 ESCWA and ILO, 2021.
- 48 Examples of the extracted root words in a job description that target women include the following: "agree", "affectionate", "cheer", "commit", "compassion", "considerate", "emotional", "feel", "flatterable", "gentle", "honest", "interpersonal", "interdependent", "kind", "kinship", "loyal", "modesty", "nag", "pleasant", "polite", "quiet", "sensitive", "submissive", "support", "tender", "trust", and "understand". Examples of the set of root words that target men include the following: "active", "adventurous", "autonomous", "battle", "champion", "confident", "decisive", "dominant", "driven", "fearless", "greedy", "headstrong", "impulsive", "independent", "objective", "reckless", "self-confident", "self-reliant", "self-sufficient", "stubborn", and "superior".
- 49 Research Ferry, 2016 shows that women surpass men when it comes to utilizing soft skills essential for superior business performance and effective leadership. Women scored higher than men on almost all emotional intelligence competencies. Kochhar, 2020 similarly reported that men are more likely than women to acquire jobs that require mechanical skills, whereas the opposite is true when it comes to jobs that entail a high degree of proficiency in social skills.
- 50 ESCWA, 2017.
- 51 ESCWA, 2018.
- 52 Labour Force and Household Living Conditions Survey of Lebanon, 2018-2019.
- 53 Ibid.
- 54 The e-accessibility score is an index with a value between 0 and 1. It is calculated based on the Web Content Accessibility Guidelines (WCAG) 2.1, which has four key principles: perceivable, operable, understandable, and robust (POUR). More information on WCAG is available at [www.w3.org/TR/WCAG21/](http://www.w3.org/TR/WCAG21/).
- 55 ILO, 2019a.
- 56 In figure 24, we further narrow our analysis to the country levels. We specifically explore results for Egypt, Saudi Arabia and the United Arab Emirates given that they possess the highest number of online job postings stating years of experience. In both Egypt and the United Arab Emirates, results are similar to the aforementioned findings at the regional level, whereby a large share of online job openings target young people. However, newly created jobs are not enough to absorb the flux of new entrants into the labour market. As reported by the ILO (2019b) model estimates, the 2020 unemployment rate for Arab countries was estimated at 42.1 per cent among the region's young women, and 19.8 per cent among the region's young men. The youth bulge experienced by Arab countries must therefore be considered a top priority in countries' national development planning. Addressing this challenge would create enough jobs to absorb the flux of new entrants into the labour market.
- 57 ESCWA, 2020.
- 58 Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- 59 We used the University of Auckland SDG Keywords Mapping to link jobs to the SDGs. More details on the methodology are available at [www.sdgmapping.auckland.ac.nz/](http://www.sdgmapping.auckland.ac.nz/).
- 60 Full details of the methodology used to link the analysed jobs to the SDGs are available at [www.sdgmapping.auckland.ac.nz/](http://www.sdgmapping.auckland.ac.nz/).
- 61 ESCWA, 2020.
- 62 Singh, H. V., Gupta, K., Sudan, R., and Singh, R., 2018. Product Space Analysis and Industrial Policy. Brookings. Available at [www.brookings.edu/wp-content/uploads/08/2018/Product-Space-Analysis-and-Industrial-Policy.pdf](http://www.brookings.edu/wp-content/uploads/08/2018/Product-Space-Analysis-and-Industrial-Policy.pdf).
- 63 Calculations are based on the top 50 hard/technical skills per occupation. After calculating pairwise the number of skills shared with their respective frequencies for each occupation, the links of each node are limited to the top 25 per cent.
- 64 International Monetary Fund, 2021.
- 65 Data is based on the ILO nowcasting model. [www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/publication/wcms\\_817042.pdf](http://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/publication/wcms_817042.pdf).
- 66 ESCWA and ILO, 2021.
- 67 Panetta, 2016.
- 68 Ibid.



The present report relies on the newly developed ESCWA Skills Monitor, using almost 1.2 million online job openings for the period June 2020–September 2021. Using Skills Monitor results, we analyse whether the type of skills and jobs demanded in the Arab region address the needs of the Fourth Industrial Revolution and the new era of economic development. We also investigate the type of skills and jobs demanded in the Arab region, their interconnectedness, and the chance of reskilling and upskilling, including those skills that are trending.

The present report shows how easily employees can accumulate skills and move from one job to another, using the ESCWA Skills Forest. To better relate to the future of work, the analysis attempts to uncover whether the labour market in the Arab region is demanding tomorrow's skills, is gender and youth inclusive, and if demanded jobs relate to the 2030 Agenda for Sustainable Development by linking available jobs to their related SDGs.

