التعاون الألماني
DEUTSCHE ZUSAMMENARBEIT

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

MINISTRY OF INDUSTRY, TRADE AND SUPPLY
THE HASHEMITE KINGDOM OF JORDAN

GIZ JORDAN
EMPLOYMENT-ORIENTED MSME PROMOTION PROJECT (MSME)

JORDAN'S ICT SECTOR ANALYSIS AND STRATEGY FOR SECTORAL IMPROVEMENT

Authors: Mr Serge Gedeon, Mr Laith Al-Qasem

Published in May 2019


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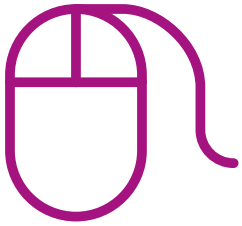

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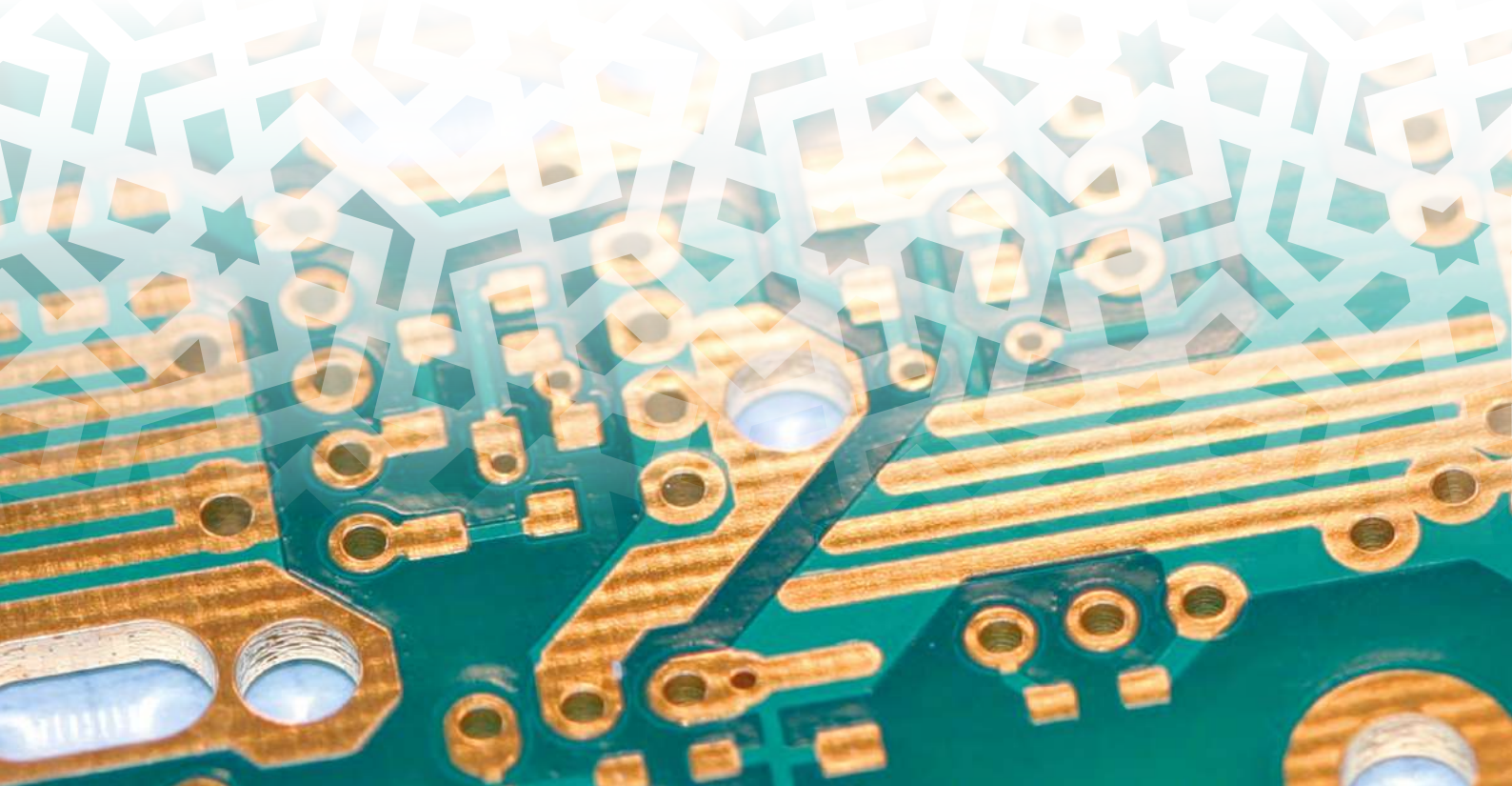

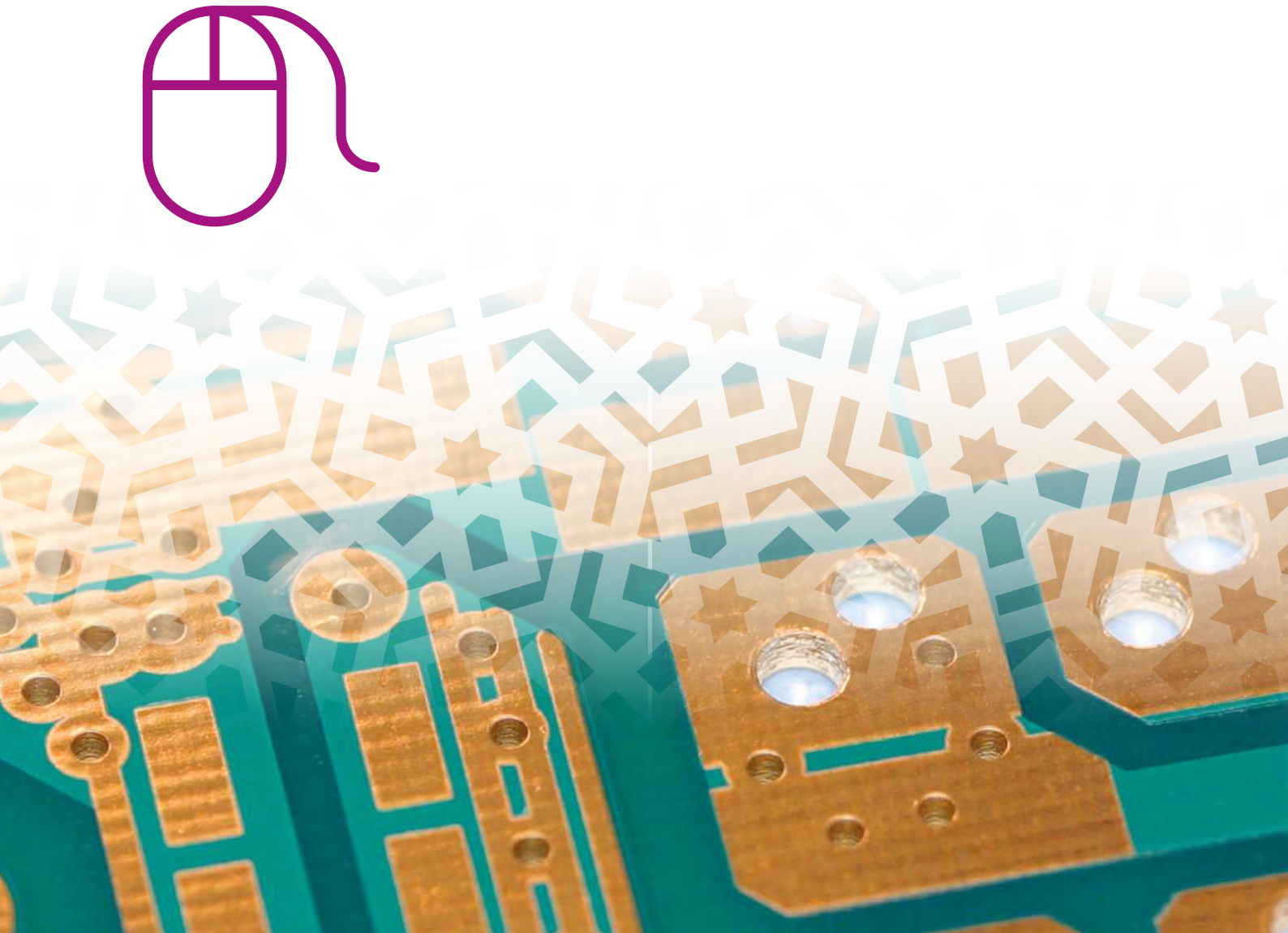

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ABBREVIATIONS

ACC .....Amman Chamber of Commerce

AI.....Artificial Intelligence

AR.....Augmented Reality

B2B .....Business-to-Business

B2C.....Business-to-Consumer

B2G .....Business-to-Government

CBJ .....Central Bank of Jordan

CCD .....Companies Control Department

CMMI.....Compatibility Maturity Model Integration

CRM .....Customer Relationship Management

DoS .....Department of Statistics

EU .....European Union

FDI .....Foreign Direct Investment

FTA.....Free Trade Agreement

GCC .....Gulf Cooperation Countries

GDP.....Gross Domestic Product

GIZ .....Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

ICT.....Information and Communication Technology

ICTAC.....ICT Advisory Council

ICT-ES ....Information and Communication Technology-Enabled Services

ICT-NSSC National Sector Skills Council for ICT

IDC .....International Data Corporation

int@j.....Information and Communication Technology Association of Jordan

IoT.....Internet of Things

IP.....Intellectual Property

ISIC .....International Standard Industrial Classification

ISP.....Internet Service Provider

JCS.....Jordan Computer Society

JEDCO ....Jordan Enterprise Development Corporation

JIC.....Jordan Investment Commission

JHA.....Jordan Hospitals Associations

JOD.....Jordanian Dinars

JSSO.....Jordan Skills Standardization Organization

JTG .....Jordan Telecom Group

KAFD.....King Abdullah II Fund for Development

LTRC.....Land Transportation Regulatory Commission

MENA ....Middle East and North Africa

MoF.....Ministry of Finance

MoH.....Ministry of Health

MoICT ....Ministry of Information and Communications Technology

MoITS ....Ministry of Industry, Trade and Supply

MR .....Mixed Reality

MSME....Micro, Small or Medium Enterprise

MWC.....Mobile World Congress

NGO .....Non-Governmental Organisation

OECD .....Organisation for Economic Co-operation and Development

OIC .....Organisation of Islamic Cooperation

PaaS.....Platform as a Service

PHA.....Private Hospitals Association

PPD.....Public–Private Dialogue

R&D.....Research and Development

SaaS.....Software as a Service

SEO .....Search Engine Optimisation

SME .....Small and Medium Enterprises

SWOT.....Strengths, Weaknesses, Opportunities and Threats

TFP.....Total Factor Productivity

TRC.....Telecommunications Regulatory Commission

TVET .....Technical and Vocational Education and Training

UAE.....United Arab Emirates

UK.....United Kingdom

US .....United States of America

USAID ....United States Agency for International Development

USD.....United States Dollar

VR.....Virtual Reality

VTCs.....Vocational Training Centres

WAN.....Wide Area Network

WEF .....World Economic Forum

WTO.....World Trade Organization

XaaS.....Anything as a Service

EXECUTIVE SUMMARY

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Employment-oriented MSME Promotion (GIZ-MSME) project aims to support Jordanian micro, small and medium enterprises (MSMEs) in line with national strategies by focusing on information and communication technology (ICT), among others, as a sector with considerable growth and employment potential.

More specifically, the project aims at improving enterprise competitiveness, enhancing competences within MSMEs and improving the business and investment climate for MSMEs active in the ICT sector. This study was conducted under the auspices of the GIZ-MSME project, in close consultation with sector stakeholders, to provide a comprehensive understanding of the sectoral structure and current and projected trends, as well as challenges and opportunities for improved competitiveness domestically and abroad.

ICT SECTOR OVERVIEW

The ICT sector in Jordan accounts for 2.5% of gross domestic product (GDP)[1] with a total annual revenue of USD 682 million, employs over 16,000 people and involves 928 companies[2], 98% of which are considered to be MSMEs. Export revenue from the sector is worth approx. USD 225 million annually[3]. The sector is an important source of employment for youth, who experience high levels of unemployment, and has a higher rate of employment of women than any other sector, at 29% of the ICT labour force[4]. The sector is concentrated mainly in Amman with some clusters and incubators in other governorates. It has a complex institutional set-up but has both strong support from the public sector through the Ministry of Information Communication Technology (MoICT) and a strong private sector association, the Information and Communication Technology Association of Jordan (int@j).

DEFINITION OF ICT SUB-SECTORS

This study provides an overview of the entire ICT sector while focusing on priority sub-sectors and vertical markets (verticals), selected based on their potential for MSME growth, employment, innovation and value addition, as well as their potential to strengthen the role of women and/or gender equality. Sub-sectors such as telecommunications and hardware were excluded as they are more likely to have a higher concentration of larger companies. The priority sub-sectors selected are software and content development, since Jordanian start-ups have more opportunities selling these products to clients locally, regionally and internationally. The priority verticals selected were HealthTech, FinTech and EdTech, mainly due to the potential for growth based on the advanced state of the existing health, financial services and education markets in Jordan.

ICT SECTOR GROWTH AND TRENDS

There are a number of trends currently driving the ICT industry both globally and in Jordan. Consumer trends include the need for mobility, individualisation, sharing economy (renting or sharing instead of buying), consumer-centricity and omni-channel connectivity, and Industry 4.0. Technology product trends include artificial intelligence (AI) and augmented analytics, empowered edge and the internet of things (IoT), automated things, immersive experience, blockchain, smart spaces, and XaaS (anything as a service). These concepts are explored fully in the present document.

ICT is generally a growth sector worldwide and in any economy is inherently linked to the development of other sectors. In Organisation for Economic Co-operation and Development (OECD) member countries, software publishing, information technology (IT) and services have persistent growth in employment, while the more traditional telecommunications and hardware manufacturing sectors are lagging behind. There is strong growth potential in the consumer, business and government adoption of ICT in the Middle East, where there is a need to catch up with the rest of the world. Strong growth is predicted in ICT spending in the Middle East and North Africa (MENA) region, particularly in software. Verticals include Jordan's highly developed education and health sectors but also services that still have low adoption of ICT. In financial services, the region is severely underbanked, meaning there is potential to develop innovative technologies with localised content to provide access to financial transactions and other banking services. Therefore, Jordan's ICT MSMEs have an opportunity to supply software packages for the region's education, finance and health sectors. Jordan's ICT MSMEs possess highly qualified human resources that make them well equipped to meet the demand in the region.

1 Department of Statistics (DoS) (2017).

2 Ibid.

3 int@j (2017): ICT & ITES Industry Statistics and Yearbook 2016.

4 Ibid.

MSMEs' KEY CHALLENGES AND OPPORTUNITIES

The key challenges for MSMEs in the ICT sector in Jordan are:

- **Limited domestic market:** The small size of the population and its purchasing power means that Jordan can only achieve scale through exports.
- **Business linkage challenges:** Operators along the value chain are poorly linked to customers due to poor self-marketing and weak government support in international promotion of the sector. Linkages helping MSMEs to access finance are also weak.
- **Weaknesses in management capacity:** MSMEs are often managed by technical experts who need strategic and operational business skills.
- **Gaps in workforce education and skills:** Quality assurance and product development skills, among others, are weak and there is poor linkage between industry and education providers, due for example to gaps between skills supply and demand.
- **Business enabling environment weaknesses:** These include weak implementation of government programmes to support the sector and its policy framework, poor sector governance, weak institutions and linkages, and red tape.

Six main opportunities are identified for ICT MSMEs in the country:

- Jordan already has experience and strengths in the ICT sector;
- Jordan has access to lucrative regional and international markets;
- Jordan has advanced and reliable infrastructure;
- core skills are strong in the selected vertical markets; and
- there is an opportunity to localise products for the Arab market.

STRATEGIC OPTIONS FOR PROMOTING MSMEs IN THE ICT SECTOR

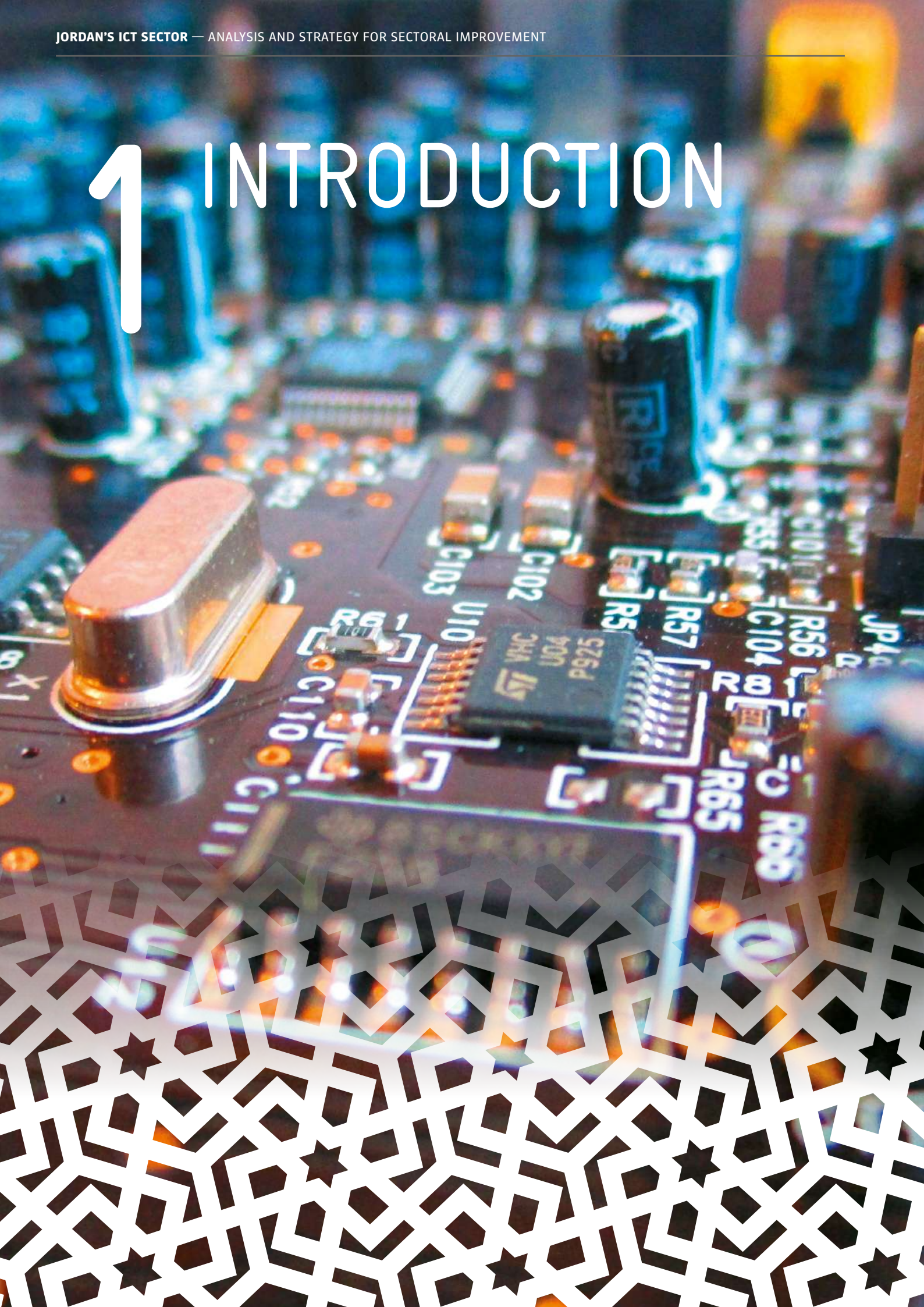
The following strategic interventions are recommended to address the challenges and maximise the opportunities being encountered by the ICT MSME sector in Jordan:

1 **Improve MSMEs' competitiveness in the ICT sector:** introduce a specialised technical assistance programme for MSME support; support MSMEs through innovation and incubators; enhance ICT products/services quality and standards; promote Jordanian ICT MSMEs and establish business linkages for domestic and export sales; develop tech markets.

2 **Enhance competences of ICT MSMEs and employment:** support the National Sector Skills Council for ICT (ICT-NCCS) to address gaps between skills supply and demand; conduct a training needs analysis; implement demand-driven capacity-building measures.

3 **Improve the business enabling environment for ICT MSMEs:** improve the ICT MSME legislative and policy framework; enhance customs processes and procedures; strengthen the institutional capacity of existing private sector associations and government bodies; enhance the capacity of authorities to promote and attract investment in the ICT economy targeted at MSMEs; facilitate linkages and access to finance for the ICT sector.

1 INTRODUCTION



1.1 CONTEXT

The Jordanian economy is currently facing a number of challenges. This is reflected by a negative trade balance, weak business growth and an increasing rate of unemployment, among other factors. The latest official statistics indicate an unemployment rate of 18.6% by the end of 2018[5]. At the same time, Jordan's economic growth remains low, 2.0% of gross domestic product (GDP) in 2018[6], and is not creating enough job opportunities. In 2016, only 49,000 job opportunities were created while the number of job seekers grew by more than 100,000[7].

Nevertheless, Jordan's private sector provides opportunities for growth, innovation and employment. In that context, Jordanian micro, small and medium enterprises (MSMEs) play a crucial role in the local economy and in employment creation. The country has more than 156,000 registered businesses, of which 98% employ fewer than 20 people. These businesses account for 40% of Jordan's GDP and employ between 60 and 70% of those employed in the private sector[8].

Despite the importance of MSMEs in the local economy, these enterprises are often not in a position to compete with foreign companies, partly due to a lack of qualified personnel but also because of limited access to markets, finance and business development services. Moreover, administrative, legal and regulatory obstacles or requirements often make it difficult to establish new enterprises and to invest in MSMEs.

As a response to these economic circumstances, creating conditions for increased private investment and improved competitiveness remains crucial for Jordan to stimulate employment-oriented growth. These priorities are clearly addressed in the government documents "Jordan 2025 – A National Vision and Strategy" and "REACH 2025: Jordan's Digital Economy Action Plan".

To support these priorities, the German Federal Ministry for Economic Cooperation and Development (BMZ) commissioned the GIZ Employment-oriented MSME Promotion (GIZ-MSME) project with the Jordanian Ministry of Industry, Trade and Supply (MoITS) as its political partner.

The GIZ-MSME project aims to support Jordanian MSMEs in line with national strategies by focusing on information and communication technology (ICT), tourism and food processing as sectors with considerable growth and employment potential. The project supports the implementation of sectoral and market strategies to boost the prospects of MSMEs and the sectors altogether. More specifically, the project aims at improving enterprise competitiveness, enhancing competences within MSMEs and improving the business and investment climate in the selected sectors.

1.2 SCOPE AND METHODOLOGY OF STUDY

To provide all sector stakeholders with a solid basis for designing and implementing effective measures to boost the growth opportunities of ICT MSMEs in Jordan, this study was conducted under the auspices of the GIZ-MSME project in close consultation with sector stakeholders. It aims to provide a comprehensive understanding of the sectoral structure and current and projected trends, as well as challenges and opportunities for improved competitiveness domestically and abroad.

For the purpose of this study, MSMEs are categorised by their number of employees as micro (1–4), small (5–19) or medium (20–99). This is in line with the definitions given by the Department of Statistics (DoS) of Jordan, the World Bank's small and medium enterprises (SMEs) database, the Central Bank of Jordan (CBJ) and the Jordan Enterprise Development Corporation (JEDCO).

The sector analysis focused on:

- Providing a thorough quantitative and qualitative description and analysis of the sector's performance, trends and potentials.
- Defining all relevant sub-sectors and suggesting priority sub-sectors that are the most promising for increased competitiveness.
- Studying the labour market needs, trends and growth potential of the sector and its sub-sectors

5 Department of Statistics (DoS), Jordan (2019).

6 Ibid.

7 Ibid.

8 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2017): Employment Promotion Programme (EPP) Jordan – Economic Trends in Jordan's Local Job Market.

in order to identify specific economic opportunities to boost employment.

- Identifying the underlying policy and institutional issues that affect the sector's and sub-sectors' domestic and international competitiveness.

- Providing strategic options to improve sectoral competitiveness, including a strategic framework and possible areas of intervention.

Jordan is a highly studied country that has benefited from decades of donor support. As such, there is an enormous inventory of economic and sector studies on Jordan. The purpose of this analysis is not merely to add a new study to this inventory; rather, it is to harvest the information and recommendations given by previous studies, as well as to develop objective means to select appropriate recommendations and sequence them in a manner which yields sustainable impact on the Jordanian economy in general and the ICT sector in particular, with a particular focus on MSMEs.

The methodology followed a multi-method approach, which involved analysing quantitative and qualitative data by applying the following tools:

- **Desk review:** At the outset, a desk review was conducted to understand the current situation of MSMEs in the ICT sector and to identify the sources of available data and statistics. A variety of national sources (Department of Statistics [DoS], Information and Communication Technology Association of Jordan [int@j] and others) were used to obtain country-specific sector and general economic data. International sources (World Bank, Statista, Trading Economics and others) complemented the data basis.

- **Stakeholder workshop:** The focus was on collecting information from stakeholders from the ICT sector, including sector associations, CEOs and business owners, as well as other relevant public institutions active as main drivers of sector growth and potential, with a focus on MSMEs.

- **Face-to-Face interviews:** During the field research, business owners, company management and employees within government and business associations were interviewed face-to-face using a semi-structured questionnaire. Interviews provided additional perspectives regarding the requirements and priorities to support MSMEs within the sector. The research team consisted of one senior consultant assisted by a local professional. This activity resulted in a total of 10 visits to ICT and ICT-enabled services (ICT-ES) companies and associations.

An ICT expert group explored the selection criteria for sustainable sector and sub-sector growth. The identified sub-sectors and verticals were prioritised based on the following criteria:

- Potential for growth: market prospects, growth, export and competitiveness
- Potential for employment
- Potential to strengthen the role of women and/or gender equality, and
- Ability in innovation and value addition.

Based on the available data and stakeholders' assessment, the following sub-sectors and verticals were identified:

- Telecommunications and infrastructure support services
- ICT hardware distribution
- Business process outsourcing (BPO) and knowledge process outsourcing (KPO)
- Programming and application development (business-to-consumer [B2C] and mobile applications)
- Software houses (business-to-business [B2B], B2C, business-to-government [B2G], enterprise solutions)
- Digital content creation, and
- Gaming.

Based on the document "REACH 2025", which details Jordan's national ICT strategy, six verticals addressing sector-specific opportunities in the ICT and ICT-ES space were further identified:

- Financial technology (FinTech)
- Education technology (EdTech)
- Health technology (HealthTech)
- Energy and clean technology
- Transport technology, and
- Communications and security technology.

Having applied the four above-mentioned criteria for assessing sub-sectors and verticals and selecting the most promising for MSME support and development, the following were selected from the longlist to be considered as priority sub-sectors and verticals:

- Sub-sectors:
  - Software and application development
  - Online and creative content.

- Verticals:
  - FinTech
  - EdTech, and
  - HealthTech.

A participatory approach has been used throughout the study to inform and consult the ICT sector stakeholders on key findings and suggested interventions; information was validated through several meetings with different stakeholders and centred around the needs of MSMEs in the sector. See Annex 7.1 for details of interviewees.

The sector study has focused on identifying market needs, trends and growth potentials based on both quantitative and qualitative information. The use of qualitative approaches along the ICT value chain has allowed MSMEs and other stakeholders to provide their own views and explanations about the challenges and opportunities they face. The identified interventions and selected recommendations are centred around the needs of MSMEs in the sector/sub-sector strategy.

LIMITATIONS OF THE RESEARCH

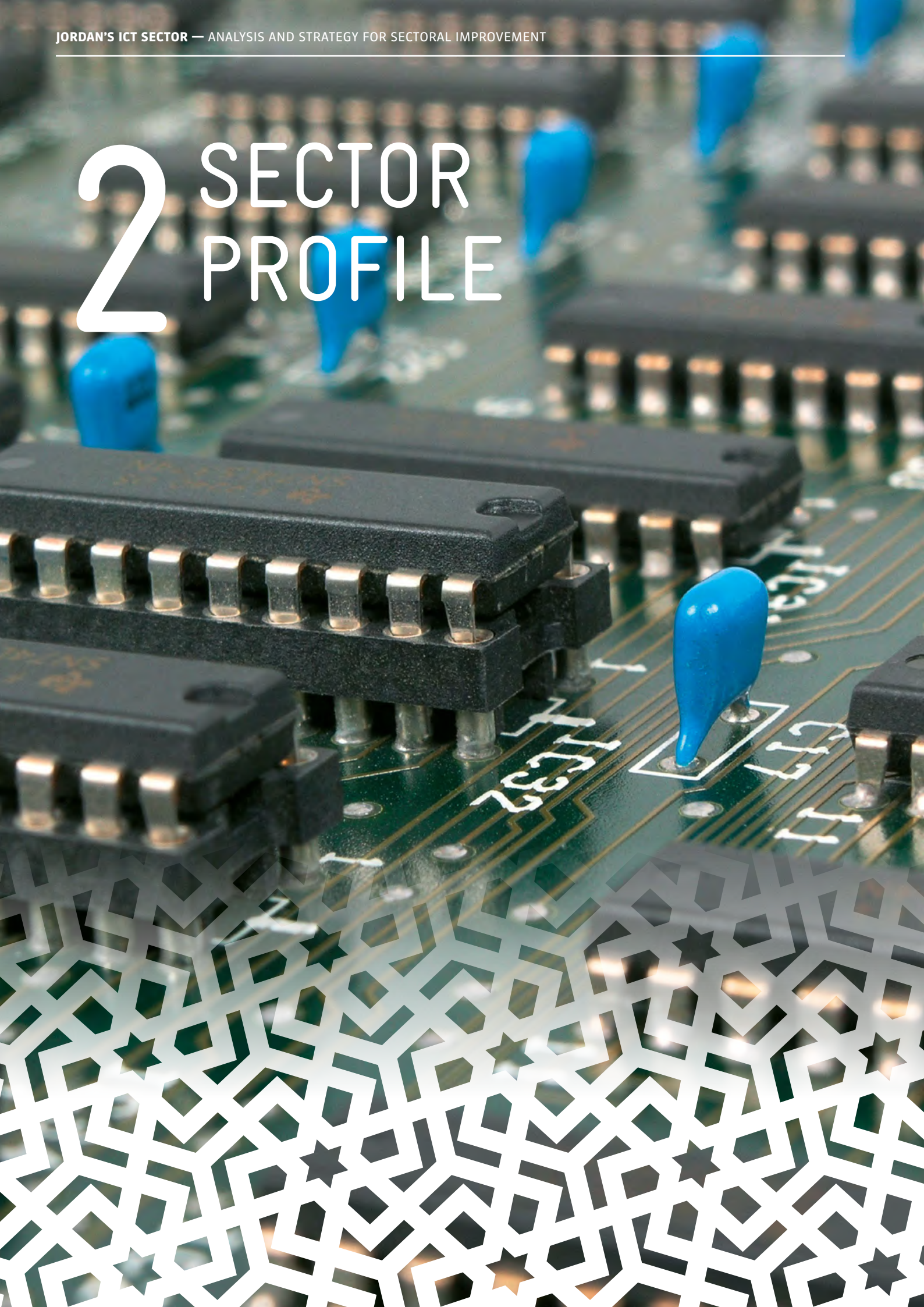
Although there are many documents providing information on ICT in Jordan, there are some limitations:

- There is limited data available on the role of MSMEs as a proportion of the whole ICT sector. However, we know that just 2% of companies in the ICT sector are large companies and considering that the telecommunications sector has a higher incidence of large companies and for this reason has not been prioritised, we can conclude that at least 98% of the enterprises which comprise the priority sub-sectors in this study are MSMEs.

- Apart from the software sub-sector, it was not possible to disaggregate information on female/male employment in the priority sub-sectors; the selection criterion relating to gender therefore could not be universally applied.

- There are discrepancies in statistics between the DoS and int@j. For example, int@j calculates that the ICT sector contributed 5.3% of GDP in 2016, while the DoS calculates 2.5%. Furthermore, int@j counts 707 companies and 13,187 employees in 2016 while the DoS counts 928 and 16,364, respectively, using what appear to be similar criteria. Because the DoS has better time-series information and because it is the more official source, we have chosen to rely on the DoS in cases of conflicting statistics. In general, this should not affect the overall information and trends and opportunities in the sector.

2 SECTOR PROFILE



2.1 BRIEF SECTOR DESCRIPTION AND GUIDING FRAMEWORKS

For the past two decades, the ICT sector in Jordan has officially and systematically been supported by the Jordanian government as a revenue-generating and employment growth sector and an enabler for other sectors. The REACH initiatives, the first of which started in 1999, have provided action plans to develop the digital economy as an engine of growth in Jordan[9].

The Jordanian government, through the Ministry of Information and Communications Technology (MoICT) and int@j, supported by the United States Agency for International Development (USAID) Jordan Competitiveness Program, developed the REACH 2025 national initiative in 2016 to leverage Jordan's strengths and exploit international opportunities in the ICT sector. REACH 2025 is intended to facilitate Jordan's movement from seeing ICT as an isolated economic sector towards digitising the entire Jordanian economy through emphasis on specialised markets and integration with global value chains. The plan is transformational in its focus on the digitisation of early adopters in so-called vertical markets.

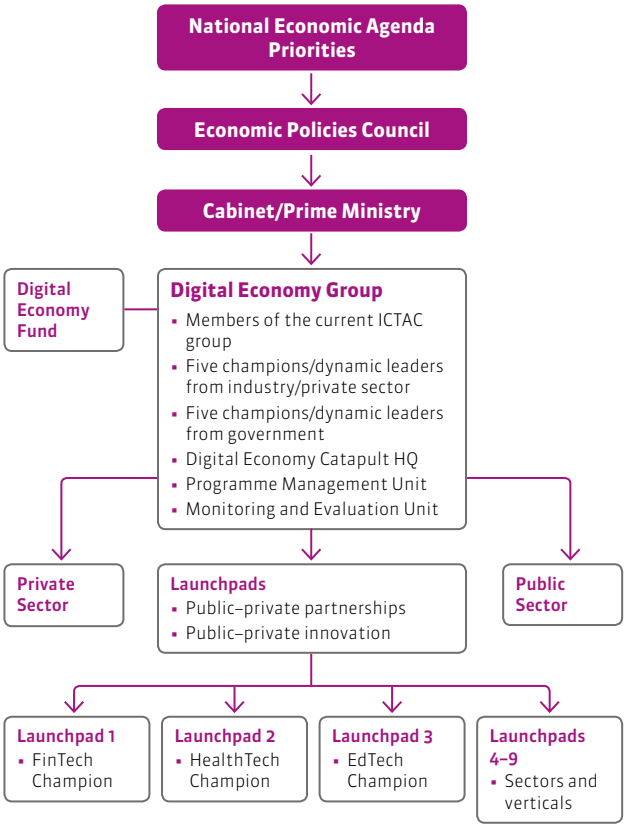
The REACH 2025 Vision and Action Plan focuses on the following goals:

- Boost economic development in key knowledge sectors.
- Enable business growth and enhancement not only for the ICT sector, but for specific digital economy sectors of focus.
- Focus on developing relevant national talent and increase job creation.
- Ensure better accessibility of, and inclusion of all citizens in, key services at lower costs of investment through digitisation of key sectors, providing better solutions for health, education, financial services, etc.).
- Ensure broad national regional development in governorates, advancement of rural areas, etc.
- Improve Jordan's global alignment and relevance in global value chains.
- Increase economic and social value addition.
- Boost public–private partnerships for better co-owned development and country advancement.
- Attract investments in new-developed fields and key sectors.
- Focus the role of government as a policymaker, regulator and potential innovation platform/adopter.

Accelerating smart specialisation in Jordan to increase the significance of the Jordanian digital economy in global value chains depends on co-ownership of the REACH 2025 action plan between the private sector (the tech sector and the key sectors of the digital economy) and the government. It requires collaborative leadership across industry, government and non-for-profit organisations (business associations), allowing the ICT sector to become an integral part of Jordan's new economic reality.

The following model[10] summarises the layers, roles and responsibilities underlying the suggested short-term governance structure. The proposed structure should drive dialogue and process towards adopting a more sustainable governance model and advanced economic structure that addresses the digital economy as a key growth pillar.

Figure 1: **Short-term governance structure layers, roles and responsibilities**



Source: REACH 2025

9 Ministry of Information and Communications Technology (MoICT) and Information and Communication Technology Association of Jordan (int@j) (2016): REACH 2025. Vision and Action Plan.

10 REACH 2025.

Within the REACH 2025 document a nationally agreed-upon framework has been articulated with actions and initiatives directed towards relevant stakeholders. However, interviews indicate that the framework is poorly understood, responsibilities are not well assigned and only limited attempts have been made as to implementation.

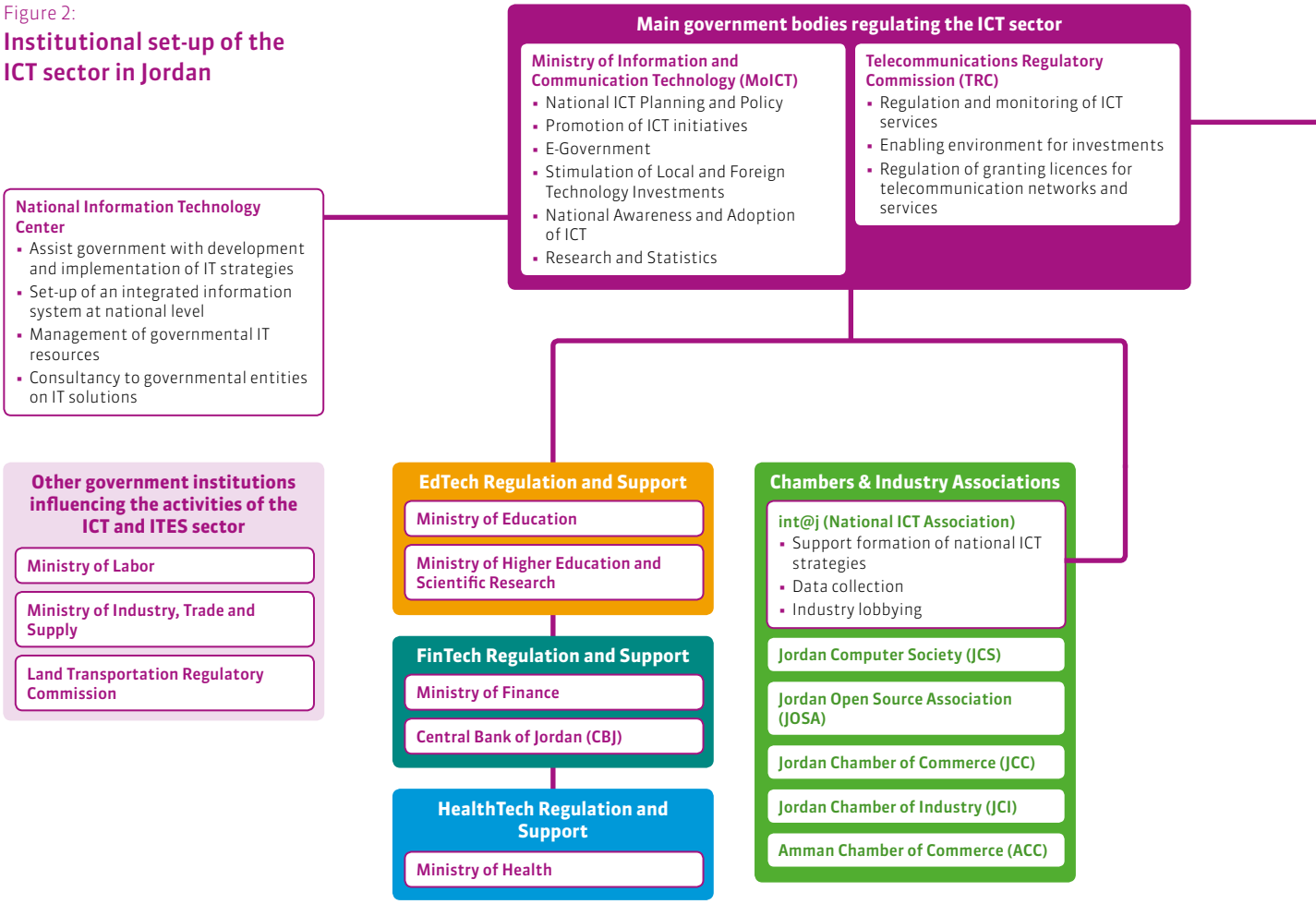
INSTITUTIONAL SET-UP

The Jordanian institutional landscape includes numerous bodies which engage in direct and indirect interventions with ICT sector enterprises. Due to the dynamic nature of the sector, and due to the continuous establishment of new institutions and initiatives in Jordan, the diagram below only provides an indication of the complexity of the sectorial set-up in Jordan.

The main challenge of the institutional set-up is that there is a myriad of stakeholders with varying and often overlapping mandates, and poor coordination among them. These institutions were often created to address specific challenges in the ICT sector, but without looking at the ICT sector's needs from a holistic perspective and without considering the existing institutions and their mandates. There is a need to establish systematic coherence and coordination that builds the players into coordinated, multi-layered networks capable of working and implementing as one. The description below focuses on the main actors involved in the ICT sector as well as the linkages among them.

The **Ministry of Information and Communications Technology (MoICT)**[11] and the Telecommunications Regulatory Commission (TRC)[12] are the main govern-

Figure 2:
Institutional set-up of the ICT sector in Jordan



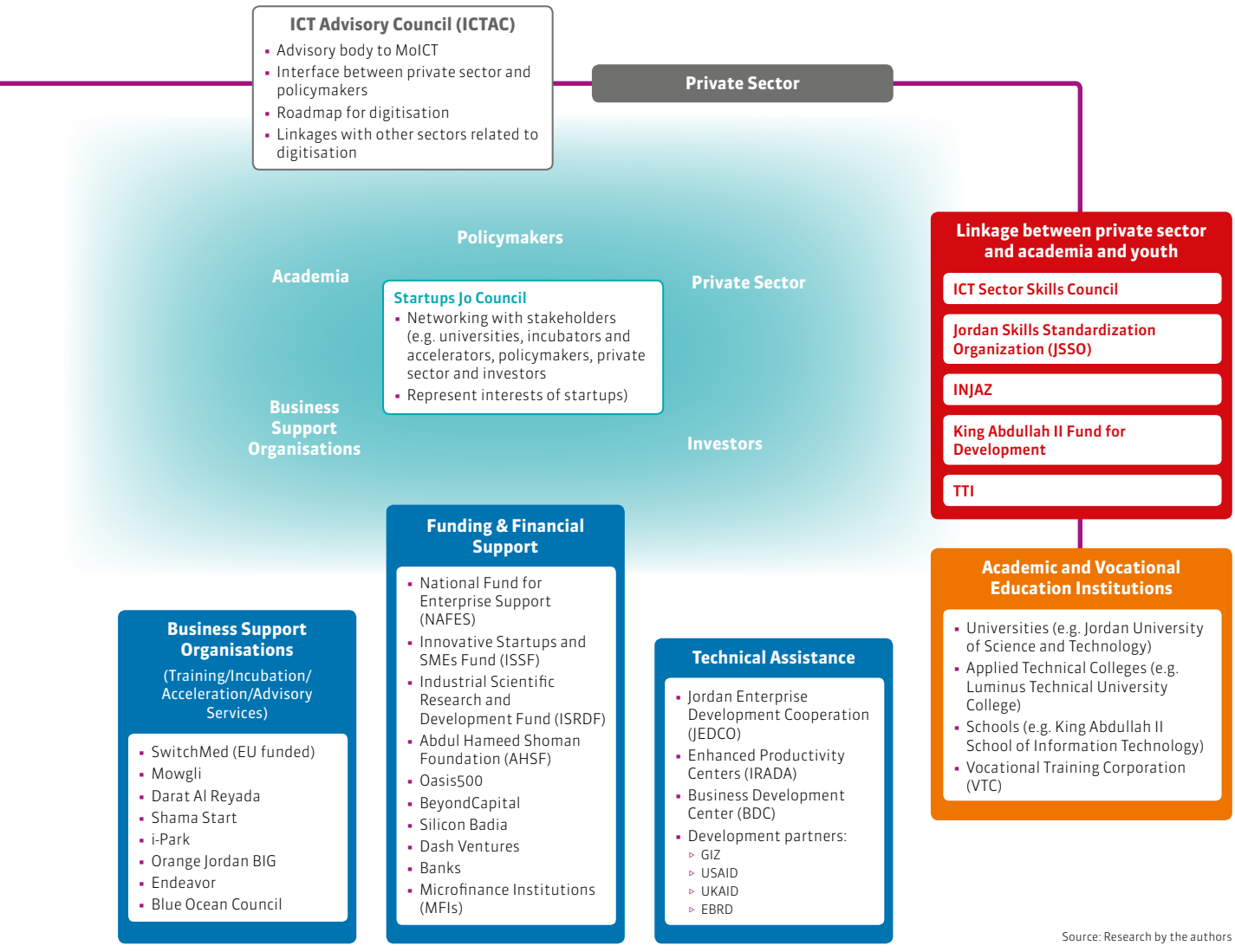
11 MoICT, http://moict.gov.jo/.

12 Telecommunications Regulatory Commission, http://trc.gov.jo/.

ment bodies regulating the ICT sector and overseeing its development. Created in 2002, the MoICT is responsible for developing sector policies and legislation, stimulating investment in the IT and postal sectors, providing broadband infrastructure, and creating and supporting the provision of e-government services. Operating under the auspices of the MoICT, the **National Information Technology Center (NITC)** was established in 2003 and assumes an executive role in managing all procurement of IT resources, including equipment, software, information, operations and human resources training[13].

Established under the Telecommunications Law No. 13 of 1995, the TRC is an independent government institution responsible for regulating the telecommunications, ICT and postal sector. This includes not only landlines and mobile telephony, but also internet service providers (ISPs). In particular, it is also responsible for regulating and monitoring licences for telecommunications networks and services, as well as spectrum allocation. Efficient and effective telecommunications drive ICT and ICT-ES-based online services. Since the arrival in Jordan of the Uber ridesharing app, the **Land Transportation Regulatory Commission (LTRC)** is also involved in regulating smart applications related to transport. Both the TRC and the LTRC are ill-equipped to regulate non-traditional businesses. This has caused much dismay in the government and among ICT-ES providers.

As an outcome of the REACH initiatives, the national ICT association, **int@j**[14], was set up in 2000, assuming a supportive role in the formation of national ICT strategies, data collection and representation of the private sector. Further, int@j launched several initia-



Source: Research by the authors

13 National Information Technology Centre, http://www.nitc.gov.jo/.

14 int@j, http://intaj.net/.

tives: IP Reach is the official portal for Jordanian technology brands, which contains information about all ICT intellectual property (IP) in Jordan and works as the ICT marketplace. The **Startups Jo Council** supports the Jordanian entrepreneurial ecosystem through strategic partnerships between local, regional and international stakeholders ranging from universities, incubators and accelerators to government, private sector and investors. Supported by int@j, the Council members are elected by Jordanian startups. The **Blue Ocean Council**, another initiative by int@j. It is a body dedicated to the provision of advisory services to entrepreneurs and companies in the ICT sector. In 2015, int@j also launched the **Jordan Skills Standardization Organization (JSSO)**. Finally, in partnership with the **Amman Chamber of Commerce (ACC)** and the MoICT, int@j launched the public incubator **Darat Al Reyada**. The incubator is hosted by the ACC.

With around 250 members, int@j represents the interests of medium- to large-sized enterprises. Micro and small businesses, although allowed to join, are deterred by the JOD 750 annual membership fee (for companies with less than 25 employees). As such, int@j's efforts are often dominated by the agendas of more financially capable companies. Compared to int@j, the **Jordan Computer Society (JCS)** and the **Jordan Open Source Association (JOSA)** are more representative of the interests of microenterprises in the ICT sector. Both associations stress individual (not corporate) developmental needs and as such their efforts are often focused on human capital development. According to the JCS website, the association is represented within the **Ministry of Industry, Trade and Supply (MoITS)**, the MoICT and the **Jordan Enterprise Development Corporation (JEDCO)** as well as within the **Jordan Chamber of Commerce (JCC)**, **Amman Chamber of Industry (ACI)** and ACC. Further, it is an active member in public and private universities[15].

Moreover, various ministries are involved in providing input for desired policy changes in the ICT sector where their respective areas are concerned. Often these changes are led by the MoICT. For instance, the regulation of the EdTech vertical is coordinated with the **Ministry of Education** and the **Ministry of Higher Education and Scientific Research**. The **Ministry of Health (MoH)** is involved in the regulation of the HealthTech vertical. The FinTech vertical is regulated together with the **Ministry of Finance (MoF)**. In particular the **Central Bank of Jordan (CBJ)**, which is the main regulator of banking and several other financial services, has taken the lead in establishing a regulatory framework for the FinTech industry and is working closely with the MoITS/Companies Control Department (CCD) and other stakeholders to facilitate the activities of new entrepreneurial efforts and established businesses. The CBJ has established a FinTech Sandbox where businesses and entrepreneurs can test their newly developed FinTechs (e.g. in money transfer or cyber security in the financial sector) without directly being subject to regulatory and supervisory requirements, thus supporting them in entering the market fast[16].

The MoITS is the government entity responsible for regulating and supporting industries and trade. It has two departments relevant for the ICT sector: the **Technology, Innovation and Support Centre (TISC)**[17] is responsible for supporting innovation and technology development, particularly in relation to industrial property; and the **Industrial Development Department** works closely with the private sector to enhance its competitiveness through suggesting and lobbying for effective policy changes and/or development as well as implementing initiatives towards the same objectives[18].

Among other responsibilities, the **Jordan Investment Commission (JIC)** has the mandate to provide an attractive business environment to local and foreign investors. As such, it is very much involved in providing regulatory exemptions to stimulate local and foreign investments for the ICT sector. To that end, JIC also has a representative to support such efforts in the ICT sector.

Moreover, there are public–private councils in place linking policymakers with the private sector. The MoICT interacts with the private sector through the **ICT Advisory Council (ICTAC)**, a consultative body which provide inputs to the Minister on policymaking, e-governance programmes and other key issues impacting the ICT sector. ICTAC includes among its members the Chairman and CEO of int@j and functions as an interface between local industry actors and policymakers[19]. Regrettably, ICTAC has met very few times and has had limited impact to date.

Academic and vocational educational institutions, such as universities, colleges, technical schools and vocational training centres, train Jordan's ICT labour force. Linkages between the private sector and

15 Jordan Computer Society (JCS), http://jcs.org.jo/en/about-us.

16 Central Bank of Jordan (CBJ): FinTech Regulatory Sandbox. http://www.cbj.gov.jo/EchoBusV3.0/SystemAssets/9328fddf-3f3d-40d8-9ed3-d98bbc89db20.pdf; Central Bank of Jordan: Central Bank of Jordan unveils its support to the financial technology (FinTech) sector and stresses on the cryptocurrencies ban. http://www.cbj.gov.jo/DetailsPage/CBJEN/NewsDetails.aspx?ID=214.

17 Technology, Innovation and Support Centre, https://tisc.mit.gov.jo/.

18 Ministry of Industry, Trade and Supply (MoITS), https://mit.gov.jo/Pages/viewpage?pageID=132.

19 infoDev: Country Case Study Jordan. https://www.infodev.org/infodev-files/resource/InfodevDocuments_631.pdf.

educational institutions are important as well. With the support of the GIZ, the **ICT Sector Skills Council (ICT-NSSC)** has been established to increase collaboration between employers and vocational training providers. The **JSSO** aims to bridge the ICT skills gap between the supply of qualified graduates and employers in Jordan by setting skills and occupational standards and developing demand-driven curricula in cooperation with academia. Similarly, **INJAZ**[20] aims to bridge the skills gap between the educational system and the changing needs of the labour market by providing skills development programmes and cooperating with schools, universities, vocational training and youth centres. Similarly, the **King Abdullah II Fund for Development (KAFD)**[21] cooperates with universities to support students through career counselling services and skill development. Furthermore, the KAFD supports the design and development of applications and digital games with a focus on youth, through its Gaming Labs in Amman and Irbid and the so-called "App Challenge" competition for young students.

There is a vast array of business support organisations which provide training, incubation, acceleration and advisory services. Most prominently, the government-initiated **Oasis500**[22] is one of the largest start-up seed investors and business accelerators in the tech and creative industry. To mention a few more: **iPARK**[23] is Jordan's technology incubator for start-ups; **Endeavor**[24] provides mentorship, strategic advice and networks; funded by the European Union (EU) and implemented by Luminus Education in partnership with iPARK, **ShamalStart**[25] is a business accelerator and seed investor in Irbid and Mafraq, supporting Syrian and Jordanian entrepreneurs in the manufacturing and services sectors and providing digital fabrication facilities (FabLab Irbid).

A variety of financial support schemes exist in Jordan, varying from equity capital providers (angel investors, seed capital funds and venture capital funds) to lenders (banks and microfinance institutions). Financial support is also provided in the form of funds such as the **National Fund for Enterprise Support (NAFES)**[26], the **Innovative Startups and SMEs Fund (ISSF)**[27], the **Industrial Scientific Research and Development Fund (ISRDF)**[28] and the **Abdul Hameed Shoman Foundation (AHSF)**[29], the latter two subsidising research and development (R&D) for companies.

Technical assistance is provided by several development partners in support of ICT MSMEs. The **GIZ-MSME** project aims to strengthen enterprise competitiveness, MSMEs' competencies and Jordan's business and investment climate. Together with the CBJ, the GIZ project **Improving Access to Remittances and other Financial Services through Digital Solutions (Digi#ances)** aims to create conditions for refugees and Jordanian households to use digital services for cross-border remittances. Through a development

20 INJAZ, http://www.injaz.org.jo/.

21 King Abdullah II Fund for Development (KAFD), http://www.kafd.jo/.

22 Oasis500, http://oasis500.com/.

23 iPARK, http://www.ipark.jo/.

24 Endeavor, http://endeavorjordan.org/?lang=en.

25 Shamal Start, http://www.shamalstart.com/.

26 National Fund for Enterprise Support, http://www.hcst.gov.jo/en/node/155.

27 Innovative Startups and SMEs Fund, https://issfjo.com/home/.

28 Industrial Scientific Research and Development Fund, http://www.hcst.gov.jo/en/node/154.

29 Abdul Hameed Shoman Foundation, https://www.shoman.org/en.

partnership with a Jordanian FinTech company, the project has enabled 60,000 Jordanians and refugees to use digital financial services, also known as mobile wallets[30].

The EU-funded **ShamalStart** fosters and invests in creative entrepreneurs who demonstrate cutting-edge ideas in manufacturing and services by providing comprehensive support, including strategic mentorship, creative workspace, networking and linkages, seed funding and access to new technologies (e.g. 3D printing) through FabLab Irbid[31]. **Jordanian Action for the Development of Enterprises (JADE)** supports hundreds of SMEs, start-ups and entrepreneurs and creates new employment opportunities for Jordanians through access to quality business development services using a voucher system[32]. Another EU-funded project – **The Next Society's Mowgli Mentoring Programme** – is supporting innovation and entrepreneurship in Jordan and the MENA region[33].

USAID's **Jordan Local Enterprise Support Project (LENS)**[34] supports the growth of MSMEs (inclusive of women, youth and the underprivileged) and better economic planning. The USAID **Jordan Competitiveness Program (JCP)** fosters competitiveness, employment and foreign direct investment (FDI) in the ICT sector[35].

Furthermore, JEDCO[36], the **Business Development Center (BDC)**[37] and the **Enhanced Productivity Centers (IRADA)**[38] provide technical assistance to MSMEs.

30 GIZ in Jordan, https://www.giz.de/en/worldwide/360.html.

31 Shamal Start, http://www.shamalstart.com/.

32 Jordanian Action for the Development of Enterprises, https://www.jade-project.org/en/about-us/.

33 The Next Society's Mowgli Mentoring Program, https://www.mowgli.org.uk/current-programs.

34 USAID Jordan Local Enterprise Support Project, https://jordanlens.org/.

35 USAID Jordan Competitiveness Program, https://www.usaid.gov/jordan/fact-sheets/usaid-jordan-competitiveness-program.

36 Jordan Enterprise Development Cooperation (JEDCO), http://www.jedco.gov.jo/.

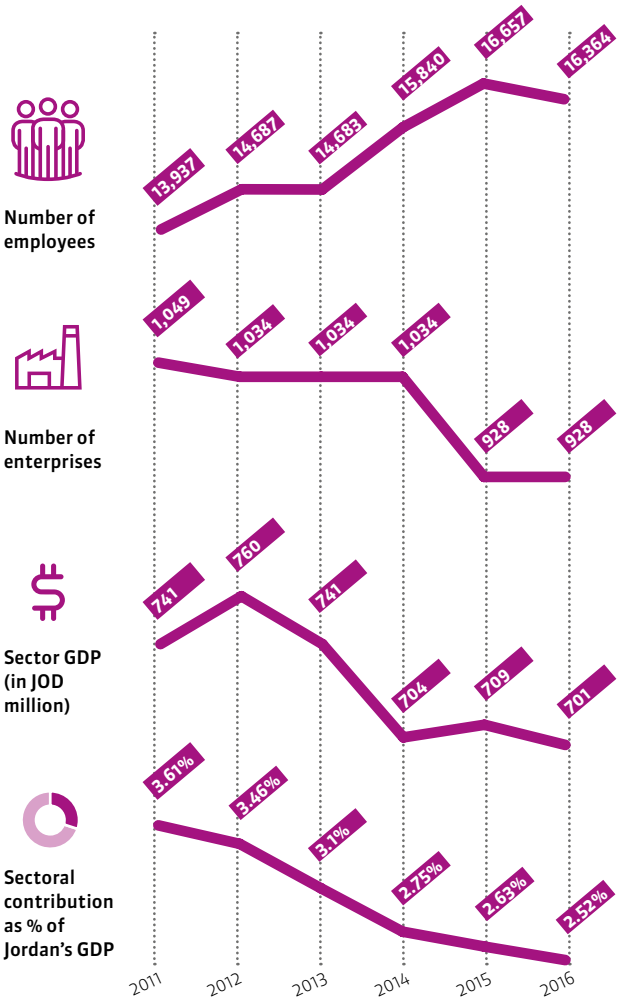
37 Business Development Center, http://www.bdc.org.jo/Impact.aspx.

38 IRADA Program, https://jordan.gov.jo/wps/portal/Home/GovernmentEntities/Ministries/MinistryServiceDetails_en/ministry+of+planning+and+international+cooperation/services/irada+program?lang=en&content_id=com.ibm.workplace.wcm.api.WCM_Content/IRADA.

2.2 JORDAN'S ICT PERFORMANCE: AN OVERVIEW

Jordan's ICT sector has the potential to become a major driver of economic growth. It has seen robust growth of mobile and internet usage in the last two decades. Since the early 2000s, increasing attention has been paid to the sector, with a series of liberalisation reforms and sector development strategies supporting long-term growth. The ICT sector represented 2.5% of GDP in 2017[39] and employed over 16,000 employees. Some 98% of enterprises in the sector are MSMEs[40].

Figure 3:
Trends in Jordan's ICT sector from 2011 to 2016

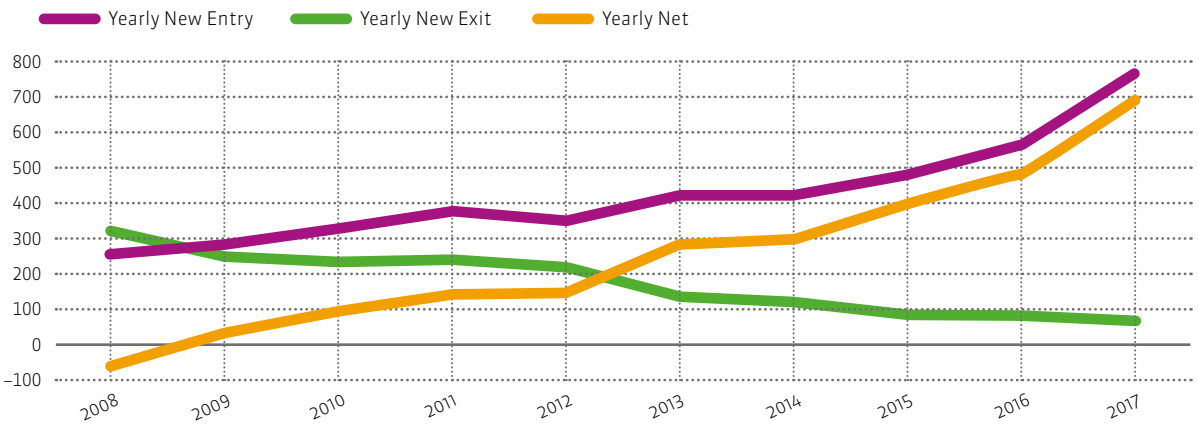


Source: DoS (2017)

39 Department of Statistics (DoS), Jordan (2017).

40 DoS (2017). Note that according to int@j, ICT & ITES Industry Statistics and Yearbook 2016 (p.8 – table 3), ICT/ITES sector employment in 2016 was 17,412. It is unclear why the figures are different, but it could be due to different measurement criteria.

Figure 4: **New firms created (registered) in Jordan with ICT-related aims**



Source: GIZ Study on Economic Impact of Tech and Tech-enabled Startups – Developed by Impact MENA based on data from CCD

When looking at the development of the ICT sector's contribution to Jordan's GDP, a continuous decrease can be observed from 3.61% in 2011 to 2.52% in 2016. This can be explained by the decrease of revenues related to telecommunications, which constitute one of the main sources of revenue in the ICT sector. In turn, this decrease was related to greater numbers of Jordanian people preferring free-of-charge communication applications such as WhatsApp, FaceTime and Skype over fee-based landline and mobile networks (incl. SMS). Furthermore, taxation (use tax) increased on telecommunications providers, which reduced consumption. In addition, competition in the telecommunications sector is very high. There are three large telecommunications providers (Orange, Zain and Umniah) which compete on the market by offering services at low prices, thereby reducing revenues in the sector[41].

The figure above shows a steady increase in the number of establishments with ICT-related aims from 2008 to 2017, while the number of ICT-related companies closing down steadily decreased. Between 2016 and 2017, the number of newly registered ICT-related firms increased from 550 to more than 750[42], while the number of companies with ICT-related aims closing down in the same year was below 100. In conclusion, there is a growing interest in starting up new ICT companies in Jordan. Note that in Figure 3, the statistics refer to businesses that have the sole purpose of ICT delivery while the graph above illustrates trends of all companies operating in the ICT sector. For example, a marketing consultancy company would not be classified as an ICT company (and would not be included in the figures above), but such a company providing digital marketing solutions such as web and app development, content development and search engine optimisation (SEO) would be categorised as having ICT-related aims, and so would be considered in the graph above.

ICT is an enabler for economic growth because of its cross-cutting nature, affecting all sectors. Adoption and proper utilisation of ICT will lead, among other things, to increased yields and quality production of goods and services. The ICT industry can be resourced, properly managed and mainstreamed to become a significant contributor to GDP. From 1995 to 2014, ICT accounted for more than 75% of GDP growth in both developed and developing countries[43]. Studies regarding the contribution of ICT have reached conflicting conclusions on whether ICT will positively or negatively affect overall employment. There is consensus, however, that technology will change the structure of employment and unemployment. Structural unemployment will occur in the long term if workers are not retrained[44]. As the industrial make-up of a country changes, this is typical. Because Jordan is not a highly industrialised country, ICT adoption is unlikely to contribute to unemployment, because technology will not replace jobs. On the contrary, Jordan's economy is predominantly service-based and as such, ICT is likely to increase job opportunities, providing a new avenue to harness and exploit Jordanian creative talent.

41 Information based on interview with Mr Nidal Bitar, CEO of int@j.

42 The number represents all companies with ICT as part of their businesses (ICT aims), including companies where ICT is the core business and those in which ICT is a secondary part of the business.

43 Giovannetti, E. (2017): Digital Divide and Digital Multiplier: A Paradigm Shift through Innovation. In: A.R. Sharafat and W.H. Lehr (eds.): ICT-centric economic growth, innovation and job creation. Geneva: International Telecommunication Union.

44 The Balance (2019): Seven Causes of Unemployment. 23 January. https://www.thebalance.com/causes-of-unemployment-7-main-reasons-3305596; Morning Future (2017): Do New Technologies Cause Unemployment? Not really. Training is the key. 7 July. https://www.morningfuture.com/en/article/2017/07/07/do-new-technologies-cause-unemployment-not-really-training-is-the-key/34/.

JORDAN'S ICT VALUE CHAIN

The ValueLinks[45] methodological approach gives an overview of the functioning of a sector. This method of presenting a sector was originally developed to describe and evaluate the complex interconnections of suppliers in the agriculture sector value chain up to the final consumer. Below is a graphic presentation of the overall value chain of the ICT sector.

In ICT, where services form a large part of the product offering and products are tailored to client needs, it is not easy to generalise about the value chain. However, we can say that an ICT company usually uses manpower, telecom services, hardware and software as inputs. It develops an end-product through consulting, development, prototyping, testing, implementation, etc. The product is then marketed and sold through distribution channels – B2B, B2C, B2G, XaaS[46], etc. – to clients and final users, depending on the solution. Afterwards come after-sales services, which include training, maintenance and support.

This description, illustrated in the image below, reflects the overall working process of the sector. The ICT sector has many sub-sectors, which will be discussed in chapter 3. What we can note here is that different value chains emerge with different sub-sectors, or even with different products.

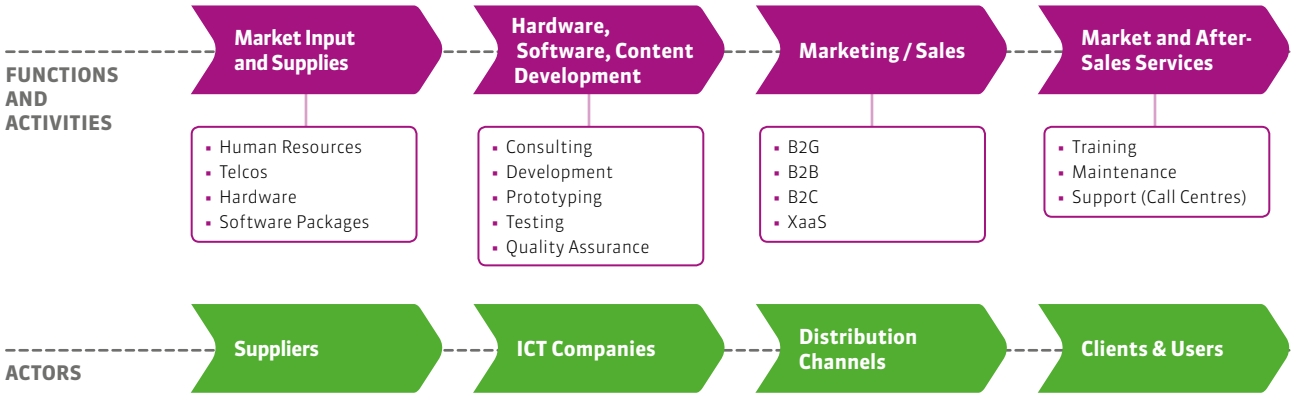
The ICT sector in Jordan has actors at every stage of the value chain. The hardware/software and content development stage is an important one for value addition and much of the sector employment is in ICT companies operating at this stage. The distribution stage is also very important, involving many retailers and wholesalers.

ICT REVENUES

As mentioned earlier, the ICT sector represented 2.5% of GDP in 2016. Total annual revenue for the ICT sector in Jordan was estimated at USD 682 million according to the latest available numbers from int@j ICT & ITES Industry Statistics and Yearbook 2016. Of this, one-third (USD 225 million) was export revenue. The main revenue earners were IT hardware and infrastructure wholesale and installation, ICT consulting and research, software development, software licence publishing and sale, and other ICT activities such as computer disaster recovery, installation (setting-up) of personal computers and software installation. The main sources of export revenue were software development, IT hardware and infrastructure wholesale, other ICT activities, software licence publishing and sale, and ICT consulting and research[47].

Grouping the main International Standard Industrial Classification (ISIC) activities for ICT, we can see that other ICT activities, which mainly comprise services, account for 29% of the sector revenues, while hardware and software have the next-largest portions and gaming accounts for less than 1%. Software is the largest sector for export.

Figure 5: **Jordan's ICT value chain**



Source: Authors

45 Springer-Heinze, A. (2018): ValueLinks 2.0. Manual on Sustainable Value Chain Development. GIZ Eschborn, 2 volumes.

46 A general term that refers to the delivery of anything as a service.

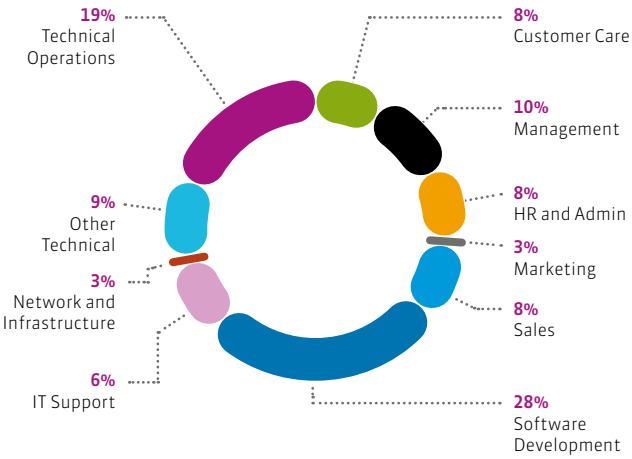
47 int@j ICT & ITES Industry Statistics and Yearbook 2016.

Figure 6: **ICT revenues in Jordan (in USD)**

ISIC activity	Total revenue (in USD)	%	Domestic revenue (in USD)	Export revenue (in USD)
Other ICT activities including: ▸ IT outsourcing ▸ ICT consulting and research ▸ Other ICT activities ▸ ICT training ▸ Reproduction of recorded media from master copies of software and data on discs and tapes ▸ Others	197,684,469	29%	138,105,793	59,578,677
Hardware including: ▸ Manufacture of electronic components and boards ▸ IT hardware and infrastructure wholesale ▸ IT hardware and infrastructure installation	182,472,069	27%	141,318,646	41,153,424
Software including: ▸ Wholesale of software ▸ Software development ▸ Software licence sale ▸ Software licence publishing ▸ Online application development ▸ Online application customisation ▸ Mobile applications development ▸ Mobile applications customisation	157,938,639	23%	78,115,213	79,823,426
Telecommunications including: ▸ Telecoms wired services ▸ Telecoms wireless services ▸ Telecoms satellite services ▸ Telecoms equipment and telephones wholesale ▸ Telecoms equipment installation ▸ Telecoms equipment maintenance ▸ Telecoms voice-over IP services ▸ Telecoms value-added services ▸ Other telecoms services	85,497,352	13%	59,191,018	26,306,366
Web-related activities including: ▸ Data processing and hosting-related services ▸ Web portals ▸ e-commerce business	31,302,919	4%	28,885,815	422,105
Call centres	20,899,805	3%	2,975,746	17,924,059
ICT maintenance and repair including: ▸ Repair of computers and peripheral equipment ▸ IT networking equipment maintenance	7,285,447	1%	7,285,447	0
ICT retail ▸ Retail sale of computers, peripheral units, software and telecoms equipment in specialised stores	1,818,995	0.27%	1,818,995	0
Games development	299,951	0.04%	0	299,951
TOTAL	**685,499,597**	**100%**	**457,696,673**	**225,807,959**

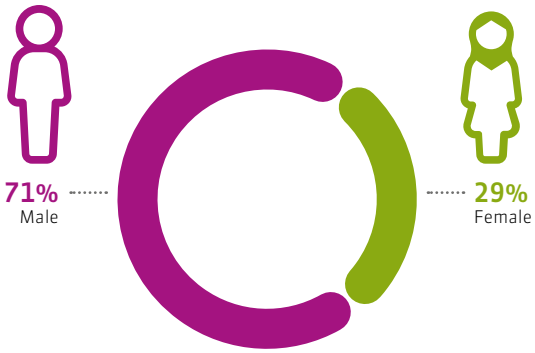
Source: int@j ICT & ITES Industry Statistics and Yearbook 2016

Figure 7: **Breakdown of employees in the Jordanian ICT sector by type of work**



Source: int@j ICT & ITES Industry Statistics and Yearbook 2016

Figure 8: **Gender distribution in the Jordanian ICT sector**



Source: int@j ICT & ITES Industry Statistics and Yearbook 2016

EMPLOYMENT, GENDER DISTRIBUTION AND YOUTH

The ICT sector has provided employment opportunities for Jordanians and non-Jordanians[48]. Sector employment can be segmented into salaried employees and those who receive compensation based on tasks they complete (freelancers, sub-contractors). It is notable that the percentage of salaried employees increases as the size of the enterprise increases. This suggests that smaller enterprises use sub-contractors as a means to shift fixed costs to variable costs. This has become an increasingly prevalent practice since a law was passed increasing corporate social security contributions from 12.75% in 2014 to 14.25% in 2017[49]. The total social security deductions from employers and employees rose to 21.75% in 2017[50]. Delays in payment often result in liens on company accounts and assets as well as financial penalties. Companies with variable and irregular cash flow (usually micro, small and some medium-sized companies) shift to variable costing to avoid these problems.

The figure here shows the breakdown of employees by type of work. Software development is the highest employer in the ICT sector, followed by technical operations. For MSMEs, the situation should be similar but micro and small enterprises are less likely to have many people devoted specifically to management and sales or solely to customer care, HR and admin and marketing. Employees of a software development micro-enterprise are likely to all be counted under software development, though they may all contribute to sales, marketing and customer care, with the owner being responsible for management, HR and admin as additional tasks.

Females are well represented in the ICT and ICT-ES sector. According to the 2016 int@j survey, 29% of employees in the sector are female while 71% are male[51]. Female employment in the sector is markedly higher than the national average of 17.7% employed females[52]. The largest proportion of female employment, 32%, is in software development[53], one of the more highly skilled sub-sectors.

ICT/ICT-ES is a very important developmental sector for Jordan. It is a youth-dominated sector in an economy where youth have the highest unemployment rate (approximately 39.7% of youth between the ages of 15 and 29 are unemployed[54]); unemployment rates of educated youth are particularly high (23% of university graduates – 27% of male and 68% of

48 The ICT sector is open to foreign labour but employees are mainly Jordanian, because it is university-degree-intensive and attractive to nationals. DoS 2016 figures indicate that the majority of employees (98.3%) are Jordanian with 1.7% distributed among Syrians, Egyptians, other Arabs and foreigners (non-Arabs).

49 Social Security Corporation: Introductory Guide to the Provisions of the Social Security Law No. 1 of 2014 and the Insurance Regulations Issued under the Law.

50 Ibid.

51 int@j ICT & ITES Industry Statistics and Yearbook 2016.

52 DoS (2018): Jordanian Women's Report on the occasion of the International Women's Day – Statistical Perspective. 7 March. http://dosweb.dos.gov.jo/jordanian-womens-report-on-the-occasion-of-the-international-womens-day-statistical-perspective/.

53 Calculated from int@j ICT & ITES Industry Statistics and Yearbook 2016 figures.

54 Statista (2019): Jordan. Youth unemployment rate from 2007 to 2017. https://www.statista.com/statistics/812127/youth-unemployment-rate-in-jordan/.

female – are unemployed in Jordan[55]). The ICT sector is also open to other nationalities, but in general it is dominated by Jordanians[56]. ICT is generally a high-value-adding economic sector and as such, salaries and benefits tend to be attractive to Jordanians.

GEOGRAPHIC DISTRIBUTION OF THE ICT SECTOR IN JORDAN

While there is little statistical information on the geographic distribution of ICT companies, all respondents of the int@j Yearbook 2016 questionnaire have their headquarters in Amman.

Following the information provided by the CCD, the below figure illustrates the distribution of technology-based start-ups within Jordan. In line with the information obtained through the int@j Yearbook 2016, the graph reflects the concentration of the ICT sector in Jordan's capital (93% in Amman) with only limited activity taking place in other governorates, such as in Irbid (2%) and Aqaba (2%).

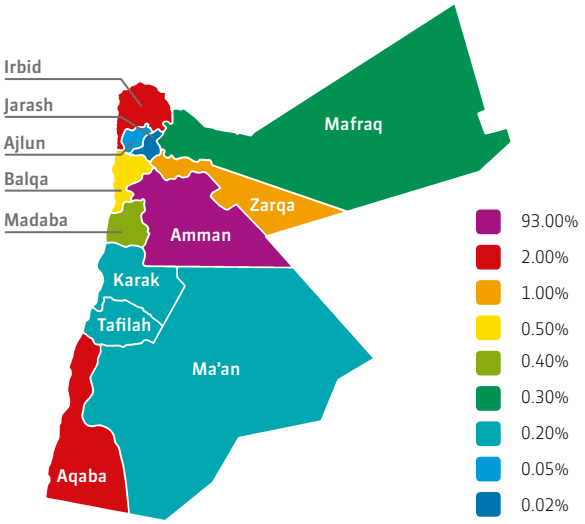
ICT companies may be located in Irbid, Aqaba and other governorates for several reasons. Situated in the northern part of Jordan, the Irbid Development Area is a zone which provides certain incentives for investments and doing business. It serves as a centre for ICT and scientific research and includes an IT and commerce cluster[57]. In the southern part of the country, Jordan established the Aqaba Special Economic Zone which attracts investments and businesses through tax exemptions. Aqaba benefits from the availability of high-speed broadband infrastructure through the FLAG (Fiber-Optic Link Around the Globe[58]) submarine optical fibre cable, which has a link station in Aqaba. Advanced telecommunications and fibre optic services are available at competitive prices at the regional level[59].

Moreover, the KAFD provides a Gaming Lab in Irbid and Aqaba. In cooperation with key players, such as Unity, Penguin, Microsoft and Sony, the Gaming Lab supports young and innovative Jordanians in the digital gaming sector[60]. In the north of Jordan (Irbid and Mafraq), ShamalStart not only supports Syrian and Jordanian entrepreneurs with business acceleration and seed investment, but also provides digital fabrication facilities in Irbid (FabLab Irbid) with the latest technologies available (e.g. 3D printing)[61]. Similarly, in addition to its main location at the King Hussain Business Park in Amman, Jordan's Technology Incubator (iPARK)[62] has two other incubators in Aqaba and Irbid, supporting the growth of tech-based start-up companies.

One call centre located in Amman has a branch in Karak (southern Jordan). It was originally opened in the framework of a government programme to financially support companies to employ women in the city. After this support came to an end, the company maintained the branch and today some 50 women work there with almost no staff turnover.

The int@j ICT & ITES Industry Statistics and Yearbook (2016) indicates that 1% of employment within the sector is employed abroad[63]. This tells us that the ICT sector in Jordan is not very active in foreign markets and/or not yet at the scale to have sales/service offices abroad.

Figure 9: **Geographic distribution of technology-based Jordanian start-ups in 2016**



Source: GIZ Study on Economic Impact of Tech and Tech-enabled Start-ups – Developed by Impact MENA based on data from the CCD

55 University World News (2018): Data suggests universities contribute to unemployment. 26 January. https://www.universityworldnews.com/post.php?story=20180127055034895.

56 According to int@j ICT & ITES Industry Statistics and Yearbook 2016, 98.79% of employees in the ICT Sector are Jordanian nationals.

57 Irbid Development Area, http://www.ida.jo/Pages/viewpage.aspx?pageID=47.

58 FLAG is a 28,000-kilometre-long submarine communications cable containing optical fibres, which connects the United Kingdom, Africa, Japan and many places in between.

59 Aqaba Special Economic Zone Authority, http://www.aqabazone.com/Pages/viewpage.aspx?pageID=53.

60 KAFD, http://www.kafd.jo/en/program/jordan-gaming-lab.

61 ShamalStart, http://www.shamalstart.com/.

62 iPARK, http://www.ipark.jo/iparkjo/Contact.aspx.

63 int@j ICT & ITES Industry Statistics and Yearbook 2016.

2.3 JORDAN'S ICT SECTOR: COMPETITIVENESS AND BUSINESS ENABLING ENVIRONMENT

2.3.1 JORDAN'S COMPETITIVE ADVANTAGE

Jordan's competitive advantage in the region in the domain of ICT is two-fold. Firstly, it has an advantage in the region in terms of ICT talent and knowledge, which is continuously developing. Secondly, Jordan's experience in the health, education and financial services sectors puts the country in a favourable position to adopt ICT in these sectors. The competitive advantage in ICT is then the combination of ICT skills and the country's experience in these vertical markets, putting FinTech, HealthTech and EdTech at the heart of Jordan's ICT advantage.

SPECIALISED ICT TALENT

Being a country of limited natural resources, Jordan's main strength lies in its human capital, and the entrepreneurial drive and imagination among the country's population should be highlighted. Good human capital is found particularly among professionals with some years of work experience. While Jordanian ICT specialists are increasingly being hired in other countries in the region, for instance in the United Arab Emirates (UAE) and Saudi Arabia, there are still barriers to overcome with regard to higher education modernisation, in particular the relevance of curricula to industry and modes of cooperation between university and industry. These barriers are of a nature that they can be addressed, and a modernisation process can be set fully in motion within a relatively short period[64].

SPECIALISED VERTICALS TALENT

ICT has a significant role to play in the modernisation and expansion of the health, education and financial sectors in Jordan, in which Jordan is already successful.

- **Health:** For years Jordan has been viewed as a regional centre for health and has attracted patients from all over the region. Jordan has an advanced healthcare system, although services remain highly concentrated in Amman. Health spending is estimated at between 7.5% and 9.3% of GDP. Jordan was ranked by the World Bank as the number-one medical tourism provider in the Arab region and among the top-five in the world, as well as being the top medical tourism destination in the MENA region[65].

64 MoICTS and int@j (2016): REACH 2025. Vision and Action Plan.

65 Jordan tops region as medical tourism hub, Jordan Times, Sep 7, 2008.

- **Education:** Jordan prides itself on its advanced education system. Despite strained resources, the Ministry of Education provides a higher proportion of its public budget for education than most countries in the world, and has developed a highly advanced national curriculum. Many other nations in the region have developed their education system using Jordan as a model. Jordan ranks number one in the Arab World in education with almost 100% literacy, and is number one in the world for school enrolment[66]. The Jordanian Ministry of Education is now making it mandatory for students to be computer-literate and able to apply their studies in computers to their regular studies, most especially the scientific and mathematical courses. Jordan's education system meets international standards and its secondary education diploma is accepted in world-class universities. Jordan also has the highest ratio of researchers in R&D among all 57 Organisation of Islamic Cooperation (OIC) member states. In Jordan, there are 8,060 researchers per million people, higher than the EU average of 6,494, and much higher than the world average of 2,532 per million[67].

- **Financial:** The financial services sector is one of the most robust and mature in Jordan, remaining resilient in the face of significant external volatility and retaining its role as a driver of economic growth in 2015. The banking sector in particular has been a major source of strength, with the CBJ maintaining a pro-growth monetary stance, following on from growth in deposits and profits at commercial banks in 2015[68]. In order to further push the sector forward, the CBJ has embraced a financial inclusion strategy as well as a regulatory framework for FinTech and has launched a Regulatory Sandbox that allows pioneers and entrepreneurs in the area of financial technology to approach the CBJ and apply for regulatory mentorship and support; it also allows FinTech solutions to be tested before going live to increase their chances of success in the market.

66 UNDP (2016): Jordan Human Development Report 2015. Regional Disparities.

67 Organisation of Islamic Cooperation (OIC) (2010): Research and Scientific Development in OIC Countries. http://www.sesric.org/files/article/394.pdf.

68 Oxford Business Group (2016): Jordan's banking sector leading growth in the financial services sector. https://oxfordbusinessgroup.com/overview/still-pillar-led-banking-financial-services-sector-remains-engine-growth-kingdom.

2.3.2 JORDAN'S BUSINESS ENABLING ENVIRONMENT

RULES AND REGULATIONS

All economic sectors are affected by national legislation and regulation. The ICT, ICT-ES and content sectors are no different. ICTAC is responsible for the digitalisation agenda of the country and for establishing sub-committees to address issues in various sectors. Through the sub-committees, ICTAC would be responsible for advocacy in the regulatory environment to improve the ICT landscape. int@j advocates on behalf of the ICT/ICT-ES industry with government and policymakers. int@j has been successful in helping to eliminate and mitigate legislative challenges and cut bureaucratic red-tape, e.g. in terms of the following[69]:

- Reduced sales tax on the ICT sector from 16% to 0%. This reduction covers all inputs related to IT production and IT service sales.
- Removed customs duties on all IT production inputs.
- Exempted all revenues derived from exports from income tax.
- Reduced income tax from 20% to 5% for sector income.
- Reduced bank interest rates on direct facilities from 14% to 5% for IT vendors.

The exemptions mentioned above are on income tax, sales tax and customs laws. The exemptions were enacted on 11 April 2016 through a decision of the Council of Ministers. They will remain in effect until they are removed by another decision of the Council.

EXPORT SUPPORT

ICT MSMEs have particular difficulties to access foreign markets for export. Although there is some participation in international events and missions organised by int@j, for example in the MWC (Mobile World Congress) in Barcelona, there is no constant and mid-term support for ICT companies to export. A structured approach to export promotion is essential to create an export culture among SMEs and equip them with the necessary skills, market knowledge and linkages. In the past, the JEDCO acronym used to refer to the Jordan Export Development and Commercial Centers Corporation. However, on 12 June 2003 this body's mandate pivoted to focus on enterprise development and it became the Jordan Enterprise Development Corporation. Thus, Jordanian companies lost assistance in export development. The JIC was originally established in 1995 as the Jordan Investment Board (JIB). The JIC absorbed the Jordan

69 int@j, http://intaj.net/.

Free Zone Corporation, the Jordanian Development Zones Corporation and the part of JEDCO which was responsible for export development and promotion. This was done to stimulate investments by integrating and developing necessary infrastructure and promoting investment opportunities to increase the investment attractiveness of Jordan. Recently, the JIC has not been particularly effective or active in export promotion. This is likely due to the wide mandate it has been given.

TRAINING

Due to the fast changes in technologies in the sector, capacity building and vocational training together comprise an important factor for the success of the ICT sector. As mentioned earlier, there are several capacity-building initiatives already in place.

Due to the importance of well-trained personnel in ICT companies, companies should be encouraged to invest in the development of their employees, and to incentivise individuals to continue their education.

According to the CCD, over 900 private training centres have been established in Jordan since the beginning of 2012. Many provide ICT training. There is little data available on the details of the services of each centre, but there is certainly a disconnect between what the sector needs and what the training centres can actually provide. This is also true of universities and vocational training centres, which have to abide by local regulations regarding acceptable curricula. It often takes over two years to change a curriculum officially, by which time it may no longer be relevant, particularly in a fast-evolving sector like ICT.

AVAILABILITY OF INFORMATION

As one of the main players in divulging information to the ICT sector, int@j uses its channels to make relevant information known among its members, mainly electronically but also via events and meetings. The JCS is mainly focused on providing human capital development in the ICT field through the provision of training courses, certification and seminars. Although the JCS has both individual and corporate memberships, it acts mostly as a professional society and does not function well as an advocate for members' needs. This is the primary reason int@j was formed. There is clearly a gap in advocacy for the needs of micro-enterprises in particular.

Additional information that should be distributed among ICT companies will relate to, for example: technological trends, business opportunities in new markets, and international tenders for ICT companies. The beneficiaries of this information will mainly be MSMEs because it is not easy for them to access such information on their own, particularly in the case of micro and small enterprises that are not members of int@j. As mentioned at the start of this report, there are also gaps in data and information available. Therefore, there is a need to both meet the information needs of the sector through producing relevant information and ensure that this information can be accessed by all MSMEs.

2.4 INTERNATIONAL ICT MARKET, CONSUMER, TECHNOLOGY DRIVERS AND TRENDS

The ICT sector's turnover worldwide is around USD 5 trillion and is expected to reach USD 6 trillion by 2022[70]. The sector is growing and will continue to grow at twice the rate of GDP growth as new technologies begin to account for a larger share of the market. The emergence of the internet of things (IoT) is already contributing to overall market growth, and within 5–10 years new technologies such as robotics and augmented reality (AR)/virtual reality (VR) will also expand to represent a significant and growing share of total ICT spending.

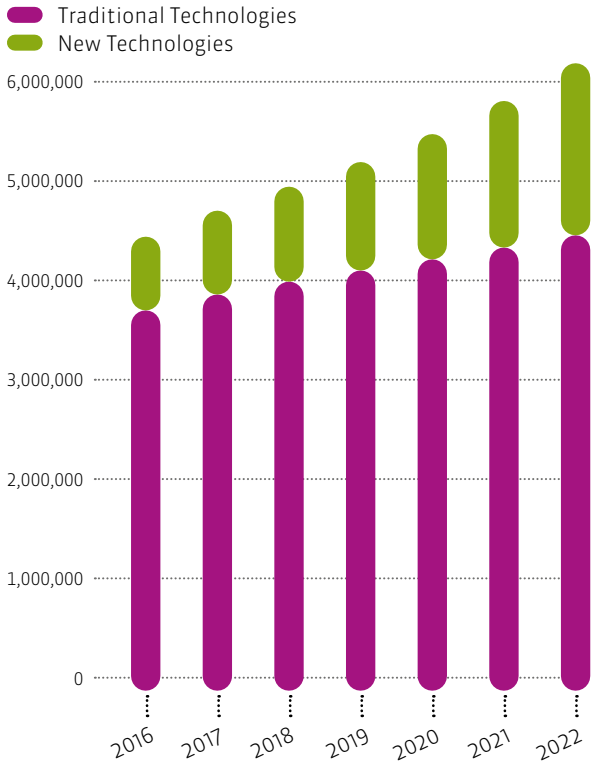
Largely due to the rapid growth of the IoT in recent years, led by investments in the manufacturing and transport industries, new technologies are already approaching USD 1 trillion in annual revenue. Over the next few years, other new technologies such as robots/drones and AR/VR headsets in addition to related software, services and their applications in different sectors of the economy will see similar growth. This increasing proportion of spending targeted at new ICT categories will drive the overall ICT industry to a new growth surge over the next decade as businesses move beyond prototyping into broader deployments of technologies such as AR viewers and AI-enabled robots[71]. The broad growth witnessed in the ICT and ICT-ES markets combined with the accelerating speed of change has created a fertile ground for Jordanian ICT and ICT-ES businesses to participate and contribute.

The growth of MSME-based sub-sectors such as content development and gaming benefit from global developments in infrastructure and the declining

70 International Data Corporation (IDC) (2018): ICT Spending Forecast 2018–2022. https://www.idc.com/promo/global-ict-spending/forecast.

71 IDC (2018): ICT Spending Forecast 2018–2022. https://www.idc.com/promo/global-ict-spending/forecast.

Figure 10: **Worldwide ICT spending (in USD million, constant currency)**[72]



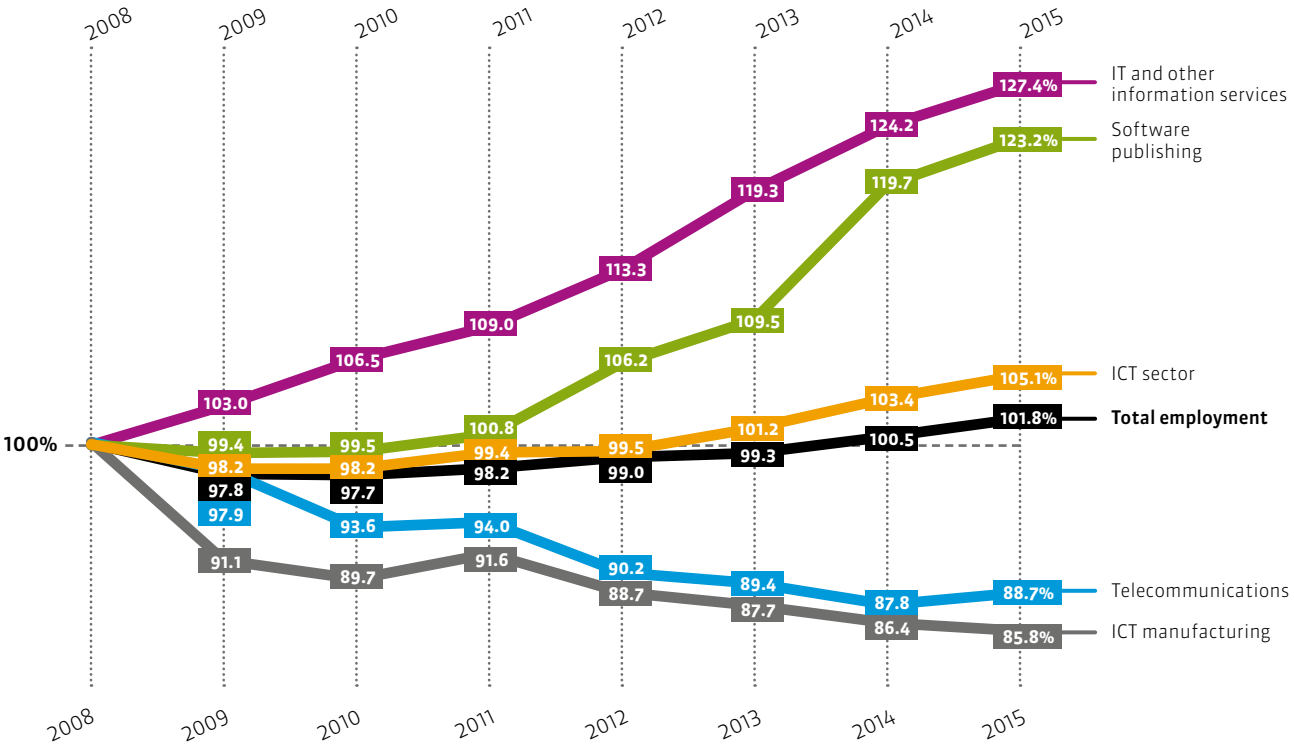
Source: International Data Corporation (IDC) (2018)

costs of mobile devices and telecommunications. Interviews with Jordanian players have indicated the limited lifecycle for many products and the need to continually develop and launch new products and services to address the consumption patterns of users in these fields.

Due to Jordan's historical and continuing investment in education and healthcare, as well as Arabic language competency, the market for localised content and software is growing and there is an emerging need for HealthTech and EdTech products. The same holds true for Fin-Tech, which has been helped by supportive legislation which facilitates the development, introduction and expansion of FinTech products/services as a means to address the financial inclusion objectives of the CBJ. Jordan's Arabic language competence will facilitate regional sales in the Arab world.

A 2017 study[73] on ICT employment in OECD member countries (36 countries including EU countries, the United States [US], Canada, Australia and Turkey) for the years between 2008 and 2015 shows that employment in telecommunications and ICT manufacturing are falling while employment in software publishing, IT and services shows persistent growth, as shown in the figure below.

Figure 11: **OECD countries' employment growth in the ICT sector (index-based comparison with 2008 status)**

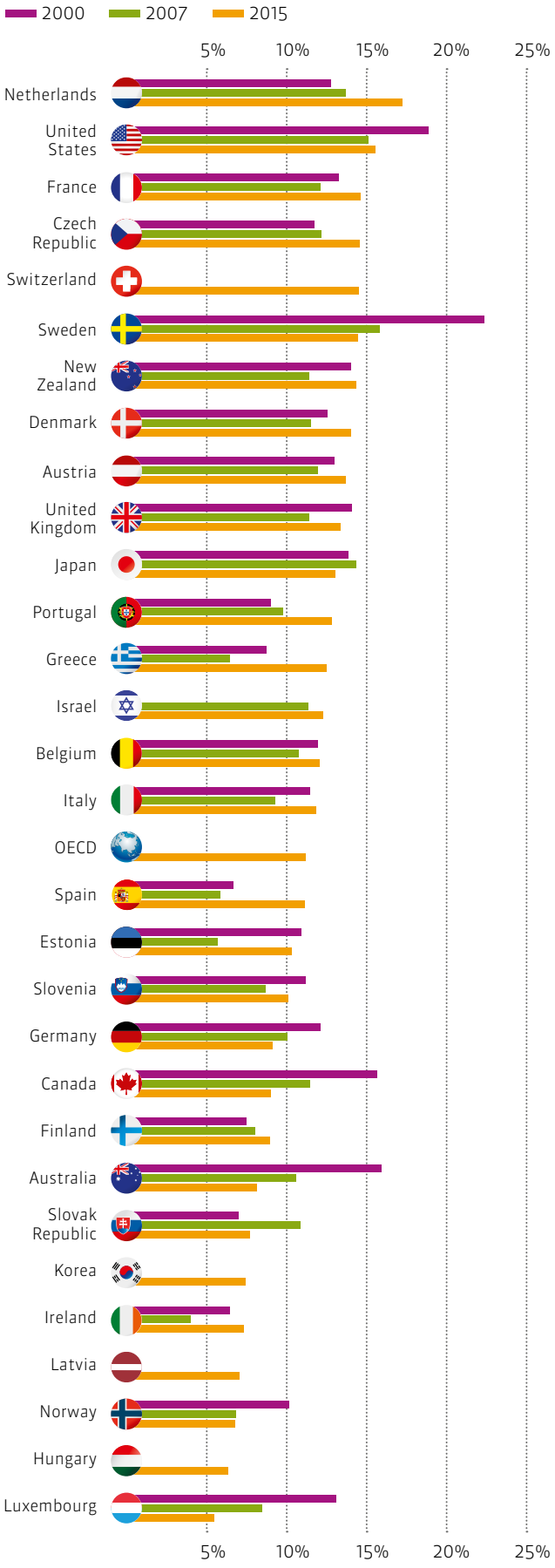


Source: OECD (2017): Digital Economy Outlook 2017. Figure 3.4 Growth of employment in the ICT sector and its sub-sectors in the OECD area.

72 "New Technologies" includes the IoT, robotics, AR and VR.

73 Organisation for Economic Co-operation and Development (OECD) (2017): Digital Economy Outlook 2017.

Figure 12: **OECD countries – Investments in ICT as a percentage of total investments**



Source: OECD (2017): Digital Economy Outlook 2017. Figure 5.2 Evolution of ICT investments.

The international trend applies to all countries, but not necessarily in the same way. That being said, if the international trend in ICT employment is increasing in software and services and decreasing in telecommunications and manufacturing, this certainly applies in Jordan, and will continue to do so. This further supports the decision to choose software as a priority sub-sector rather than manufacturing or telecommunications.

ICT INVESTMENTS[74]

The OECD study showing ICT investments as a percentage of total investments for OECD member countries between 2000 and 2015 shows that a considerable proportion of global investment is still being spent on ICT across all OECD countries.

Investment in ICT contributes to capital deepening and can therefore help raise labour productivity. The use of ICT throughout the economy may also help firms increase their overall efficiency, thus promoting the growth of multi-factor productivity (MFP)/total factor productivity (TFP). Moreover, ICT use may contribute to network effects, such as lower transaction costs and more rapid innovation, which should also improve TFP. Jordan's potential to attract investors globally that could invest in this sector presents an opportunity for the country to become a regional hub for the ICT sector due to its human capital.

LINKAGES

The current importance of the ICT sector to Jordan's economy is derived from the level of its forward and backward linkages as a whole and more explicitly its forward linkages. The degree of integration of the ICT sector can be seen from the level of added value emerging from these linkages.

A 2017 study for the US Department of Energy[75] for the US local market shows a strong trend towards increasing linkages between ICT services and other key sectors; this is evidenced by the increase in ICT expenditures by over 27% in the 2008–2014 period. Household expenditures for ICT services also increased by nearly 23% for the same period (compared with real GDP growth of just 13.7%). In addition, ICT expenditures as a proportion of each industry's production inputs

74 OECD (2017): Digital Economy Outlook 2017.

75 Anderson, D.M., Niemeyer, J.M., Hoffman, M., and Samuel, T.J. (2017): Economic and Physical Linkages of the Information and Communication Technology (ICT) Service Industry to Key Industries of the Economy. An Ad Hoc Analysis. US Department of Energy and Battelle Memorial Institute. January. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-26137.pdf.

(input fractions) are showing growing importance relative to all other production inputs for these industries. We assume the same is true for Jordan, since there is a clear trend showing an increase of these linkages through the establishment and growth of several companies in the areas of AgriTech, HealthTech, FinTech and EduTech.

DRIVERS OF ICT DEMAND

Any value chain starts with the consumers. ICT is used globally by mass markets both directly and indirectly, whether by rural women in developing countries accessing health information through mobile applications, or by highly automated production lines in developed countries.

The following have been identified as key drivers for ICT demand:

Mobility: Today's societies are more mobile than ever before. Long distances can be covered in a shorter time than ever but the transformation of the workspace is an area where mobility can really be observed; one example is the increasing number of workers who can flexibly perform their work from multiple locations like their home office or while travelling. This development towards remote work has been enabled by today's ICT devices and services. Broadband, mobile internet and smart devices enable what has been coined "accessibility and availability". Accessibility is an important need in the Middle East, where war and political instability affect the ability to physically move with ease. The ICT sector in Jordan needs to look at how to make products and services accessible and available to clients in the region.

Individualisation: People have an increasing desire to emphasise their individuality in diverse areas of life. Companies aim at satisfying this demand by "mass customisation" of their products and services. Information technology plays an important role as facilitator of the entire customised order fulfilment process. This trend has been around for a long time and is growing with younger generations, both worldwide and in Jordan.

Sharing economy: Especially in highly developed countries, there is a trend towards borrowing/renting instead of excessive property ownership. This is inspired by environmental and economic motivations. By relinquishing ownership of infrequently used goods, people hope to reduce waste and contribute to a more sustainable society. Examples of this trend are car sharing or the private lodging service Airbnb. Using sharing economy services, people no longer need to acquire an expensive good and incur the operating expenses that are traditionally attached to it. Instead, cost can be refined according to the pay-as-you-use principle. In some cases, e.g. renting out one's own property to others (Airbnb), it is even possible to generate additional income through these activities. Sharing economy services use state-of-the art ICT to efficiently connect buyers and sellers remote from one another, thereby scaling the idea behind traditional sharing platforms such as bulletin boards or neighbourly connections. In addition, individuals in regions of political instability such as the Middle East are often averse to property ownership as they are unsure of what the future will hold. However, in general the sharing economy trend is more developed in higher-income countries.

Consumer-centricity and omni-channel connectivity: Consumer-centricity refers to the trend towards individualisation from a business perspective. It means that more markets are becoming buyers' markets, which are characterised by increasing power of customers in general and consumers in particular. Individual consumers can be identified easily by tracking their digital traces on the web, e.g. via smartphone usage profiles or retail loyalty card data. Companies are expected to reach their customers using multiple channels. A major data management challenge is to keep track of one unique customer identity across all channels and to maintain the same user experience across these different channels. Omni-channel connectivity would not be possible without robust ICT infrastructure. This applies equally in Jordan, where ICT players need to compete with international offerings that are available through different channels in order to meet the needs of individual consumers.

Industry 4.0: Industry 4.0 assumes state-of-the-art automation of production processes according to the principles of subsidiarity, process virtualisation by optimal information transparency, batch size of one and the interconnection of machines, workpieces and workers. Entire production networks are expected to become even more integrated over the value chain. In the new "smart factories" enabled by Industry 4.0, workers will require more ICT-related skills and larger responsibility for monitoring automated production facilities[76]. Industry operates in a global setting. In order to keep up with international competition, Jordanian industry must also adopt such practices.

Trends: While there is no agreement among global advisory firms, research institutions, relevant

76 Bärenfänger, R., Otto, B. and Gizanis, D. (2015): Business and Data Management Capabilities for the Digital Economy. White Paper. https://www.alexandria.unisg.ch/244405/1/White%20Paper%20Capabilities%20for%20the%20Digital%20Economy%2021%20rbae_v1.0.pdf.

organisations, magazines and governments on a single list of ICT trends, most interested parties recognise the following as the key technology trends:

- *AI and augmented analytics:* In the forthcoming years, companies will continue to use AI to surprise, connect and communicate with their customers in ways they may not even appreciate or realise. This includes faster, cheaper and smarter automation of everything from emails and content generation to industrial manufacturing[77]. Hence a new trend is emerging in the market: augmented analytics. Augmented analytics represents a major boost for data and analytics capabilities, allowing data scientists to use automated algorithms to explore more hypotheses in an environment in which there are increasing amounts of data to prepare, analyse and group, and from which to draw conclusions. Augmented analytics can identify hidden patterns while removing personal bias. Augmented analytics and automated insights will eventually be embedded into enterprise applications. Gartner predicts that by 2020, more than 40% of data science tasks will be automated[78].

- *Empowered edge and the IoT:* Edge computing is a typology where information processing and content collection and delivery are placed closer to the sources of the information, with the idea that keeping traffic local will reduce latency. For example, intelligence can be expected to move towards the edge in a variety of endpoint devices, from industrial devices to screens to smartphones to automobile power generators, in place of reliance on centralised systems. Currently, the focus of much of the research around this technology is linked to the need for IoT systems to deliver disconnected or distributed capabilities for the embedded IoT world. This type of typology will address challenges ranging from high WAN (Wide Area Network) costs to unacceptable levels of latency. Further, it will enable the development of digital business and IT solutions[79] [80] [81].

- *Automated things:* Automated technologies use AI to perform tasks traditionally done by humans. Automated things exist across five types: robotics, vehicles, drones, appliances and agents. They operate with varying degrees of capability, coordination and intelligence. For example, they can range from a drone operated in the air with human assistance to a farming robot operating completely autonomously in a field. The broad picture is that virtually every application, service and IoT object will incorporate some form of AI to automate or augment processes or human actions. Collaborative automated things will increasingly drive the future of AI systems[82].

- *Immersive experience:* Conversational platforms, which change how users interact with the world, and technologies such as AR, mixed reality (MR) and VR, which change how users perceive the world, will lead to a new, immersive form of experience. AR, MR and VR show potential for increased productivity, with the next generation of VR able to sense shapes and track a user's position and MR enabling people to view and interact with the world in which they live [83] [84].

- *Blockchain:* Blockchain is a type of distributed ledger, an expanding, chronologically ordered list of cryptographically signed, irrevocable transactional records shared by all participants in a network. Blockchain allows companies to trace a transaction and work with untrusted parties without the need for a centralised party (i.e. a bank). This greatly reduces business friction. Blockchain's first applications were in finance, but have expanded to encompass government, healthcare, manufacturing, supply chains and other areas. Blockchain can potentially lower costs, reduce transaction settlement times and improve cash flow. The technology has also given rise to a host of blockchain-inspired solutions that utilise some of the benefits and parts of blockchain. Blockchain will not only start to become more commonplace in business, but also become fundamental to transparency and trust with the realisation that it can be used to do far more than validate monetary transactions. Already, blockchain is being used to certify the ethical production of extra-virgin olive oil, to track solar energy usage, and to provide a single source of truth for the documentation processes underpinning the global shipping industry. In 2019, it will be used in even more diverse contexts, from verifying the authenticity of precious stones to tracking the source of food contaminations and

77 Forbes (2017): Top 10 Trends For Digital Transformation In 2018. 26 September. https://www.forbes.com/sites/danielnewman/2017/09/26/top-10-trends-for-digital-transformation-in-2018/#3c61b20d293a.

78 Gartner (2018): Top 10 Strategic Technology Trends for 2019. 15 October. https://www.gartner.com/en/newsroom/press-releases/2018-10-15-gartner-identifies-the-top-10-strategic-technology-trends-for-2019.

79 Forbes (2017): Top 10 Trends For Digital Transformation In 2018. 26 September. https://www.forbes.com/sites/danielnewman/2017/09/26/top-10-trends-for-digital-transformation-in-2018/#3c61b20d293a.

80 Gartner (2018): Top 10 Strategic Technology Trends for 2019. 15 October. https://www.gartner.com/en/newsroom/press-releases/2018-10-15-gartner-identifies-the-top-10-strategic-technology-trends-for-2019.

81 CXOtoday (2018): Top 10 Trends To Dominate ICT Industry In 2019. 8 October. http://www.cxotoday.com/story/top-10-trends-to-dominate-ict-industry-in-2019/.

82 Gartner (2018): Top 10 Strategic Technology Trends for 2019. 15 October. https://www.gartner.com/en/newsroom/press-releases/2018-10-15-gartner-identifies-the-top-10-strategic-technology-trends-for-2019.

83 Ibid.

84 CXOtoday (2018): Top 10 Trends To Dominate ICT Industry In 2019. 8 October. http://www.cxotoday.com/story/top-10-trends-to-dominate-ict-industry-in-2019/.

confirming drugs are produced in accordance with stringent industry regulations[85].

- *Smart spaces:* A smart space is a physical or digital environment in which humans and technology-enabled systems interact in increasingly open, connected, coordinated and intelligent ecosystems. As technology becomes a more integrated part of daily life, smart spaces will enter a period of accelerated delivery. Other trends such as AI-driven technology, edge computing, blockchain and digital twins are also driving towards this trend as individual solutions become smart spaces. The most widespread example of smart spaces is smart cities, where areas that combine business, residential and industrial communities are being designed using intelligent urban ecosystem frameworks, with all sectors linking to social and community collaboration[86], [87].

- *XaaS:* XaaS is a general, collective term that refers to the delivery of anything as a service. It recognises the vast number of products, tools and technologies that vendors now deliver to users as a service over a network – typically the internet – rather than providing them locally or on-site within an enterprise. Thanks to cloud-based flexible consumption models, companies no longer need to bear the risk and cost of buying complex technologies and acquiring scarce expertise. Instead, they can leverage the investments and expertise of the world's biggest technology companies and savviest start-ups. Deloitte's most recent Flexible Consumption/XaaS Survey[88] showed "access to newest technology" and "accelerated innovation", even more than "reduced costs", as key XaaS priorities in companies already using XaaS.

With the further development of the aforementioned technologies, new solutions will emerge to solve today's businesses problems and hurdles, whether those businesses are in finance, education, healthcare, agriculture, manufacturing or other sectors. These solutions are just as applicable in Jordan as anywhere else. Because the global ICT sector is relatively barrier-free, Jordanian start-ups can follow new trends in improving the products and services they offer. For example, the use of immersive experience and AI is expected to take the gaming industry in Jordan to a new level. The same applies to HealthTech, since the use of AI and Blockchain will guarantee advanced security measures as well as shorter processing time for Jordanian hospitals/HealthTech.

85 CXOtoday (2018): In 2019 AI, Blockchain To Rule The Enterprise, Says Oracle. 26 December. http://www.cxotoday.com/story/in-2019-ai-blockchain-to-rule-the-enterprise-says-oracle/.

86 Gartner (2018): Top 10 Strategic Technology Trends for 2019. 15 October. https://www.gartner.com/en/newsroom/press-releases/2018-10-15-gartner-identifies-the-top-10-strategic-technology-trends-for-2019.

87 McKinsey Global Institute (2018): Smart Cities. Digital Solutions For A More Livable Future. June. https://www.mckinsey.com/~/media/mckinsey/industries/capital%20projects%20and%20infrastructure/our%20insights/smart%20cities%20digital%20solutions%20for%20a%20more%20livable%20future/mgi-smart-cities-full-report.ashx.

88 Deloitte Insights (2018): Accelerating agility with XaaS. Many companies are using IT as-a-service to steer their way to competitive advantage. https://www2.deloitte.com/content/dam/insights/us/articles/4557_accelerating-agility-with-XaaS/DI_accelerating-agility_with-XaaS.pdf.

2.5 MARKET OPPORTUNITIES AND MARKET REQUIREMENTS FOR THE JORDANIAN ICT SECTOR

Developments in IT and global connectivity, combined with economic liberalisation, have given a stimulus to cross-border trade in services. With improvement in infrastructure and skills in developing countries, such trade is expected to continue to grow[89].

Due to Jordan's membership of the World Trade Organization (WTO), Jordanian ICT/ICT-ES companies have unfettered access to most export markets. The biggest restriction to markets is the restriction on the presence of natural persons working within the identified export markets. Otherwise, Jordanian ICT/ICT-ES companies have access to export markets regionally and internationally. Jordan's ICT/ICT-ES exports were worth USD 225 million in 2016[90].

The ability to supply products or services to markets depends on the targeted clients. Large institutional clients, governments, etc., usually seek companies with Capability Maturity Model Integration (CMMI) L3 certification or better. CMMI is a training and appraisal programme designed originally for the field of software engineering and administered by the CMMI Institute. This level of certification is usually the domain of large businesses. Smaller and less sophisticated clients usually do not require CMMI certification, often settling for and accepting ISO certification as well as personnel certification. Additionally, more and more companies internationally and regionally are seeking to use agile development methodologies.

A 2016 McKinsey study for the Middle East showed a big gap between consumer adoption and digitalisation in business and government as well as ICT supply and innovation; this implies strong growth potential in the near future, as consumers are clearly primed and ready to quickly embrace new digital offerings. Statistics show that 50% of the population of the region is under 24, and this is likely to boost the digital adoption rate in the Middle East in coming years due to the more tech-savvy nature of this group[91].

A 2017 Gartner study expected MENA IT spending to reach USD 155 billion in 2018[92]. This constituted a growth rate of 3.4%. Software was expected to have the strongest growth, 12.7%[93]. Regional software growth has been driven by enterprises seeking new functionalities in back-office systems such as supply chain management, customer resource planning and enterprise resource planning across multiple sectors.

The level of IT spending in the MENA region varies across the different sectors. Investment in cloud computing is among the lowest in the world due to insufficient local/regional hyper-scale and large-scale data centres, which are needed to support cloud systems and which enable local organisations to derive cloud offerings from abroad. There are also legislative inadequacies, currency issues and inertia in adoption. The largest spending segment in the MENA region, the communications services segment, is growing to serve increasing demand for premium mobile phones. Communications coverage and data transfer rates are expanding while prices remain low. Regionally increasing demand for premium mobile phones is set to fuel growth for devices spending.

The MENA region is witnessing continued focus on technology initiatives and improvements. The leading segments driving ICT spending growth in the region are banking and securities, insurance and retail. Banking sector IT investment is driven by a move into digital business, data analytics, blockchain and AI. In the insurance sector, IT spending is led by investment in software applications.

A McKinsey 2016 study[94] also showed that digital creation in the Middle East is lagging behind. The Middle East has just one-thirtieth the ICT patents per million population compared with the US, and one-third fewer patents compared with emerging market players such as the BRICS countries (Brazil, Russia,

89 International Bank for Reconstruction and Development/The World Bank (2010): The Global Opportunity in IT-Based Services. Assessing and Enhancing Country Competitiveness. http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/Global_Opportunity_IT_Based_Services.pdf.

90 int@j ICT & ITES Industry Statistics and Yearbook 2016.

91 Digital McKinsey (2016): Digital Middle East. Transforming the region into a leading digital economy. October. https://www.mckinsey.com/~/media/mckinsey/featured%20insights/middle%20east%20and%20africa/digital%20middle%20east%20transforming%20the%20region%20into%20a%20leading%20digital%20economy/digital-middle-east-final-updated.ashx.

92 Gartner (2018): Middle East and North Africa IT Spending to Reach $155 Billion in 2018. 5 March. https://www.gartner.com/en/newsroom/press-releases/2018-03-05-gartner-says-middle-east-and-north-africa-it-spending-to-reach-155-billion-in-2018.

93 Ibid.

94 Digital McKinsey (2016): Digital Middle East. Transforming the region into a leading digital economy. October. https://www.mckinsey.com/~/media/mckinsey/featured%20insights/middle%20east%20and%20africa/digital%20middle%20east%20transforming%20the%20region%20into%20a%20leading%20digital%20economy/digital-middle-east-final-updated.ashx.

India, China, South Africa)[95]. Jordanian content MSMEs have much potential for growth in the MENA region in the coming years.

The largest foreign target markets for Jordan are regional export destinations that show significant market opportunity, such as Saudi Arabia, the UAE and Qatar. Other export markets served are mainly English-speaking countries like the US and United Kingdom (UK). The table below shows which export opportunities are available for Jordan in each of these countries.

Figure 13: **Opportunities for Jordanian ICT export in the region**

Country/ region	Opportunities
MENA	▸ Global growth in cross-border trade in services is expected to continue ▸ Large gap between consumer adoption and digitalisation among business and government as well as ICT supply and innovation ▸ 50% of the population of the region is under 24 (tech-savvy) ▸ Strong growth in software demand ▸ Strong growth in FinTech ▸ Lagging in digital content creation
Kingdom of Saudi Arabia	▸ Largest ICT market in the Middle East – excellent operational scale ▸ ICT market continues to be substantially under-developed ▸ Significant unmet demands for web-based and mobile services; increased enterprise and government usage ▸ Dependence on ICT imports ▸ Demand for EdTech and HealthTech (National Transformation Program 2020 seeks to develop, i.a. healthcare and education) ▸ Twenty-year ICT plan for household adoption ▸ Planned deregulation and substantial public investment efforts ▸ Investment in infrastructure, ICT hardware and science and technology ▸ R&D co-funding initiatives ▸ Strong commitment from the government to e-commerce and e-governance initiatives ▸ Commitment to leading in connectivity and IT ▸ Public investment in connectivity for Economic Cities, IT knowledge and internet-based services literacy programmes ▸ Rising personal wealth ▸ Arabisation is a large emerging market
UAE	▸ The UAE National Innovation Strategy focuses on seven main sectors including education and health. Infrastructure projects such as UAE Vision 2021 and Dubai Expo 2020 are the main drivers of demand for ICT ▸ High IT spending ▸ Growth predicted in software sub-sector
Qatar	▸ Growing government demand for ICT services ▸ Government focus on the healthcare sector – ICT growth programme ▸ Dependence on ICT imports

Source: Authors

95 World Economic Forum (WEF) (2016): The Global Information Technology Report 2016. Innovating in the Digital Economy. http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf.

KINGDOM OF SAUDI ARABIA[96]:

Saudi Arabia is the dominant ICT market in the Middle East in terms of revenue. The telecommunications and IT sectors make up over 55% and 51%, respectively, of the Middle East market. Reports indicate that Saudi Arabia's ICT expenditures grew 6% in 2017 to over USD 36 billion, expected to reach USD 40 billion in 2018[97]. Yet, the world's ICT markets are maturing in general, while the Saudi Arabian market continues to be substantially under-developed. It is reliant on expatriate labour and foreign companies, with little or no development of local companies and workforce, and supply is still behind other countries in areas like e-commerce[98].

Saudi Arabia's National Transformation Program 2020 seeks to develop healthcare and education, among other areas[99]. Achieving the targets for those two pillars will require close integration and effective use of technology. These markets have high potential for Jordanian ICT MSMEs, specifically for EdTech and HealthTech providers. The country also has a 20-year ICT plan which will support wide technology and telecommunications adoption within households and enterprises. Serious deregulation and substantial public investment efforts will develop substantial investment opportunities.

The Saudi Arabian ICT market (government, individual consumers and enterprises) is characterised by the following:

- Deregulation, privatisation and WTO accession promoting private-sector opportunities – supported by significant investment incentives.
- Funding for public–private partnerships such as KACST (King Abdul Aziz City for Science and Technology).
- R&D co-funding initiatives such as the Technia cluster of companies including Technia Defense, Technia Energy and Technia Aviation.
- Venture capital initiatives such as the recent collaboration between Saudi General Investment Authority (SAGIA) and Intel.
- Strong commitment from the government to e-commerce and e-governance initiatives (including IP protection).
- Significant unmet demands for web-based and mobile services; increased enterprise and government usage of web-based services provides large-scale opportunities for contractors and service providers.
- Massive public investment in connectivity for Economic Cities provides unique opportunities for green-field projects covering millions of users.
- Public investment in IT knowledge and internet-based services (ICT-ES) literacy programmes.

Rising personal wealth and growing commitment to achieving leadership in connectivity and information technology are major drivers of Saudi ICT growth. The Saudi Arabian ICT market provides excellent operational scale, as it is home to more than half of the ICT companies in the Middle East. Saudi society is young and rapidly growing. Therefore, its consumer market leans heavily towards technologically literate early adopters. Arabisation is a large emerging market, and there is an increasing supply of qualified software engineers becoming available due to public and private training initiatives. As such, digital content and software development activities enjoy strong growth prospects. While Saudi Arabia is a strong competitor of Jordan in the field of ICT, its strong growth and need to catch up with the rest of the world indicate an opportunity for Jordanian companies.

QATAR[100]:

ICT spending in Qatar was USD 2.1 billion in 2017 and is expected to reach USD 2.8 billion in 2019[101]. Growth has been largely driven by the government's increasing requirement for ICT services. Qatar has embarked on an ICT growth programme which is designed to harness technology and innovation to drive sustainable economic development across five priority sectors: transport, logistics, environment, healthcare and sports. The ICT industry in Qatar is still

96 Export.gov (2018): Saudi Arabia – Information and Communications Technology. 11 May. https://www.export.gov/article?id=Saudi-Arabia-information-communications-technology.

97 Saudi Gazette (2018): Saudi Arabia's ICT spend to reach $40 billion this year. 30 April. http://saudigazette.com.sa/article/533909; Export.gov (2018): Saudi Arabia – Information and Communications Technology. 11 May. https://www.export.gov/article?id=Saudi-Arabia-information-communications-technology.

98 Hathaway, M., Spidalieri, M. and Alsowailm, F. (2017): Kingdom of Saudi Arabia Cyber Readiness at a Glance. Potomac Institute for Policy Studies, September. https://www.belfercenter.org/sites/default/files/files/publication/cri-2.0-ksa.pdf.

99 Kingdom of Saudi Arabia: National Transformation Program 2020. https://vision2030.gov.sa/sites/default/files/NTP_En.pdf.

100 Export.gov (2018): Qatar – Information and Communication Technology. 3 November. https://www.export.gov/article?id=Qatar-Information-and-Communication-Technology.

101 Ministry of Transport and Communications (2016): Qatar's ICT Landscape 2016 – Business. http://www.motc.gov.qa/sites/default/files/qatars_ict_landscape_2016_-_business.pdf.

mainly import-dependent[102]. It would be beneficial for Jordanian EdTech, HealthTech and gaming MSMEs to consider the Qatari market when considering export opportunities and market expansion.

UNITED ARAB EMIRATES (UAE)[103]:

2018 IT spending in the UAE is expected to have reached USD 7.7 billion (overall ICT spending is around 15.7 billion including communications). Infrastructure projects such as UAE Vision 2021 and Dubai Expo 2020 are the main drivers of demand for ICT.

Growth of the ICT sector in the UAE is expected to be driven by the ICT services sector (6% growth), software (4.8% growth), servers, storage and networks (2.3% growth) and mobile devices (2.2% growth). Sales of IT peripherals and displays and PCs and tablets are expected to fall.

The UAE National Innovation Strategy focuses on seven main sectors[104]: renewable energy, transport, education, health, technology, water, and space. Large investments are currently being poured into these sectors. Jordanian tech companies, especially in EdTech, HealthTech and other relevant IT sub-sectors, should consider UAE opportunities when planning to export their products/services.

SYRIA AND IRAQ:

In more peaceful times, Syria and Iraq could also be interesting markets for Jordan's ICT sector. However, given political unrest, these markets are almost impossible to measure. Syria is currently under sanctions from the US, which means that it cannot attract US investment to re-build its economy and the infrastructure needed for ICT. Syrian ICT infrastructure has suffered a lot during the last eight years of war and would need a major revamp before being able to support in any efficient way high-tech solutions like HealthTech, EdTech and FinTech. While HealthTech innovations may be able to assist international non-governmental organisations (NGOs) to reach those in need, the uncertainty around how long those needs will exist disincentivises innovation in this area.

Identifying the size of opportunities proves to be very difficult because of the chaotic environment in both countries. Syria and Iraq are not considered as priority markets for Jordanian ICT MSMEs for the following reasons:

The prevailing political unrest in both countries, which means that there is currently little or no market potential.

Uncertainty as to when the war might end (it could take months or years), rendering it difficult to measure ICT market potential; uncertainty as to what type of regime will rule these countries in times of peace and what this will mean for Jordan: the different outcomes would have different economic scenarios, e.g. more democratic regimes are likely to have more open economies in which ICT can thrive.

Even if the conflicts end soon, basic infrastructure will need to be in place before there are real ICT opportunities. This could take years.

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102 Ibid.

103 Gulf News TECH (2018): Regional ICT spending to reach $230b this year. 23 January. https://gulfnews.com/technology/regional-ict-spending-to-reach-230b-this-year-1.2161892.

104 United Arab Emirates, Ministry of Cabinet Affairs, Prime Minister's Office (2015): UAE National Innovation Strategy. https://www.moei.gov.ae/assets/download/1d2d6460/National%20Innovation%20Strategy.pdf.aspx.

3 SUB-SECTOR BRIEFS AND DESCRIPTION OF PRIORITY SUB-SECTORS

3.1 PROFILING THE MSMEs IN THE ICT SECTOR

According to the most recent DoS survey (2016), the ICT sector is composed of 928 enterprises which employ 16,364 employees. ICT companies comprise both well-established and new companies. Most of the existing ICT companies are MSMEs, which operate alongside some large ICT players and the country's three large telecommunications operators (Orange, Zain and Umniah). The distribution of the enterprises by size can be seen in the following table.

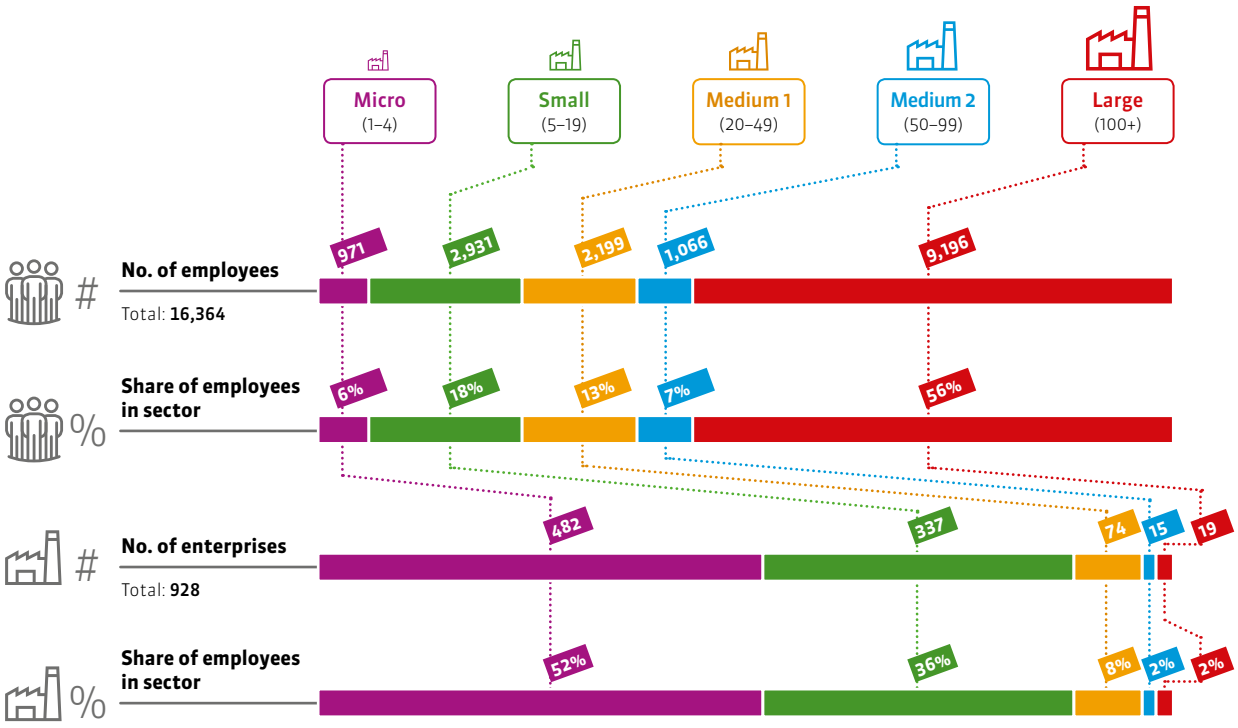
This tells us that 98% of companies in Jordan's ICT sector are considered to be MSMEs (88% are micro and small businesses), at the same time accounting for 44% of employment in the sector, or 7,168 jobs.

Of the 928 companies registered:

- 353 are software development houses.
- 35 are business and knowledge process outsourcing companies.
- 79 sell packaged software.
- 461 are telecommunications and telecommunications support companies or hardware distributors, or are engaged in other ICT-related activities.

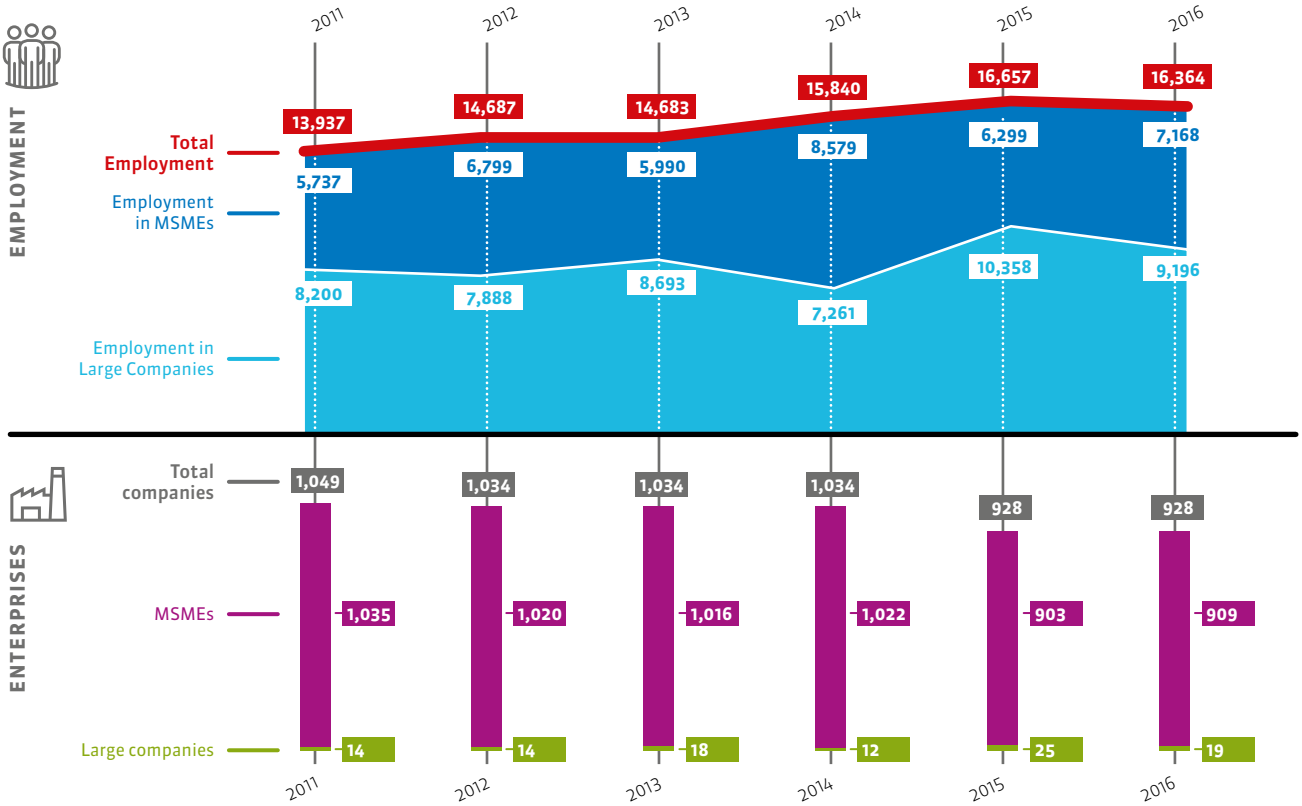
It is interesting to note that over time, the number of companies fell from 1,049 in 2011 to 928 in 2016 (mainly due to a fall in micro-sized enterprises), but the level of employment rose over this time (see figure below). The number of large companies fluctuated during this period between 14 and 25, falling to 19 in 2016, never accounting for more than 2.7% of all companies. This indicates strong growth coming from the SME sector both in numbers of enterprises and employment, and it is likely that micro-sized enterprises merged or became employees of large or small and medium-sized enterprises in the sector.

Figure 14: **Distribution of Jordanian ICT entreprises by size**



Source: DoS (2016) – Employees and Enterprises by Economic Activity and Size Group of Employment

Figure 15: **Jordanian employment and enterprise trends between 2011 and 2016**

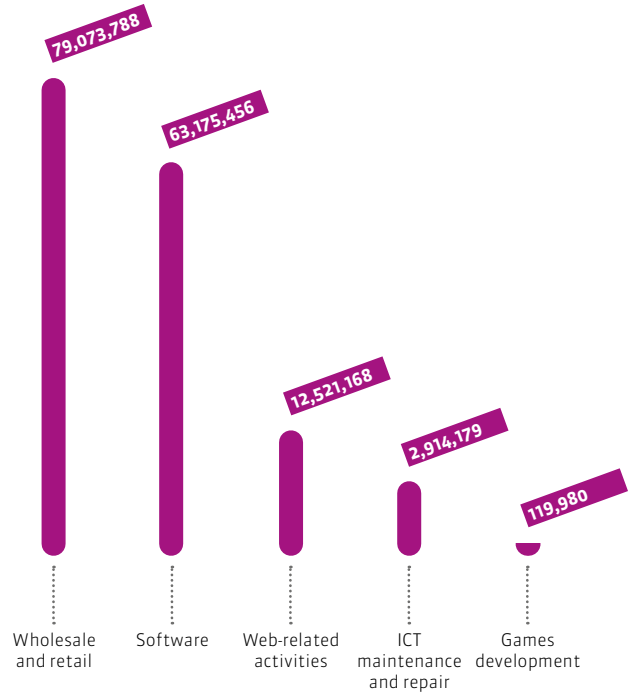


Source: Author's analysis of DoS statistics

There is little information on the breakdown of ICT revenue for MSMEs in Jordan. However, a study published by the Oxford Business Group states that SMEs account for roughly 40% of Jordan's total nominal GDP[105]. This figure was also confirmed by the 2011 census[106] and a study for the Association of Banks in Jordan[107].

Some key stakeholders in the ICT domain also estimated that MSMEs' revenue for the software, content, gaming and services sub-sectors is around 40% of the total revenue of each sub-sector respectively. Figure 16 shows some figures for ICT activities dominated by MSMEs. The categories hardware and telecommunications are likely to have a higher concentration of revenue going through large companies and the ICT retail sector is likely to be dominated by MSMEs, so the 40% rule has been applied to the categories to give an indication of the likely revenues earned by MSMEs.

Figure 16: **Total revenue (in USD) of Jordanian ICT MSME in 2016**



Source: Authors' calculations based on original DoS statistics 2016

105 Oxford Business Group (2017): Jordan targets small business growth. 19 October. https://oxfordbusinessgroup.com/news/jordan-targets-small-business-growth.

106 Venture (2016): Facilitating Finance. 16 June. http://www.venturemagazine.me/2016/06/facilitating-finance/.

107 Kandah, A. (2011): SMEs in the MENA Region Access to Finance. International Arab Banking Summit 2011: The Future of MENA, Impact on Global Economy. Association of Banks in Jordan.

3.2 ICT SUB-SECTORS AND VERTICALS IN JORDAN

Varying definitions of ICT sub-sectors are given in international sources. In general, these sub-sectors include hardware, software, telecommunications, content providers, and wholesale and retail.

Because ICT interacts with many sectors of the economy, the sector also contains what are referred to as vertical markets. A vertical market is one that includes a group of companies and customers that are all organised around a specific niche. Companies in a vertical market are adapted to that market's specialised requirements and generally do not serve a larger market. In the case of ICT in Jordan there are vertical markets for the financial, education, health, transport, government and gaming/entertainment sectors.

HARDWARE:

Hardware refers to the physical devices involved in the use of ICT and relates to the design and manufacture of computers, peripherals, mobile telephones, digital assistants and communication and network devices. Hardware generally requires a large capital investment and competes on economies of scale. As such, hardware manufacture is rarely the domain of MSMEs. There may be a few cases in which MSMEs can compete, but these generally relate to highly specialised, high-value, low-volume custom hardware.

Hardware manufacturing companies hardly exist in Jordan, having long ago moved out to other parts of the world due to the lack of achievable economies of scale in Jordan.

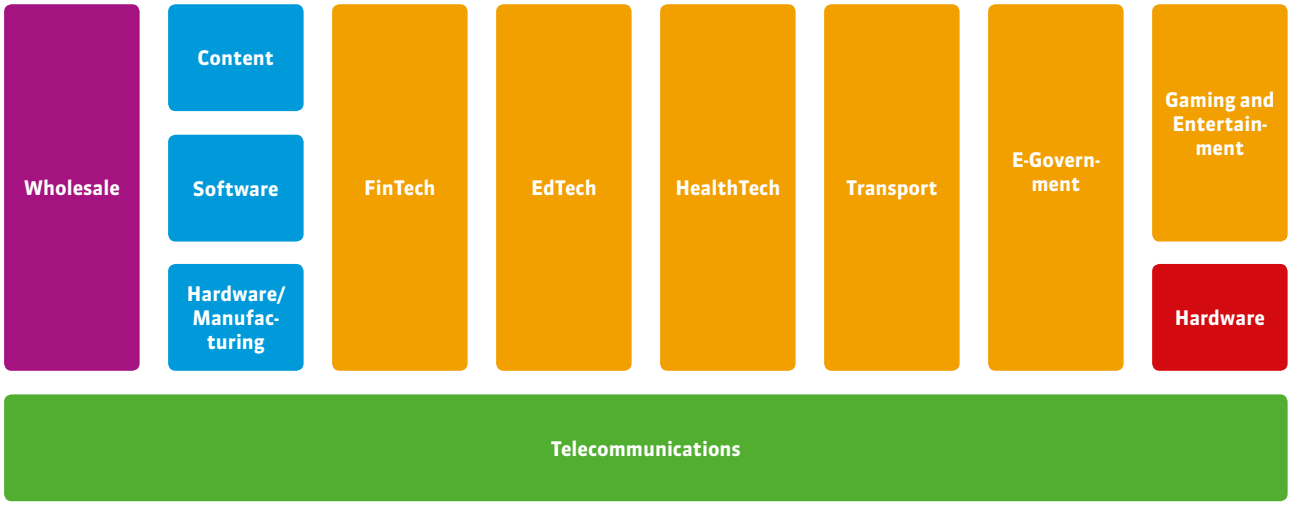
SOFTWARE:

Software is a set of commands which instruct a computer to perform or execute specific tasks. Such commands are often referred to as applications, scripts, programs or instructions. There are a variety of software categories including systems software, programming software and application software. For the purposes of this study, the focus will be on application software.

Application software is designed to execute specific tasks. Applications can be a single program or a collection of programs. Application software is what consumers typically think of as "software". Examples of application software include word processors, spreadsheets, databases, engineering CAD/CAM software, gaming applications and educational software. As such, software is a universal platform through which functionalities and creative ideas can be brought to life.

Barriers to entry in software development are generally low. Trained or educated programmers can develop a variety of products and services to serve specific needs and requirements with a simple PC/laptop and appropriate system and programming software. As such, software development is an attractive domain for MSMEs. All that is required is creativity, technical competence and basic tools.

Figure 17: **ICT sub-sectors and vertical markets**



Source: Authors

Because software development is dependent on knowledge and technical creativity, its added value and potential competitiveness is extremely high. This facilitates export opportunities regionally and globally.

TELECOMMUNICATIONS:

In Figure 6, we can see that the telecommunications sub-sector in Jordan accounts for 13% of the ICT sector, worth USD 85 million annually, mainly domestic revenue. However, it is a sub-sector dominated by three large mobile operators. The liberalisation reforms in Jordan's telecommunication industry between 1999 and 2004 led to the privatisation of the Telecommunications Corporation, nowadays operating as the Jordan Telecom Group (JTG). Since the privatisation in 2000, the government of Jordan is holding a 30% stake, while the remaining shares are owned by France's Orange. Among the three mobile operators active in Jordan, JTG – also branded as Orange Jordan – is the country's second-largest mobile operator, with a 31% market share. Orange Jordan is the only integrated operator which offers mobile, landline and internet services. Zain Jordan is the largest mobile operator in terms of market share, with 40%, and has been part of Kuwait's Zain Group since 1994. The third-largest operator is Umniah, a subsidiary of Bahrain's Batelco. Among the big three, Umniah is the youngest operator, entering the market in 2005[108]. These three operators account for the majority of revenues in the sector. Orange and Zain alone employ over 1,600 employees[109], or 10% of all ICT employees in Jordan.

Globally, telephone calls continue to be the ICT industry's dominant revenue generator. However, telecommunications is currently more about data, text and image transmission than voice communications. This is driven by recent advances in network technology: high-speed internet access for computer-based data applications such as broadband and interactive entertainment is widespread. Fastest revenue growth is created through value-added services provided via mobile networks.

According to the Deloitte 2017 Telecommunications Industry Outlook, telecommunications continues to drive economic growth, innovation and disruption across and within any sector. Broadband connectivity and mobile devices are increasingly embedded in society and are driving trends in video streaming, mobile payments and the IoT.

Telecommunications is typically a highly regulated market because of limited available bandwidth. It is also highly capital-intensive. As such, it is not an MSME sector. Telecommunications (telephone) companies, mobile communication companies and ISPs are playing a transformative role in the evolution of the information society through ICT.

CONTENT PROVISION:

Content provision is the input of material to any media. Specifically, it is the input of knowledge (material) to digital media for a defined audience (end user) with a particular context. Content is knowledge or material which is conveyed through some medium. This includes speech, the written word, any form of self-expressive art, distribution, marketing and/or publication. Digital content creation is the development, update and support of e-newsletters, white papers, blog posts, case studies, websites, photos, videos, presentations, social media pages, etc.

As with software development, content provision has low barriers to entry and its desirability depends on the talent and skill of the content provider. As such, content provision is the intersection of ICT with the arts, design, humanities and communication. Therefore, content provision is an attractive and potentially competitive MSME sector.

In Jordan, content development currently accounts for more than USD 27 million in revenue equivalent or 4% of all ICT revenues, mainly for the domestic market[110]. Content is often developed by software companies rather than specialised digital content enterprises.

WHOLESALE AND RETAIL:

This includes the wholesaling and retailing of ICT equipment as well as rental and leasing of equipment. The definition also includes computer maintenance and repair services. As such, this segment is predominantly focused on the local market (i.e. not export-oriented). Some definitions of ICT sub-sectors also include management consulting services engineering, architectural, surveying and construction management services here, but such definitions appear too broad.

108 Oxford Business Group (2018): The Report: Jordan 2018. https://oxfordbusinessgroup.com/jordan-2018/ict.

109 According to Zain and Orange annual reports. https://www.zain.com/en/press/ZainGroup_2017FYresults/; https://www.orange.jo/EN/Documents/annual_report/orange_annual_report__en_2018.pdf.

110 int@j ICT & ITES Industry Statistics and Yearbook 2016.

The Jordanian wholesale and retail of ICT equipment is worth over USD 150 million annually, of which USD 40 million is accounted for by exports of IT hardware and infrastructure[111]. While the revenue is significant, this is not a high-skilled sub-sector or one that shows significant potential or comparative advantage for Jordan.

VERTICAL MARKETS:

The vertical markets in the ICT sector are:

- **HealthTech:** This refers to ICT products specifically designed for the health sector, also referred to as Digital Health. Products could include patient medical data capturing, diagnostic software, payment management systems that interact with health insurance companies and medical research database management and interaction.

- **FinTech:** This refers to ICT products and services supplied specifically to the financial services sector. Products include software security products, interbank payments systems, customer bank account management systems and many more. The financial services and ICT sectors are highly interdependent.

- **EdTech:** EdTech refers to technology in the education sector. Online learning platforms, academic research databases and clouds, and examination management systems are examples of EdTech products.

- **Transport:** ICT services for the transport sector are central to the operation of e-commerce. Products include ordering systems, logistics management systems, transport tracking devices (GPS) and software systems that interlink manufacturing companies and logistics providers. On the international market, Amazon's delivery drones are a more advanced example of ICT in transport.

- **E-government:** This is the use of electronic communications devices, computers and the internet to provide public services. Applications could include online passport renewal; online tax payments; registration of births, deaths and marriages; and many others.

- **Gaming and entertainment:** The gaming sub-sector consists of the development, marketing, and monetisation of video games (both stationary and mobile). Typical products and services supplied include game programs for computer, console and mobile phone.

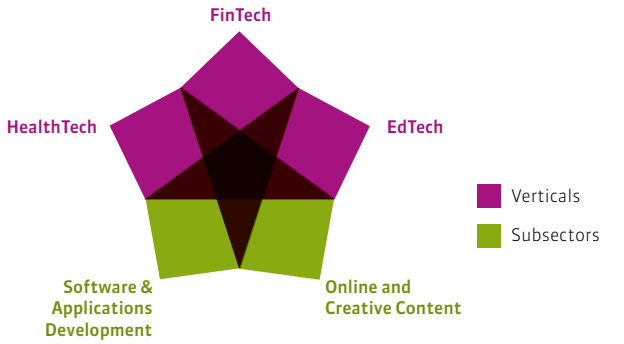
Successful vertical markets in the ICT sector are dependent on the availability of content expertise (medicine, banking, education, etc.). This is particularly true if the verticals are to be exported. The Jordanian market is open to many verticals, including transport (Uber, Careem), logistics (there are several Uber-like companies being formed to provide logistics services) and capacity utilisation companies which help owners of investment-intensive infrastructure increase their capacity utilisation by making down-time capacity available to users at lower prices. The main challenges faced by new verticals are poor regulation and/or an inability to regulate innovative new services. This was recently seen when the government of Jordan tried to regulate Uber/Careem in Jordan with much difficulty.

111 Ibid.

3.3 PRIORITISED SUB-SECTORS AND VERTICALS

Applying the selection criteria, two priority sub-sectors and three priority vertical markets were chosen. The three verticals – FinTech, HealthTech and EdTech – were selected based on their market potential and the existing capacity of Jordan's ICT ecosystem to serve these markets. Besides the verticals, the sub-sectors software and application development and online and creative content were selected due to their large potential to develop the ICT sector in Jordan. These sub-sectors and verticals all show potential for growth in MSMEs.

Figure 18:
Overview of the prioritised sub-sectors and verticals



Source: Authors

Based on the market perspectives and expected competitiveness to export, the prioritised verticals and sub-sectors have growth potential. The still-small number of existing companies and the latent investment potential will attract start-ups to boost the selected areas. This is also in line with the national ICT strategy REACH 2025.

3.3.1 SOFTWARE SUB-SECTOR

This sub-sector covers software development and packaged software. Software development houses include all companies whose primary output is software and software technology; they often create IP and the main programming activities take place in Jordan. The output can be further classified into:

- Programming and application (app) development (B2C, e.g. mobile and desktop applications);
- Enterprise software houses (B2B and B2G, e.g. enterprise solutions, SaaS, etc.).

Some examples of typical products and services include software programs and solutions, applications, software as a service (SaaS), consulting services, and implementation and maintenance services.

Software houses represent about 50% of the ICT companies in Jordan, a total of 353 companies, and are worth USD 116 million in revenue, USD 48 million of which is exports. In absolute values, it is the sub-sector with the third-biggest revenue overall and the biggest revenue from exports. There are few large companies in this domain so it can be assumed that the proportion of MSMEs is close to the industry average of 98%.

Figure 19: **Revenues and exports in software houses**

software

Number of companies	Total revenues (in USD)/ per company (in USD)	Total exports (in USD)/ per company (in USD)
353	116,525,152	48,278,089
	330,100	136,765

Source: int@j ICT & ITES Industry Statistics and Yearbook 2016

The packaged software sub-sector is Jordan's primary importer and distributer of licensed software. It includes importers, distributors, resellers, value-added resellers, system integrators and implementers. One example of a typical product and service is ready, not changeable, software programs for the corporate and consumer markets. There are 79 companies in the sub-sector (mostly MSMEs), which is worth USD 70 million. Interestingly, USD 31 million is exported.

Figure 20: **Revenues and exports in packaged software**

packaged software

Number of companies	Total revenues (in USD)/ per company (in USD)	Total exports (in USD)/ per company (in USD)
79	70,789,626	31,967,442
	896,071	404,651

Source: int@j ICT & ITES Industry Statistics and Yearbook 2016

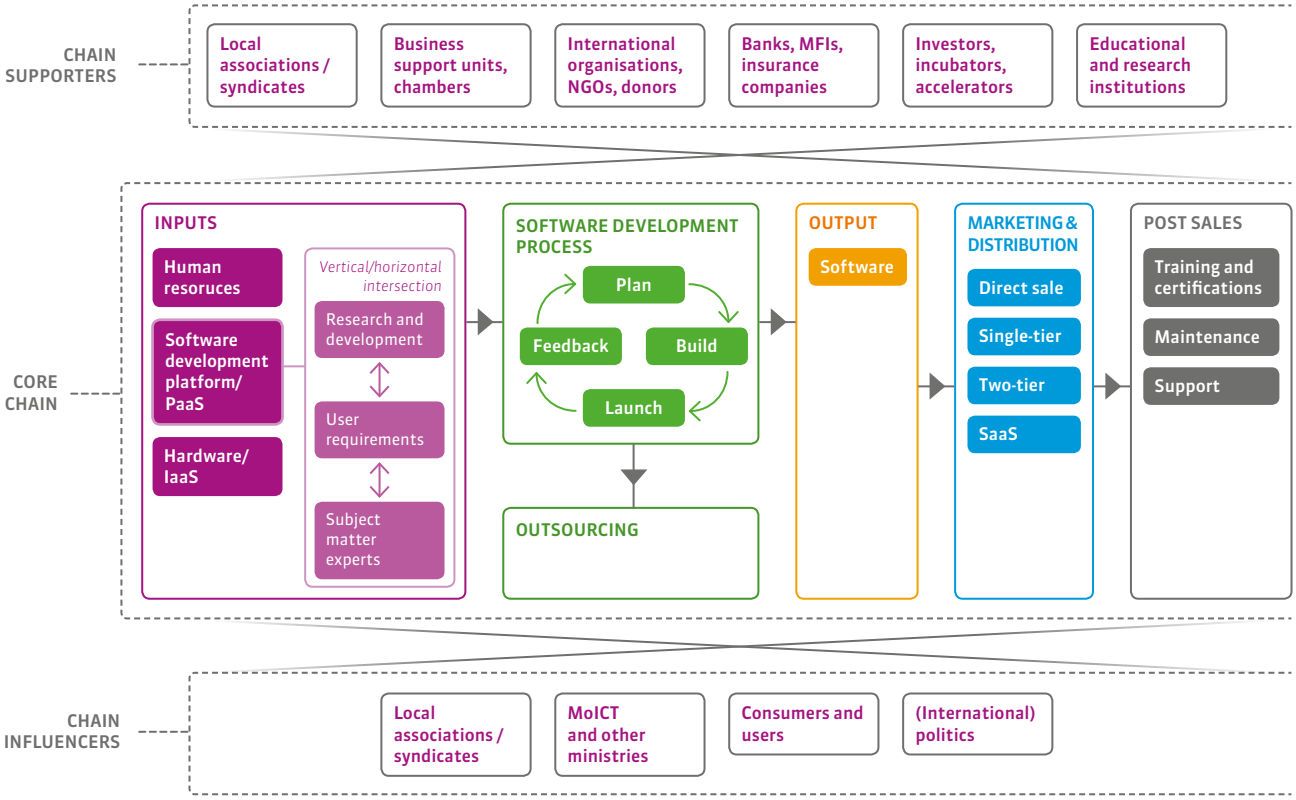
The software sub-sector was selected as a priority sub-sector because it is the greatest employer of women in the ICT sector (more than 30% of software sub-sector employees are women); it has good potential for revenue and employment growth in MSMEs, given the low requirement for capital investment and the innovative nature of the sub-sector; and it is a prime area of innovation.

Although the data provided by the DoS does not provide trends on employment by sub-sector, the overall ICT sector is in growth in Jordan and given that global trends indicate growth in employment in the software sub-sector, while some others are declining, it is likely that the growth in employment is coming from the software development sub-sector.

Skills development is an important need for this sub-sector. While there is already a good base, the strict rules on curricula changes will need to be addressed if Jordan is to keep up with this quickly evolving sub-sector.

In Jordan, not only is the software sub-sector important in its own right, but both software and content development underpin the HealthTech, EdTech and FinTech vertical markets; though separate focus areas, their products are likely to be dominated by software development and the supply of digital content.

Figure 21: **Software value chain**



Source: GCConsult (2018)

As seen in the illustration, the software value chain upstream part starts with the inputs: the human resources, a key asset to this chain; the software development platform or PaaS (Platform as a Service), which is now commonly used worldwide, including in Jordan; and the hardware or IaaS (Infrastructure as a Service), a practical practice to reduce capital expenditure.

Then comes a very important part of the inputs: the intersection of the verticals with the technology. This involves gathering the user requirements through R&D and the active contribution of the vertical's subject matter experts, who represent a key asset for Jordan especially in health, education and finance. It should be noted that communication activities have a crucial role in the pre-development stage (the stage of identification of stakeholders' requirements) and are a significant factor in conducting R&D activities.

Based on the identification of customer needs and market data, the above-mentioned activities will contribute to the development of innovative software applications, whether customised or off-the-shelf offerings.

Then comes the development process. Several or different processes can be applied at this stage (which processes are used is not of importance in our case – different processes can be chosen depending on the company's preferences). One example is a simplified agile software development methodology consisting of four main recurring phases: plan, build, launch and feedback. Agile practices are being more commonly used in Jordan these days. Jordan increasingly follows the international trend in software development; several iterations of this development process will yield a product that is ready to be sold.

Moving downstream, we get to the marketing and distribution of the developed product(s). Several distribution methods can be deployed; however, the most pertinent in our case are direct sales, single-tier, two-tier (the number of tiers being defined by the number of middlemen between the original seller and the ultimate buyer) and SaaS – the model that allows access to software applications over the internet, whereby the services from one or multiple providers can be used for free or after paying a subscription fee. As confirmed by the different interviews conducted, most of the Jordanian IT/IT-ES companies combine several distribution methods to sell their solutions.

Activities that refer to training, maintenance and support of the software products can be implemented by using conventional methods or by inclusion in the SaaS model. The emergence of SaaS contributes significantly to streamlining and simplifying the downstream activities of the value chain.

The main chain influencers/drivers for Jordan are emerging technologies and tools including infrastructure and devices. Laws and regulations are also big influencers of the chain, as are the end-customer/industry requirements, expectations and aspirations as well as international politics, which can influence this value chain positively or negatively.

As for the key chain supporters that influence and enforce the value chain in Jordan, we can list the following: local syndicates and associations, business support units, chambers, international organisations, NGOs, donors, financial institutions, investors, incubators, accelerators, educational institutions and research institutes.

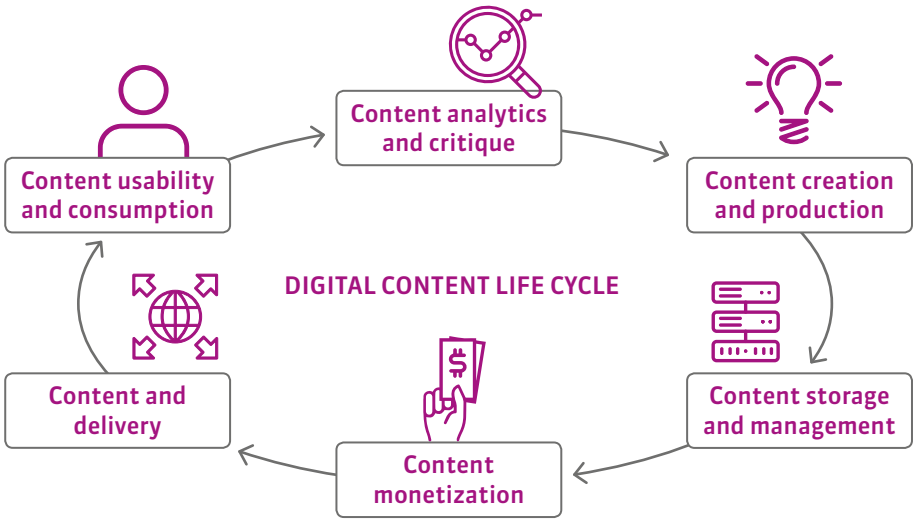
The process of software development is skill-intensive and knowledge-intensive because labour with appropriate knowledge and skills is a crucial input; as Hoch (1999) notes, software production comprises "nothing but knowledge in codified form". The required capital investment, including hardware and software development tools, is comparatively low and does not constitute an entry barrier as in other areas of ICT (notably hardware and telecommunications). Keeping this in mind, the competitive advantage of the software industry cannot be built on economies of scale only, but will emerge mainly from developing innovation capabilities and product differentiation. There is an opportunity for Jordanian MSMEs to develop the software sub-sector due to low barriers to entry and a functional value chain. Traditional skills and knowledge from other sectors (e.g. medicine and education) can also be repurposed for a series of new products/services such as EdTech, HealthTech, FinTech, etc., facilitating scalability of these new products and services and thereby allowing greater revenues to be generated.

3.3.2 DIGITAL CONTENT SUB-SECTOR

The digital content creation sub-sector is mainly an ICT-ES. It complements the work of software houses and other ICT-ES providers, and services consumers directly online. Some examples of typical products and services offered in Jordan are homepages, written texts, graphs, images, audio and video multimedia.

This priority sub-sector provides a platform for different types of workers to contribute to the products. Types of workers include scriptwriters, animators, graphic artists, narrators, sound engineers, musicians, interface designers, singers and actors. ICT has

Figure 22: **The content development cyclical value chain**



Source: Pennings (2017)

become an integrative virtual place where all these talents can be integrated and presented.

Content (video, text, animation, graphics, narration, music, sound, etc.) is a global platform for self-expression and communication, in line with the global trend of individualism which is exhibited by millennials. Trends such as user-generated content are the foundation of global content development. The creation and distribution of such content is driven by the availability and democratisation of increasingly powerful and flexible IT devices and the availability of existing infrastructure (pipelines) which facilitate content distribution. ISPs, telecommunication (telcos) and mobile operators are all seeking to push content through their networks as a means of revenue generation. In the content realm, there is a lack of Arabic content and great opportunity to spread and share new knowledge, ideas and ideologies in the Arab world. Jordan can play a key role to fill this gap since it has the right mix of talents required.

Digital content permeates all aspects of software development. Innovation includes establishing how to integrate content into software applications to make them easier or more pleasant to use. As such, it is difficult to separate digital content as a unique category, as it is increasingly becoming integral and essential to software.

The above graphic represents the key steps in the content development cyclical value chain, starting at one o'clock.

The digital content value chain includes content creation and production, storage, monetisation, distribution, consumption and evaluation.

Content production starts with an idea or a market analysis that seeks to fill a certain gap or meet a certain need; it is the process of developing and creating visual, audible or written assets such as stories, videos, images, graphs, songs and so on.

Content storage, protection and management also forms a key part of the value chain. Whether the content is audio, video, images or text, access, permissions and availability of the content should be well managed.

The next stage, content monetisation, is the practice of actively making money from existing content and searching for new ways to do so.

Content distribution and delivery involves the promotion of content to audiences in multiple media formats through various channels (HDTV, mobile devices, games, websites, etc.). These channels can be categorised into three groups: owned, earned, and paid.

- Owned content distribution: The distribution of content to channels that belong to the distributor.
- Earned content distribution: The distribution of content by third parties.
- Paid content distribution: Content distribution which is explicitly paid for. Payment may take many forms, but often works on a cost-per-click (CPC) model where the owner of the content pays a certain amount every time someone clicks to view the content.

By analysing how the audience is consuming the content (time spent, re-usability frequency, daily active users, monthly active users, etc.) and comparing them

to the goals and key performance indicators (KPIs) set in the content production analysis sub-phase, the process leads back to the initial conception of content with the consideration of audience/consumer analytics, feedback and critiques.

This priority sub-sector was selected during the validation workshop. Similarly to software development, it is a natural MSME sub-sector and it feeds on innovation. As mentioned earlier, it currently accounts for 4% of the ICT revenues in Jordan. The demand for local content provides a major opportunity to expand this proportion. In the next chapter, as above, the opportunity for localisation/Arabisation of content is discussed. There is large potential to localise content for Arab markets, which provides the growth potential to qualify digital content as a priority sub-sector.

The digital content sub-sector is evolving, both in Jordan and globally. The market is as yet underdeveloped and data is lacking in this area. In Jordan, most digital content is developed by software companies. The customisation of content (which can equal Arabisation) reinforces the opportunity for the growth in this market.

3.3.3 HEALTHTECH VERTICAL

HealthTech is a vertical market which facilitates the sustainability of hospitals and healthcare. HealthTech is driven by developing and sustaining operational efficiencies in hospitals and clinics. This has become increasingly important as the complexity of business processes within hospitals and clinics increases, thereby increasing the cost of providing healthcare services. HealthTech helps control and reduce operational expenses, increasing operational efficiencies in hospitals. This improves the competitiveness of the individual hospitals. Additionally, HealthTech is helping to separate management of hospitals from the provision of healthcare, enabling professional management to run a hospital as a business. Finally, the increasing need for electronic medical records is also driving HealthTech, as the MoH and insurance companies are requiring more comprehensive and sophisticated medical analytics, which can only be provided through ICT[112].

The value chain for HealthTech products can be generally described as follows. Through inbound logistics, technical talent that is relevant for this sub-sector – programmers, software designers, systems analysts, subject matter experts like doctors, lab technicians, pharmacists, physiotherapists, health management experts, hospital managers, etc. – obtain needed infrastructure (hardware, software, communications, space). At the operation and manufacturing level, resources are organised and directed so as to achieve the desired results. This stage involves management of staff working in this sub-sector, quality assurance, identification and validation of product or service ideas, product or service design, and the organisation of resources to develop and test. The hospitals, insurance companies, laboratories, therapists, doctors, institutions and enterprises are considered to be at the outbound logistics stage, after which come the required marketing and sales processes for the developed products. During this stage, public relations and advertising companies, software publishers, mobile communication companies, ISPs, distributors and agents, hospitals, insurance companies, doctors, companies and institutions create, communicate and deliver the enterprises' offer to the clients and partners in the HealthTech sub-sector. The after-sales service then involves distributors, agents and certified technicians whose role is to ensure that the product or service works effectively after it is sold. The value added in this sub-sector value chain comes from the margins, which are dependent on the existence of competition, the innovativeness of the product, the after-sales service, and the need served by the product.

A note on vertical markets:

Vertical markets are markets which can be served by the ICT sector. Any ICT service providers, from hardware to telecoms to content providers, can operate in vertical markets. A vertical market is thus not a value chain per se but represents the final customer of several possible ICT value chains.

In theory, any size of company can operate in vertical markets. However, in reality, they are a breeding ground of micro and small start-ups because of the innovative and customised nature of the products at this point in time. It could be that, in the future, these start-ups become large companies as the verticals mature, but for now, these are MSME opportunities.

This analysis has found that many companies claim to offer EdTech, FinTech and/or HealthTech products because they want to be considered in such fields, due to the small size of the local market. This indicates that at this point in time, the companies involved in these verticals overlap not only among the tech, but also with the software and content sub-sectors. In future, as export markets grow, specialised HealthTech, FinTech and EdTech companies are likely to emerge and grow.

112 Nielsen Games (2008): Video Gamers in Europe 2008. http://www.fi.uu.nl/publicaties/literatuur/ISFE_Consumer_Research_2008_Report_final.pdf.

Jordan's health sector has benefited not only from its pool of skilled workforce and high-quality, low-cost medical tourism segment, but also from the significant impact made by its vigorous pharmaceuticals manufacturing base, making it a regional leader in service delivery and speciality care[113]. The different HealthTech start-ups can therefore leverage the available opportunities in this sector to supply the growing needs of the country and region in HealthTech software, content and equipment to bridge the potential supply gap.

HealthTech products include electronic healthcare records, hospital facilities management, hospital and medical standard operation procedures, and healthcare customer relationship management (CRM). HealthTech products may sometimes be delivered not by HealthTech companies, but rather by software companies branching into vertical markets. For example, a company could specialise in CRM and supply and tailor products for HealthTech and other tech areas rather than specialising in HealthTech and branching into HealthTech products.

Interviews indicated a lack of use of hospital information management systems and electronic medical records systems in the Jordanian market, two key elements of today's advanced healthcare. There is also a need to establish an information centre (knowledge management centre) to consolidate information in the pharmaceutical sub-sector as well as to provide basic IT content solutions like websites and e-platforms.

3.3.4 EDTECH VERTICAL

EdTech is driven at a global level by the speed of change and the need to educate/train and re-educate/re-train quickly. Today's generation requires school curricula which are delivered in a manner which is closer to their day-to-day experiences. This means on-demand education and training which is customised to the learning curve and interests of the individual student. Additionally, EdTech, because of its ability to incorporate several types of media and content and because it uses designed course pedagogy and pre-approved educational content, can be effectively used to fill gaps between national educational requirements and existing instructor competencies.

The value chain for EdTech products can be generally described as follows. The inbound logistics stage involves gathering technical talent – programmers, software designers, system analysts, subject matter experts, course designers, pedagogy experts, teachers, etc. – and obtaining needed infrastructure (hardware, software, communications, space). The operation and manufacturing stage involves the management of staff, quality assurance, identifying and validating product or service ideas, designing the products or services, and the organisation of resources to develop and test. Software publishers, schools, universities, training centres, mobile communication companies, ISPs, shipping companies (if packaged software), physical distributors and agents then play a role, categorised within the outbound logistics component. The creation and communication of the available products and the delivery of the enterprises' offer to clients and partners are also essential for this sub-sector. The marketing and sales team involves public relations companies, advertising companies, software publishers, mobile communication companies, ISPs, distributors and agents, schools, universities and training centres. The after-sales service level includes distributors, agents and certified technicians. At this stage, the team ensures that the product or service continues to work effectively after it has been sold. The value added in this sub-sector value chain comes from the margins, which, as mentioned above are dependent on the existence of competition, the innovativeness of the product, the after-sales service, and the need served by the product.

Almost all ICT companies operating in this vertical in Jordan are MSMEs. Specific products include development and delivery of educational content using cloud computing or client server architecture, educational content management systems, and electronic testing/examination systems.

113 Oxford Business Group (2018): The Report. Jordan 2018. https://oxfordbusinessgroup.com/jordan-2018/health-education.

Similarly to HealthTech, EdTech is a new sector that is emerging and evolving. Countries like the US and China have superiority in EdTech and there are no particularly dominant companies in the sub-sector so far. If Jordan can help its education sector to understand the usefulness of and need for EdTech, for example in relation to on-demand education and training and pre-approved educational content, and maximise the potential for EdTech to address skills gaps, Jordan's ICT sector can help ensure that the country maintains its prestigious status in education.

3.3.5 FINTECH VERTICAL

The main driver of FinTech in Jordan is the new CBJ regulations as well as mobile phone penetration in society. The CBJ is trying to increase financial inclusion among citizens. Currently, 70% of Jordanians above the age of 15 do not use banks. The need to accommodate CBJ regulations has enabled many companies to develop and deploy FinTech solutions to facilitate increased financial inclusion. Furthermore, the CBJ is promoting FinTech as a means to mitigate the threats brought about by new technologies (blockchain) and technology-based products and channels such as bitcoin. Additionally, there is an international trend towards a cashless society.

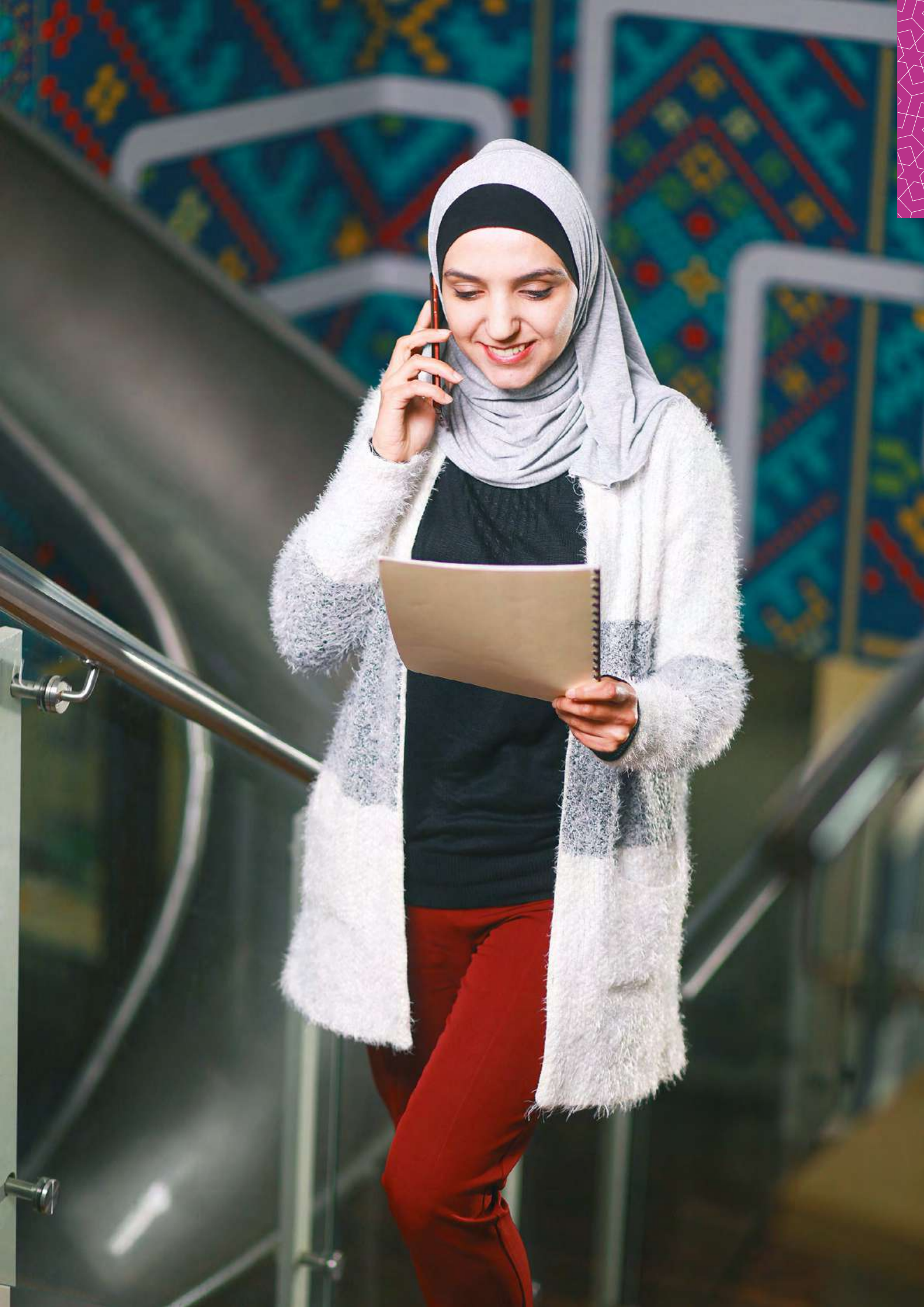
As a way of encouraging Jordanians to use electronic payments, the CBJ partnered with FinTech company Madfoo'atcom to launch eFAWATEER.com, an electronic bill presentation and payment system (EBPP) in 2015. This enabled clients to view and pay all types of bills electronically through local banking channels, including internet banking, ATMs and mobile banking[114].

The value chain for FinTech products can be generally described as follows. FinTech inbound logistics involves gathering technical talent including programmers, software designers, system analysts and subject matter experts – i.e. accountants, actuaries, auditors, bankers, cryptologists, statisticians, communication experts, etc. Operations and manufacturing seeks to organise and direct the available resources to achieve the desired result through management of staff, quality assurance, identification and validation of product or service ideas, designing the products or services and organising and managing resources to develop and test. The outbound logistics stage on the other hand is the stage in which products or services are brought to the end-user or customer with the help of banks, payment gateways, insurance companies, prepaid card companies, financial service providers, regulatory bodies, mobile communication companies and ISPs. A marketing and sales team is also available in this sub-sector value chain that ensures products are created and communicated, and deliver the enterprises' offer to clients and partners; actors include public relations companies, advertising companies, software publishers, mobile communication companies, ISPs, distributors and agents, banks, prepaid card companies, financial and investment institutions, payment gateways and insurance companies. Finally, the after-sales stage, which involves distributors, agents and certified technicians, ensures that the product or service works effectively after it is sold. Again, similarly to HealthTech and EdTech, the margins earned are dependent on the level of competition, innovativeness of the product, after-sales service, and the need served by the product.

There is currently little or no data on the status of the FinTech sub-sector in Jordan. We do know, however, that some companies are already operating in the area, as discussed during interviews. We also know that there are some regulatory challenges in the sub-sector with incentives to enter the vertical being offset by unfavourable interpretation of tax laws – this will need to be addressed in the interventions.

As described above, there is an opportunity for FinTech in Jordan due to the low current use of banks. Not only Jordan but the region in general is underbanked and FinTech solutions can provide access to banking for the population. This vertical is emerging and evolving globally but is showing much potential for MSMEs. In Ireland, one of the most developed markets for FinTech, MSMEs have been the leaders of innovation, with companies of ten people or less already exporting services to the UK and US. In a similar way, Jordan has an opportunity to become the main supplier of FinTech solutions in the Arab world.

114 Clifford Chance (2019): Fintech in the Middle East – Developments Across MENA. https://onlineservices.cliffordchance.com/online/freeDownload.action?key=OBWIbFgNhLNomwBl%2B33QzdFhRQAhp8D%2BxrIGReI2crGqLnALtlyZe0kGaWDomfCJ6c9GpgNonw%2Fp%0D%0A5mt12P8Wnx03DzsaBGwsIB3EVF8XihbSpJa3xHNE7tFeHpEbaeIf&attachmentsize=3881748.



4 CHALLENGES AND OPPORTUNITIES

Like any other sector, the ICT sector in Jordan faces many challenges but can also draw on a number of opportunities. The main challenges and opportunities are listed below and summarised in a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis at the end of the chapter. In some cases, challenges and/or opportunities are specific to a sub-sector, but they mostly apply to the ICT sector in general. However, the challenges and opportunities derived from the priority sub-sectors may not be relevant to the other sub-sectors.

4.1 CHALLENGES

The main challenges in the ICT sector in Jordan relate to its limited domestic market, business linkages, management capacity, workforce education and skills and business enabling environment.

LIMITED DOMESTIC MARKET

The limited size of the Jordan ICT market – largely concentrated in Amman – sets limits to the potential expansion of the country's domestic companies[115]. This constraint is worsened by the intensity of competition, which poses an additional challenge to ICT MSMEs. Related to these structural features of the domestic market, two further issues were raised during interviews, especially by smaller companies. First, MSMEs face difficulties in marketing solutions to bigger clients, like banks, even when they have technically good products offered at competitive prices. For example, big clients can be very demanding and slow to move, and MSMEs might need to hire extra staff or subcontractors to meet the demand of a big project. Second, these companies often have problems with receiving payment after the product or service is delivered. Smaller companies have less access to the credit and overdraft facilities enjoyed by their larger competitors. They generally need to pay the costs of a project upfront while waiting several months for payment from the client. A small country with a limited domestic market must focus on exporting to the surrounding region if it wants to be competitive and help MSMEs to grow.

115 Jordan's purchasing power parity per capita is placed 126th in the world compared with, e.g. Qatar in 2nd place, UAE 13th and Saudi Arabia 22nd, and Jordan is only 88th in the world in terms of overall country purchasing power. CIA The World Factbook: Country Comparison – GDP per Capita (PPP). https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html; Index mundi: Country Comparison – GDP (purchasing power parity). https://www.indexmundi.com/g/r.aspx?v=65.

BUSINESS LINKAGES

Challenges in business linkages are those related to linking operators along the value chain. Interviewees and desk research revealed the lack of collaboration between MSMEs, poor marketing of ICT products/services, poor promotion of Jordanian products both by government and individual companies and poor knowledge of and access to regional and international markets. Strategic interventions need to bring buyers and sellers together and facilitate MSMEs to access customers at home and abroad.

Another linkage gap in the market is in access to finance. Despite availability of funding, there is a mismatch between traditional banking credit operations and requirements, which are designed for larger corporations, and the majority of Jordanian potential borrowers, who are mostly MSME owners. Furthermore, MSMEs often have poor financial literacy and are often unaware of the financing available, the financing that is best for their needs (e.g. debt or equity) and where to get that finance. MSMEs that are not well connected and do not have access to other stakeholders along their value chains will find it difficult to improve their product offerings and market share. This is less of a challenge for larger companies, as suppliers and customers tend to find them.

WEAKNESSES IN MANAGEMENT CAPACITY

Many ICT MSMEs are managed by engineers and technical graduates (software developers, etc.), who have little knowledge of management or the components of management (accounting, finance, marketing, communications, etc.). These individuals do not necessarily know how to make use of the many programmes which exist in Jordan to assist MSMEs. They have little understanding of the role of HR management as a strategic skill and make little effort to design and develop career paths for employees. They also have a lack of ability to identify trends and their implications for enterprise and business, and have little knowledge of export opportunities and requirements. In addition to these weaknesses, managers sometimes have language limitations (English) that may hinder exports outside of the Arab world. Weak management capacity of MSMEs will hinder their ability to grow their companies and markets successfully.

GAPS IN WORKFORCE EDUCATION AND SKILLS

At the workforce skills level, although basic skills exist, there is a need to improve quality assurance and control abilities and product development skills, as well as the ability to access certification. There is poor linkage between education and training and the ICT industry, and curricula are often not current. In general, the Jordanian workforce has a poor attitude towards lifelong learning, little knowledge on innovation and creative thinking and poor communication and interpersonal skills. Gaps in workforce education and skills directly affect product quality and the ability to provide new products that meet the needs of markets both in Jordan and abroad.

BUSINESS ENABLING ENVIRONMENT WEAKNESSES

Although Jordan enjoys an existing regulatory framework for ICT, a number of aspects of the business enabling environment need to be improved. These include weak government support to the sector and its policy framework, poor sector governance, weak institutions and linkages, and red tape.

Government support and policy/legal framework: The government is criticised for its inability to recognise and assist innovative start-ups, and MSMEs are not supported to connect with investors as there is no clear policy to attract investment. The REACH 2025 document was developed for the MoICT and int@j but the action plan has not been fully implemented. Furthermore, there is a poor regulatory framework for encouraging innovation and R&D, IP laws need to be improved, and the application of some regulations for MSMEs is unfavourable and can render businesses regionally uncompetitive. Although the laws themselves are not necessarily bad for business, the manner in which government interprets and applies laws is often counter to the intention of the laws themselves. Strong enforcement of IP rights and support in valuing IP is required so that companies can use IP as collateral for loans or sell the company at an appropriate value. The public has also not been sensitised about IP.

Political instability and the refugee crisis also means that government changes regulations frequently to address public budget deficit, focusing on government cash flow rather than cost reduction and competitiveness. In the case of FinTech, there are incentives to enter the sub-sector, but the banking sector is highly taxed; therefore, if a FinTech company comes to be classified as a financial services company, it is difficult to be profitable in the long term, so these early incentives are not sustainable.

Government also needs to support the ICT sector with data. int@j's efforts are a good start, but the verticals represent relatively new sub-sectors, both internationally and in Jordan, and so trends will take a while to appear. If Jordan wishes to excel in these areas, it needs to look at gathering data and following trends locally and internationally.

Sector governance: There is poor monitoring and evaluation of government performance, cost management, job creation, FDI, Domestic Direct Investment, exports and export growth. In addition to this, there is poor awareness of the tax exemptions in the sector. This affects MSMEs in particular as they are less likely to hire large accounting firms which have all the information.

Weak institutions and linkages: The main challenge of the institutional set-up is that there are numerous players with numerous, varying and often overlapping mandates. Often, these institutions were created to address specific challenges facing the sector without taking stock of ICT sector needs in a holistic manner and without identifying which bodies were already doing what. The result is that instead of having a well-integrated eco-system, the players often collide and compete for governmental and donor funding. Thus, the sustainability of individual institutions is often related to their ability to obtain funding, not their ability to provide needed services to the eco-system at the appropriate stage of enterprise development. This means that the current institutional arrangements in the Jordanian ICT sector are not strong enough to meet the needs of the sector's MSMEs in particular, which rely on institutions for representation, advocacy and information, among other things. Private sector associations also need more support, for example in helping MSMEs acquire international certification.

Red tape: Customs procedures are unclear and tax clearance is a lengthy process; tax regulations are open to creative interpretation by the tax department and tax officials are incentivised to generate income from penalties and fines.

The implications of weaknesses in the business environment are collective. If the sector cannot be competitive due to lack of government support, unfavourable regulation, weak institutional arrangements, poor sector governance and red tape, it will not be able to grow exports and attract either foreign or domestic investment.

4.2 OPPORTUNITIES FOR THE JORDANIAN ICT SECTOR

Several market opportunities have been identified for Jordanian ICT MSMEs. Some of them are also cited as challenges, e.g. HR, access to export markets, but this shows that competitive advantage emerges from overcoming the hurdles. Six main opportunities are identified for ICT MSMEs in the country: Jordan already has some experience in ICT; Jordan has access to lucrative regional markets; Jordan is also exporting to international anglophone markets; Jordan has advanced and reliable infrastructure; core skills are strong in the selected vertical markets; and there is a strong opportunity for Arabic-language content in the region.

JORDAN ALREADY HAS EXPERIENCE AND STRENGTHS IN THE ICT SECTOR

Although there is some way to go, Jordan's ICT sector already exists and despite some challenges there is already a relatively strong regulatory environment in place. One of its strengths is the qualifications and technical skills of ICT professionals in Jordan. This was reported during many conversations with stakeholders and companies. Some companies have gained international reputation in specific fields, for example ProgressSoft in payment systems and IrisGuard in iris recognition technology. Furthermore, Jordan is considered to have a high rate of entrepreneurship relative to the region, which enhances the ICT sector's ability to thrive, and there is ongoing new product development and innovation. Jordan can build on these existing strengths and experience.

REGIONAL MARKETS

Jordanian ICT companies, including MSMEs, face almost no cultural or language barriers entering neighbouring markets. Jordan has a strong strategic geographic location in the centre of the Middle East and has good relations with the majority of these countries. This indicates good opportunities for export to these markets. Jordan is also one of the region's most open economies to trade and foreign participation; taxation has become relatively favourable. The verticals have particular opportunities in the regional markets as outlined in the previous chapter. Opportunity for FinTech resides in the very low penetration of bank accounts in the region. FinTech solutions can provide alternatives to classic banking. Opportunities for HealthTech and EdTech are reflected in the foreign market analysis in chapter 2, particularly in relation to Saudi Arabia and the UAE where demand and policy are driving the health and education markets.

INTERNATIONAL MARKETS

English is well spoken in Jordan, especially by the staff of ICT companies. Many of the contacted representatives of companies informed the researchers that they had studied abroad, the majority in North America (US and Canada) and others in Europe. Many of them still maintain a relationship with these countries, which facilitates doing business with these markets. Jordan's diaspora is another source of good contacts to be explored.

There is also an opportunity for Jordanian companies to fill labour gaps in more developed countries. German companies could outsource programming, for example, to MSMEs in Jordan. Not only would Jordanian MSMEs thus gain clients and grow, but they could learn from the management skills of international companies.

Furthermore, Jordan has established international trade agreements to develop business with other countries. Free trade agreements (FTAs) for goods and services exist between Jordan and the US, Singapore, the European Free Trade Association and the EU; Jordan is also a signatory of the Greater Arab Free Trade Agreement (GAFTA), which comprises 22 countries, and the Agadir agreement with Morocco, Egypt and Tunisia. ICT goods and services are covered by these agreements. For MSMEs, FTAs are important not only because of pricing implications but also because of the cost savings in the administration of tariff and customs procedures in international markets.

To maximise the opportunities in international markets for MSMEs, the challenges related to business linkages need to be addressed.

INFRASTRUCTURE

Jordan has good ICT infrastructure, especially since the liberalisation of the telecom sector started in 1999. Statistically, mobile phone and internet penetration is 100% of the population. This enables the development and implementation of ICT solutions. The young population is open both to new technologies and use of the existing ICT infrastructure, creating a dynamic sector on both the offer and the demand side. Relevant educational institutions and training providers are also in place.

SKILLS AND VERTICALS

Jordan's ICT sector is not competitive when it comes to costs, in comparison with countries like India, some eastern Europe countries, or even Egypt. Neither can it compete on quantity. Therefore, it has to explore its competitive advantage in services with higher value added. These specialisations could include software architecture, quality assurance and technical writing.

It also has to focus on specific and narrow market niches. Focusing on HealthTech, EdTech and FinTech will help Jordanian companies build expertise in verticals where the sectors are already advanced and demonstrate superior skillsets. The increasing complexity and costs in vertical markets can be mitigated using ICT solutions, which provides an excellent entry point for ICT innovators.

ARABISATION/LOCALISATION

Many Jordanian companies conduct "Arabisation" of software and solutions. Arabisation means the development of ICT products in the Arabic language and for Arab cultures. This includes not only translating internationally successful products into the Arabic language, but also adapting content to the Arab context. There are also simple activities of Arabisation, such as translation of products to the Arab market with minor adaptations for international clients, without owning the IP. Concerning audio products, the Jordanian dialect is well accepted in many countries, which presents an advantage for activity in this area.

Arabisation means preparing content not only for the Middle East, but also for the Arab community and consumers all over the world. Some industry staff claim that the majority of worldwide Arab content is generated in Jordan.

SWOT ANALYSIS

The Jordanian ICT sector's strengths, weaknesses, opportunities and threats have been reflected in the sub-sections on opportunities and challenges above; they are summarised in the following figure. Although some points are specific to individual priority sub-sectors, the study found that most of the opportunities and challenges applied to all. Note, however, that the study has focused on points relating to the priority sub-sectors and verticals; for example, challenges more relevant to the telecommunications sub-sector are not apparent.

Figure 23: **SWOT analysis on Jordan's ICT sector**[116]

STRENGTHS

- Jordan already has experience in the ICT/ICT-ES sector
- There is already a relatively strong regulatory framework for the ICT sector
- Jordan is one of the region's most open economies to trade and foreign participation; taxation in the sector has become relatively favourable
- Jordan is considered to have a relatively high rate of entrepreneurship for the region
- Strong strategic geographic location in the centre of the Middle East and good relations with most of the region
- Arabisation: a majority of worldwide Arab content is generated in Jordan
- Major export markets are Gulf Cooperation Council (GCC) countries and the US; well-spoken English
- Success stories: IrisGuard and ProgressSoft
- ICT skills are already existing and developed and there is a steady flow of ICT graduates

WEAKNESSES

- Bureaucratic hurdles
- Limited domestic market
- Relative mismatch between outputs of capacity-building institutions and industry requirements
- Relatively low level of R&D by global standards
- Higher company costs relative to competing countries like India and much of eastern Europe
- Low capacity in marketing solutions to bigger clients like banks
- Low customer understanding of use or usefulness of ICT products and services
- Weak strategic management skills (business planning, marketing, human resources)
- Limited focus on the provision EdTech software and content in schools
- Limited availability of information and statistics
- Low access to finance
- Weak business linkages

OPPORTUNITIES

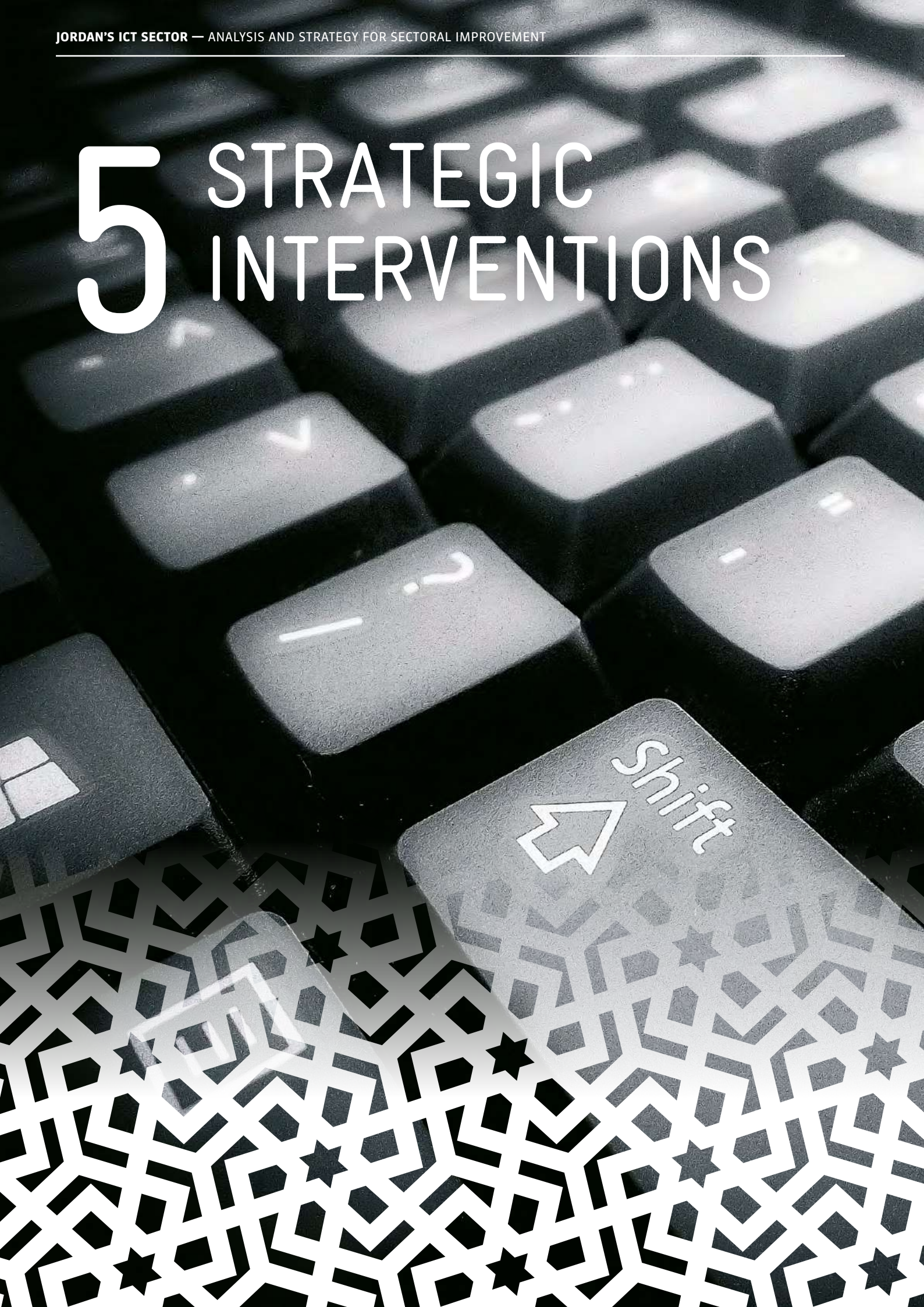
- Well-established vertical markets (Health, Education, Financial).
- ICT solutions can mitigate increasing complexity and costs in vertical markets
- Access to regional and international markets, including signed FTAs with considerable number of countries
- Relevant educational and training providers
- Global trend towards e-commerce and cashless economies
- Existing mobile and terrestrial networks to distribute Jordanian-generated content
- Availability of FinTech products that can be used by banks
- Many Jordanian sectors are increasingly employing ICT and ICT-ES solutions
- Large youth population in the region
- Increased ICT penetration regionally
- CBJ intends to improve financial inclusion. Fintech can facilitate this
- Large international market for ICT
- Little capital investment is required for content and software start-ups
- Excess demand for Arabic content
- Falling prices of telecommunications

THREATS

- Regional competition in content (Arabic), HealthTech and EdTech in GCC countries can hinder market entry
- Low disposable income in the Arabic-speaking world
- Heavy international competition in FinTech
- Jordan is over-reliant on foreign aid
- Government bureaucracy hinders procurement and other business processes
- "Brain drain" due to difficulty in retaining national human capital and opportunities available abroad
- Jordanian companies cannot compete on costs or quantity with other countries like India and Egypt
- Healthcare and education verticals have low financial resources
- The current weak local economy can make investment difficult

116 This SWOT analysis was based on qualitative interviews and int@j's evaluation of the ICT sector. int@j (2012): Jordan ICT Sector Profile. Analysis, Achievements, Aspirations. http://inform.gov.jo/Portals/0/Report%20PDFs/6.%20Infrastructure%20&%20Utilities/ii.%20ICT/2012%20INTAJ-ICT%20Sector%20Profile.pdf.

5 STRATEGIC INTERVENTIONS



Based on the overall sector analysis and identification of sub-sector priorities, objectives must be defined for the sector. The following objectives should be realised in order to foster employment-oriented MSME promotion in the ICT/ICT-ES sector in Jordan:

- Improve enterprises' competitiveness in the ICT/ICT-ES sector by improving MSME organisational/management capacity and support the capacity of meso-level organisations.
- Enhance competences of ICT/ICT-ES-sector MSMEs, employment and decent work by building workforce education and skills.
- Improve the business climate through policy development and institutional support.

The interventions address the observed key factors affecting MSMEs' performance and competitiveness in the ICT/ICT-ES sector with a focus on innovation, capacity building and finding common grounds for collaboration; they also highlight the role of the government in terms of the policy, regulatory and business enabling environment, and the importance of bringing stakeholders together and supporting MSMEs' ability to access markets. By implementing these interventions, Jordan can move closer to being an ICT gateway for the region.

Based on the challenges and opportunities outlined, the above key objectives were identified. For each of the objectives, a set of strategic interventions was developed. The strategic interventions are listed here and the tables in the next pages outline suggested activities for each intervention.

Creation of an enterprise development map, which would specify the types of services and inputs normally required at various stages of enterprise and entrepreneur/management development and where these services can be found within the Jordanian eco-system, would be of great utility for enterprises and business owners (entrepreneurs) in navigating the complex landscape of opportunities.

The interventions are sometimes specific to verticals but mostly relevant to the entire ICT sector, as the challenges and opportunities are cross-cutting. Therefore, the successful implementation of the interventions will positively affect not only the priority sub-sectors and verticals but also other sub-sectors such as gaming and hardware and other vertical markets such as transport and e-government.

5.1 IMPROVING MSMEs' COMPETITIVENESS IN THE ICT SECTOR

To address the challenges related to management capacity and business linkages, the following interventions were developed.

IMPLEMENT SPECIALISED TECHNICAL ASSISTANCE PROGRAMMES FOR MSME SUPPORT SCHEMES

This intervention would create a platform to extend specialised technical support to the various types of ICT MSMEs and/or their associations. With the support of international development partners, this platform could take the form of a Business Consulting Unit that MSMEs could approach for technical support in a specific business area they identify, e.g. operations, financial planning, product development, strategic planning, human resources and export. This could address the challenge of weak management capacity in MSMEs and poor linkages along the value chain. The first step would be setting up a multi-stakeholder platform or committee to govern the Business Consulting Unit, followed by assessment and feasibility studies, strategy development, establishment and implementation.

The Business Consulting Unit could address the issue of poor data by using data and market intelligence to support MSMEs' planning and decision-making.

MSMEs and associations need information and data that can help them with demand/customer-oriented planning, product development sales and marketing. This need could be served by setting up an ICT value chain information system/observatory to be fed by authorities and associations and used by all stakeholders for data collection, knowledge management and dissemination, and to promote communication/interaction between chain stakeholders. This intervention addresses the challenges of poor management, inadequate marketing capacity, limited access to markets and business linkages.

The Unit could also seek to harmonise the findings of different studies and ensure consistent information and data for the sector.

IDENTIFY AND SUPPORT MSMEs IN INNOVATION, EMPOWER EXISTING INCUBATORS AND PROMOTE THE CREATION OF NEW ONES

The idea here is to create a mechanism to identify and engage with start-ups or existing businesses that have innovative business ideas that provide value-added and sustainable solutions for Jordan's ICT sector. Existing lending platforms can be utilised as means of accessing innovative concepts and business ideas. Also, the demand for business incubators is higher than the supply, even after filtering out the start-ups. Sub-sector- or vertical-specific business incubators have proven to be of high value but they need more support to offer value-added services to MSMEs. This will help to address the challenges of lack of support for innovation.

At the beginning it would make sense to support single incubators specialising in FinTech, HealthTech and EdTech, respectively, and at least one supporting software and content, while supporting general ICT incubators in all governorates.

ENHANCE ICT PRODUCTS/ SERVICES QUALITY AND STANDARD DEVELOPMENT PROGRAMMES

This can be achieved by developing a programme with various instruments designed for Jordanian ICT with the aim of systematically promoting and securing on-going quality and standard development of ICT MSMEs, including support in acquiring international certification. The programme's objective would be to improve the overall quality of products and services within the ICT industry and access to international and domestic markets. This will help to address the challenges of quality and certification. The provision of incentives such as tax holidays for start-ups and incubators that host MSMEs in this sector, putting in place a private sector institution that is in charge of certification and advocacy for these MSMEs, and the provision of business development services for MSMEs in terms of compliance with standards, could contribute to sustainability in this case.

MICRO-LEVEL MARKETING: FACILITATE DEMAND-DRIVEN BUSINESS LINKAGES AND BUILD COOPERATION AND BUSINESS TIES THROUGH CONFERENCES, TRADE FAIRS AND NETWORKING

To address the major challenge in business linkages for MSMEs in Jordan, exports of MSME ICT products and services should be improved by supporting MSMEs with information and marketing to respond to the demand requirements (regional and international); sustaining and enhancing existing e-portals that promote ICT products and services; organising technical conferences/support events on topics such as digitalisation, new technologies and practices, access to finance, risk and business continuation management, manpower and skills requirements and service quality, to better emphasise internal marketing for knowledge sharing; and organising regional events/fairs/workshops for the prioritised sub-sectors and verticals in Jordan to raise awareness of Jordanian products and services and create new business linkages.

A strategy should also be developed to plan for trade fairs and conferences both in Jordan and abroad, exhibiting and visiting depending on relevance and suitability. Based on the strategy, int@j should increase participation in international trade shows, fairs and exhibitions, to highlight ICT priority sub-sectors and promote Jordanian ICT products and services. Government-sponsored branded int@j exhibition stands can allow for the promotion of Jordan but also allow Jordanian MSMEs to promote products and services under this umbrella, enabling trade contacts and relations to be developed.

In addition to commercial business linkages, activities should create opportunities to bring MSMEs and potential investors together to exchange views and establish social networks. Investors should learn of MSME potential and MSMEs should learn about investor needs and motivation.

In the case of EdTech, a special intervention is needed to link EdTech providers with education providers, sponsoring delegations to meet education providers in Jordan and regional markets of high potential, promoting customised and relevant product offerings. This approach could also be used for the HealthTech and FinTech verticals if considered relevant.

This intervention can address the challenges of access to finance, business linkages, market linkages,

marketing and export challenges and investment promotion challenges that are currently faced in the Jordanian ICT sector.

PROMOTE MSME ACCESS TO LOCAL AND INTERNATIONAL ICT DEMAND THROUGH DIGITAL MARKETING

MSMEs should be helped to communicate their services to local and international clients through digital means, for example attracting clients to websites through SEO, online advertising and content creation for social media. This would involve supporting ICT MSMEs, ideally through a combination of training and one-to-one coaching, to help them understand digital marketing and develop marketing communications strategies. This intervention will address the challenge of limited product development and marketing.

MACRO-LEVEL MARKETING: PROMOTE SUB-SECTORS' AND VERTICALS' ACCESS TO LOCAL AND INTERNATIONAL DEMAND

Promoting Jordanian ICT products collectively is the role of the Jordanian government and private sector representation. However, int@j, the JCS and other organisations will need financial support from the government to carry out such activities. Macro-level marketing requires establishing an identity for the ICT sector in Jordan (for example as a regional gateway for ICT) on a global level, stimulating the market and promoting the diversity of Jordan's product offering for the prioritised sub-sectors and verticals. It should also aim at increasing the understanding of priority customer segments of ICT products. This intervention addresses the challenge of limited access to markets and poor customer understanding.

Within these interventions, strategic marketing plans should be developed respectively for the FinTech, HealthTech and EdTech sub-sectors, with a focus on regional markets.

PROMOTION OF THE VERTICALS/TECH MARKETS

Supporting the improvement of, e.g. academic curricula in hospital management to reflect modern management and ICT systems and partnership between verticals and the respective sectors will address the challenge of customer understanding of products. Because these markets are underdeveloped, a key success factor will be partnership along the value chain. Techs companies/ verticals and the relevant sectors need to work together through joint investment and/or contractual arrangements (formal or informal) to understand the needs of the sector and end-customers and to develop relevant and useful products for these markets. Success in this area in Jordan will build experience and pave the way for future exports.

Improving MSMEs' competitiveness in the ICT sector

Intervention 1.1 Implement specialised technical assistance programmes for MSME support schemes

(SHORT / MEDIUM / LONG TERM)

Activities

- Establish a Business Consulting Unit to provide demand-driven technical assistance to MSMEs in the ICT sector. Sub-activities are:
  - Set up or use an existing multi-stakeholder platform comprising public and private sector actors, academic institutions, development partners and NGOs to govern the development of a technical assistance strategy and design and scope the Business Consulting Unit
  - Deploy technical resources and advisors within the Business Consulting Unit
- Use data and market intelligence to support MSMEs' planning and decision-making
  - Initiate new market-targeted studies that are sub-sector-specific to study trends and growth per sub-sector/vertical. Produce reports for the software, content, FinTech, HealthTech and EdTech sub-sectors
  - Harmonise data and information from existing studies
  - Set up an Information Systems (IS) tool (i.e. ICT observatory) to be fed by authorities and associations and used by all ICT stakeholders for data collection, knowledge management and dissemination, and to promote communication/interaction between chain stakeholders (based on MSME information needs)

Partners
Development partners, MoICT, ICT associations, DoS, research institutes, donors, private sector

Target
MSME

Intervention 1.2 Identify and support MSMEs in innovation, empower existing incubators and promote the creation of new ones

(SHORT / MEDIUM / LONG TERM)

Activities

- Establish new ICT start-up competitions in the different governorates to identify innovative ICT MSMEs
- Set up a programme to support innovative start-ups, providing mentoring in new product development, business planning and marketing, and provide platforms to promote business solutions (see also 1.4)
- Establish partnerships with lending institutes to adopt and support innovative business ideas
- Support new and/or existing sub-sector-specific business incubators for prioritised sub-sectors and techs/verticals in Amman and cross-cutting incubators in all governorates
- Boost incubators to offer essential services for start-ups (such as legal counselling, accounting, bookkeeping, financial auditing, tax advisory, human resources counselling, long-term mentoring) and advanced services (such as business plan development and update assistance, marketing plan development and update assistance, industry and market trend/demographic research, access to finance support)

Partners
Donor agencies, lending agencies, investment funds, MoICT, associations, private sector, incubators

Target
on micro and small

Intervention 1.3 Enhance ICT products/services quality and standard development programmes

(MEDIUM / LONG TERM)

Activities

- Incentivise start-ups and incubators that provide business development services and advocacy for standard certification and compliance, particularly organisations that can provide certification and training
- Promote adherence to international quality and process improvement programmes like CMMI and ISO 9000 for software development, ensuring MSMEs are supported to access the standards relevant to the sub-sectors and verticals
- Help existing certified MSMEs maintain and further enhance their current quality (pass from a certain certification level into a higher level)
- Through the Business Consulting Unit, support MSMEs to establish a monitoring and complaints systems to continuously analyse demand and customer satisfaction with delivered services

Partners
MoICT, MoH, Ministry of Education, CBJ, sector associations, development partners

Target
All MSMEs

Intervention 1.4 Promote Jordanian ICT MSMEs and establish business linkages for domestic and export sales

(SHORT / MEDIUM / LONG TERM)

Activities

- Develop marketing communications strategies for sub-sectors and verticals to promote Jordanian ICT service providers. This can include producing short videos profiling sub-sectors and verticals and developing information campaigns and promotional materials to explain ICT offerings to priority customer segments for each sub-sector and vertical
- Establish links between international distributors, international system integrators, regional and international channel partners and regional government authorities and the Jordanian ICT industry, and hire export accelerators in targeted export markets
  - Make a strategic plan for hosting and attending trade fairs, conferences and events. Events planned in Jordan should seek to coincide with other events that attract target clients and investors to the region. International trade fairs, conferences and events relevant to the sub-sectors and verticals include GITEX, conhIT and the MWC, among others. Events should be supported with targeted PR activities to attract the right MSMEs and buyers. Existing product lines with potential for export should be identified and market analysis-driven feedback provided on product and service requirements
  - Create sub-sector steering committees. The committees together with int@j, the JCS and the MoICT can organise events/fairs/workshops based on the strategic plan
  - Organise sub-sector and tech-specific matchmaking events and themed events for Jordanian ICT MSMEs to meet potential buyers, particularly in the region
- Support MSMEs to develop marketing communications strategies to promote their enterprises, encouraging the use of content in social media and digital marketing platforms; enhance existing online promotion platforms, ensure regular updates and offer further functionalities (interaction functionalities, e-commerce…)
- Support the HealthTech, FinTech and EdTech sub-sectors to engage with the respective sectors both in Jordan and regional markets by sponsoring delegations to visit sector representatives (e.g. education ministries, financial services associations, hospital associations, MoH) to explain the ICT solutions and discuss market needs with a view to developing customised offerings

Partners
MoICT, MoFA, chambers, int@j, JCS, associations, private sector, incubators, Techs, sub-sector committees

Target
All, focus on MSMEs

Intervention 1.5 Sub-sector-specific: develop markets

(MEDIUM TERM)

Activities

- Encourage partnerships between healthcare organisations/education sector/banking sector and Techs, by facilitating roundtable discussions and partnership in product development
- HealthTech: Support the modernisation of the hospital management curriculum to reflect ICT by integrating international best practices
- Encourage partnership in the development of industry-specific products such as a knowledge centre for the pharmaceutical industry. This could comprise public–private or private–private partnerships that ensure the best combination of sector-specific and ICT knowledge to tailor-make the right products, either through joint investment or contractual working arrangements

Partners
Private sector, HealthTech, MoH, PHA, JHA, academia, Ministry of Education, banking sector, international partners

Target
MSME

5.2 ENHANCING COMPETENCES OF ICT MSMEs AND EMPLOYMENT

The following interventions will address the challenges of insufficient workforce education and skills.

ENCOURAGE PARTNERSHIPS/ CLUSTERING AMONG AND WITH MSMEs, SECTOR SPECIALISTS, RESEARCH INSTITUTES AND ACADEMIA

Promoting cooperation of MSMEs with sector specialists such as financial institutions (for FinTech), research institutes and academics will enable them to gather ICT information, disseminate technological results in ICT and apply them in their ICT operations. This will address the challenge of lack of linkages between universities and industry and workforce development.

To establish linkages between the education sector and industry, academic curricula should be adapted to MSME needs, making it easier for MSMEs to find employees. The ICT-NSSC should be central to this process. The ICT-NSSC comprises representatives of government, employers, academia and the workforce; it aims to match supply and demand on the labour market by maintaining a Labour Market Intelligence System (LMIS), match skills supply and demand, advocate for improvements in the technical and vocational education and training (TVET) sector, and monitor and evaluate progress.

CONDUCT TRAINING NEEDS ANALYSIS OF MSMEs CONSIDERING REGIONAL AND LOCAL REQUIREMENTS

Before developing capacity-building programmes, it is necessary to carry out an analysis of the needs and conditions for training and development and the labour demand of the ICT market. The overall training needs analysis should be prepared in light of the current needs as well as projected growth and development. Training needs could include leadership and project management skills; specialised technical training such as mobile development and IT security; soft skills training such as time management, teamwork and presentations skills; and language training, e.g. for business English. The analysis should be governed by the ICT-NCCS. This will address the challenge of inappropriate education and skills and the lack of an updated curriculum for the sector.

CAPACITY-BUILDING PROGRAMMES WITHIN THE SPECIALISED TECHNICAL ASSISTANCE PROGRAMMES FOR MSMEs

Market-based approaches for capacity-building programmes should be established and developed through key institutions, such as associations, to secure sustainability of measures. Depending on the training needs identified, management and leadership skills (e.g. marketing, project management) training should be provided to MSMEs to help them to grow, as well as to ICT personnel to help them secure better jobs. Training programmes to address immediate training needs already identified/known by the sector to serve the emerging needs of the industry could also be provided. This will address the challenge of absence of soft skills and language limitations in the sector.

Enhancing competences of ICT MSMEs and employment

Intervention 2.1 Encourage competence building through partnership of MSMEs, sector specialists, research institutes and academia

(SHORT / MEDIUM / LONG TERM)

Activities

- Provide technical assistance to ICT-NSSC in linking and strengthening the partnership between the private sector and academia, so that the skills transferred to students meet the requirements of the market
- Support ICT-NSSC to conduct necessary research related to competence/capacity building at MSME level: checking ICT MSME skills needs, and following current trends in leading ICT countries such as Germany, the UK, the US, China, Ireland, Norway and Switzerland
- Conduct ICT awareness campaigns and work with academia in order to prepare a more digitally aware workforce of the future, i.e. involve ICT experts when developing curricula, making sure that the content and software that will be used in schools do not contradict the existing curricula
- Support education providers to adapt curricula to industry needs and international benchmarks
- Encourage academia to contract subject matter experts to give classes to their students
- Promote and facilitate exchange and internship programmes between universities and ICT MSMEs

Partners
ICT-NSSC, research institutes, academia, private sector, subject matter specialists, development partners

Target
Large and MSME

Intervention 2.2 Conduct training needs analysis of MSMEs considering regional and local requirements

(SHORT / MEDIUM TERM)

Activities

- Conduct a market workforce gap analysis to identify training enhancement needs
- Assess viability of TVET and other ICT training programmes to respond to market needs assessment
- Carry out a rapid training needs assessment for key ICT personnel, particularly for identified key MSMEs
- Support key institutions in curriculum development to address the needs of the ICT industry

Partners
Ministry of Labour, Ministry of Education, Ministry of Tourism and Antiquities (MoTA), associations, VTCs/schools, universities

Target
MSME

Intervention 2.3 Capacity-building programmes within specialised technical assistance programmes for MSMEs

(SHORT / MEDIUM TERM)

Activities

- Develop training modules and seminars with tailored materials that meet local needs
- Conduct specialised management training and seminars based on modules developed in, e.g. leadership, agile project management, marketing planning, digital marketing, access to finance, product development, strategic thinking, Six Sigma, lean management, export-readiness assessments
- Conduct specialised technical training and seminars based on modules developed in, e.g. analytics and AI, R and Python, user experience, mobile development (Android and iOS), agile development, SCRUM, IT security
- Conduct soft skills training in, e.g. critical thinking, time management, communication, teamwork, problem solving, governance, presentation, negotiation
- Carry out mentoring programmes, learning groups, visits to best-practice companies (local and international)
- Conduct language training in business English

Partners
Development partners, associations, training providers

Target
MSMEs

5.3 IMPROVING THE BUSINESS CLIMATE FOR MSMEs IN THE ICT SECTOR THROUGH POLICY AND INSTITUTIONAL DEVELOPMENT

The following interventions should support the improvement of the business enabling environment by enhancing the policy and institutional framework.

IMPROVE ICT MSME LEGISLATIVE AND POLICY FRAMEWORK

This intervention should start with an assessment of the policy framework for ICT, the priority sub-sectors and verticals, taking into account the needs of MSMEs in particular. It should identify which laws are relevant to the ICT sector and evaluate their effect, areas for improvement and policy gaps, comparing with international best practice. It should be ensured that the policy and legal framework puts Jordan in a competitive position regionally. Aspects of the legal framework that could affect the sector negatively or positively include licensing, e-commerce laws, domestic businesses law, investment law and IP law, among others. Following the assessment, adjustments can then be made to policy, legislation and regulations for the ICT sector taking into consideration the specific needs of MSMEs, market requirements and the need to encourage start-ups in priority sub-sectors and verticals. Laws and regulations should further protect IP rights and encourage competition in all sectors. This should support the ability of ICT companies to commercialise/monetise their IP. This would mean that ICT companies could use IP as collateral for loans or for attracting investment, and incorporate IP in their evaluations of companies being sold. Policy improvement should seek also to reduce government red tape. There are ongoing efforts by a group of industry leaders and stakeholders to advocate for the legal framework for start-ups setting out a clear, unified definition of start-ups; incentives; and support mechanisms. This group should be consulted to check progress and align advocacy strategies.

RECONSIDER TAXATION SYSTEM FOR BUSINESSES

Stability is required in legislation and programmes, especially the taxation system, in order not to push investments away. Businesses say profits are shrinking and many are considering moving to other countries. The taxation system needs to be reviewed and adjustments made to ensure policy is attractive to ICT MSMEs and investors; these adjustments should relate to the issue of changing and unstable tax rates, which inhibit the ability of Jordanian enterprises to plan or develop business models, rather than the tax rates themselves. In the case of FinTech, tax incentives need to be reviewed to ensure that companies are incentivised to stay in the sub-sector.

ENHANCE CUSTOMS PROCESSES AND PROCEDURES AND PROCESSING TIME

Customs processes and procedures should be enhanced in order to permit technology, especially cutting-edge technology, to enter Jordan in a timely manner with clear processes and procedures to follow.

STRENGTHEN THE INSTITUTIONAL CAPACITY OF EXISTING PRIVATE SECTOR ASSOCIATIONS AND GOVERNMENT BODIES

This intervention aims to address the challenges of lack of support to and by associations and institutions and the weak institutional framework by supporting the strengthening of private sector associations such as int@j, the JCS and the Open Source Society in strategic business development, as well as improved services for MSME members in terms of advocacy and lobbying, products and services, marketing and outreach, and training. These measures should also be extended to support associations relevant to particular sub-sectors and verticals such as the PHA. Finally, support should be provided to the MoICT and ICTAC in institutional development to enhance capacity to support MSMEs, public–private dialogue (PPD) and inter-institutional cooperation in the ICT sector.

ENCOURAGE PPD TO IMPROVE THE BUSINESS ENVIRONMENT FOR MSMES IN THE ICT SECTOR

ICTAC provides the ideal platform for PPD. It and other existing PPD platforms should be supported to address business environment issues for the ICT sector as a whole and in relation to specific sub-sectors/topics. A cluster approach will assist in increasing ICT through building an informal private-sector-driven partnership structure in close cooperation with the public sector.

SUB-SECTOR-SPECIFIC: EDTECH

Encourage advocacy and PPD for the development of the EdTech sector to address the lack of business linkages.

SUB-SECTOR-SPECIFIC: HEALTHTECH

Support the PHA and Jordan Hospitals Associations (JHA) to advocate for HealthTech and engage in PPD.

SUB-SECTOR-SPECIFIC: FINTECH

Support PPD to resolve high taxation of established FinTechs and other issues that arise.

ENHANCE THE CAPACITY OF AUTHORITIES TO PROMOTE AND ATTRACT INVESTMENT IN THE ICT ECONOMY TARGETED AT MSMEs

This can be achieved by promoting investment in Jordanian companies and providing direct support to potential investors and MSMEs in the ICT economy, using existing investment promotion policies as the starting point together with relevant information on development plans in selected locations; arrangements should also be made for the provision of support and financial services (micro credit, matching grants, capital attracted through joint ventures) to enable MSMEs to make required investments. R&D should also be encouraged through grants and subsidies, and technical assistance should be provided to support the functioning of the JIC and the MoICT in investment promotion for ICT. These measures will address the challenges related to investment promotion in the ICT sector in Jordan.

FACILITATE LINKAGES AND ACCESS TO FINANCE FOR THE ICT SECTOR

In order to address access to finance issues, financial support and incentive schemes should be introduced by government to respond to MSMEs' requirements. This means introducing subsidy and incentive schemes for MSMEs to foster the business climate of the sector. For example, the incentivisation/subsidisation of national hosting costs should be made obligatory for some Techs. Any incentive scheme should consider the needs of all company sizes.

Furthermore, the information gap between available financing institutions/government incentives and MSMEs/start-ups needs to be addressed. Although lots of improvements have been made, thanks to the momentum of several international development partners' projects that have supported access to finance initiatives, and the existence of national lending institutions/programmes, there is still potential for further advocacy and facilitation of access to finance transactions. A major area of support should be geared towards improving the technical ability of MSMEs to pursue funding and improving MSMEs' awareness of funding programmes and government incentives. Support from international development partners should consider the development of a scheme that subsidises interest rates that are endured by MSMEs through lending.

Improving the business climate for MSMEs in the ICT sector through policy and institutional development

Intervention 3.1 Improve ICT MSME legislative and policy framework (MEDIUM / LONG TERM)

Activities

- Conduct an assessment of the policy framework in consultation with existing firms in each of the priority sub-sectors and verticals, taking into account international best practices and addressing red tape. Challenges should be disaggregated by company size
  - As part of the assessment, there should be an in-depth analysis of IP rights, best practices and what should be applied in Jordan, considering also how to measure/monetise IP value
  - Either as part of the assessment or separately, an assessment should be conducted of the tax system in Jordan and its impact on the ICT sector, particularly MSMEs, comparing it to regional and international benchmarks, with a specific focus on FinTech
  - The assessment should take into account the priorities and progress of the lobby group for the improved policy and legal framework for start-ups
- Conduct PPD meeting/s to agree improvements that are needed in the policy framework
- Implement recommendations to address policy and legislative challenges: revise the existing legal framework for each of the priority sub-sectors and verticals in order to encourage new market entrants and investments
- Change the taxation system according to recommendations and resolutions agreed; keep the taxation system clear and steady so businesses can plan effectively, addressing red tape; and optimise MoF tax clearing procedures and processes for timely processing. This will require high-level government commitment

Partners
MoICT, international partners, sector associations, private sector, MoF, CBJ

Target
All

Intervention 3.2 Enhance customs processes and procedures and processing (MEDIUM / LONG TERM)

Activities

- Support the relevant government organisations including the MoF, the customs department, the MoICT and the MoITS to
  - Revise current customs processes and procedures and optimise them for the benefit of ICT MSMEs
  - Revise current customs import requirements for high-tech products and establish a clear requirements list
  - If possible, implement a fast-track import channel for high-tech equipment that can have a major impact on the ICT sector

Partners
MoF, customs, MoICT, private sector

Target
All

Intervention 3.3 Strengthen the institutional capacity of existing private sector associations and government bodies (MEDIUM / LONG TERM)

Activities

- Review governance and organisational models of ICT industry and related associations, institutions and fora, e.g. int@j, JCS, PHA, JHA, ICTAC, MoICT
- Support relevant and willing associations, institutions and fora to develop organisational strategies and plans to fulfil their mandates and the implementation of REACH 2025, provide relevant services for members, and attract new members
- Institutionalise the training function at key ICT associations and support fostering of private–public partnerships in training for excellence
- Support organisations to look for new financing channels and develop fundraising and financial sustainability strategies and plans to increase associations' budget lines, human capital and capabilities
- Support relevant organisations in implementing organisational plans and advocacy initiatives
- Support MSME-focused PPD initiatives and processes by strengthening ICTAC and mentoring it in its role to facilitate PPD for the improvement of the business enabling environment for ICT
- Facilitate PPD for the HealthTech, FinTech and EdTech sub-sectors, particularly regarding FinTech taxation

Partners
Associations, development partners, MoICT private sector EdTech, chambers, associations, educational institutions, HealthTech, MoH, Ministry of Education

Target
Focus on MSME

Intervention 3.4	**Enhance the capacity of authorities to promote and attract investment in the ICT economy targeted at MSMEs** (MEDIUM TERM)		
Activities	▸ Map ICT investment opportunities, develop a strategic marketing plan to promote Jordan as a regional ICT hub and Jordanian ICT as an attractive sector for investment, and communicate investment opportunities and applicable incentives to domestic and international investors ▸ Support the development of an incentive scheme for R&D that responds to investor needs ▸ Identify the financial service products that MSMEs require in order to be able to invest, and link financial service providers with the private sector to improve access to long-term capital ▸ Provide technical support to the JIC and the MoICT through mentoring to help them carry out their roles in investment promotion ▸ Set up a committee to arrange exchanges between investors and MSMEs, e.g. roundtable events	**Partners** MoICT, JIC, Jordan Tourism Board, associations, local authorities, MSMEs	**Target** All

Intervention 3.5	**Facilitate linkages and access to finance for the ICT sector** (MEDIUM / LONG TERM)		
Activities	▸ Conduct awareness and outreach programmes to further promote existing lending options and government incentives among private sector associations, incubators, technical assistance programmes and MSMEs on the availability of financial support and incentives and how to access them ▸ Extend technical support for MSMEs to meet lending institutes' eligibility requirements, e.g. business ideas/concepts, proposal writing, feasibility studies, business planning and financial modelling. This should be provided by the Business Consulting Unit (see 1.1) ▸ Strengthen the link between MSMEs and loan and credit guarantee institutions to secure bank funding through fora, roundtable discussions and capacity building for informative marketing communications ▸ Provide training to financial institutions on how to value IP ▸ Advocate for specific subsidies and incentive schemes depending on company size and needs (this can be informed by the policy framework assessment). PPD platforms can enable advocacy. (See 3.1 and 3.4)	**Partners** JIC, CBJ, commercial banks, lending institutions and micro funds, development partners	**Target** MSME

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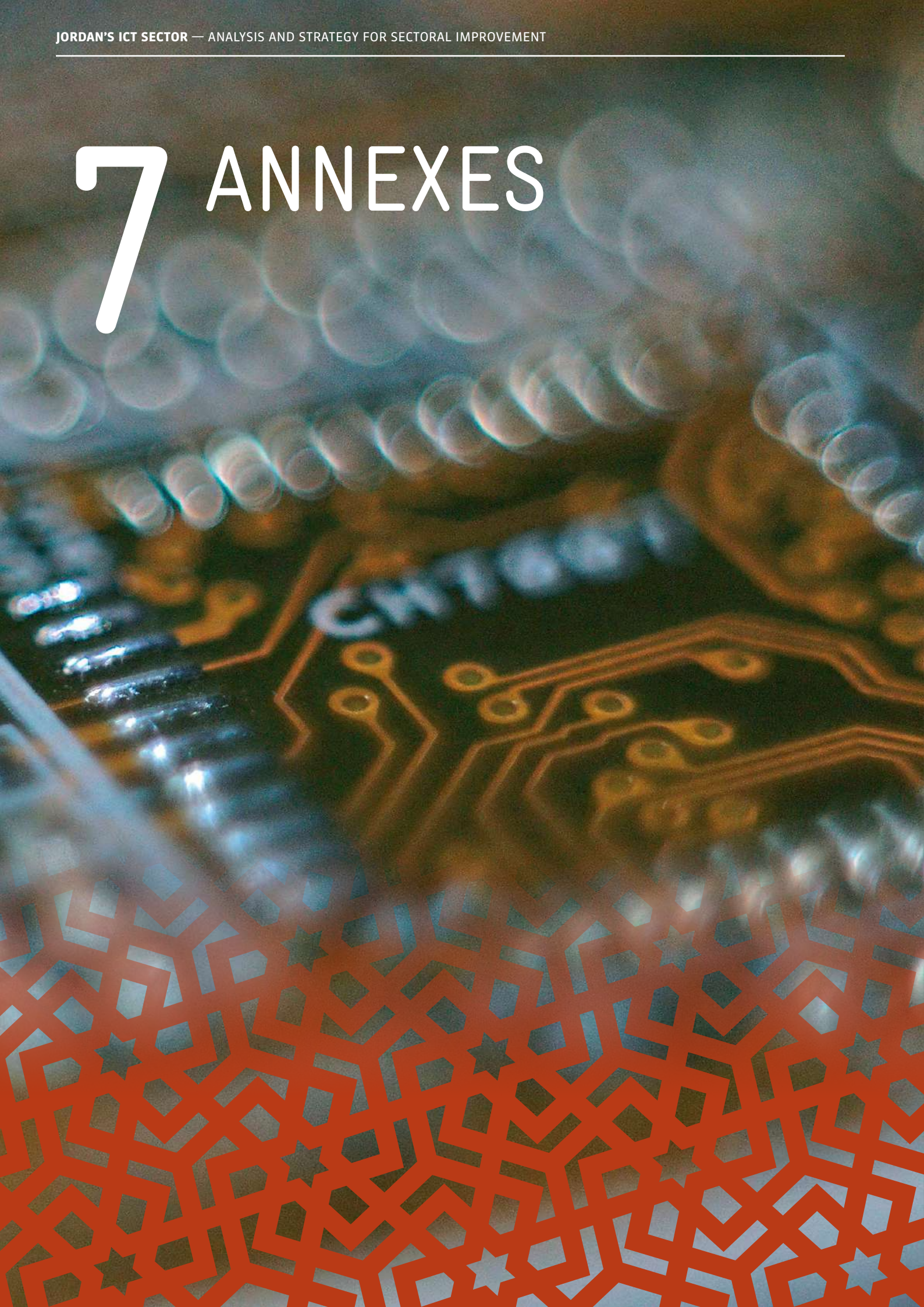
7 ANNEXES



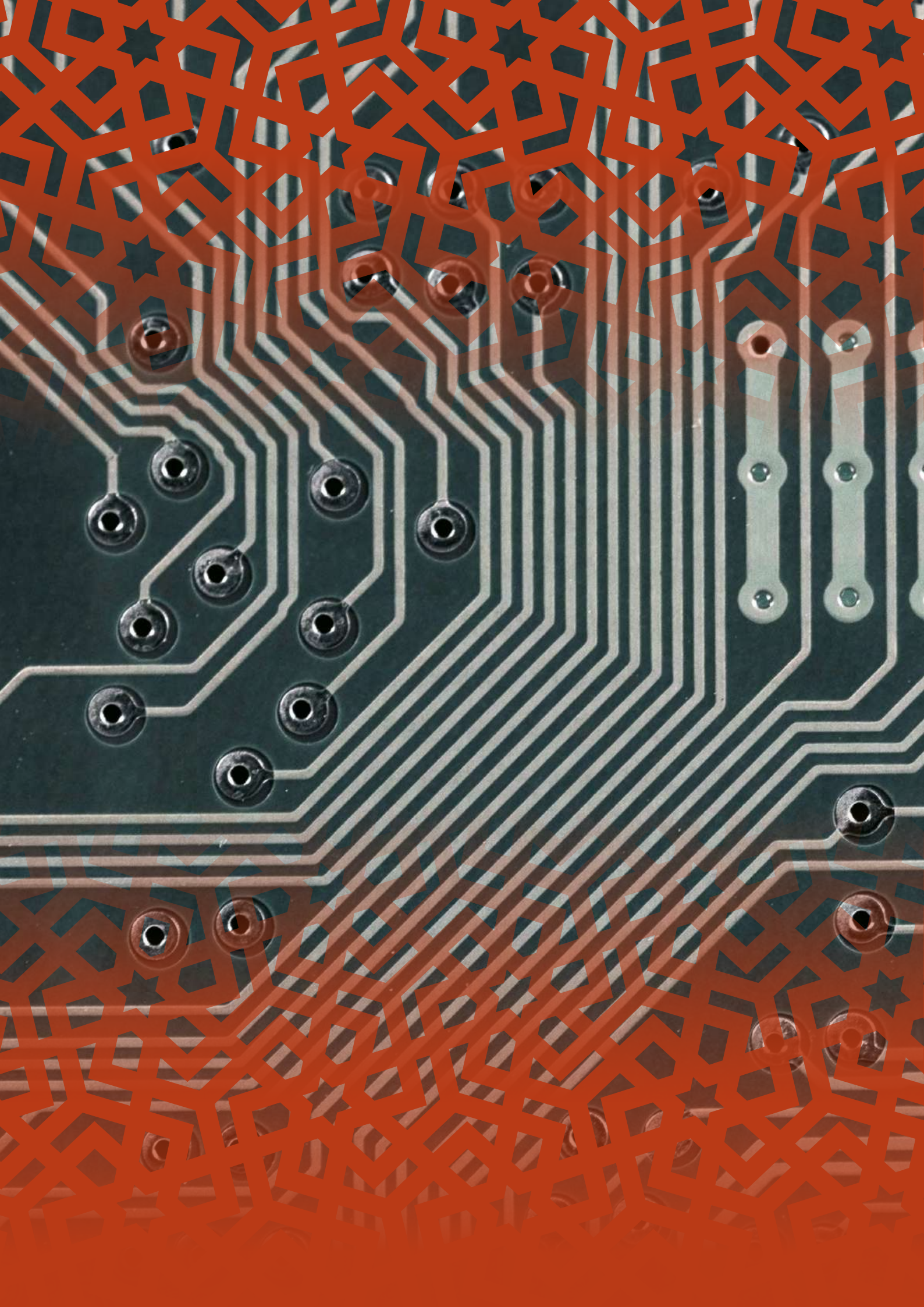
7.1 SECTOR INTERVIEWS AND VALIDATION MEETINGS

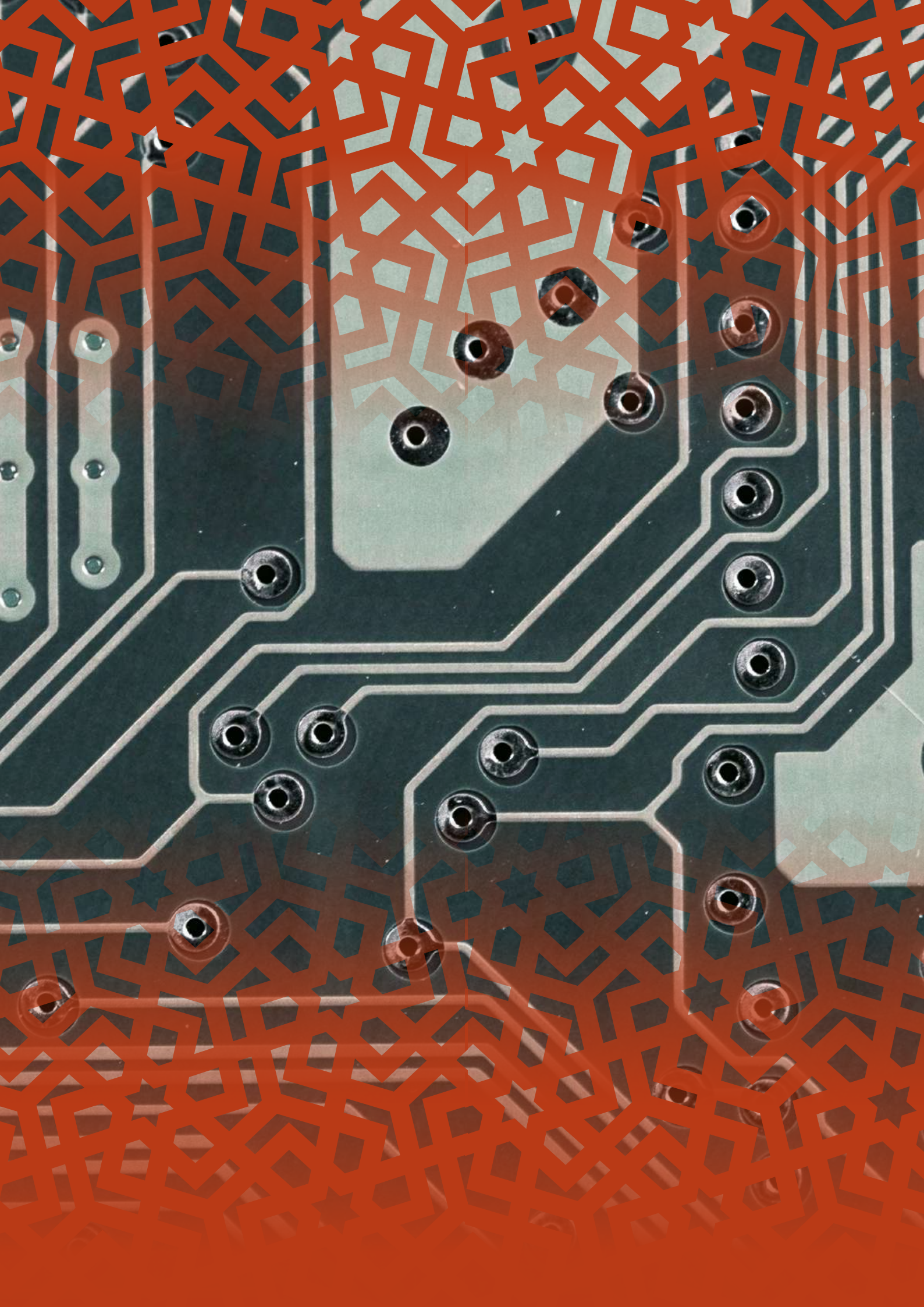
MAIN STAKEHOLDERS:

Validation Workshop	Representatives of
Validation workshop to confirm sub-sectors	▸ MoICT ▸ int@j ▸ Crown Prince Foundation ▸ Endeavour ▸ JIC ▸ Abed Shamlawi – national ICT specialist

GOVERNMENT INSTITUTIONS, BUSINESS MEMBERSHIP ORGANISATIONS, DEVELOPMENT PARTNERS, AND PRIVATE COMPANIES:

Name of company/organisation	Interviewee	Size of enterprise	Sector/vertical
Ministry of Information and Communications Technology (MoICT)	Dr. Nael Adwan, Director of Investment and Promotion Department	—	Government institution
int@j	Nidal Bitar, CEO	—	Business membership organisation
iPark	Serene Duwayri, Director	—	Technology incubator
Dinarak	Imad Aloyoun, CEO Ayman Dababneh, Head of Business Development	Medium	FinTech
Traxaware	Sameer Mubarak, Founder	Small	FinTech
Al Khalidi Hospital and Medical Center (in the process of building a HealthTech company)	Walid Al Khalidi, Managing Director	—	HealthTech
Optimiza	Majed Sifri, CEO	Small	HealthTech (incl. telecommunications, banking, government, and education)
Eskadenia	Doha Abdelkhaleq, Managing Partner Lana Aqrabawi, Health Department Manager	Medium	HealthTech (incl. telecommunications, insurance, and education)
Learment	Ashraf Nairoukh, Managing Director	Medium	EdTech / content creation
Maysalward	Nour Khreis, CEO	Medium	Gaming and entertainment / content creation
Beladcom Studios (in the process of closing down)	Mohammed Hujeij, Co-founder	Small	Gaming and entertainment / content creation





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