DIGITAL SKILLS SUPPLY AND DEMAND GAP ANALYSIS

Ministry of Digital Economy and Entrepreneurship

DigiSkills
Digital Skills Association
جمعية المهارات الرقمية

AVASANT

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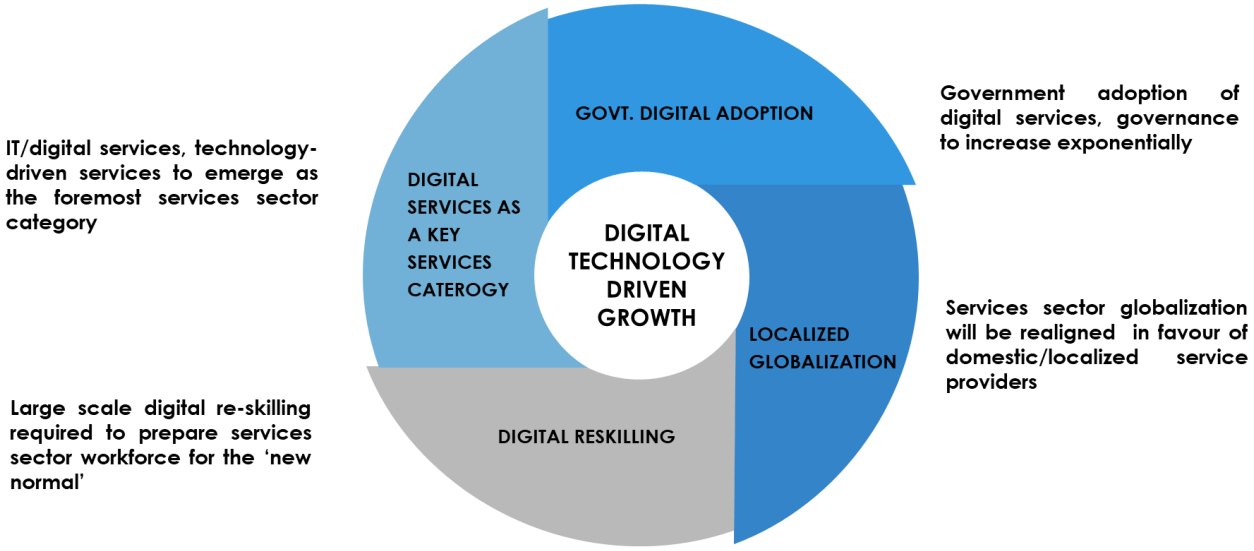
Global Services Sector Overview

Digital Services - The Next Services Sector Growth Driver

While the overall services sector was largely resilient to past economic challenges, the global pandemic has highlighted the challenges of reliance on specific services sub-sectors requiring direct consumer-provider interaction, such as transportation or tourism. At the same time, broadband and digital technologies, lead to ICT and professional services emerging as a highly resilient subsegment with the services sector.

Economies with a higher degree of digital adoption have significantly limited both the social and economic impact of the pandemic while also having a much shorter recovery cycle. Figure 1 indicates the emergence of digital technologies and related services as central to future development and post pandemic recovery programs.

Figure 1 – Digitally Driven Development Policies and Post Pandemic Recovery



Source: Avasant

The pandemic-induced disruption provides an opportunity for Jordan to pivot its growth strategy by prioritizing a digital growth path. While the ICT sector has been a priority sector for Jordan for several years including the latest 'Economic Priority Program 2021-2023[1]', a key driver to this will be creating a broader pool of trained resources and broadening the scope of services by adding digital technology driven services to position Jordan as key technology export destination.

[1] Note: Released Aug 2021

Global ICT Sector Market

The global Information Communication and Technology (ICT) sector[2] has emerged as a key services sector export segment for many developing countries and is playing a significant role in socio-economic transformation. **According to the World Trade Organization (WTO), for 2021, global ICT services trade was valued at USD 3.7 Trillion with USD 676 Billion in cross border exports making up 64% of the total services exports[3].**

ICT Export Market Size and Growth

According to United Nations Conference on Trade and Development (UNCTAD)[4], for 2020, the contribution of ICT services exports as part of the overall services bucket increased while that of the broader digitally deliverable services exports segment held steady across all regions. The worldwide exports of the wider category of digitally deliverable services[5] fell marginally by US$ 57 billion to US$3.17 Trillion. However, it went up from 52% in 2019 to 64% in 2020 as a proportion of overall services exports.

The value of global ICT service exports (a subset of digitally deliverable services) reached US$676 billion (6% rise YoY) in 2020 on the back of increased digital adoption due to the global pandemic. As part of the overall services bucket, ICT services[6] exports grew from 10% to almost 14%.

As the shift to a digital economy continues it is also changing the composition of the traditional workforce towards technology-centric roles, with many technology jobs becoming obsolete and being replaced by newer positions and job profiles.

Global ICT Outsourcing Landscape

The relevance of the outsourcing[7] sector in global trade and investment can be gauged by the fact that over 50 countries now consider ICT outsourcing as one of the key focus sectors for national growth. The concept of outsourcing has also evolved rapidly over the past three decades. While in the '90s, cost arbitrage was the key factor determining outsourcing decisions, outsourcing strategy is now firmly focused on value addition, process improvement, time to market, and delivery models.

[2] Note: The Information Communication and Technology (ICT) sector has two key subsegment- Telecom and Business Services, IT. The IT services are further sub-divide into IT and BPO services. The term IT-BPO covers the ambit of domestic and international 'outsourcing' services. Latest Available Dataset
[3] Source: WTO World Statistical Review 2021. Latest available dataset
[4] Source: UNCTAD, Digital Economy Statistics, 2020 (Latest Available)
[5] Note: ICT services includes telecommunications services, IT system design, software development, and related tasks
[6] Note: Digitally deliverable services represent a broader concept – services that can be delivered over ICT networks (UNCTAD, 2015)
[7] Note: Outsourcing, Global Outsourcing, IT Outsourcing refer to the same concept and universe of outsourced ITO, BPO and Digital Services. The term 'Outsourcing' has been used in the report for easy referencing

According to the National Association of Software and Services Companies (NASSCOM)[8], the Indian IT industry body, **the global technology spend[9] was valued at around USD 1.7 Trillion (9% YoY growth)[10] in 2021 and is projected to grow to USD 1.8 Trillion by 2022 (at 6.5% growth rate).** The global sourcing market also grew significantly at 12-14% reaching USD 238-243 Billion in 2021.

Figure 2 – Global Technology Market Size Based on Spend

Source: NASSCOM-Strategic Review, 2022

Global Digital Skills Shortage

As demand continues to increase for new ICT skills, the sector continues to suffer from a significant lack of qualified candidates globally. The ICT advances have resulted in skills shortages in several specialties including in cyber security, cloud computing, robotics, software design, programming, and data management and analysis. At the same time, the need for soft skills required to work in collaborative work environment has also increased.

As shortage of digital workforce becomes even more acute in key source markets as well as delivery locations, the breath of outsourcing i.e., locations as well as the method of employment i.e., remote working is expected to become even more central delivery of outsourcing services. Locations with conducive ecosystem supporting such work environment (legislative support, quality and scalability of talents, low-cost, high-quality connectivity) will undoubtedly attract foreign services providers in turn giving an entirely new avenue for employment.

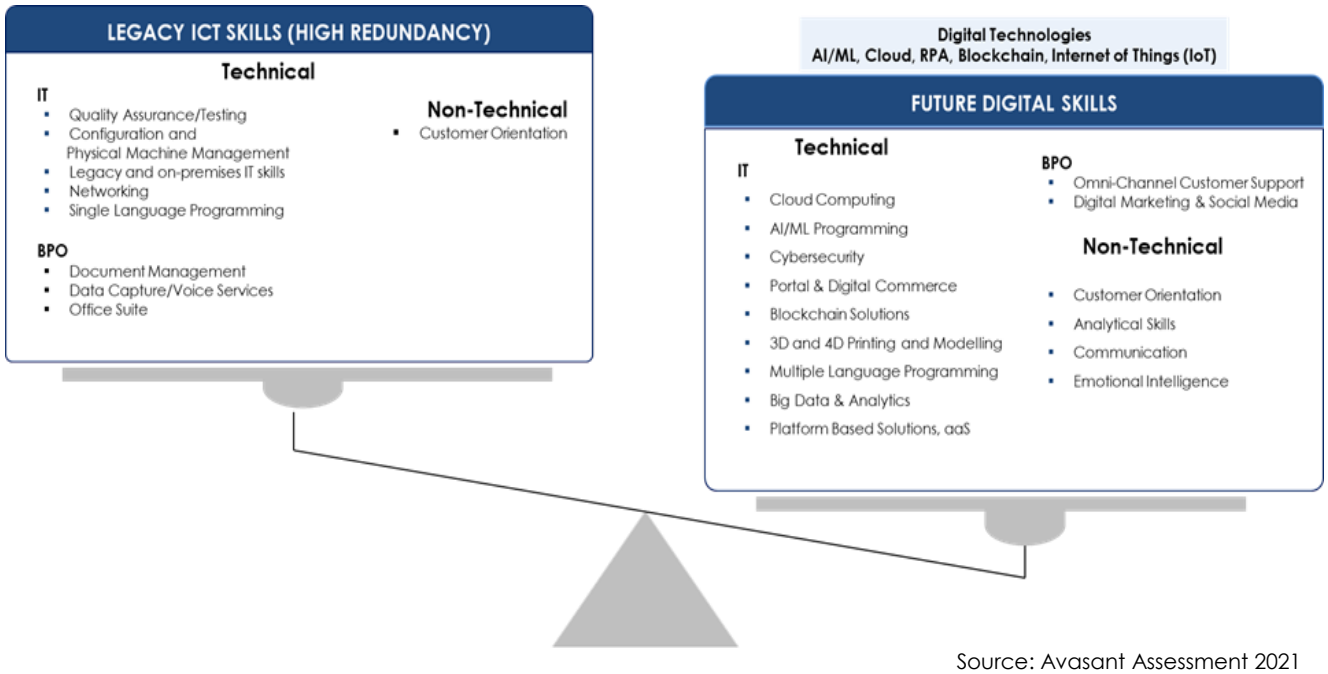
Digital Skills Trends in Global Outsourcing Sector

- **Focus on Digital Talent: Economies are working towards building a digital talent pool while preparing the workforce for a future hybrid way of working**. Technology service providers are looking at growing their digital talent pipeline by directing their organic talent investments toward
- three key areas – talent localization, digital upskilling/ cross-skilling, and hybrid workplace transformation.

[8] Source: NASSCOM Strategic Review 2022
[9] Note: Spend refers to the actual spend on procurement of IT-BPO services and is a better representation of demand for IT-BPO outsourcing services as against market size estimates.
[10] Note: The Global Spend excludes Hardware

- **COVID-19 Impact on Outsourcing as a Service: The pandemic induced digital transformation forced companies to relook at technology and outsourcing with digital talent is being prioritized along with technology adoption.** As per NASSCOM, the Indian IT services association, IT service providers have seen a 30% growth in digital deals, a cloud spending increase of approximately 80%, and a 15% rise in customer experience spending since the outbreak of COVID-19[11]
- **Global Shortage in Digital Skills: With a surge in digitalization, the need for digital skills among the employable population has increased exponentially.** Digital talent encompassing both technical skills and soft skills are the most sought after across the world.
- **Focus on Upskilling: Enterprises and governments are investing in upskilling/reskilling their employees to make them future skills ready.** For example, Amazon committed USD 700 Million to reskill 100,000[12] of its workers in the US in cloud computing. Salesforce partnered with NASSCOM India's Future Skills Prime Program, under its OneIndiaTalent Program, to train nearly 100,000[13] potential employees and students in digital skills by 2024. To support clients' reconfigured talent strategies and workforce transformation agendas, outsourcing service providers are prioritizing reskilling to bridge the talent gap.
- **New Skill-Sets: The emergence of digital technologies has given rise to new jobs that demand digital skill sets, while many recently 'in demand' skills have been made redundant.** Any large-scale skill development program should adequately focus on these new digitally driven skills while ensuring an adequate supply of trained resources to support existing outsourcing services.

Figure 3 – Digital Skills for the Future



Source: Avasant Assessment 2021

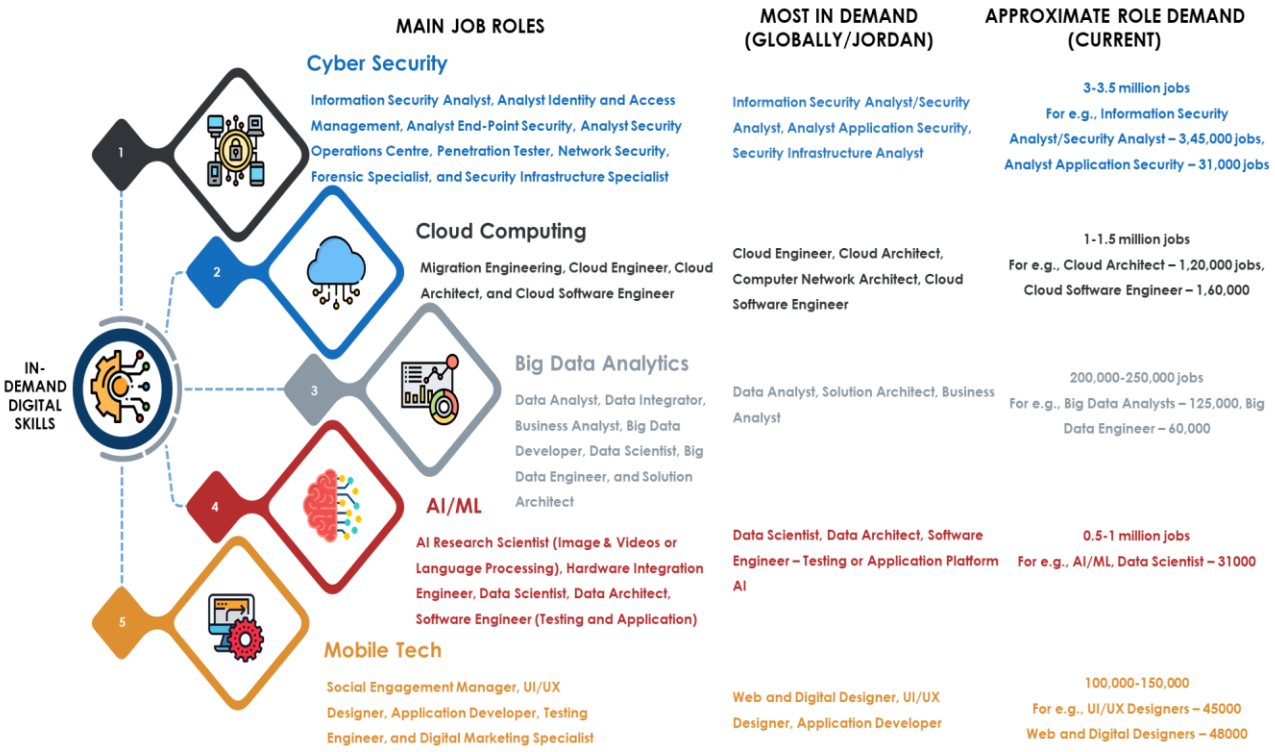
[11] Source: NASSCOM, 2020
[12] Source: Amazon, 2020
[13] Source: Salesforce, 2020

Global Skills Demand Forecast

The global digital skills shortage can be mainly classified into two broad segments – general digital skills and skills that make an individual more effective by improving his usage of digital tools and technologies. This is also fundamental to the development of advanced digital skills. Secondly, advanced technology skills i.e., skills that are required for the development of products and solutions that leverage digital technologies.

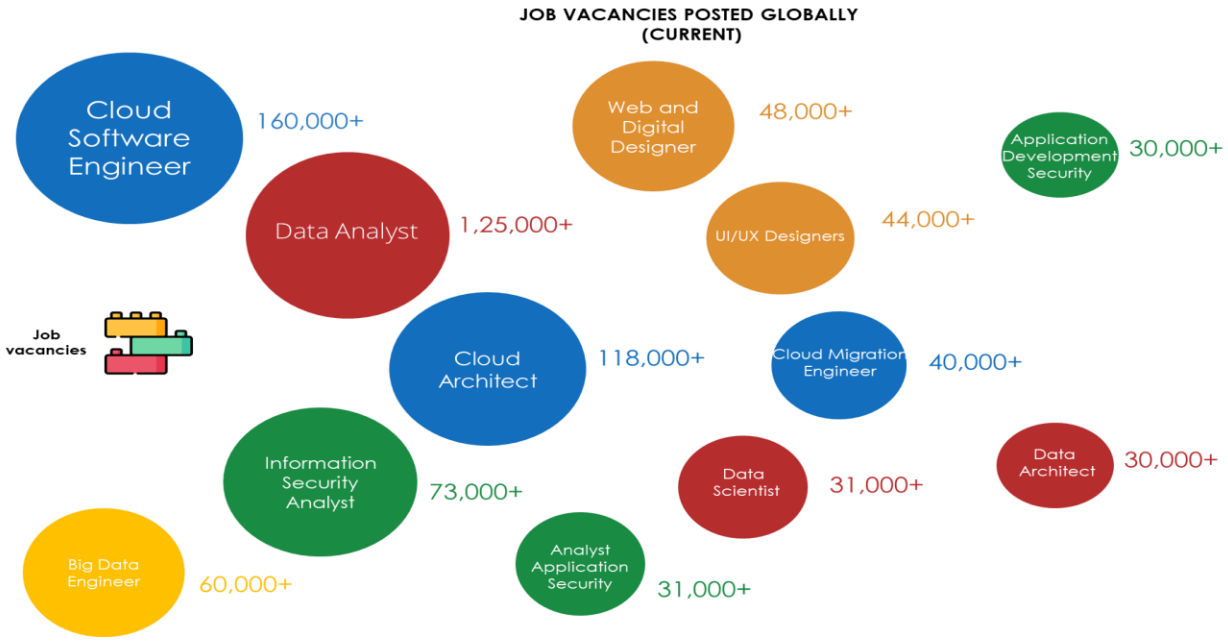
It is important to have a targeted skill development program focusing on sepcfic digital skills within the broader digital technology as Jordan attempts to capitalize on the global skills shortage. The selection of focus segments should be based on identifying most in-demand skills and the ability to train and absorb these resources into the ICT workforce within the country.

Figure 4 – In Demand Digital Skills and Roles – Globally



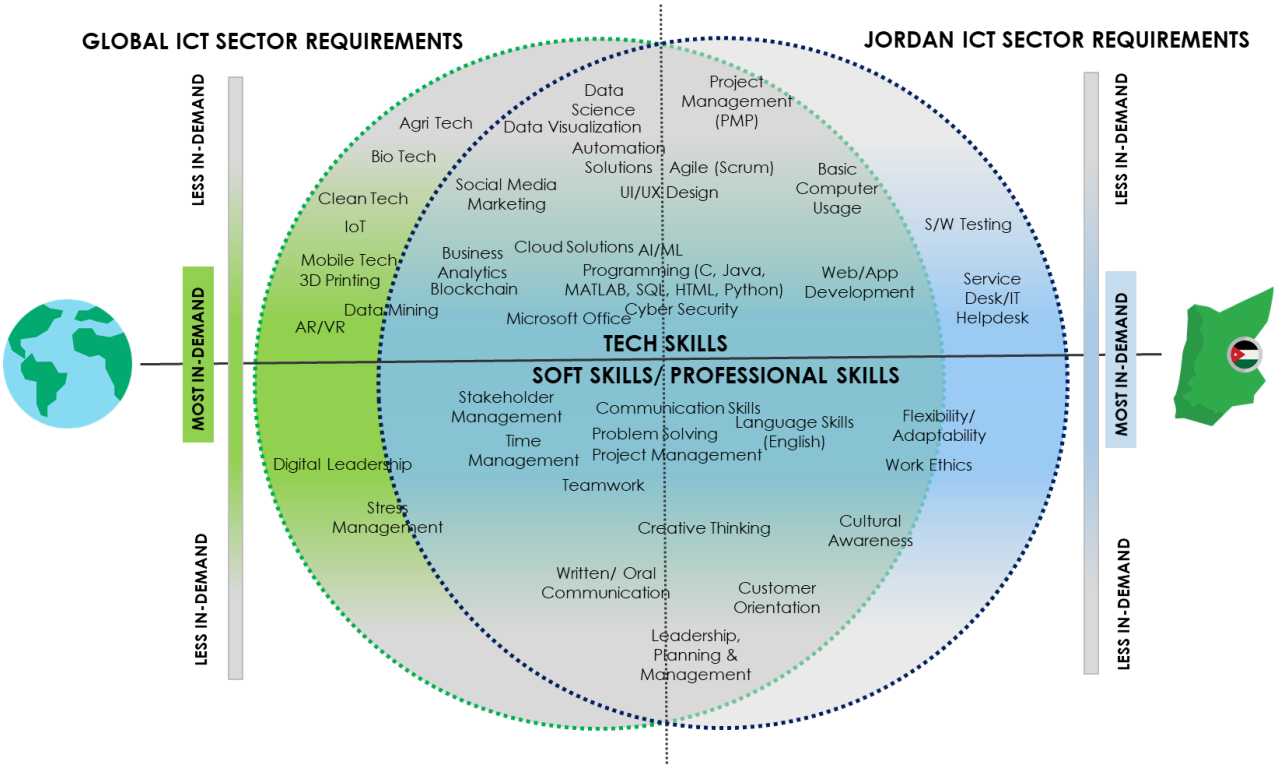
Source: Avasant Estimates Based on Global Demand

Figure 5 – Current Global In-Demand IT Roles (Indicative)



Source: LinkedIn. Based on Job Listings

Figure 6 – Key Skills in Demand in Domestic & Global Markets



Source: Avasant Assessment

Jordan ICT Sector Overview

Overview

Jordan has many attributes to become a technology leader and digital hub within the Middle East and North African (MENA) region as well as a global outsourcing hub. Several factors such as availability of affordable technical talent, one of the highest literacy rates in the world, comparatively better digital infrastructure, geopolitical stability, a liberalized telecom sector, and proximity to key regional markets adds to its overall value proposition.

The government of Jordan has been playing a leading role in developing the ICT[14] sector, which is in line with its long-term objective of becoming the digital hub of the Middle East. Over the years, the government has launched multiple short and long-term plans outlining the vision and strategy for the sector's development[15]. In 2020, Ministry of Digital Economy & Entrepreneurship (MoDEE) initiated the Youth, Technology, and Jobs (YTJ) project to improve digital adoption and digitally led income and employment opportunities. Part of the project is the Digital Skills Association (DigiSkills) project, an initiative focusing on a public-private partnership to improve technical and vocational labor skills in Jordan to reduce digital talent shortage.

Table 1 – Jordan ICT Sector Overview

	Parameters	Jordan
ICT Sector Landscape	ICT Exports/ ICT Goods Trade (2020)[16]	USD 391Million
	ICT Revenue (2020)[17]	USD 3.3 Billion (2020)
	Full Time ICT Sector Employee Base (2020) [18]	24,541 (2021)
People Skills	Tertiary Enrollments (%) - (Of Total Working-Age Population)[19]	59.04%
	ICT Fresh Graduate Employability Rate[20] (2020)	42%
	Skill Set of Graduates[21]	Rank 69/141
	Digital Skills Among Active Population[22]	Rank 31/141
English Language Skills	Education First (EF) English Proficiency Index (EPI) [23]	Rank 90/112
Global Rankings	Global Innovation Index (2020)[24]	Rank 81/132
	WEF ICT Adoption (2019)[25]	Rank 82/141

[14] Note: The ICT Sector also includes Telecommunication in Jordanian context
[15] Source: OECD. Promoting Investment and Business Climate Reforms in Jordan's ICT sector, 2021
[16] Source: Telecommunications Regulatory Commission (TRC), Jordan 2022
[17] Source: Telecommunications Regulatory Commission (TRC), Jordan 2022
[18] Source: DoS, Jordan, 2020
[19] Source: World Bank, Labor force with Advanced Education, 2020
[20] Source: MHESR-Jordan
[21] Source: WEF, Global Competitiveness Report, 2019
[22] Source: WEF, Global Competitiveness Report, 2019
[23] Source: EF. English Proficiency Index, 2021
[24] Source: WEF Global Innovation Index, 2021
[25] Source: WEF, Global Competitiveness Report, 2019

ICT Establishments

As per MoDEE, for 2020, around 1,058 companies from a broader list of 7,500 are considered as ICT establishments as against 906 in 2019.

Table 2 – Number of ICT Establishments and Employees – Jordan

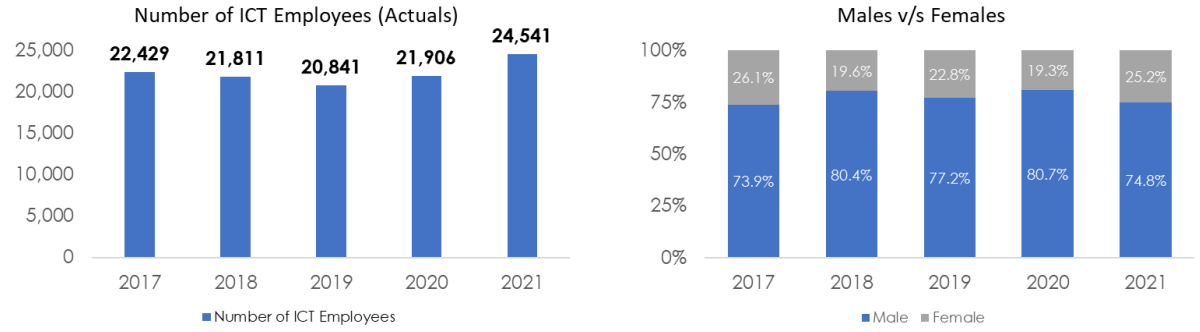
Information and Communication	2019	2020
Total Establishments	906	1,058
Total Employees	20,841	21,906
Average Employees Per Establishment	23	21

Source: DoS Database, 2020-MoDEE Classification

ICT Sector Employment

In 2021, the sector saw a sharp 12% increase in employment to a total of 24,541 employees, the highest ever employee count for the sector. Between 2017-2020, the ICT sector employee growth was near stagnant, at an average of 21,747 employees per annum (making up roughly 1% of the total workforce in 2020[26]).

Figure 7 – Jordan ICT Sector Employment and Gender Distribution (2017-20)



Source: Jordan DoS, 2021. Latest Available Dataset

While increase in 2021 indicates to a higher demand for trained resources owing to higher uptake of digital service both in domestic and overseas markets, the stagnant growth of the employee base during the 2017-2020 period (covering pre-pandemic and pandemic periods) points to the limited contribution by the sector towards reducing the unemployment rate especially among the tertiary educated youth. **During 2020, pandemic induced demand stagnation led to the sector witnessing a very high attrition rate with an almost a 95% workforce turnover**. While 3,600 individuals took up new ICT sector jobs, nearly 3,500 individuals resigned from their current ICT roles, neutralizing any net positive impact that the new jobs may have had in reducing the unemployment rate in Jordan or broadening the sector skill base. While the high workforce

[26] Source: Department of Statistics (DoS). Employment and Unemployment, 2020

turnover during the peak of pandemic should be considered as an aberration it also highlights the limited stability of the domestic ICT sector considering that the ICT sector globally had emerged as one of the most resilient sectors during the pandemic.

The average number of employees per establishment, at 21, indicates that majority of Jordan's ICT establishments are small firms. **As per ITA-US, approximately 98% of ICT companies in Jordan are classified as SME's[27]. While around 64% of ICT companies is Jordan employ resources on full time basis around 50% of all companies are micro level enterprises employing less than 10 employees. This indicates that while Jordanian ICT sector prefers full-time employees, their small size limits the number of ICT graduates that can be absorbed into the workforce on an annual basis.**

In order to meet the acute skilled resource shortages in global and regional ICT sector and to become a Middle East digital hub, it is important for Jordan to have ICT firms of various sizes and ICT competencies to meet varying demands.

ICT Workforce Age Distribution

Over 43% of the current ICT sector employee base in Jordan comprises of 20–29-year-old indicating to a relatively young sectoral workforce (2020). This augurs well with the overall demographics (youth as part of the population).

However, when the age group is divided further, the 20-24 age group averaged around 14.4% of the total ICT workforce (2017-2020). This indicates that the industry is not adding a significant number of fresh college graduates, but rather employs resources with some corporate experience and/or post graduate degree. This also corroborates the low (around 42%) absorption rate among fresh graduates.

Further, approximately 29% of the ICT workforce consisted of employees in the age group of 25–29 years who would have either gained a master's degree or an experience of 3–5 years in professional work environment substantiating the high level of competition (due to lack of skilled resources) among employers to hire resources with at least a couple of years of experience.

For Jordan to fully realize its potential and the vision of becoming a technology hub, it has to improve its ICT workforce composition by increasing the participation of the 20–24 age group. This segment is also the most suitable for targeted IT training programs esp. in emerging technologies.

A tiered skill development program will not only allow for a broader skill pool it will also allow for prospective students to choose courses based on their aptitude and interests in line with market requirements. The supplemental program will also help in improving the employability rate of current students.

[27] Source: International Trade Administration, USA Website

ICT Labor Force Demographics

Gender Composition

For 2021, out of the total base of 24,541 ICT employees, approximately 18,535 were male and 6,188 females. Females, despite being highly educated (a greater number of females hold related graduate degrees), made up just 25% of Jordan's working population in ICT sector. **Considering that females make up around 50% (varies from 48-52% yoy) of annual ICT course intake, it indicates to a significant under-utilization of trainable female resources who can be quickly deployed with targeted ICT trainings to serve client requirements.**

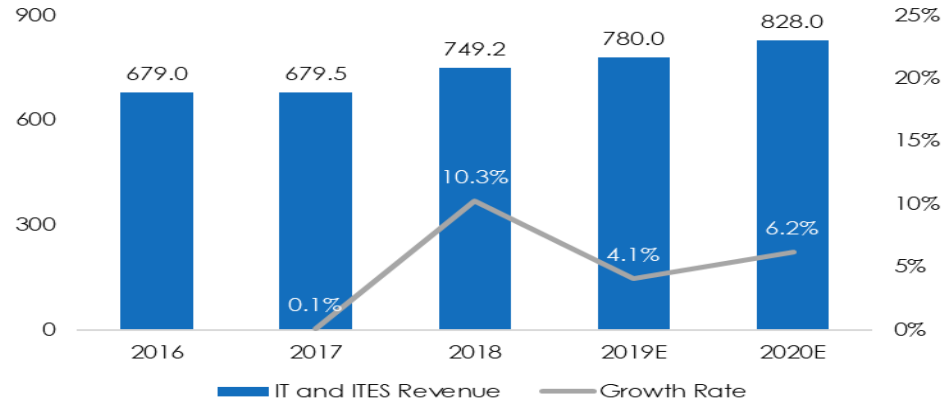
ICT Sector Revenues

Jordan's ICT sector accounts for approximately 4% of the country's GDP. The industry witnessed a fluctuating growth rate during 2017 – 2019 period, declining from 10.3% in 2017 to 4.1% in 2019. For 2020, it registered a 6%, growth rate with annual revenue of USD 2.3 Billion[28].

IT and ITES Revenues[29]

The IT and ITES segment of the ICT sector is approximately around 34% of the overall ICT market. **In terms of ICT exports at USD 391 Million[30] indicates a significant growth potential. It is essential for Jordan to tap into ICT services export market to grow the ICT sector.**

Figure 8 – Annual IT, ITES Services Revenue, 2016–2020 (USD Million)



[28] Source: International Trade Administration, USA
[29] Note: For 2016-2018, the IT/ITES segment size (outside of telecom) is based on intaj yearbook. For 2020 estimates are based on US ITA market estimates (overall ICT market) and growth rate and estimated the IT/ITES revenue.
[30] Source: Telecommunications Regulatory Commission (TRC), Jordan 2022

Source: int@j, International Trade Administration, USA Website, Avasant Estimates (2019,2020)

Startups Ecosystem in Jordan

As of February 2022, there are around 376[31] startups in Jordan, out of which 85 new startups (both registered and unregistered) were enrolled between Dec 2021 and Feb 2022. More than 50% of these startups are in their growth stage, indicating a strong market demand for the various service offerings.

The total workforce involved in the startups was 3,628[32] (9 workers per startup on average), out of which 39% were females, and 61% were males.

The startup ecosystem in Jordan will play a pivotal role in positioning Jordan as a key IT hub in the MENA region. The fact that more than 50% of startups are in their growth stage, while approximately 25% of companies are in their MVP (Early) stage (have developed a headline product/service based on identified market demand and once the operations are established, can quickly scale to growth stage), indicates to an increased significant demand for skilled resources in various tech domains especially digital technologies – AI/ML, Cloud, Cyber security etc. As such, short term skills specific training programs and industry relevant ICT curriculums will play a vital role in not only more employment opportunities for Jordanians but also ensure the startup ecosystem remains vibrant.

Domestic ICT Labor Force Assessment

Jordan ICT Workforce Strength and Weakness

Strengths

- **Healthy ICT Graduate Output**

The annual ICT graduate output number is healthy considering the current size of the sector with around 4000-4200 ICT graduates[33] completing an ICT related course every year. Considering the current ICT workforce base the output can support a nearly 15-20% growth in entry level workforce requirements provided the 'employability 'of these resources is improved.

- **ICT Course Preference**

In terms of course popularity, most graduates pass out with Computer Science, Computer Information Systems (CIS) or Software Engineering degrees. These majors have remained consistently popular, representing the top graduating majors for bachelor's degree students from

[31] Source: int@j, Jordan's Startup Landscape & Gap Analysis Study, 2022
[32] Source: int@j, Jordan's Startup Landscape & Gap Analysis Study, 2022
[33] Source: Ministry of Higher Education and Scientific Research

2010 to 2020. Based the course content in these programs, the graduates should have a good grasp of technical skills that can be quickly adapted to the employment requirement through supplemental training. This in turn supports the development of a broader skills pool.

- **Good Curricula Alignment on Fundamental Concepts**

The course curriculum rolled out in the universities is quite aligned in terms of fundamental IT skills e.g., curriculums of the five most prominent universities cover almost all the required fundamental technical skills in demand at least theoretically. This when supplemented by hands-on or practical training can help prepare the students to be much easily absorbed into the workforce.

- **Large General Tertiary Graduate Pool**

Jordan has one of the highest tertiary education enrollment rates in the world (over 59% of workforce) with around 298,819 students enrolled in various courses. In terms of general skill sets of graduate students, Jordan is in the upper quartile (69 out of 141 countries) indicating to good quality education at broader level. As the IT sector grows, this large student base can be selectively trained to supplement the existing IT steam output.

Weaknesses

- **Low Participation Rate in IT Courses**[34]

ICT is not among the most favored academic streams among Jordanian under-graduates. In 2020, out of total Undergraduate students at Jordanian universities (total – 298,819 students), just 7.78% of students opted for "ICT " as their major (23,234 students).

The low uptake of ICT course is due to a number of reasons - limited availability of seats in top rated universities and hesitancy to join related courses in other universities due to the perceived low quality of training, limited understanding of the ICT sector and related opportunities, the current low level of employment within the sector, relative ease to get employment in other sectors/other course programs etc. While not a concern in the short term, the low participation rate may possibly lead to skills shortage in the medium to long term (as service providers continue to prefer IT graduates) and indicates the need to expand the target student pool to include non-IT graduates for any future training/skill development programs.

- **Low Employability of IT Graduates**

There is a chronic employability' gap among IT graduates with only 42% being placed into the sector (2020). The low levels indicate to a significant academic-employment gap. Some of the main reasons for non-employability include limited technical skills, poor professional skills, lack of ability to apply concepts, poor language skills as well as disinterest in joining the workforce in case of female graduates.

- **Low Coverage of In-Demand Digital Skills in University Curriculums**

[34] Source: Jordan Yearbook 2020

While fundamental IT skills such as programming, databases, web development etc. are well covered within the curriculum across various programs albeit with limited practical training, there is limited coverage of emerging digital technologies like Blockchain, Cyber Security and Cloud Computing[35] etc. Considering the huge global demand for these skills and for Jordan to effectively leverage the global skill shortage, it is necessary to improve the roll out of similar in-demand programs as part of the university curriculums.

- **Limited Practical, Hands on Experience**

One of the key reasons for limited employability about entry level graduates is the lack of hands-on training. Barring a few universities, most do not have compulsory internship programs as part of their curricula which is a norm in most other countries with a similar IT sector landscape.

- **Costly, Time Consuming Skill Upgrade Requirements at Enterprise Levels**[36]

Jordanian companies spend considerable time and resources to train selected candidates before deploying them on projects leading to a long gestation period. This time lag can be significantly reduced by offering candidates various skills development programs that would not only improve candidate suitability but also help reduce the training period for companies in turn helping reduce overhead costs.

- **Lack of Mid-Level Resources**

The sector is witnessing a significant increase in salaries for mid-level resources (>3 years of experience) due to the limited resources. Mid-level salaries are around 2.5-3x more than entry level salaries effecting overall project economics. The constant movement of resources results in limited development of mid-level resources resulting in a smaller resource base and high wages. This is further exacerbated by the movement of trained resources to other countries further limiting the supply of mid-level resources.

- **Limited Female Absorption into IT Workforce**

While at IT graduate level, females make up half of the graduate pool their employability rate is significantly lower at 31% (as comparted to 51% in males) i.e., less than a third of females pursuing IT degrees end up in the workforce. This indicates to a limited interest among even trained female graduates to seek employment in the sector.

- **Lack of Professional/Soft Skills**

Professional Skills are critical in building business relationships to ensure continued collaboration in solving business problems. This includes a rage of soft skills e.g., work ethics, communication, teamwork problem-solving etc. As per the project survey, professional skills have been identified as the single most important skill requirement followed by basic computer usage and communication skills[37]. The need for soft skills-related training seems to be higher than technical/hard skills and indicates to the lack of emphasis in developing these skills in the university curriculum. The need for these professional skills become even more important as the client base

[35] Note: Avasant-MoDEE Jordan IT Sector Side Demand Survey 2022
[36] Note: Avasant-MoDEE Jordan IT Sector Side Demand Survey 2022
[37] Note: Avasant-MoDEE Jordan IT Sector Side Demand Survey 2022

is spread globally and resources must work with others across multiple geographies spanning multiple cultures.

- **Limited Language Skills**

Limited English language skills is a significant impediment to the growth of the IT sector in Jordan. The Jordanian university graduates lack significantly lack in language proficiency esp. English. This not only limits the ability of employers to hiring suitable candidates for project delivery but also effects the ability of the country to project itself as a viable outsourcing destination. While developing language prophecy will require interventions at various levels in the educations system, in terms of the IT sector, short term business English programs should be offered as part of skill development programs. These programs should equip candidates to communicate effectively in English across various mediums in a professional work environment.

Tertiary Level IT Education in Jordan

The growth of existing ICT companies and the emergence of numerous digital startups has accentuated the demand for trained resources. Limited supply of skilled resources is already affecting the ability of local companies to scale while maintaining cost advantages.

To address the increasing demand for resources, Jordan needs to streamline its talent supply by increasing the size of the talent pool as well as improve the quality of resources while being in sync with changing global skill requirements.

Universities and Community Colleges

In the Jordanian context, a university degree is seen as a prerequisite by most IT and Digital Services employers. Most employers require a 4-year university degree for entry-level positions[38]. Examining the current university education system and its alignment (to market needs) and quality of curricula is critical towards understanding the availability of existing skills within the sector and uncovering vital gaps that can be targeted with interventions.

Universities

According to the Ministry of Higher Education and Scientific Research (MHESR), as of 2022, there are 32 universities in Jordan, of which 10 are public, 20 private and 2 regional institutions. **There is high availability of ICT courses within various university categories. At bachelor's level programs, 100% of public universities, 85% of private universities, and 100% of regional universities offer at least one ICT related course.** The University of Jordan, AL-Balqa Applied University, and Princess Sumaya University for Technology, with 8 ICT major programs, offer the widest variety of ICT majors for incoming students. As of the 2021/2022 academic year, there are 42 available bachelor's degree ICT majors across the Jordanian universities. **The majors offered are a mix of traditional ICT topics such as computer science and software engineering, and advanced digital technologies,**

[38] Source: Avasant Survey Result Assessment (2022), Intajf. Labor Market Study ICT Fresh Graduates, 2016

including AI, data science, cyber security, and computer programming. The most common bachelor's degree ICT majors are BSc. in Computer Science, Software Engineering, Computer Information Systems, Data Science and AI, and Computer Engineering. While traditional ICT programs still dominate most university courses, segments covering advanced technologies such as AI, cyber security, and financial technology (FinTech) are being added to the course program.

Community Colleges

IT Majors in Community Colleges

As of 2021, 6 of the 40 community colleges offered bachelor's degrees with ICT majors. Prospective undergraduate students at community colleges have a much lower variety of bachelor's degree ICT majors when compared to universities. Prince Hussein Bin Abdullah Technical Military Faculty and University of Balqa Applied Arts offer the most diversity in terms of bachelor's degree ICT majors out of these six colleges. The community colleges also offer diploma (or equivalent) courses, with 6 of the 40 community colleges offering related courses. **The most common diploma (or equivalent) IT course in Jordanian community colleges are computer technology, AI, and cyber security.**

IT Related Course Enrollments

ICT Course Enrollments

For 2020, there were 4,281 new student enrollments in various ICT related courses across the country, a small drop from the 4,298 enrollments for 2019[39]. **In total, in 2019-2020, about 7.8% (23,234) of the total undergraduates (298,819) had enrolled in an Information Technology and Computing graduation courses making it the fifth largest program** after health (56,000), human studies (43,718), commercial and business administration (42873), and Engineering and Engineering professions (30123).

Figure 9 – ICT Steam Undergraduate Students Break Up (2019-2020)

Year	Enrollment
2019	4298
2020	4281

Degree	Diploma	Bachelors	Masters/PhD
2019	6% (251)	86% (3707)	8% (340)
2020	3% (125)	88% (3785)	9% (371)

Gender	Male	Female
2019	48% (2063)	52% (2235)
2020	52% (2232)	48% (2049)

Source: The MHESR/MoDEE

[39] Note: Enrollment Data Provided by MoHESR.

In terms of course popularity, most graduates pass out with Computer Science, Computer Information Systems (CIS) or Software Engineering degrees. These majors have remained consistently popular, representing the top graduating majors for bachelor's degree students from 2010 to 2020[40]. However, **there is a clear downward trend for the number of graduates within Computer Information Systems, which declined from 39% of all ICT graduates in (2010-2011) to 14% in (2019-2020)**. While Software Engineering was trending upwards from 2010 until 2015, the major's share of ICT graduates diminished substantially by 2020, reaching 19%. **The downward trend can be primarily attributed to the course curriculum being offered and its relevance to the fast-changing market requirements**.

Computer Science has remained the major of choice for most graduates since 2011 and remained the top graduating ICT major in 2020, aligning with the fact that it is the top-ranked major for ICT employers during recruitment. [41]

In terms of gender spread, the IT student base is evenly spread across male and female students. For 2020, 48% (2049) of the total enrollment were females while it was 52% (2235) for 2019.

Curriculum Suitability Assessment

The course curriculum and its suitability to meet the changing market needs are as important as the availability of various IT-related courses. A critical first step towards assessing the curriculum is determining its alignment with local and global requirements, i.e., skills demand. The following table outlines the key in-demand skills both in domestic and global markets.

Table 3 – Key Global and Domestic In-Demand Skills and Job Roles[42]

Technical and Professional Skills and Job Roles
Technical Skills/Hard Skills
Basic Computer Skills (Microsoft Office, Microsoft Excel, Windows)
Cyber Security – • Information Security Analyst • Application Development Security • Analyst Application Security
Programming (C, Java, MATLAB, SQL, HTML, Python)
Cloud Solutions – • Cloud Software Engineer • Cloud Migration Engineer • Cloud Architect
Artificial Intelligence/Machine Learning • Data Scientist • Data Architect • Software Engineer - Testing or Application Platform, AI
Business Analytics

[40] Note: Latest Available Data – 2018 Calendar Year – MoHESR, 2020 Data sourced by MoDEE from MoHESR
[41] Source: Avasant Survey Result Assessment (2022), MoHSER, Intaj. Labor Market Study ICT Fresh Graduates, 2016
[42] Source: Avasant Assessment of Domestic and International Skill Demand. Covered in detail in previous sections

Web/App development
UI/UX Design
Social Media Marketing
Automation
Blockchain
Data science and data visualization
Database Management
Project Management
Big Data • Big Data Analyst • Big Data Engineer • Big Data Solution Architect
Operating Systems
Networking
Artificial Reality/Virtual Reality
Soft Skills/ Professional Skills
Communication Skills
Language Skills
Stakeholder Management
Time Management
Teamwork
Creative Thinking
Problem Solving
Cultural Awareness
Customer Orientation
Leadership, Planning, and Management
Ethics

Source: Avasant Assessment (of Global Skills Deficit Trends)

According to Jordanian IT companies, as in the case of global IT and digital service providers, a combination of both technical and soft skills is a prerequisite for employment in the sector.

Course Content

While the programs cover almost all the required technical skills in demand, theoretically, they are deficient in hands-on or practical training, which is key to bridging the academia-employment gap. Also, most universities do not have compulsory internship programs as part of their curricula which is a norm in most other countries with a similar IT sector landscape. Universities should aim to develop strong industry-academia relationships that would support hands-on training/internship programs while making it a mandatory part of the education delivery process.

Regarding course study plans, the focus is largely on programming skills, AI/ML, cybersecurity, database management, data science, and networking while blockchain and AR/VR technology-related programs are limited.

In terms of soft skills/professional skills, there is a significant gap across the board. Only three out of the five universities have soft skills in the course curricula, focusing on Arabic and English language skills followed by entrepreneurship and leadership skills. As per Avasant's demand-side analysis and general market feedback, **there is a significant gap in soft skills among graduate students, making it hard to adjust to a professional work environment. As digital technologies become mainstream to service delivery and remote working becomes common, a range of soft skills are required for effective service delivery. Some of the most sought-after skills include project management, communication and language skills, stakeholder management, time management, teamwork, creative thinking, problem-solving, cultural awareness, customer orientation, leadership, planning, management, and ethics[43]. As expected, the soft skills requirements align with global requirements though the need for English communication is more pronounced in Jordan.**

Positively, **while the focus is more heavily on traditional topics among established universities, there does seem to be a shift towards more recent and industry-relevant topics, indicating an acknowledgement of the changing market requirements.**

ICT Skills Qualification Assessment – Non-University Programs

Bootcamp Programs

Bootcamps are post-secondary education paths that offer short term, intensive training sessions. They are designed to provide aspiring technology professionals with the technical skills needed to start careers in the IT sector. **In Jordan, bootcamps are considered as a rapid skills enhancement model. Under a pilot scheme, the Ministry of Digital Economy and Entrepreneurship (MoDEE) collaborated with various training agencies to deliver skills training programs. The programs produced promising preliminary results, with pass outs being rapidly absorbed by the private sector, with an over 80% placement rate (as compared to a 42% post graduate industry absorption rate).**

International Resources for IT Skills - Massive Open Online Course (MOOC)

The emergence of Massive Open Online Courses (MOOC) has radically altered the traditional training methodology by providing open access to content and trainers over the internet thereby making high quality content easily available across the world in a cost-effective manner.

While MOOCs address the challenges around content quality and availability, local factors can limit its optimal usage, e.g., high bandwidth and electronic hardware (laptop/PC/smart phone/tablets) are a prerequisite for such courses and may not be available easily or at a

[43] Source: Avasant Survey Result Assessment (2022)

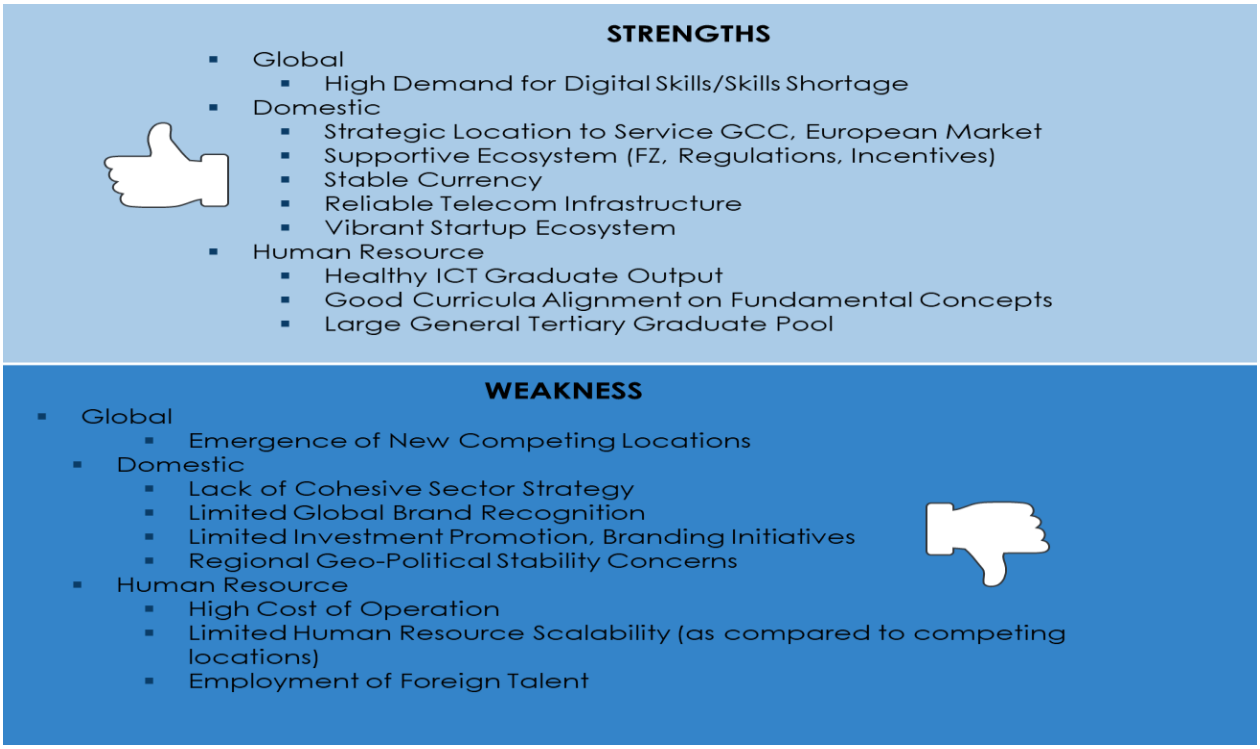
reasonable cost. In the Jordanian context, the lack of localized content in Arabic is also a major challenge. While most students would have basic English language skills it might not be enough to maximize the learning from a complex technical course.

Expanding Jordanian ICT Market – Challenges and Barriers to Entry

For the Jordanian ICT sector to achieve its full potential it has to grow the sector base by attracting more foreign investments into the sector. Foreign participation in the sector will not only aid in higher levels of employment and revenue generation it will also help increase market competitiveness, drive faster market driven changes in terms of solutions and technology adoption etc.

While Jordan had established itself on the global outsourcing map over a decade ago it has not been able to capitalize on the early advantage due to the lack of a cohesive sector development strategy. As the IT services outsourcing sector has evolved, **in order to attract investments, it is not only important to have a supportive domestic ecosystem but also to be able to effectively compete against other locations by having a better overall value proposition.** There are multiple barriers to entry that limits the attractiveness of the Jordanian ICT sector and in turn international investors in the sector.

Figure 10 – Jordanian IT Sector Advantages and Barriers to Entry



Global Factors

- **Emergence of Alternative Locations: Over the past decade there has been a significant increase in the number of locations/countries vying to be an outsourcing services destination. Emergence of new locations with varied service offerings and unique value propositions, e.g., niche services, digital competence etc., is making the sector more competitive. At the same time, advantages like cost arbitrage, geographical proximity, etc., have also been eroded due to the increasing 'commoditization' of traditional IT/BPO services**. Several Eastern European countries have now established themselves as a viable outsourcing destination in addition traditional outsourcing locations that have diversified their services portfolio. **Jordan will have to establish a clear value proposition when competing against these locations to be able to effectively attract investments into the sector.**

Domestic Factors

- **Lack of Cohesive Sector Strategy and Roadmap** – **Jordan currently lacks a cohesive and comprehensive ICT sector development strategy clearly articulating growth targets**. This in turn limits the ability to outline strategic intervention required for the development of the sector which can improve Jordans attractiveness as an investment destination.
- **Limited Global Brand Recognition** – Jordan has not yet established itself as an attractive global outsourcing destination despite having significant advantages when compared to other regional competitors. While the country ranked among the top emerging IT-BPO locations over a decade ago it has since been overtaken by a number of other emerging locations esp. in Eastern Europe.
- **Limited Investment Promotion, Branding Initiatives** – **There is limited awareness in key outsourcing markets and current services delivery hubs about Jordans' value proposition due to limited investment promotion and branding and marketing initiatives** in turn limiting investor interest.
- **Regional Geo-Political Stability Concerns** – Although Jordan's geographic location makes it attractive specially to service the GCC market there are concerns around service disruption. While unfounded, the general perception of the lack of geo-political stability in the region plays negatively in terms of attracting international investors.
- **Limited Investment Incentives** – Jordan lacks a comprehensive bouquet of investment incentives which are key to attract foreign investments. It offers limited investment incentives when compared to other competing locations that offer a range of incentives ranging from corporate and local tax breaks, subsidized infrastructure, capital and profit repatriation, training, and skill development grants etc. While many of these are also provided in Jordan e.g., Free Zone benefits it has not been packaged and promoted effectively.

Human Resource Factors

- **High Cost of Operation** – The cost of operation in Jordan is relatively high as compared to many competing locations especially human resource cost in turn dissuading investors from considering the country as possibly service delivery location. Increasing talent supply can help support lowering resource costs
- **Limited Human Resource Scalability** – Limited human resource scalability to support IT/digital subsegments. **Scalability is an important factor while making investments decisions as it helps**

forecast future increase in cost of delivery. Limited scalability can lead to wage escalation as more providers enter the fray and is considered negatively while making investment decisions. For example, of the around 0.3 Million undergraduate students every year, only 7.8% of students opted for IT related course. Large service providers model the operations and related cost escalation taking into consideration at least a minimum of 400-500 employees over a 4-5 year period to ensure project viability prior to making an investment commitment.

- **Employment of Foreign Talent** – Limited flexibility in hiring long term trained international technical/managerial resources to bridge mid-level resource gap when the sector is witnessing a significant increase in salaries for mid-level resources (>3 years of experience). While Jordan is competitive at junior levels, high mid-level salaries erode its advantages significantly. Several countries are making it easier for trained resources from other nationalities to relocate in order to ease wage escalation and ensuring competitiveness by attracting best of breed talent.
- **Outward Talent Migration** – Like other sectors, the Jordanian ICT sector also suffers from outward migration of trained resources especially to GCC countries further straining the already limited workforce base. The reasons for outward migration ranges from limited opportunities locally to expand skills, better compensation, and exposure to latest technology

International Comparative Assessments

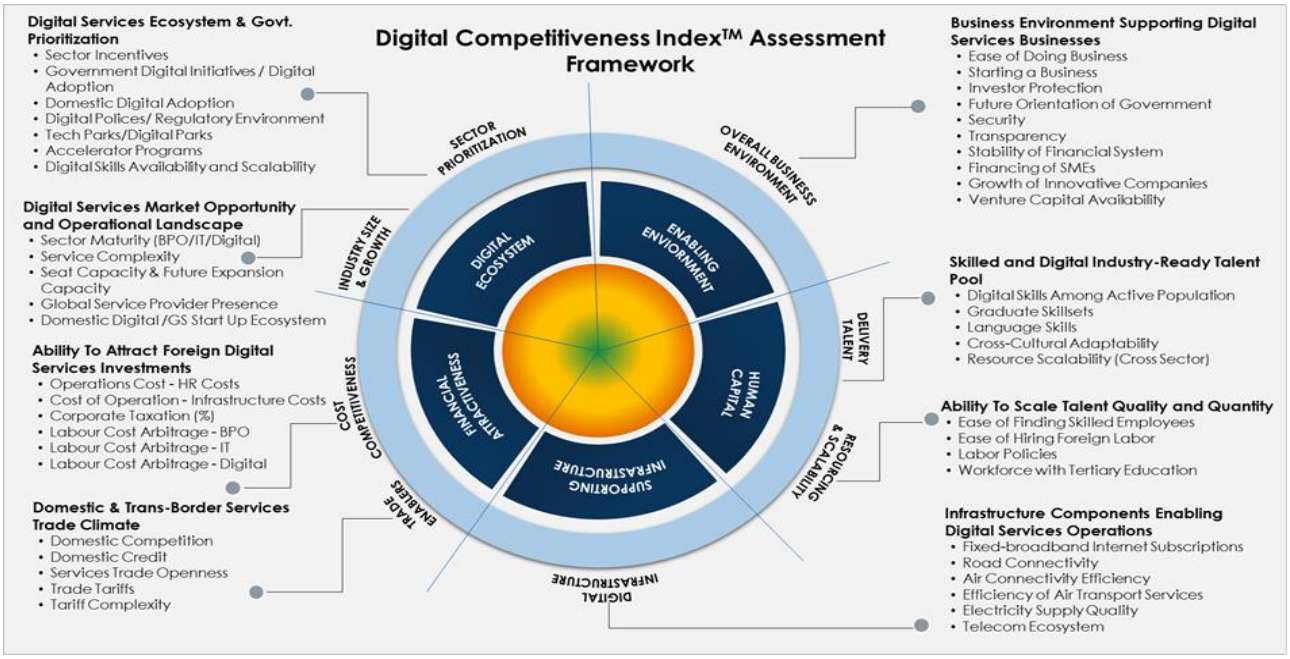
International comparative assessments help assess a locations' standing as compared to other competing countries and how it can reshape existing policies to be better attract inward investments.

Comparative Assessment

Digital Competitiveness Index™ (DCI)

Recognizing the shifts in the global outsourcing sector, Avasant has developed a new framework to assess the competitiveness of global services locations namely Global Equations Digital Competitiveness Index (DCI). The framework evaluates the digital readiness of a location across key foundational service delivery pillars and provides a holistic assessment of its digital standing. It also enables locations to identify existing gaps and comparative advantages, in turn supporting better policy decisions and preparedness for a technology driven global service delivery ecosystem. The following figure provides a high-level overview of the Digital Competitiveness Index:

Figure 11 – Global Equations Digital Competitiveness Index™



Source: Avasant

Based on the analysis, Global Equations Digital Competitiveness RadarView™ matches locations to a maturity level (i.e. Emerging, Challenger, Innovator and Leader), and provides a blueprint to help close digital competitiveness gaps. The figure below showcases the Global Equations Digital Competitiveness Index™ 2021.

Figure 12 –Digital Competitiveness Index 2021

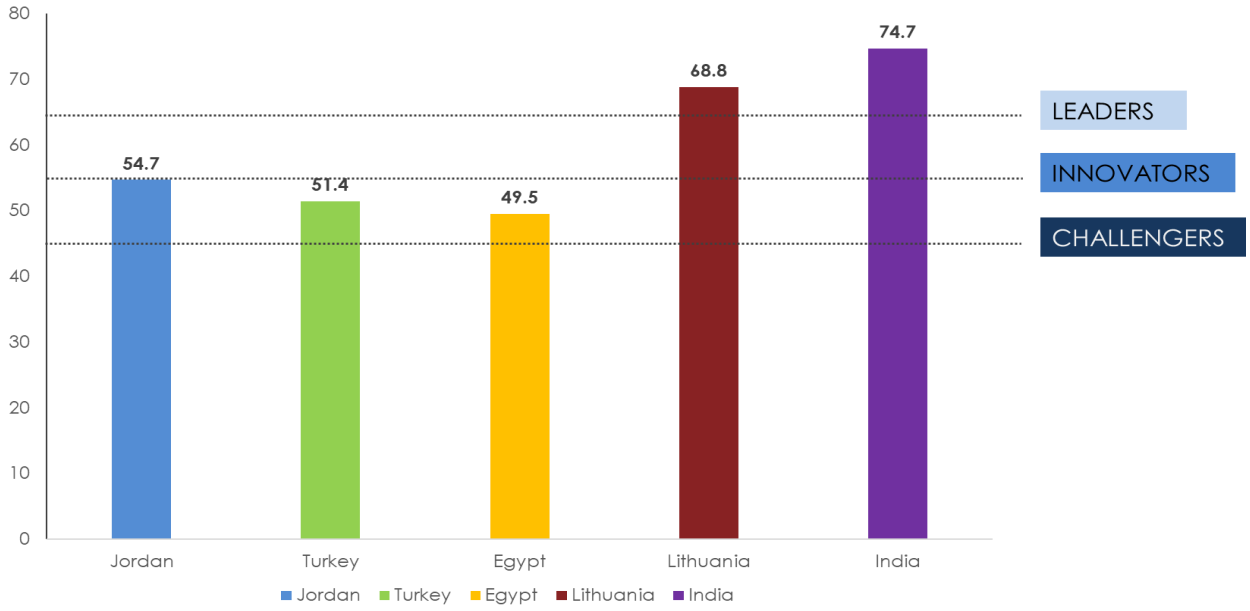


Table 4 – Comparative Assessment of Sub-Indicators for DCI Index

Sub-Indicators for DCI Index (100)	Jordan	Turkey	Egypt	Lithuania	India
Digital Services Ecosystem	14.49	12.78	13.98	19.69	24.84
Business Environment	10.08	9.5	9.03	10.48	9.96
Human Capital	11.31	11.85	10.08	17.87	17.71
Financial Attractiveness	14.64	13.52	13.11	17.05	18.76
Infrastructure	3.08	3.76	3.31	3.66	3.41
Digital Competitiveness Score	**54.7**	**51.4**	**49.5**	**68.8**	**74.7**
	Challenger	**Challenger**	**Challenger**	**Leader**	**Leader**

Figure 13 –DCI – Human Capital Competitiveness 2021™

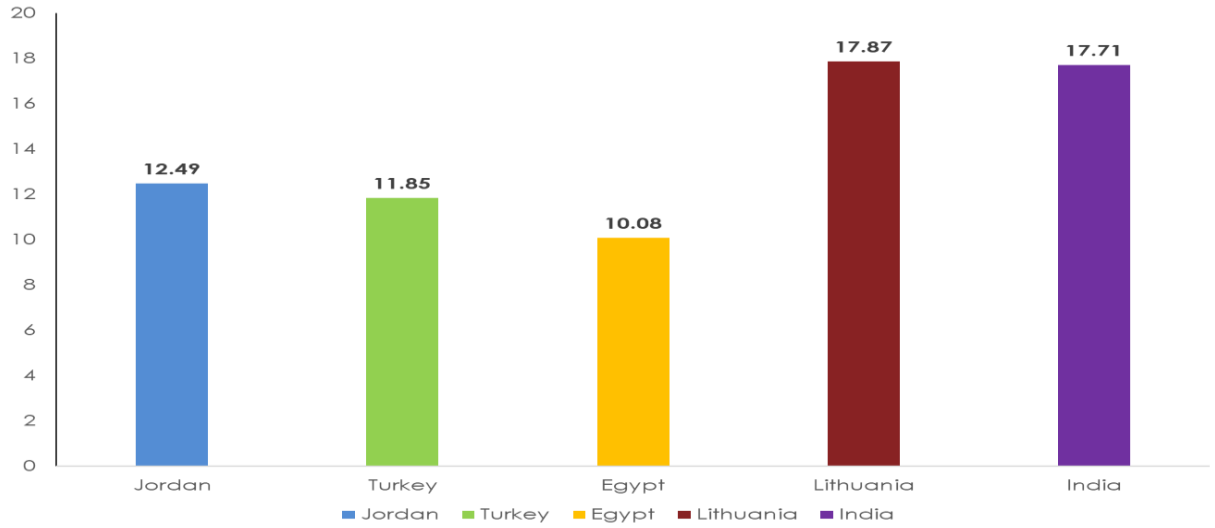


Table 5 – Comparative Assessment of Sub-Indicators – Human Capital

Sub-Indicators (25)	Jordan	Turkey	Egypt	Lithuania	India
Digital Skills Among Active Population (1.5)	0.98	0.63	0.92	0.96	0.86
Skillset of Graduates (2)	1.03	0.89	0.71	0.97	0.92
Ease of Finding Skilled Employees (2)	1.28	0.97	1.0	0.82	1.06
Ease of Hiring Foreign Labor (1)	0.44	0.54	0.57	0.44	0.44
Labor Policies (1.5)	0.58	0.69	0.41	0.82	0.63
Workforce with Tertiary Education (% of total working-age pop. with advanced education) (2)	1.18	1.58	1.52	1.66	1.2
Language Skills (4)	1.25	0.85	1.25	3.4	2.5
Cross-Cultural Adaptability (4)	1.55	1.7	1.5	3.5	3.4
Resource Scalability (Human Resources) (7)	4.2	4	2.2	5.3	6.7
Total Human Capital Score	**12.49**	**11.85**	**10.08**	**17.87**	**17.71**

Jordan Digital Skills Development Approach

To maximize the gains i.e., employment generation, Jordan needs to have a two-pronged approach. First, it should target global IT and BPO outsourcing companies, especially in established outsourcing locations like India and E Europe to establish delivery centers in Jordan to serve regional and global markets. The credibility of recognized IT and BPO outsourcing companies will also give a boost to Jordan's position in the outsourcing market. Secondly, supporting existing domestic companies to service the demand through market promotion, skill development support etc.

Table 6 – Regional Offshoring Market Size 2022 (US$ Billion)

Region	Total Enterprise Outsourcing Spend (US$ Billion)	Offshoring Services Market Size (US$ Billion)
US	US$ 1,900-2,000	US$ 165-170
UK	US$ 400-450	US$ 32-38
DACH (Austria, Germany, and Switzerland)	US$ 600-650	US$ 12-17
Benelux (Belgium, Luxembourg, and Netherlands)	US$ 250-300	US$ 11-16
Nordics	US$ 175-200	US$ 4-6
Middle East	US$ 80-85	US$ 3-5

Source: NASSCOM and Avasant Analysis

Opportunity for Jordan - Demand for Jordanian Talent

- **Existing domestic companies: Most of the existing domestic companies in Jordan plan to expand by 5-10% in the next 1-2 years. The demand survey shows that over 80% of the surveyed companies plan to expand by at least 10% in the next 1-2 years, in turn needing at least 3,000 trained resources in the near term.**
- **International companies:** Large global service providers, once committed to investing in Jordan, will generate significant opportunities to justify the geographic expansion. Most large service providers have a minimum threshold of at least 500 positions.
- **GCC market:** High-skilled Jordanians migrate to GCC countries for better work opportunities. With remote work becoming the new normal, especially post the COVID-19 pandemic, Jordan workers can take advantage of the remote work jobs available in the GCC countries
- **Remote work opportunities:** Along with the GCC market, remote work options are available across the world now. Jordanians can work in any global company even if it does not have a presence in the country

Considering all these factors, there is an immediate opportunity (1-2 years) of at least 10,000 new positions within the IT services sector in Jordan.

Jordan Digital Skill Development Recommendations

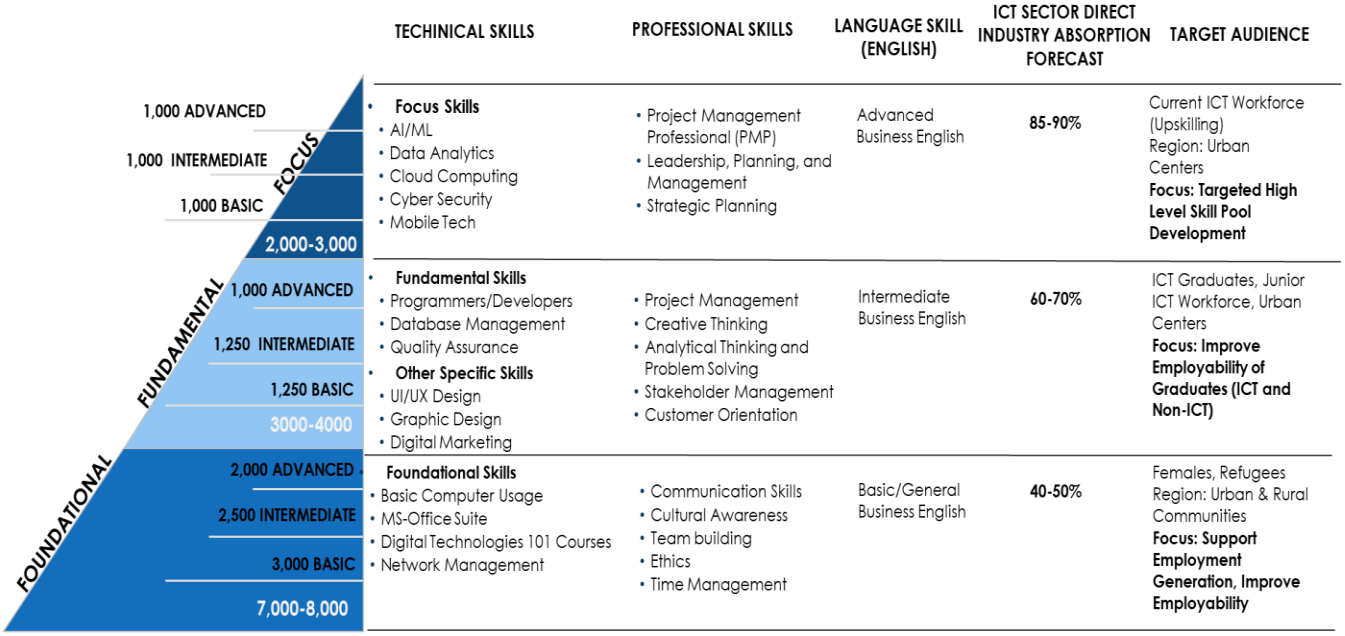
In order to ensure long term and sustainable development of the Jordanian ICT sector, any proposed skill development program should take into account a few key factors –

- **Skills shortage in the domestic and global context (as established in previous segments of the report)**
- **Future demand for specific skills (technical as well as professional)**
- **Sustainability of the skills development program in the long term (funding, structure, constant evolution based on changing market requirements)**
- **Ability to support long term growth of the sector by developing a broader skill pool**
- **Support broader digital mandates e.g., improving digital inclusion, digital literacy, etc.**

Human Resource Recommendations

1. Skill Development Program Rollout

Figure 14 – Jordan Digital Talent Development Pyramid



Source: Avasant

Approach Definitions

The proposed approach classifies digital skills (both technical and professional skills) into three levels –Foundational, Fundamental, and Focus (in increasing order of relevance, complexity, and importance for the ICT sector) –

- **Foundational Segment**: This segment is the first tier and primarily focuses on developing base skill pool of digitally trained resources who can then either with further training be a part of the ICT sector or can be employed in other sectors. The training programs will focus on basic computer and productivity skills to general understanding of digital technologies. These courses should also attempt to focus on females and displaced to help them enter the job market. Along with the technical knowledge, these courses will also focus on providing professional skills training including communication, ethics, teamwork, etc. to make them employable.
- **Fundamental Segment:** This segment will form the mid-tier of the skills pyramid and will focus on improving the employability of ICT graduates and assist junior ICT resources to move up the career by offering specific technical skill development training programs. Depending on proficiency assessment, the segment can also be opened for non-ICT graduates. A key objective of this segment is to develop some of the most sought-after fundamental skills like programming languages, database management, testing, quality assurance etc. that also forms the basis of advanced digital skills. In that way, this mid-tier will form the core of the Jordanian ICT sector.
- **Focus Segment:** The focus segment will form the top tier of the Jordanian skills pyramid and will focus on developing specialized digital skills. The programs should focus on offering intensive technical skills training to a relatively smaller audience with prior work experience. In terms of the participation base, it would mostly be the current ICT workforce looking at upskilling/reskilling. Based on industry feedback and high demand in the domestic and global market, these training programs will focus on advanced specific digital skills within the digital technologies – AI/ML, Cloud, Cyber Security, Mobile Technologies, and Data Analytics. Since these technologies are subject to fast changes, there will always be a need for upskilling/reskilling the ICT workforce to ensure the continual availability of trained resources to support the growing demand for these technologies.

Each of the technical and professional skills are further divided into three proficiency levels – Basic, Intermediate, and Advanced –

- **Basic:** Introductory courses designed to provide a broad understanding of the subject area. The basic courses will help the target audience to build confidence before starting a higher-level course. These courses are meant for students who have no or minimal experience or for ICT workers looking at a new area of interest.
- **Intermediate:** These courses are meant for people with basic knowledge of the subject area and targets ICT graduates and junior level ICT resources with at least 3 months of professional experience. The intermediate courses are designed to students upskill/reskill by forming a base needed to undertake advanced level of education or training required.
- **Advanced:** These courses are meant mostly for students who have either completed both basic and intermediate level of training in the area or ICT workers with at least 12 months of professional experience or holders of globally recognized certifications.

The program is expected to train around 13,000-15,000 resources over the course of two years.

2.Setting up an Industry-Led Digital Skills Development Agency

Develop an industry lead national skills development agency to direct digital skill development initiatives. The agency should ideally be a multi-stakeholder partnership (connecting public authorities, business, education, training providers and labour market stakeholders) that would provide long term direction to the ICT sector's digital skills requirements. It could also play an important role in improving the broader digital literacy and digital adoption among the general population.

Some of the main objectives of the proposed agency/council could include:

- Primary
  - Training and skill development ecosystem management
  - Certification
  - Creating Awareness
  - Facilitating employment/industry absorption
  - Trainer Training - Providing uniform training and technical exposure to all trainers
- Secondary Objectives
  - Contribute to ICT sector development programs
  - Contribute to broader digital literacy initiatives
  - Support curriculum improvement in territory institutions

The mandate of the current DigiSkills program can be reassessed to align its current scope to the responsibilities of an industry skill development body (working in close collaboration with intaj as the industry association). The government can also empower DigiSkills by assigning it to be the authority on digital skills development (sector specific).

3. Develop Online Training Delivery Capacity

Develop a robust online skill development program across key industry segments and skill requirements. Developing the capacity to deliver training programs remotely online/virtual medium will help both improve access to training facilities/programs as well as help faster updating of programs based on industry requirements. Considering the current global situation, the provision of virtual or virtual plus classroom training has become critical. Providing online training programs is also not only more cost-effective but also offers much more flexibility to scale. Once established, the training programs across various levels can be delivered through the online platform or a combination of online and classroom training programs.

The proposed platform should be developed and rolled out with extensive collaboration across various key elements including:

- **Content Partners** – Public/Private companies that can develop and curate content (both online and in-person as required) based on industry requirements at regular intervals
- **International Certification Partners** – Partnerships on global certification for training and certification for intentionally recognized certification programs e.g., Amazon Web Services, Microsoft, Cisco, Google etc.

- **Physical Infrastructure** – Partnerships with public/private entities on the usage of physical infrastructure for training purposes e.g., classrooms, computer labs e.g., vocational training locations in semi-urban areas and universities, and private training labs in urban areas. Such an approach will help lower capital investments and improve the usage of existing infrastructure
- **Accreditation and Quality Assurance Partners** – Partnerships with national certifications bodies to certify various programs under the digital skills development program. Such accreditation will not only confirm the qualified training but also add confidence to the usefulness of the program at both trainee and employee levels.

Possible Jordanian Alternative

Jordan can consider looking at leveraging existing segments (both public and private) of an online training ecosystem to reduce implementation timeline and cost. This includes assessing existing offerings and its suitability to be a part of a digital skills development program.

- Edraak Platform

Funded by the Arab Fund for Economic and Social Development (the Arab Fund) and the Mikati Foundation, Edraak is the first not for profit Arabic MOOC platform. Edraaks' existing training ecosystem and delivery platform can be leveraged to roll out the proposed training programs (or part of it).

- **Content:** Edraak focuses on localized curricula from Jordan, Egypt, and Syria, representing most of the curricula in the Arab region**.**
- **Language Challenge:** Most Edraak courses are offered in Arabic or with Arabic subtitles (in case the course is offered in other languages). The ability create and curate Arabic content can be key to resolving the challenges around quality Arabic content. The existing capacity around of content conversion and localization can help launch local content at a faster pace.
- **Accreditation**: Upon completion of the course, a certificate accredited by the Queen Rania Foundation for Education and Development is offered to the students. This can be extended with other accreditations to also add value to the current programs being offered on Edraak.
- **Telecommunication Partners:** Edraak has partnered with Zain, Orange, and Umniah for easier and cheaper access to the platform's courses and learning content for the students. Students can download Edraak's content with lower bandwidth consumption. The same can be considered for DigiSkills modules hosted on the platform.

Importantly, as Edraaak has royal patronage and DigiSkills is a government sponsored program it would allow for easier collaboration and cross-utilization of resources.

4. Training Program Accreditation and Quality Assurance

As the digital skills are ever evolving**, it is important to ensure that the proposed program not only ensures trained resources meet the industry requirements but also the training content is updated based on the changing technology trends and sector requirements.**

Developing an accreditation mechanism for both the training ecosystem (course content, trainers, training/programming platforms/labs as well as the output (trained resources) can be very effective in ensuring high-quality output which in turn can help in establishing Jordan as a 'high talent quality' location. The program can leverage existing accreditation mechanisms/institutions e.g., Accreditation & Quality Assurance Commission for Higher Education Institutions to assess its training programs and certify the same while also creating an internal assessment mechanism for assessing the training ecosystem (course curriculum improvements, trainer assessments, student selection process modification etc.)

5. Increase Female Participation

While females make up around 50% (varies from 48-52% yoy) of annual ICT course intake the workforce participation drops to 25% indicating to a significant under-utilization of academically qualified female resources who can be quickly deployed with targeted ICT trainings to serve client requirements.

In terms of the benefits, flexible hours and work from home options are indicated to be the most attractive by current and prospective female employees. Considering the changing work environment, both benefits can be rolled out more broadly to attract more female employees, e.g., staggered working hours suiting female population, work from home every week, etc., can help the female workforce base be both productive as well as adequately balance personal responsibilities.

A high-level campaign encouraging participation in the sector covering the various initiatives taken by the sector to encourage female participation can be an effective way to encourage higher participation (both at employment as well as skill development program levels).

Training and Skill Development Support

- **Seat Reservation:** Certain number of seats per course/class in the proposed skill development program can be reserved for female candidates to ensure availability of seats in programs of choice
- **Free or Subsidized Digital Training Programs:** Providing free or subsidized digital skills development programs can encourage female participation.
- **Awareness Campaigns**: Rollout awareness programs (as part of the broader campaign) focusing on female students about advantages and career opportunities within the sector. Organizing awareness campaigns to support women especially young females to understand about the study programs, trainings, and employment opportunities available and accessible online e.g., Intaj SheTechs program

Employment Support

- **Direct Salary Support:** Provide salary support to services providers to encourage hiring of females. This could be expanded to also include other direct support if a certain percentage threshold of overall female employment is achieved. The salary support program can be run in conjunction with the current support initiatives under the DigiSkills and YTJ programs
- **Direct/Indirect Childcare Support:** Lack of childcare support has been indicated as one of the main reasons limiting female employees. Providing direct childcare support i.e., direct cash

handouts to employees can help mitigate the challenge. Alternatively, service providers can be encouraged to partly or fully cover childcare cost through direct payments to childcare partner firms. DigiSkills/YTJ can also consider a similar model as part of its initiative.
Note: Amendments[44] to Jordan's labor laws require institutions to offer daycare services for their employees' children who are 5 years old or younger, regardless of the number of female employees.

- **Transportation Support:** Similar to childcare, companies can look into providing transportation support to its female employees. It will not only ease commute challenges but also help employees to be more focused on work. In India, most IT/BPO companies offer transportation services to its employees to ensure efficient and safe commute.
- **Provide Part-time/Flexible Remote Work Options:** Providers can consider offering flexibility in terms of timing (when) and location (where) the work is performed. As work from home/remote work has become a norm in the IT sector, especially after the pandemic, it can help in significantly improving female labor force participation in the long run.

6. Integrate Internship, Placement, On-Job Training (OJT) Programs into Academic Programs

- **Internship (Academic Stage)**

Providing students hands on training through internship programs by integrating it as a part of the regular academic program can be highly effective in bridging the gap as well as preparing the students for the work environment. Adding an internship program to the course towards the latter part of the academic year will provide students an opportunity to apply their skills in real work environment in turn giving them an opportunity to self-assess their skills and identify areas of improvement which can in turn be fulfilled through post graduation short term training programs. Such an approach will also help academic institution to identify improvement areas in various academic programs based on students' performance/ employer feedback/ student feedback.

While helping students gain valuable practical training it also provides an opportunity for employees to identify suitable candidate for full time employment after the completion of the academic programs.

- **Placement Programs (Post Academic)**

To encourage hiring of new, inexperienced resources, a short-term direct salary subsidy program can be instituted (or existing support programs can be modified).

On Job Training (OJT) Program – Under an OJT program, inexperienced resources can be placed into IT services companies who in turn get compensated in form of salary subsidies. The program would be limited in terms of the type and tenure of resources. The program will provide a higher level of salary support but would be for a shorter duration. This is most optimal for new graduates to get experience.

Placement Support – Under placement support, a longer duration but lower value support can be provided directly to service providers for hiring qualified unemployed graduates.

[44] Source: International Labour Organization, Labour Code, Law No. 8 of 1996, Jordan

In both the cases, the proposed training programs can act as a feeder program.

7. Establish a Career Progression Framework

Develop a Career Progression Framework (CPF) model along with an online job portal listing all digital job opportunities.

Career Progression Framework (CPF) – A CPF supports long-term career progression in a structured manner by visually showcasing an occupational roadmap and outlining the steps (training, experience, formal education, years in the organization etc.) required to achieve ideal positions e.g., title, compensation, or skills. Laying out a clear CPF for the digital services sector will enable the workforce to clearly identify the various growth opportunities and identify specific steps to achieve career objectives. Having a clear understanding of the long-term growth objectives can help in ensuring long term commitment to employees and limit movement of trained resources outside of the ICT/digital services sector (a major problem in Jordan). It will also the sector more attractive to new graduates as they are able to clearly visualize a long-term career within the sector.

8. Develop Sector Dedicated Job Portal

Develop an online job portal allowing for a seamless connection between trained resources and prospective employees. The portal should showcase all IT and ITeS related job openings, internships, and apprenticeships by IT companies in emerging and core IT skills. It should allow for easy application to these openings to the students/candidates who have been part of the various training and certification programs and have cleared the related assessments.

The portal will provide job seekers access to a comprehensive list of job vacancies and allow for easy application for the job. Similarly, employers will get access to job seekers' profiles/resumes and the ability to contact them easily. The portal will help pace up the entire hiring process by saving time and effort at both ends.

9. Easing Travel/Stay Requirements, Hiring of International Resources

As Jordan currently suffers from significant shortage of mid-level resources, easing the process of hiring foreign resources, especially from mature delivery locations can provide a short-term solution for bridging the gap. This can include issuing medium-term visas to individuals with technical/digital skills keen on collaborating with local SMEs as part of knowledge transfer, technical capacity development initiatives.

These sector-specific initiatives can also be part of a broader program to encourage the mobile workforce to consider Jordan as a digital destination.

10. Leverage TVET/Community Infrastructure in Semi-Urban Areas for Foundational Training Programs

Use existing TVET/Vocational education training centers to roll out foundational digital skills training programs. The common training infrastructure can be used to deliver online lectures, provide practical training. Such centers can also be positioned as part of impact sourcing programs. The centers can provide basic digital skills training that would enable resources:

- To improve employment prospects
- To be effective in a work environment requiring basic digital skills
- Prepare for more complex digital training

Basic improvements to current infrastructure (used for other vocational and professional training programs) e.g., internet connectivity, improved internet speed, wireless broadband, small computer labs, projectors can help in effectively transforming existing training centers into digital training locations.

Sector Initiatives/Investment Attraction Recommendations

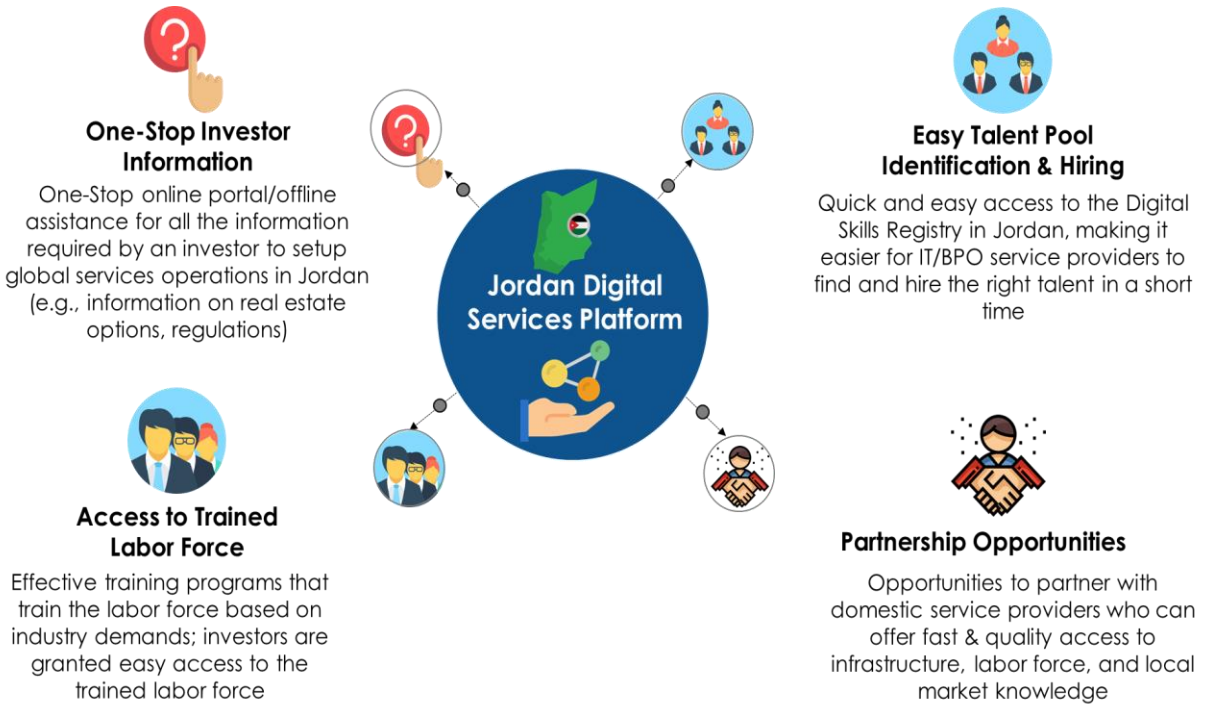
11. Develop a 'Single Window' Digital Sector Industry Platform

Develop a digital one stop shop global services platform covering all elements related to the global services sector – infrastructure, human resource, legal and regulatory under a single window (platform).

The Digital Services Platform should be designed as a one-stop-shop solution for stakeholders to gain access to industry data (related to human resources, physical infrastructure, sector incentives, industry updates, etc.) in a single online location, and in real-time.

Furthermore, the platform would ensure easy access to industry-ready talent via a skills registry which can be accessed by employers and potential investors. The following figure represents a high-level conceptualization of the proposed solution. The proposed Job Portal can feed into the one-stop platform for human resource-related segments.

Figure 15 – Jordan Digital Services Platform Concept



Source: Avasant

12. Strengthen Services Export Promotion/Outward Industry Promotion

The first key step would be to institute (or identify) an agency responsible for attracting foreign investments and undertaking market promotion initiatives. The main objective of the export facilitation entity should be to undertake global marketing and promotion to improve the visibility of 'Brand Jordan'.

Some of the key facets of an export facilitation program include:

- Acting as an avenue for global branding and promotion for 'Jordan ICT Sector' as well as domestic SME's
- Facilitate inward investments by supporting the investment process
- Liaise with local government entities to streamline the investment process
- Support B2B global partnership opportunities by leveraging the investment promotion channels
- Support easing services export by providing assistance in streamlining export procedures and documentary requirements
- Develop services export toolkit covering key export requirements e.g., international financial transactions, key market information, documentary/ regulatory requirements etc.
- Support SMEs in outward and inward partnership initiatives (events and forums)
- Peer to peer networking opportunities

- Training and guidance on engaging with international clients
- Providing periodic market insights and development updates

13. Target Market Expansion

Expand the current target market focus to include key outsourcing services delivery and service provider base locations. This would entail a focused marketing and promotion campaign in some of the key locations esp. India (home to over 50 percent of global SSO and headquarters of half of the largest global IT/BPO companies) to educate service providers about Jordan's value proposition in turn positioning to attract service providers and shared service centers.

14. Domestic Service Provider Market Expansion

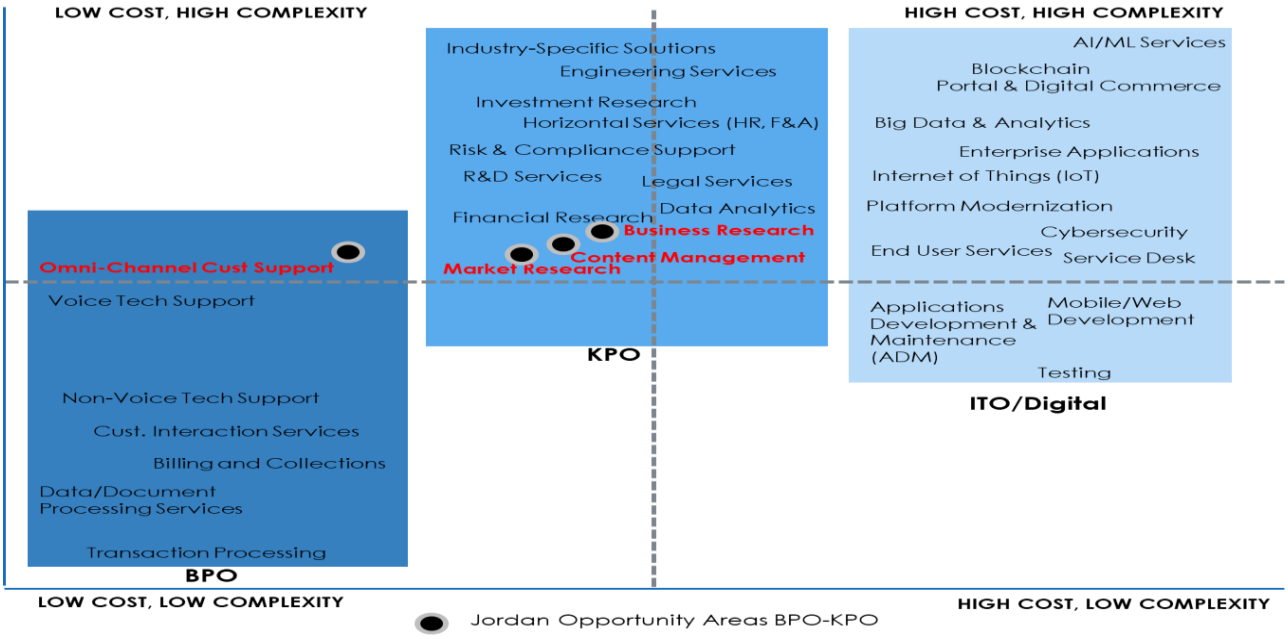
Support the growth of existing domestic service providers across all services segments (CC/BPO, ITO, KPO, Vertical Services). Some of the other short-term steps for better marketing and branding can include:

- Proactively positioning local service providers for partnership opportunities as part of branding and promotion initiatives
- Support local providers to establish business linkages by leveraging Government/Investment Promotion channels
- Leverage government channels in key markets especially GCC to position Jordan (and its service providers) as partners
- Support domestic service provider expansion by attracting jobs to Jordan through partnerships in the GCC market
- Create and execute targeted marketing campaigns (especially joint public and private sector) for top target markets i.e., the GCC region
- Leverage Jordan's tourism sector image to position the country as a "Services Destination"

15. Focus on Developing the BPO/KPO Segments

Support the growth of the BPO and other higher value non-IT services segments of outsourcing services by providing similar training and capacity building initiatives. While the BPO sector can also absorb people with limited technical skills resulting in higher employment generation the Knowledge Process Outsourcing (KPO) segment can support higher value services.

Figure 16 – BPO-KPO Sub-Segment Opportunities for Jordan



Source: Avasant

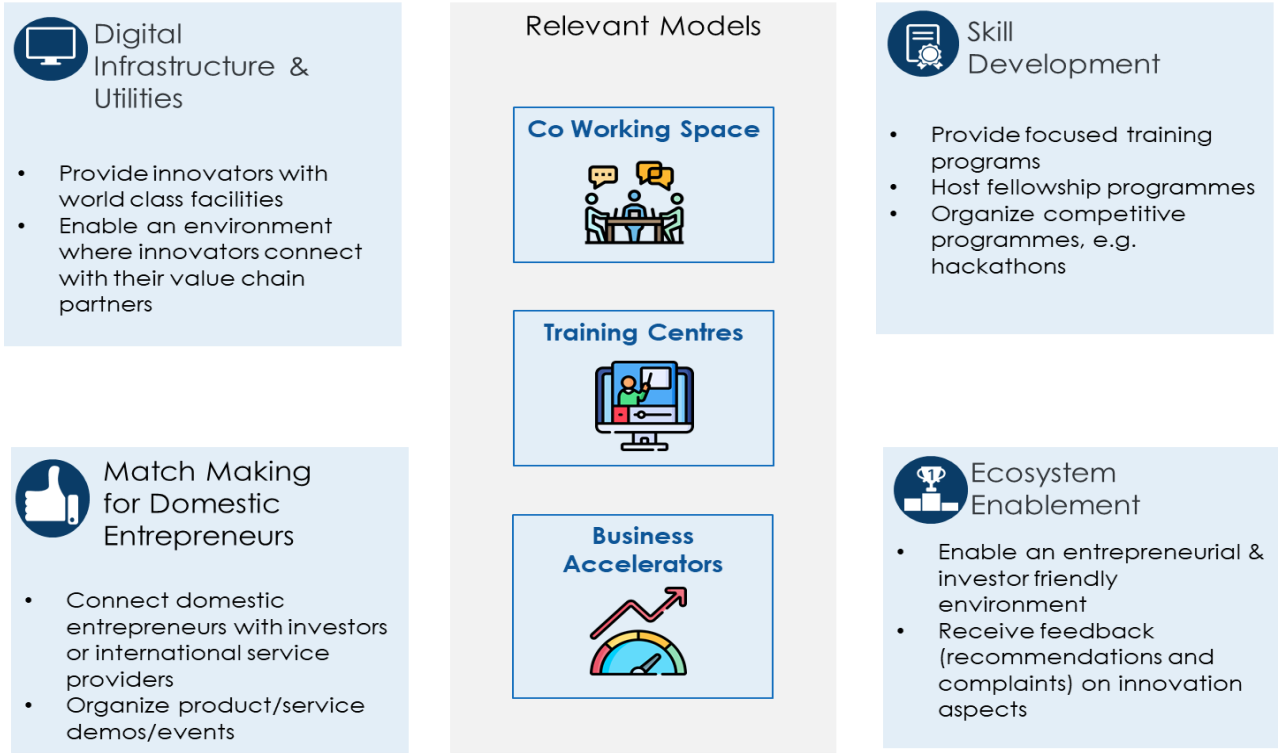
16. Develop Training+Incubation Facilities (Digital Innovation Hubs)

Develop at least two 50 seat incubation and training centers that provide all the facilities required to deliver outsourcing services (across the various services segments). This facility can be offered for free or at a minimal rental to prospective international investors and domestic SMEs for a predefined time. The facilities can also be used as training locations to roll out various training programs and other industry-related initiatives e.g., hackathons, events, conferences etc.

Such facilities can enable international service providers and domestic entrepreneurs to quickly enter the market, deliver services on a pilot basis, and assess the local business environment against their business objectives before deciding on expanding their operations in the country. The availability of an incubation space can become an added incentive for prospective investors to gain easy access to quality infrastructure and other business support services.

For domestic service providers, incubators can assist in operationalizing at a small scale without having to commit to upfront capital investments. It can play a key role in assisting in transitioning to larger sustainable operations by providing the required launchpad, administrative and legislative support, and other related business assistance services to help firms establish their business operations.

Figure 17 – Digital Innovation Hubs Model and Benefits



Appendix

Glossary

Abbreviations	Explanation
1H	First Half
aaS	as-a-Service
ABET	Accreditation Board for Engineering and Technology
ACV	Annual Contract Value
ADM	Application Development Maintenance
AI	Artificial Intelligence
APAC	Asia Pacific
API	Application Programming Interface
AR	Augmented Reality
ASAC	Abdul Aziz Al Ghurair School of Advanced Computing
AWS	Amazon Web Service
BFSI	Banking, Finance, and Investment
BPO	Business Process Outsourcing
BTM	Business Technology Management
CC	Contact Centre
CCNA	Cisco Certified Network Associate
CISA	Certified Information Systems Auditor
CISM	Certified Information Security Manager
CITC	Communications and Information Technology Commission
COVID-19	Corona Virus Disease
CSR	Corporate Social Responsibility
CV	Curriculum-Vitae
DCMS	Digital, Culture, Media & Sport
DCX	Digital Customer Experience
DigiSkills	Digital Skills Association
DIGITAL	Digital Europe Program
DoS	Department of Statistics
EU	European Union
FinTech	Financial Technology
FTE	Full-Time Employee
GCC	The Gulf Cooperation Council
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GEI	Global Entrepreneurship Index
GJU	German Jordan University
HR	Human Resources
HTU	Al-Hussein Technical University
ICDL	International Computer Driving License
ICT	Information and Communication Technology
ICTC	Information and Communications Technology Council
int@j	Information and Communications Technology Association, Jordan
IoT	Internet of Things

ISO	International Organization for Standardization
ITA	International Trade Association
ITAC	Information Technology Association of Canada
ITES	Information Technology Enabled Services
ITIL	Information Technology Infrastructure Library
ITO	Information Technology Outsourcing
JUST	Jordan University of Science and Technology
KPO	Knowledge Process Outsourcing
LTUC	Luminus Technical University College
MCIT	Ministry of Communications and Information Technology
MCITP	Microsoft Certified IT Professional
MENA	Middle East and North Africa
MHESR	Ministry of Higher Education and Scientific Research
ML	Machine Learning
MoDEE	Ministry of Digital Economy and Entrepreneurship
MOL	Ministry of Labor
MOOC	Massive Open Online Courses
NASSCOM	The National Association of Software and Service Companies
NOS	National Occupational Standards
PMP	Project Management Program
PSUT	Princess Sumaya University for Technology
RbK	ReBootKamp
RPA	Robotic Process Automation
SaaS	Software-as-a-Service
SDGs	Sustainable Development Goals
SDLC	Software development Life Cycle
SIT	SAGO International for Training
SLA	Service Level Agreements
SME	Small and Medium Enterprises
SSO	Single Sign On
UK	The United Kingdom
UN	United Nations
UNCTAD	The United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific, and Cultural Organization
US	The United States
VR	Virtual Reality
WEF	World Economic Forum
YTJ	Youth, Technology & Jobs
ZINC	Zain Innovation Campus