

**Upskilling and Reskilling in the United Arab Emirates:
Future-proofing careers with AI skills**

Journal:	<i>Journal of Adult & Continuing Education</i>
Manuscript ID	JACE-2024-0076.R2
Manuscript Type:	Original Research Article
Keywords:	Upskilling, Reskilling, United Arab Emirates, Artificial Intelligence

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Abstract

The rapid evolution of technology, particularly in Artificial Intelligence (AI), is reshaping the global job market at an unprecedented pace. This transformative wave presents challenges and opportunities, especially for the United Arab Emirates (UAE), as it endeavors to future-proof its workforce. This article examines the imperative of upskilling and reskilling as a strategic response to the dynamic demands of the contemporary job landscape in the UAE. Focusing on the pivotal role of Artificial Intelligence (AI) skills, the paper explores the current state of the UAE workforce, highlighting the vulnerabilities of existing job roles and industries to technological disruptions. The global context of upskilling initiatives provides a backdrop to understand the urgency of this issue and offers insights into successful implementation strategies.

Keywords: Upskilling, Reskilling, United Arab Emirates, Artificial Intelligence

1. Introduction

The United Arab Emirates (UAE) stands at the crossroads of an unprecedented era characterized by rapid technological advancements reshaping the fabric of its workforce. As emerging technologies, particularly artificial intelligence (AI), become increasingly integral to various industries, the traditional contours of employment are undergoing a profound transformation (Makridatis, 2017). This paradigm shift underscores the urgency of addressing human capital development and the evolving needs of the workforce in the UAE (Dirani et al., 2018; Gonzalez, 2008), where the synergy between human potential, competitiveness, and technological innovation is crucial for sustained economic growth. Research from PwC in 2024 indicates that an annual AI growth rate ranging from 20 to 34 percent is expected in the Middle East, with a potential impact of \$320 billion by 2030.

The contemporary workforce in the UAE finds itself navigating a landscape where job roles and industries evolve and are being redefined by the speed and advances of technology (Hui et al., 2023). A recent ServiceNow survey indicated that more than half of workers in the UAE believed that their education had not prepared them for the modern workplace. Against the backdrop of this transformative wave, this article aims to explore the imperative of upskilling and reskilling as strategic imperatives for the UAE. By examining the current state of the workforce, we aim to unravel the intricacies of a job market increasingly shaped by automation, data, machine learning, and Artificial Intelligence (AI). The essence of work, from routine tasks to complex decision-making, is being influenced by technological interventions, necessitating a re-evaluation of the skillsets demanded in the professional world.

The primary objective of this article is, therefore, to comprehensively explore the critical need for upskilling and reskilling the workforce, tailored to the demands of the contemporary job market in the UAE, with a specific focus on AI skills. By analysing the existing literature, this article sheds light on the challenges, opportunities, and potential strategies that can empower individuals, industries, and policymakers to navigate the dynamic landscape of the future workforce. In doing so, we aim to contribute to the ongoing discourse on future-proofing careers.

2. Literature Review

As the world advances toward the Fourth Industrial Revolution, the United Arab Emirates recognizes the need to reskill and upskill its workforce to adapt to the future demands of AI technologies (Alyani, 2023) and strengthen its national capabilities. Using AI to automate tasks and improve efficiency has the potential to revolutionize industries and create new job opportunities. This includes recognizing the potential barriers that certain groups of workers may face in obtaining AI-related job skills, which could lead to exclusion from economic activities (Jetha et al., 2023).

Reskilling is crucial for companies in the UAE looking to adopt AI systems as it helps employees develop the knowledge and skills they need to work effectively with the technology in new roles (Morandini et al., 2023). A PwC survey in 2023 indicated, for instance, that 8 in 10 Emirati graduates desired to develop key skills such as entrepreneurship, "research and data analytics, and application of emerging technologies to start their own business" (Emiratisation Survey, 2023, p.11). Furthermore, reskilling and upskilling initiatives must be inclusive, ensuring that Emirati women receive adequate support and opportunities to develop the necessary skills for the future labor market (Collet et al., 2022). Reskilling and upskilling women are essential to equip

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3 them to meet the demands and adapt to the structural shifts of the future labor market. This approach will help
4 bridge the gender gap in AI skills and ensure equal opportunities for women in the UAE.
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6 2.1. How do upskilling and reskilling contribute to economic growth in the United Arab Emirates? 7

8 In the face of rapid technological advancements, globalization, and evolving industry demands, upskilling and
9 reskilling have emerged as critical components of economic growth and individual prosperity (Li, 2022).
10 Upskilling, in the context of this article, refers to enhancing existing skills and knowledge, while reskilling
11 focuses on acquiring new skills to adapt to changing job requirements (Morandini et al., 2023). These two
12 strategies empower individuals to thrive in a dynamic workplace like the UAE and contribute to the nation's
13 economic competitiveness. The literature identifies several global trends that drive upskilling and reskilling:

14 (1) Technological Disruption. The rapid adoption of new technologies, such as artificial Intelligence,
15 machine learning, and automation, is transforming industries and creating new job roles. Other jobs may rapidly
16 become obsolete. Although the impact of this disruption is not uniform across sectors, the transition could create
17 a paradox where high-skilled jobs are on the rise. However, low-skilled workers face increased vulnerability to
18 job displacement leading to regional disparities in labor market outcomes (Morandini et al., 2023). The Institute
19 for Public Policy Research (IPPR) has found that 8 million UK jobs could be at risk from artificial intelligence
20 (AI). Upskilling and reskilling are essential to equip employees in the UAE with the skills needed to
21 understand, analyze, operate, and manage these new technologies effectively.

22 (2) Globalization, Socio-Economic Shifts, and Demographic Imbalance (Daleure, 2017). The
23 interconnectedness of the global economy leads to shifts in job demand and supply. This also introduces
24 complexities related to socio-economic disparities and cultural dynamics. Upskilling and reskilling enable
25 employees to adapt to these changes and pursue opportunities in emerging and promising industries in the UAE,
26 such as healthcare and medical tourism, biotechnology, renewables, manufacturing, FinTech, and the digital
27 economy (Khan, 2023), with a strategy that aims to double the contribution of the digital economy to the UAE's
28 non-oil GDP from 11.7 percent to over 20 percent by 2031.

29 (3) Skills Mismatch. The gap between the skills required by employers and the skills possessed by job
30 seekers highlights the need for targeted upskilling and reskilling programs to bridge this gap. Santandreu
31 Calonge et al. (2019) argued, for instance, that the “divide between the skills employers” sought “and the skills
32 attained by graduates and the subsequent need of businesses to bridge this gap by investing in skills training for
33 their employees” was “a growing phenomenon” (p.3). UAE Minister of Education, H.E. Ahmad Belhoual Al
34 Falasi, stated that “a gap exists amongst Emirati graduates and the needs of the job market. Forty percent of
35 students have skills which are not needed in the job market” (Edarabia, 2017, p. X). In the context of the UAE,
36 the skills mismatch also affects international graduates who seek employment in their host country (Calonge et
37 al., 2023).

38 In conclusion, upskilling and reskilling are essential strategies for addressing the challenges posed by
39 technological disruption, globalization, and skills mismatches, ultimately contributing to economic resilience
40 and growth in the UAE. By equipping the workforce with relevant and adaptive skills, the UAE enhances its
41 competitiveness on a global scale. It ensures that both Emirati citizens and international graduates can thrive in
42 emerging industries. As the nation navigates these complexities, prioritizing upskilling and reskilling will be
43 critical for harnessing the potential of its human capital and achieving its economic objectives and growth.

44 2.2. Upskilling and reskilling contributions to economic growth

45 A workforce with relevant skills increases productivity, innovation, and economic output (Abdeldayem et al.,
46 2021). Upskilling and reskilling enable employees to adopt new technologies, leading to more efficient and
47 effective work practices and processes. It also equips employees with the adaptability to transition to new job
48 roles, reducing unemployment and ensuring a smooth transition during economic shifts (Diaz et al., 2022.,
49 Hassock & Hill, 2022) or diversification. This adaptability enhances labor market flexibility and resilience
(Morandini et al., 2023).

50 Companies that invest in upskilling and reskilling their employees attract and retain highly skilled talent,
51 fostering a competitive advantage. This investment in human capital contributes to economic growth and
52 innovation. Moreover, upskilling and reskilling opportunities for all population segments, including women,
53 promote inclusive economic growth (Sakamoto, 2019), decrease gender gaps, and reduce income inequality.
54 Finally, upskilling and reskilling existing or aspiring entrepreneurs and small business owners with the
55 necessary skills to start, manage, and grow their businesses contribute to job creation and economic
56 diversification (Emiratisation Survey, 2023).
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60 3. Theoretical Framework

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4 Social capital theory (SCT) argues that our networks and relationships provide valuable resources that can
5 facilitate access to opportunities and enhance individual and collective outcomes. This makes it a perfect lens to
6 examine upskilling and reskilling in the context of the United Arab Emirates, as strong professional and family
7 connections and networks can provide access to learning opportunities and career advancement. SCT was
8 therefore found to be most appropriate in the context of this article. Bourdieu introduced SCT in 1985. It was
9 defined as “the aggregate of the actual or potential resources which are linked to possession of a durable
10 network of more or less institutionalized relationships of mutual acquaintance or recognition” (Fiorini et al.,
11 2018).

12 The theory of Social Capital (SCT), as it has been examined in several scholarly works, provides a thorough
13 framework for understanding the concept of reskilling and upskilling, especially in the AI era and technological
14 progress (Ferragina & Arrigoni, 2017; Field, 2016; Martin et al., 2020; Inaba, 2021; Li, 2022). The relevance of
15 SCT in the context of reskilling and upskilling is underscored by its emphasis on social networks, trust, norms,
16 and reciprocal relationships, which are foundational to interactions within learning ecosystems (Lin, 2002;
17 Field, 2016). This framework is particularly salient in the era of artificial intelligence (AI) and technological
18 advancement, where collaborative learning and information exchange become essential for developing new
19 competencies (Bates & Davis, 2004; Bassani, 2007; Ali et al., 2023; Dahlke, 2024). This is especially important
20 when developing AI skills, as group learning and information exchange are essential.

21 The significance of social inclusion in gaining access to educational and training services is
22 emphasized by the studies conducted by Kreuter and Lezin (2002) and Bates and Davis (2004). This indicates
23 the need for strategies that guarantee equitable learning opportunities, which are crucial for the UAE's AI skills
24 development programs. The emphasis on inclusivity is consistent with the observations made by numerous
25 authors, such as Akdere (2005) and Pandey (2023), regarding the application of Social Capital Theory to Human
26 Resource Development (HRD), emphasizing the value of establishing settings where various groups can
27 participate in AI learning.

28 This paradigm is further clarified by Dakhli and De Clercq's (2004) research on the relationship
29 between human capital, social capital, and innovation. According to their findings, social capital development
30 improves AI training programs' capacity for innovation in the United Arab Emirates. This is supported by
31 McElroy et al. (2006), who reexamined social capital theory from the standpoint of knowledge management, in
32 which they make the case for social capital's function in promoting innovation and knowledge sharing (Wang et
33 al., 2021). Building on similar insights, Dahlke et al. (2024) discovered that the development of social capital
34 facilitates the adoption of AI technology innovations through training. They suggest that these initial
35 investments could initiate virtuous cycles of AI knowledge diffusion (Alekseeva et al., 2021).”

36 A fair-minded viewpoint is provided by the critiques of Social Capital Theory by Claridge (2018) and
37 Ferragina and Arrigoni (2017), who pointed out the theory's shortcomings and the necessity of context-specific
38 adjustments. This is pertinent in the UAE, where unique cultural and economic factors may impact adopting AI
39 skills training initiatives. Finally, the justifications of social capital theory in social media research by
40 Carmichael, Archibald, and Lund (2015) create opportunities for using digital platforms in AI skills training.
41 This is especially important where social media usage is high, as digital platforms can significantly help in
42 learning and networking to develop AI skills.

43 Therefore, the combined knowledge from these diverse studies offers a solid theoretical framework for
44 improving the efficacy of AI upskill and reskill training initiatives in the UAE. With its emphasis on linkages,
45 networks, and social structures, social capital theory provides insightful direction for creating learning programs
46 that transfer technical skills and create a nurturing environment that encourages creativity and inclusive
47 development.

48 **4. Methods**

49 This study used a scoping review methodology to investigate upskilling and reskilling in the context of the
50 United Arab Emirates.

51 In **Phase 1**, the research question that was investigated was as follows:

52 RQ1: To what extent should the UAE upskill and reskill its workforce to meet the changing job market's
53 challenges and demands?

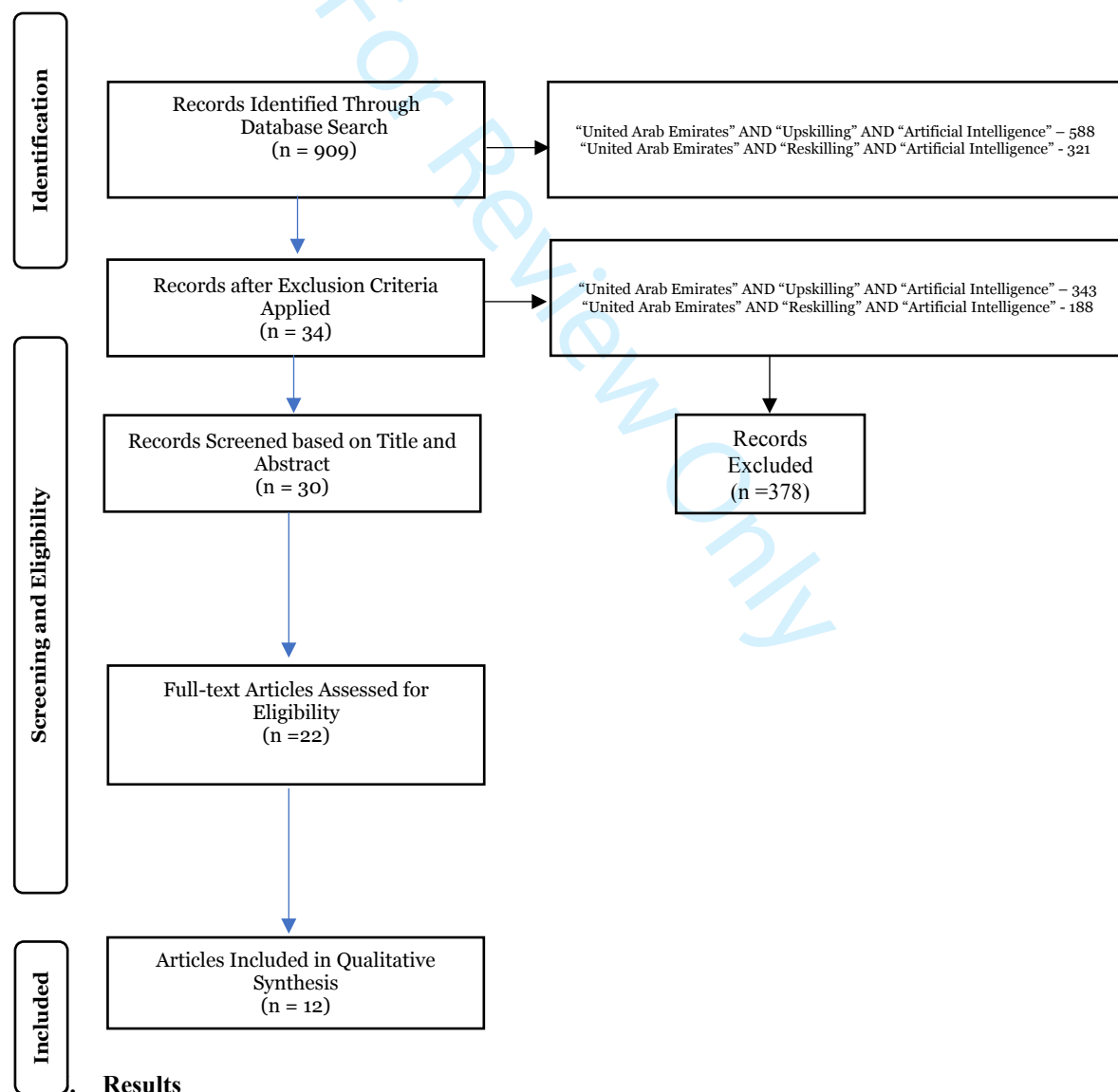
54 **Phase 2** involved the identification of relevant studies.

55 The initial search was conducted by five databases (a) the Google Scholar databases, (b) Scopus, (c) Applied
56 Social Science Index and Abstracts (ASSIA), (d) Social Sciences Full Text (Wilson Web), and (e) Social
57 Services Abstracts (CSA) for peer-reviewed English articles published between January 2022 and January 2024.
58 Book chapters, reports, theses, conference articles, and op-eds were excluded. Two searches were conducted
59 using Boolean terms (1) “United Arab Emirates” AND “Upskilling” AND “Artificial Intelligence” (yielding 343
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– excluding overlapping results), and (2) “United Arab Emirates” AND “Reskilling” AND “Artificial Intelligence” (yielding 188 – excluding overlapping results).

During **Phase 3**, a comprehensive selection process was conducted to ensure minimal bias. To maintain consistency, a protocol based on the Preferred Reporting Items for Systematic Reviews and meta-analysis guidelines for scoping reviews (PRISMA-ScR) was used, as shown in Figure 1. Three authors performed abstract screening, and exclusion criteria were applied. Articles were excluded if they (a) were published in a language other than English, (b) were published before January 2022, (c) were reports, (d) were book chapters, (e) were conference articles, and (f) were op-eds.” After screening, 12 articles were selected for inclusion in the review, excluding articles outside the context of AI, upskilling or reskilling as the main theme. The authors utilized Krippendorff’s alpha coefficient, as introduced by Krippendorff in 2011, to assess the agreement level and inter-rater reliability during the analysis of responses from the four chatbots (0.92 for full texts). The chatbots played a crucial role in providing consistent evaluations of the abstracts and articles, thereby assisting in identifying relevant articles. The main aim of employing this measure was to minimize subjectivity in our analyses and maintain consistency across different raters.

Fig 1. Search Process using PRISMA-ScR



Phase 4: 12 eligible studies were included (Table 1). Thematic analysis was used to identify themes.

Table 1. Articles included in the Review

	Author (s)	Article Title	Keywords	Main Objective	Methodology
1	Ahmad, N., Haque, S., & Ibahrine, M. (2023).	The news ecosystem in the age of AI: evidence from the UAE.	Artificial Intelligence; Journalism; Ecosystem; UAE	To explore how AI tools are used in the news ecosystem in the UAE.	Qualitative in-depth semi-structured interviews
2	Alhammadi, A., Alsyouf, I., Semeraro, C., & Obaideen, K. (2024)	The role of industry 4.0 in advancing sustainability development: A focus review in the United Arab Emirates.	Industry 4.0; Sustainable development goals; Systematic literature review; SDG 14; Life below water	To review how Industry 4.0 technologies contribute to sustainability development SDGs, specifically in the UAE.	Systematic review
3	Al Haziazi, M., Muthuraman, S., Al Yahyaee, N., & Al Balushi, A. (2022).	Opportunities and challenges in digitalizing the HRM in the Middle East.	Digitalization; Human Resource; Technology; Competitive Edge; Middle East.	To understand the opportunities and challenges in digitalizing the HRM in the Middle East.	Systematic Literature review
4	Ali, N., Santos, I. M., AlHakmani, R., Abu Khurma, O., Swe Khine, M., & Kassem, U. (2023).	Exploring technology acceptance: teachers' perspectives on robotics in teaching and learning in the UAE.	Robotics; TAM model; Teaching usefulness; Learning usefulness; Behavioral intentions	To investigate teachers' perceptions on the adoption of robotics in classrooms.	Quantitative (questionnaires) and Qualitative (focus group discussions)
5	Almutawa, E. A., & Dilawer, T. (2023).	The impact of AI technology on organizational efficiency: Analysing the pros and cons of digitalization in the context of UAE.	AI technology; Digitalisation; Organizational efficiency; Automation; Decision-making and analytics.	To evaluate the impact of AI adoption on organisational efficiency.	Semi-structured Interviews/ Open-ended technique
6	Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023).	New era of Artificial Intelligence in Education: Towards a sustainable multifaceted revolution.	AI; Deep learning; Education; Intelligent systems; ChatGPT	To examine the transformative role of AI in education.	Scoping review
7	Gambhir, B., & Bhattacharjee, A. (2021).	Embracing the role of artificial intelligence in accounting and finance: contemplating the changing skillset expectations.	Training, Accounting; Finance; Artificial Intelligence (AI); Skillset	To highlight how AI is changing the face of the accounting and finance roles, proposing new skill set expectations from these professionals.	Questionnaire
8	Iyer, S., Gernal, L., Subramanian, R., & Mehrotra, A. (2022).	Impact of digital disruption influencing business continuity in UAE higher education.	Business continuity; Business continuity management; Maturity model; United Arab Emirates; Education sector; Higher education; Digital disruption	To examine the impact of digital disruption on business continuity in the UAE higher education sector.	Mixed method- Qualitative and quantitative
9	Paderanga, C., Soni, A., & Nisa, N. (2023).	Artificial intelligence adoption among accountants in the UAE: an integrated AI acceptance-avoidance model.	Artificial intelligence; AI adoption in accounting; Technology acceptance; Attitude towards AI; Unified theory of acceptance and use of technology (UTAUT); Technology threat avoidance theory; (TTAT) Integrated AI acceptance-Avoidance model (IAAAM)	To develop and test a model of understanding AI adoption and avoidance in accounting. To investigate accountants' perceptions of AI adoption in the UAE.	Monomethod approach (quantitative)
10	Pandya, B., Patterson, L., & Ruhi, U. (2021).	The readiness of workforce for the world of work in 2030: perceptions of university students.	Competencies; knowledge; Skills, abilities and other; KSAO; New	To investigate the readiness of university students for the workforce in 2030.	Quantitative (five-point Likert scale survey)

			workplace; New workforce; Work in 2030; Artificial Intelligence; future competencies; readiness for future work.		
11	Santandreu Calonge, D., Thompson, M., Hassock, L., & Yaqub, M. (2023).	Hybrid flexible (HyFlex) learning space design and graduate-level implementation: An iterative process.	HyFlex; Learning spaces; Design-thinking; Technology-enhanced learning	To evaluate the process of designing and implementing Hyflex classrooms in graduate programs.	Case study
12	Shouman, I., & Dilawer, T. (2023).	The role of digitalization in innovation: Investigating the environmental sustainability in the context of circular economy in UAE.	Environmental sustainability; Circular economy; Digitalization; Innovation; Digital technologies	To investigate the relationship between digitalization and environmental sustainability in the UAE's circular economy.	Qualitative (semi-structured interview)

Phase 5: Organize and Summarize the Results.

Five main themes emerged from the data. Additionally, various sub-themes are listed to provide a comprehensive overview of the findings.

5 Themes emerged from the data:

- (1) Operational efficiency, Challenges, Disruption, and Limitations Associated with AI Adoption in Different Sectors;
- (2) Ethics, Human Resources, and Organizational Competitiveness;
- (3) AI in Education, Student Development, Employability, and Higher Education;
- (4) Transformation of Job Roles and Business Processes;
- (5) Digital Transformation and Right-Skilling.

6. Discussion

Theme 1: Operational Efficiency, Challenges, Disruption, and Limitations Associated with AI Adoption in Different Sectors

AI is poised to disrupt several sectors in the UAE. The key industries particularly susceptible to these disruptions are oil and gas, healthcare, finance, banking, retail, and e-commerce.

Oil and Gas. The oil industry contributes around 30% of the country's GDP (Ministry of Finance, 2019). As the primary sector of the economy, it is expected to be at the forefront of technological progress and innovation. The AI-driven enhancements in the oil industry include predictive maintenance, optimization of oil extraction processes, and the analysis of geological data to improve exploration and production efficiency. Analysis from Mordor Intelligence estimates that the value of AI in oil and gas will reach \$3.349 billion by 2026, highlighting the enormous potential of the technology in the field (Mordor Intelligence, 2024).

Predictive maintenance combines IoT and AI to anticipate equipment failure and deploy the necessary repairs to avoid system downtime. Unlike traditional preventive maintenance, which can sometimes be unnecessary, predictive maintenance allows for precise and on-point maintenance. Preventive maintenance applies to oil extraction and transportation components, including monitoring pump conditions, vessels, virtual rigs, tank pressure, and machinery conditions (Birlasoft, 2023). The benefits of predictive analytics include reduced downtime and lower maintenance costs. McKinsey reported that predictive maintenance reduced downtime by 20%, leading to a yearly production increase of more than 500,000 oil barrels for a single oil company (McKinsey & Company, 2021). A 2021 report from IoT Analytics estimated that the predictive maintenance market would reach \$28.2 billion by 2026 (Journal of Petroleum Technology, 2023).

Optimizing oil extraction processes using AI is a rapidly evolving area with significant advancements. AI can simultaneously analyze multiple datasets and variables to calculate an oil well's estimated ultimate recovery and predict its performance before drilling, helping producers decide where to drill (National Energy Technology

Laboratory, 2020). AI can be used to enhance deepwater exploration and extraction. AI-driven methods, such as those developed by SparkCognition and Shell, use generative AI technology to accelerate the imaging and exploration of subsurface structures. This approach saves time and money, improves exploration success rates, and increases production levels. ExxonMobil utilizes IoT and AI to collect data, optimize operations, and implement autonomous drilling, enhancing efficiency and reducing environmental impact (Multiplatform, 2024). Similarly, Chevron employs AI to fine-tune its drilling procedures and bolster safety (Chevron, 2022).

Analyzing geological data to improve exploration and production efficiency in the oil industry has been an active area of research and development. Generative AI has created accurate reservoir models and simulations by analyzing geological and geophysical data (Koroteev & Tekic, 2021). As a case study, BP has employed AI to improve its reservoir modeling to help find better locations for drilling (Microsoft, 2018).

According to the report by GlobalData, the number of patents related to AI in the oil and gas industry has increased dramatically. It indicates the pace and intensity of innovation driven by AI technology. The UAE oil industry must be ready to embrace the forthcoming AI evolution and be at the forefront of technological progress.

Finance and Banking. The banking sector in the UAE plays a significant role in its economic development. According to a KPMG report, the top 10 local banks in the UAE held almost \$900 billion in total assets with an annual growth of 10% (KPMG, 2023). The potential of AI in the finance and banking sector is significant, with current applications already making an impact.

Detection and prevention of fraudulent activities are significant areas of application of AI in finance and banking. Research indicates that AI-based techniques are notably effective in identifying and mitigating financial fraud (Sood et al., 2023). In banking, AI applications extend to credit risk analysis, personalization of customer experiences, risk intermediation, and instantaneous resolution of complex problems (Sadok et al., 2023). Proactive fraud detection, including identifying money laundering activities, is achieved through AI-powered anti-money laundering applications incorporating rules, processes, laws, and regulations (Singh, 2022). AI also plays a vital role in decision-making processes, reducing fraud risk and improving customer experience across various banking sectors (Mehndiratta et al., 2023). AI-based systems are instrumental in identifying and preventing cybercrimes, although implementing and maintaining such systems can be costly (Verma et al., 2023). Overall, the potential of AI in enhancing fraud detection and prevention in finance and banking is significant.

Customer service and personalized banking experience are well-suited for disruption based on the AI-driven natural language processing software. AI is revolutionizing the banking sector by automating customer service processes and enabling the creation of personalized banking experiences. Banks are now equipped to automate various customer service tasks, such as answering frequently asked questions and providing real-time support, which significantly improves efficiency and minimizes the need for human intervention (Fares et al., 2023; Verma & Sehgal, 2023; Elaprolu et al., 2023). Additionally, AI empowers banks to analyze customer data and preferences, thereby offering personalized services that include product recommendations, tailored financial advice, and customized offers, further enhancing the customer experience in the banking industry (Verma & Sehgal, 2023; Elaprolu et al., 2023; Sheth et al., 2022).

Retail and e-Commerce. As a regional powerhouse, the UAE's e-commerce market size is forecasted to reach 17 billion U.S. dollars by 2025 (Statista, 2024). AI has a significant potential to enhance various aspects of retail and e-commerce drastically. AI chatbots capable of understanding and responding to customer concerns are valuable in improving customer experience and lowering costs. AI can be used extensively in retail and e-commerce for inventory management, personalized marketing, and customer service. It optimizes inventory management, enables customized marketing strategies, improves customer service through chatbots, and offers various benefits such as enhanced customer experience and reduced costs.

AI is used to optimize inventory management and logistics in retail and e-commerce. It helps retailers understand and anticipate customer needs, enhance customer lifetime value, and improve decision-making (Reddy & Khanna, 2024). AI and forecasting techniques predict sales and plan inventory accordingly (Boileau, 2023). By analyzing massive amounts of data, AI enables retailers to make supply chains more efficient (Reddy & Khanna, 2024).

AI also plays a crucial role in personalized marketing for retail and e-commerce. It analyzes customer data to forecast purchase behavior and enables retailers to offer personalized recommendations and targeted

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3 advertisements (Boileau, 2023). AI technologies like chatbots interact with customers, provide assistance, and
4 offer customized services (Areiqat et al., 2021). This enhances the customer experience and increases customer
5 satisfaction (Boileau, 2023).
6

7 Finally, AI can drastically improve customer service in the retail and e-commerce industry by providing instant
8 responses and quick access to information. AI-powered chatbots can automatically handle customer inquiries,
9 reducing the need for additional staff and improving response times (Huseynov, 2023). AI also enables
10 businesses to analyze customer data and gain insights to enhance customer satisfaction and overall company
11 performance (Negi, 2023).
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14 ***Theme 2: Ethics, Human Resources, and Organizational Competitiveness***

15
16 Artificial intelligence has drastically changed the leading industries of the UAE: processes, employees'
17 professional tasks, and legal frameworks. However, ethics remains an essential principle in this new
18 environment. For this reason, integrating ethics into organizations' artificial intelligence programs is necessary
19 to improve companies (Almutawa & Dilawer, 2023). This is the case in different organizations, such as media
20 companies. Ahmad et al. (2023) highlighted the impact of ethics on innovation processes implemented by
21 media companies: this intangible asset affects these organizations' practices and reputations. Thanks to codes of
22 ethics, media companies improve their quality standards and reinforce their relationships with citizens, public
23 authorities, and suppliers. Artificial intelligence changes media companies' internal processes and leads
24 employees to learn new professional skills. This represents an opportunity and risk, so media companies should
25 respect codes of ethics and legal frameworks. This way, they protect employees' rights and ensure that the use
26 of artificial intelligence positively contributes to the common good.
27

28 Besides media companies, other organizations, such as higher education institutions, integrate ethics and
29 artificial intelligence. As Kamalov et al. (2023) stated, artificial intelligence can negatively affect plagiarism,
30 privacy, and authorship in students, professors, and universities. This is why these organizations reinforce their
31 ethical standards and find synergies between artificial intelligence and the basic principles of learning:
32 professionalism, quality standards, and critical thinking. Finally, other companies, such as those specializing in
33 accounting, also promote soft skills, such as creativity, empathy, leadership, and ethics, to efficiently integrate
34 artificial intelligence into their departments' practices (Paderanga et al., 2023). This approach makes these
35 companies' behaviors more credible, reinforces their social responsibility, and promotes artificial intelligence
36 respectfully. In other words, thanks to ethics, these companies become digital organizations without losing their
37 basic functioning principles.
38

39 Companies' human resources directors assume an important responsibility: to change employees' mentalities
40 concerning artificial intelligence to implement this technology and help companies become digital
41 organizations. According to Al Haziakil et al. (2022), artificial intelligence impacts human resource departments
42 as they implement internal automated processes (payment, employee monitoring) and educate all employees on
43 the professional use of this technology. Human resources experts lead an internal revolution to transform their
44 departments and the whole organization. These departments are especially relevant in educational institutions:
45 universities and schools. According to Ali et al. (2023), educators in these organizations need to upskill in
46 innovative pedagogy; and to do that, they count on their human resource departments' learning programs about
47 artificial intelligence and education.
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49 Human Resources departments are also crucial in other sectors. As Almutawa and Dilawer (2023) affirmed,
50 employees working in several sectors, such as banking, healthcare, manufacturing, or retail, must constantly
51 update their skills, execute new professional tasks, and assume different responsibilities. A similar situation
52 exists in the healthcare industry (Li et al., 2023): doctors and nurses interact with patients who have previously
53 improved their digital health literacy skills, which forces hospitals' human resource departments to constantly
54 train their employees in medical technology (Alyani, 2023). Regardless of the sector, human resource experts
55 are essential assets in every company interested in implementing artificial intelligence: They transform
56 companies, lead organizations to new goals, and create brand value (Iyer et al., 2022). However, human
57 resource departments must interact with the company's corporate communication department to efficiently
58 achieve these goals. Both structures will become companies' engines to accelerate digital transformation and
59 achieve new organizational goals.
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3 Respecting ethics and promoting human resource experts' roles will improve organizations' competitiveness. In
4 the United Arab Emirates, companies interact with stakeholders from several countries, which constitutes a
5 challenge since every company follows a different business logic, respects different legal frameworks, and
6 implements different internal policies. For this reason, UAE's companies need to research the impact of
7 technology on their internal functioning and make smart decisions to improve their competitiveness. Al Haziail
8 et al. (2022) analyzed how digitalizing companies contributed to enhancing their competitiveness, and they
9 proved that it positively affects processes, internal practices, and quality standards. Pandya et al (2021) also
10 proved that using artificial intelligence improves companies' competitiveness. Even if implementing artificial
11 intelligence involves initial costs, this technology improves organizational efficiency and competitiveness
12 (Almutawa & Dilawer, 2023).

13
14 For this reason, most organizations in the United Arab Emirates invest in this area and recruit experts in
15 artificial intelligence, deep learning, the Internet of Things, and big data. This search for competitiveness is
16 essential in some areas, such as accounting departments: experts in accounting resort to different technological
17 tools (Power BI, Tableau, Qlikview) and robotic process automation to optimize their efforts and enhance their
18 internal efficiency.

19
20 Finally, focusing on artificial intelligence to improve organizations' competitiveness means that these
21 organizations must implement global processes that include all departments and employees. As Santandreu et al.
22 (2023) stated, higher education institutions follow this worldwide approach and develop new learning
23 environments where students and professors interact differently in teaching, research, outreach, and
24 administration. This global approach is essential to optimize resources and efficiently influence employees'
25 mentalities about using artificial intelligence.

26 ***Theme :3 AI in Education, Student Development, Employability, and Higher Education.***

27
28 Governments, educational institutions, and businesses are crucial in promoting upskilling and reskilling
29 initiatives. Artificial intelligence technological knowledge and AI skill sets are required to implement the UAE's
30 national strategy in artificial intelligence. AI technologies transform work practices, and employees require new
31 skills to succeed (Margaryan, 2023). To ensure that the higher education graduate is work-ready, they need to
32 be able to use AI skills correctly and enhance their productivity and capability by using the technology ethically
33 and effectively (Shwedeh et al., 2024). Education institutions are responsible for ensuring students are aware of
34 the limitations of AI software and can use it effectively as another tool in their toolbox of productivity in the
35 workplace. Pandya et al. (2022) advised that 40% of existing jobs worldwide in 2030 will be with automation,
36 artificial intelligence, virtual reality, and augmented reality. A new set of skills, knowledge, and other
37 characteristics will be required to be successful in the workforce.

38
39 Specific jobs may (will?) become redundant. AI will be able to focus on menial jobs, while tomorrow's
40 graduates will require developed technical skills and social intelligence. Upskilling the labor force is therefore
41 critical to handling the AI transition (AI Guide, 2018). Emerging sectors are and will be using AI in the UAE.
42 Around 43% of current work activities have the potential to be automated across key sectors such as
43 administration, government, manufacturing, and construction. Emiratis employed in the public sector (70%)
44 will be impacted by AI automation; currently, only 40% of the UAE workforce has adequate digital skills,
45 whereas, in the UK, 56% have good digital skills in the UK (AI-Readiness Index, 2017). The focus is on
46 developing digital skills and a basic understanding of AI to help make better decisions while adopting
47 automation technologies in the workplace. Upskilling students is important to build AI systems; a pool of UAE
48 AI knowledge talent is required (UAE National Strategy for Artificial Intelligence 2031, 2018). Adult learning
49 and tertiary education are important in preparing citizens for emerging technologies. In 2018, The Parliamentary
50 Committee on AI (AI in the UK, 2018) stated that "All citizens have the right to be educated to enable them to
51 flourish mentally, emotionally, and economically alongside artificial intelligence."

52
53 In 2018, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister, and Ruler
54 of Dubai, approved the Strategy for the Advanced Skills National Programme and indicated that the UAE wants
55 "Emiratis to be prepared for the changes around us and equipped with advanced skills that maintain UAE's
56 competitive edge." The Emirate of Abu Dhabi (Abu Dhabi Future Skills 2030 Report, 2019) identified the
57 driving sources that shape the future of jobs and skills, implementing policies that incentivize businesses to
58 invest in upskilling and reskilling programs, provide financial incentives and funding for training programs such
59 as Future Skills for Youth (Government Development & the Future Office, 2024) the 'Professional and Practical
60 Training Programme' launched by the Ministry of Human Resources and Emiratisation (MoHRE), and
collaborate with educational institutions to develop relevant curricula. Coders HQ (UAE Minister of State for

1
2
3 Artificial Intelligence Digital Economy & Remote Work Applications Office, 2024) and Sibaq Lahja are
4 initiatives [https://ai.gov.ae/sibaq_lahja/] launched by the Minister of Artificial Intelligence, Digital Economy,
5 and Remote Work Application Office to equip young Emirati coders and software engineers with the necessary
6 skills to develop and deploy AI solutions in the realm of Arabic Natural Language Processing (NLP).
7 Additionally, in 2022, the Emirati Talent Competitiveness Council launched NAFIS (NAFIS, 2024), “a federal
8 program to increase the competitiveness of Emirati human resources,” facilitating employment opportunities for
9 Emiratis in the private sector.

10
11 To ensure the graduates are productive and capable in the workplace (Al-Tkayneh et al., 2023), universities,
12 colleges, and vocational training centers must adapt their curricula to meet the evolving skills needed by
13 industry (Mishrif et al., 2023; Kamalov et al., 2023; Hassock & Hill, 2022). This has been done by offering
14 programs such as the Bachelor of Science in Computer Science—Artificial Intelligence (AI) at the British
15 University in Dubai or the Masters and PhD programs at Mohamed bin Zayed University of Artificial
16 Intelligence. All educational institutions should offer flexible learning options, incorporating AI and the use of
17 technology in all training, and partner with businesses to provide relevant workplace-based training.

18
19 Research in New Zealand found that 72% of educational establishments do not have an AI policy to support
20 teachers and students safely using AI integration (Gander & Shaw, 2024). Additionally, less than 55% of the
21 staff had received professional development on how AI could support teaching and learning, and the AI tools
22 commonly used by educators in New Zealand were Google Gemini and Microsoft Co-Pilot (Gander & Shaw,
23 2024). Ali et al. (2023) proposed that the next generation of students requires the acquisition of problem-
24 solving, critical thinking, and collaborative skills. Technology in the classroom increases these skills,
25 particularly using robotics in the classroom. The Dubai Ministry of Education distributed Lego Mindstorms
26 Education kits to encourage teachers to use robotics in the classroom to support learning. Additionally, they
27 trained the teachers on how robotics can significantly impact teaching and learning. Ali et al. (2023) found a
28 positive correlation between the use of the robotics software and the attitude towards using the software in the
29 classroom after the teachers had received the up-skilling.

30
31 Iyer et al. (2023) stated that technology use can only happen once people are convinced it is useful and there are
32 opportunities to use it in their processes. Systems need to be updated and upgraded to integrate the new
33 emerging technologies. Digital transformation provides a competitive edge and delivers student satisfaction,
34 enhancing efficiency and agility in educational institutions (Iyer et al., 2023). Fadlelmula and Qadhi (2024), and
35 Kamalov et al. (2023) recommend incorporating AI into the education system and leveraging its capabilities to
36 deliver better student learning outcomes. Universities must ensure they use the latest technologies and
37 encourage students and teachers to use them extensively. This will enhance the sustainability of higher
38 education, and students will gain new skills (Hultberg et al., 2024), enhancing their employability (Iyer et al.,
39 2023). Higher education employees will need to change and adopt new technologies, and this will only happen
40 if higher education institutions support reskilling (Iyer, 2022).

41
42 Kamalov et al. (2023) rationalize that AI in education comprises personalized learning, assessment automation,
43 teacher-student collaboration, and intelligent tutoring systems, which support improved learning outcomes,
44 increased productivity, and access to quality education. Although the use of AI technologies can lead to data
45 privacy, security, and bias issues, educational institutions must ensure that AI literacy and ethics education are
46 part of the curriculum to meet the challenges presented by technology.

47 ***Theme 4: Transformation of Job Roles and Business Processes***

48
49 Companies integrate upskilling and reskilling programs into their employee development strategies, provide
50 them with financial support, and encourage a culture of lifelong learning. One of the main reasons these
51 organizations lead this process is that artificial intelligence makes most employees work differently, and more
52 efficiently. In media companies, journalists use artificial intelligence, algorithms, and automation to enhance
53 traditional practices: searching for information, analyzing public opinion, and writing news (Ahmad et al.,
54 2023). This technology allows journalists to manage information more efficiently and identify/analyze/fight fake
55 news. Some media companies have established a new role: Automation Editor. Ahmad et al. (2023) stated that
56 this editor ensures all journalists use artificial intelligence professionally and respect quality standards. In some
57 higher education institutions, professors use robotics to promote the values of constructivism and critical
58 thinking, which helps students improve their performance (Ali et al., 2023). Artificial intelligence-based tools
59 allow professors and students to interact differently and focus on improving learning experiences. However, to
60

efficiently do that, professors must update their skills in using artificial intelligence to engage with students with debates, collective projects, and online lectures (Santandreu et al., 2023).

Besides media companies and higher education institutions, employees working in other sectors, such as finance, retail, or manufacturing, need to improve their skills in the use of artificial intelligence to implement data-driven decision-making processes efficiently; additionally, employees should be able to use this technology to make better decisions and accelerate their organizations' growth (Almutawa & Dilawer, 2023). Professionals working in other industries must follow the same process affecting their job roles: healthcare professionals for instance must integrate artificial intelligence into their daily practices. Doctors, nurses, and other healthcare professionals must improve their skills (Alkhaaldi et al., 2023) in using artificial intelligence for medical purposes: consultations, patient monitoring, and analysis of medical information (Alyani, 2023; Santandreu-Calonge et al., 2023). This situation constitutes a challenge and an opportunity: healthcare professionals will be forced to leave their comfort zone, learn new skills, and help hospitals become digital organizations. Regardless of the industry (media companies, universities, banks, retail companies, factories, hospitals), employees' roles will change from a technical and social perspective in the coming years: employees will establish new relationships with society and be forced to reskill/upskill constantly. This situation will allow them to grow and assume new responsibilities, positively impacting companies economically.

This technology also impacts companies as a whole. Indeed, most organizations in the United Arab Emirates invest in artificial intelligence to optimize their processes in terms of time, quality, and cost. The professional use of artificial intelligence allows companies to work faster and become more efficient. This is the case in media companies where artificial intelligence-based tools enable journalists to work faster, use fewer resources, and produce better content (Ahmad et al., 2023). Nevertheless, journalists must not only rely on this technology: they must also respect the main tenets of journalism and promote themselves as the main asset in the newsrooms. Human resources experts also optimize their resources, work faster, and produce more reports in less time (Al Haziakil et al., 2023). Artificial intelligence helps them become more data-informed employees. Finally, higher education institutions also resort to this technology to implement new processes, such as online lectures, and this way helps professors and students optimize their time (Iyer et al., 2022). These online initiatives benefit university professors since they can simultaneously work on several research projects, positively impacting their professional performance and productivity.

Besides optimizing time, the professional use of artificial intelligence helps companies in the United Arab Emirates improve quality standards, accelerating innovation processes. According to Paderanga et al. (2023), this technology positively impacts accountants' attitudes and behaviors since they become more efficient employees and produce better quality analyses. Thanks to artificial intelligence, accountants grow professionally and accelerate innovation processes. Pandya et al. (2021) insisted on the positive impact of artificial intelligence on societal learning processes in higher education institutions: students and professors work differently, improve their critical thinking and creativity skills, and develop new knowledge collectively. Santandreu et al. (2023) also echoed this idea, stating that hybrid flexible modalities in universities reinforced engagement among professors and students, positively impacting quality learning and innovation processes. Professionally using artificial intelligence helps employees accelerate innovation processes, which is essential for companies since stakeholders' perceptions and trends, legal frameworks, and social challenges change constantly.

In addition to optimizing time and improving quality, companies in the United Arab Emirates resort to artificial intelligence to optimize their costs, increasing their benefits. Journalists working in newsrooms use different algorithms to manage information more efficiently and reduce fixed costs, such as those related to outsourcing external organizations for some of these tasks (Ahmad et al., 2023). Human resource managers implement automated processes to free employees from repetitive tasks, reducing the costs directly associated with these activities: scanning documents, archiving information, and verifying legal issues (Al Haziakil et al., 2022). Professionals in different sectors, such as financial companies or factories, implement artificial intelligence-based initiatives to reduce costs associated with different tasks: machine operations, packing, and maintenance (Almutawa, Dilawer, 2023). Healthcare managers use artificial intelligence and big data to reduce costs by implementing initiatives such as online consultations, online appointment systems, and telemedicine practices (Alyani, 2023; Santandreu-Calonge et al., 2023). Finally, university professors use automated evaluation systems to reduce their workload, positively affecting these organizations' structural costs (Kamalov et al., 2023). Implementing artificial intelligence-based tools certainly involves initial economic investments, but most organizations can optimize their processes and reduce costs in the midterm.

Theme 5: Digital Transformation and Right-Skilling

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3
4 In 2017, the UAE government launched the “UAE Strategy for Artificial Intelligence 2031” (Strategy, 2022) to
5 position the country as a global leader in artificial intelligence and integrate AI into major sectors such as
6 education, government services, and community wellbeing by investing in the people and industries. One of the
7 strategic objectives emphasized in the AI Strategy is attracting and training talent for future jobs enabled by AI,
8 highlighting the importance of upskilling initiatives in preparing the workforce for an AI-driven future. Among
9 the eight objectives outlined in the AI strategy, objective five focuses on raising awareness and developing skills
10 of the public, students, professionals, and government employees.

11
12 When adopting AI upskilling initiatives, several factors can significantly impact the pace and success of
13 implementation. The UAE government recognizes the significance of nurturing a cultural shift towards
14 embracing AI integration, upskilling, and “developing better digital skills and basic understanding of AI”
15 (Strategy, 2022, p.32). When it comes to the adoption of AI upskilling initiatives, cultural factors can
16 significantly impact the pace and success of implementation. Several studies highlighted how factors such as
17 lack of knowledge, understanding, and trust, fear of loss, and reluctance to adopt new technologies could hinder
18 the acceptance and adoption of AI upskilling initiatives (Shwede et al., 2024; Chaudhry et al., 2022;
19 Ismatullaev & Kim, 2022; Tubadji et al., 2021). The UAE government recognizes these potential barriers and
20 challenges. It takes proactive steps to ensure the successful adoption of these initiatives in the UAE, such as
21 providing public and government training programs to raise awareness and shift mindsets towards education and
22 skill development. These initiatives and campaigns highlight the benefits of AI upskilling and enhance career
23 opportunities, especially in sectors where automation technologies will impact thousands of jobs (Strategy,
24 2022). Addressing the cultural norms, biases, and attitudes towards AI by effectively demonstrating the potential
25 for job enhancement and security through upskilling will contribute to gradually shifting the perceptions of AI
26 from a threat to an opportunity for growth.

27
28 Almutawa and Dilawer (2023) stated that UAE’s AI strategy includes digitalization to provide effective
29 solutions and overcome challenges. The focus is on making the country a leader in AI while also creating new
30 markets with high economic value. Digitalization and automation allow machines to do repetitive tasks while
31 allowing employees to focus on tasks that need more attention, creativity, and innovation. AI enhances the
32 decision-making capabilities of organizations by providing critical information to inform decisions through data
33 analytics, which can improve performance, organizational efficiency, and customer experience (Almutawa &
34 Dilawer, 2023; Morandini et al., 2023). Organizations can help employees identify the skills required for AI
35 adoption, improve current skills, and develop new skills; they also need to provide training to support workers
36 in changing and being open to using AI (Morandini et al., 2023). Morandini et al. (2023) propose that reskilling
37 can help organizations retain top talent and ensure employees have the necessary skills to utilize AI effectively.

38
39 The healthcare services industry has been steadily growing in the UAE over the last decade. With world-
40 renowned institutions such as the Cleveland Clinic and Mayo Clinic Network commencing their operations in
41 the UAE and a vast network of local, high-quality healthcare providers, the healthcare industry has become a
42 significant sector in the country (USUAE Business Council, 2021). Private-sector healthcare spending is
43 forecasted to increase at a cumulative annual growth rate of 9.5%. The potential of AI in healthcare is vast and
44 has already started to revolutionize the industry.

45
46 Diagnostic and treatment processes using AI have witnessed significant strides in healthcare. AI's capability to
47 analyze large volumes of medical and scientific data aids in enhancing disease detection, personalized medicine,
48 and drug development, marking a shift in how healthcare professionals approach patient care (Sharma & Kumar,
49 2023; Radakovich & Nazha, 2021). In major hospitals, AI systems play a crucial role in supporting medical staff
50 with patient diagnosis and treatment, thereby increasing efficiency and accuracy in healthcare delivery (Lee &
51 Yoon, 2021). AI is also instrumental in managing patient engagement and adherence, streamlining
52 administrative tasks, and improving operational efficiency in healthcare organizations (Pabalkar & Chanda,
53 2022; Lee & Yoon, 2021). The power of AI extends to clinical data analysis, where algorithms are adept at
54 identifying patterns for accurate diagnoses and assisting healthcare professionals in decision-making (Roy et al.,
55 2021; Pabalkar & Chanda, 2022). This is especially valuable in clinical trials, where AI's ability to manage and
56 analyze large data sets can significantly enhance efficiency and precision. The integration of AI across various
57 aspects of healthcare, from diagnostics to clinical trials, highlights its potential to bring transformative
58 improvements in patient care and outcomes.

59
60 Morandini et al. (2023) state that it is important to consider both the individual and organizational components
when introducing AI into an organization. Creating an adaptable and skilled workforce able to meet the
technological challenges of the future is critical. In summary, upskilling and reskilling are not just individual

1
2
3 investments but essential catalysts for economic growth, innovation, and social progress in the 21st century. By
4 investing in the skills of its citizens and residents, the UAE can empower individuals to thrive in a rapidly
5 changing world and contribute to a more prosperous and equitable future.
6
7

8 **7. Conclusions**

9
10 The unique socio-economic landscape of the UAE significantly influences its approach to AI upskilling and
11 reskilling initiatives. As discussed in this paper, the UAE's strategic vision is anchored in its ambition to become
12 a global leader in AI, necessitating a workforce equipped with advanced digital skills. The cultural emphasis on
13 innovation and technology adoption fosters a supportive environment for these reskilling efforts. Furthermore,
14 the government's proactive policies, exemplified by the 'UAE Strategy for Artificial Intelligence 2031',
15 underscore the urgency of cultivating a skilled workforce capable of integrating AI across various sectors. This
16 paper also highlights the critical importance of inclusivity in these initiatives, addressing barriers faced by
17 diverse demographic groups, including women and Emirati nationals, to ensure equitable access to training
18 programs. Collectively, these contextual factors enhance individual employability and drive national economic
19 growth, positioning the UAE to thrive in an AI-driven economy.

20
21 In essence and to answer the research question of this study, the UAE must facilitate the upskilling and
22 reskilling of its workforce to meet the fast evolving job market's challenges and demands and ensure that
23 artificial intelligence skills are an integral part of this development. This will help the country enhance its
24 competitive advantage. The UAE government has concentrated on providing clear strategies, policies and
25 support within industry and educational institutions. There are, however, operational efficiency challenges and
26 disruptions when adopting AI across the sectors. Adoption also creates ethical, human resources, and
27 organizational changes to jobs and processes while increasing competitiveness. Educational institutions are
28 acutely aware that they must train their staff and students to use technology and AI ethically and effectively to
29 ensure work-ready graduates. This technology will change how people do their jobs in the United Arab
30 Emirates, improving quality standards, organizational efficiency, customer experience, and productivity and
31 accelerating innovation. However, more disruption is required within industry and educational institutions to
32 ensure the workforce is ready and able to meet the challenges of tomorrow's workforce requirements.
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