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Ministry of Information and
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Information and Communications
Technology Association - Jordan

REACH2025 FROM VISION TO ACTION

Roadmap to excellence



Title:

REACH 2025
Vision and Action Plan

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INTRODUCTION

The future in Jordan is a collaborative and networked future. The ICT sector, tech start-ups, universities, key economic sectors and policy makers need to work together closely to ensure Jordan's relevance in the digital economy 2025. The purpose of this vision paper is to identify common ground, and common agreed actions to create the skills and the capacity required to shape the future digital innovative Jordan. It is in this connection important that both the ICT sector capacity, as well as the digitization of the market and its actors, complement each other.

This vision builds on strong foundations in Jordan:

- The first REACH Initiative was launched in year 2000 as the official kick-start of a comprehensive public-private partnership aimed to develop the country's ICT sector and pave the way for the other economic sectors to move into the Knowledge Economy.
- There are over 600 Jordanian ICT companies in the ICT cluster, which drive digitization and are a key resource for skills and capacity in Jordan.
- Jordan has established a maturing ecosystem with international tech firms, established firms, venture funds, angel investors, incubators and accelerators.
- As a country with limited natural resources, Jordan's economy diversified early based on investments in cutting-edge technologies and infrastructure. The key to reaching the future will be to build on these enablers and accelerate digital innovation through cross-sectoral collaboration.
- Jordanians are a people that have shaped their future over centuries. There is a deeply engrained tradition to make the future happen through informed decisions and to enable the future to the benefit of everyone.

In 2015, his Majesty King Abdullah II called upon the leaders of the tech industry to come together and develop a new roadmap for the tech sector in an all-inclusive process that would include the private and public sector, academia, investors, and entrepreneurs. The REACH2025 initiative has been launched to re-invigorate digital Jordan and particularly one of the growth engines of the Jordan economy – the ICT sector. To facilitate the management of this call to action, a core team has been assembled from the sector alongside the Ministry of Information and Communications Technology, mandated to develop a focused action plan.

REACH2025 has key relevance to the economic development of Jordan. The vision and action plan:

1. Works as a booster for economic development in key knowledge sectors;
2. Enables businesses growth and enhancement not only for the ICT sector, but for the digital economy sector of focus;
3. Focuses on building relevant talent and increasing job creation rate;

4. Ensures better accessibility and inclusion of all citizens to key services at lower costs of investment through digitization of key sectors, providing better solutions for health, education, financial services etc.);
5. Ensures national regional development in governorates, rural areas advancement, etc.;
6. Gives Jordan global alignment and relevance in global value chains;
7. Increases economic and social value add;
8. Boosts public-private partnerships for better co-owned development and country advancement;
9. Attracts new investments in new developed fields and key sectors; and
10. Focuses the role of government as a policy maker, regulator and potential innovation platform/adopter.

The methodology of this vision and action paper has been led by a design-thinking inspired approach. This means that a key notion of the exercise has been to co-create a vision and mission statement and an action paper. The approach and aim have been to put end-users' needs at the centre of the policy formulation system, leading to solutions that are progressively refined through an iterative process of providing voice to end-users and engaging them in shaping decisions (co-creation); considering multiple causes of and diversified perspectives to the problems at hand; and experiment with initial ideas.¹ This means that the process has focused on stakeholder engagement and making the stakeholders' voices heard so that the actions could be co-created and owned in Jordan. What this process does not do, is to provide a one-size-fits-all model for actions in Jordan, nor is it a full national diagnostics exercise.

However, the design thinking process does not stop with this action paper. The actions laid out in this paper are largely based on international good practise and input from Jordan stakeholders. However, it is necessary to activate strong stakeholders in Jordan further to ensure that they are the right actions for Jordan. Moreover, the budget considerations for each action are largely based on international benchmark good practise and need to be stress-tested in a Jordanian environment.

REACHING THE VISION OF A DIGITAL ECONOMY IN JORDAN

To reach the vision of a digital economy in Jordan, and action plan has been created alongside with the vision and mission. The action plan takes its point of departure in the vision statements for Jordan 2025, which are captured in the REACH2025 vision paper. The vision paper was developed based on an extensive stakeholder consultation in Jordan building on a thorough review of international key trends, expert interviews and a review of policy documents. The stakeholder consultation has ensured a strong grounding and support for the vision in Jordan.

The vision paper and the action plan thus build on a strong foundation in Jordan. It is not reinventing the wheel, but leveraging the existing Jordan potential and differentiators into the digital economy. Concretely, the vision paper and action plan have been created by mapping leading international digital economy

¹ development/English/Singapore%20Centre/GCPSE%20Design%20Thinking%20Summary.pdf

<http://www.undp.org/content/dam/undp/library/capacity->

models, enablers and levers to the Jordan differentiators, to create the best model for a digital economy in Jordan. This means creating an action plan for Jordan that ensures relevance in global value chains and addresses the challenges in Jordan.

Box 1: A new way of approaching economic transformation in Jordan – Reach 2025

The vision, mission and action plan seeks to streamline the economic transformation across the entire Jordan economy through digitization. With the plan, Jordan is moving away from seeing ICT as an isolated sector and **towards digitizing the entire Jordanian economy** with emphasis on niche markets and global value chains.

Fundamentally, this vision and action plan seeks to **accelerate digitization** across Jordan and support, enable and inspire the **next generation of digital entrepreneurs and intrapreneurs** building on Jordan's strength of being a young and tech-savvy nation.

The aim of this vision is to support and **accelerate Jordan's economic goals, create jobs for all Jordanians, empower women and position Jordan in the future digital global economy**, through a clear alignment with the Jordan Vision 2025. This process includes introducing new mechanisms to initiate a different level of economic dialogue that will address key national development needs.

KEY TRENDS THAT DRIVE THE FUTURE

The world is looking at the Fourth Digital Revolution. It combines multiple technologies that are leading to unprecedented paradigm shifts in the economy, business, society, and individually². This means that increasingly, sectors are disrupted and increasingly digitized. This offers immense opportunities for networked societies, but it also poses threats if timely actions are not taken.

In countries such as Germany and Denmark, this revolution has been addressed through focus on Industry 4.0 – next generation manufacturing. However, the fourth industrial revolution is not only about smart and connected machines and systems; its scope is much wider. A great number of technology breakthroughs emerge, covering wide-ranging fields such as artificial intelligence, robotics, the internet of things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, materials science, energy storage and quantum computing, to name a few. Many of these innovations are in their infancy, but rapidly growing in importance as they build on and amplify each other in a fusion of technologies across the physical, digital and biological worlds. Waves of further breakthroughs in areas ranging from gene sequencing to nanotechnology, from renewables to quantum computing, are occurring simultaneously,

² Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

broadening the scope³. In fact, digital solutions are viewed as one of the most important driving forces across the entire economy⁴.

THE KEY MEGATRENDS following this digital revolution are presented here⁵.

The physical trends include autonomous vehicles, 3D printing, advanced robotics and new materials. For the autonomous vehicles, particularly the opportunities for drones are interesting. Over time, it will for example be possible to use these for checking power lines. 3D printing has the advantage of being able to be easily customized. For small companies and for entrepreneurs it brings opportunities to design products and solutions in close interaction with customers regardless of their location, and to embed services in new solutions and at a lower cost. That way, also small producers, for instance in areas like design, can bring new products to the global markets⁶. The physical trends can also give way to distributed manufacturing, which is a form of decentralized manufacturing whereby enterprises use a network of geographically dispersed manufacturing facilities coordinated through IT. Distributed manufacturing is a way of increasing the flexibility and agility of a value chain⁷ and can create relevance for especially SMEs in these. Advanced robotics are increasingly used across sectors for a wide range of tasks, with the advances in sensors increasingly enabling robots to respond better to their environment. Lastly, with time new materials may significantly disrupt the manufacturing industries⁸ with new benefits for example in medico tech and health applications.

One of the main bridges between the physical and digital applications is the internet of things. The increased number of devices connected to the internet enables businesses to monitor and optimize assets and activities to a high level, affecting across all industries⁹. This is what Gartner Group terms **the digital mesh**¹⁰. The emphasis of this trend is on sensor technologies, connected devices and the consequences of this interconnectivity. The device mesh will drive augmented and virtual reality with huge implications for citizens, governments and businesses alike. Blending with ambient user experience, organizations will need to consider their customers' behavior journeys to shift the focus on design from discreet apps to the entire mesh of products and services involved in the user experience. Part of the mesh are also the opportunities 3D printing may bring with them – with its capacity to prototype a wide range of materials.

A related trend is the **smart machines**¹¹. The key element of the future will be data and information. Data analytics will drive production processes as well as help steer, manage and optimize value chains

3 Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

4 Brynjolfsson, Erik and Andrew McAfee (2012): Race against the machine: How the digital revolution is accelerating innovation, driving productivity, and irreversibly transforming employment in the economy

5 Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

6 Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

7 For instance Leitao, Paulo (2008): Agent-based distributed manufacturing control

8 Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

9 Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

10 Gartner Group (2016): Top 10 Strategic Technology Trends For 2016, <http://www.ibaset.com/blog/gartner-top-10-strategic-technology-trends-for-2016-define-the-future-of-manufacturing/>

11 Gartner Group (2016): Top 10 Strategic Technology Trends For 2016, <http://www.ibaset.com/blog/gartner-top-10-strategic-technology-trends-for-2016-define-the-future-of-manufacturing/>

within and across sectors. Advanced machine learning is what makes smart machines appear “intelligent” by enabling them to both understand concepts in the environment and to learn. Advanced machine learning gives rise to a spectrum of smart machine implementations — including robots, autonomous vehicles, virtual personal assistants (VPAs) and smart advisors — that act in an autonomous (or at least semiautonomous) manner. Closely connected to this discussion is the emergence of **artificial intelligence** (AI). AI is driven by exponential increases in computing power and by the availability of large amounts of data. Many of these algorithms learn from the trails of data that are left in the digital world. This results in new types of “machine learning” and automated discovery that enables intelligent robots and computers to self-programme and find optimal solutions from first principles. Applications such as Apple’s Siri provide a glimpse of what the future holds with respect to the rapidly advancing AI field – so-called intelligent assistants¹². These advantages can be exploited in a range of sectors, including in new digital learning applications, which can support personalization of learning, be it in school or in a company environment.

All of these key trends boil down to the **new digital reality**¹³. The digital mesh and smart machines require intense computing architecture demands to make them viable for organizations. The mesh app and service architecture are what enables delivery of apps and services to the flexible and dynamic environment.

This new reality means that Jordanian companies face a future where digitization is everywhere and in all sectors. Digitization will affect different sectors at different times and with different intensities. The increased interconnectivity of everything means that the ability to innovate in the context of large-scale demand driven innovation projects becomes paramount. Due to the fast development of digital technology, innovation of components and apps will tend to be optimized towards being phased out again at some point. Therefore, innovation requires the ability to optimize every single partial innovation towards a future paradigm.

Therefore, **how companies and nations approach digitization is of key importance**. A strategy, which only focuses on efficiency, will eventually lead to a commoditization of products and services and thus a competitive situation where price is the main determinant¹⁴. This means that focus not only should be on efficiency, but also on elements such as how companies continuously innovate through interaction with customers, suppliers etc., and how the companies can create increased value-add for customers without the price increases correspondingly. Networking and collaboration is the key source to such forms of innovation. Reshaping the full potential of the digital revolution depends on whether the companies use digitization for cost-effectiveness or as a driver for cost-effectiveness as well as innovation. Some of the digital tech companies in Jordan may have an understanding of keys to competitiveness, which are not aligned to rapidly changing markets for digital products and services. On the other hand, Jordan is

¹² Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

¹³ Gartner Group (2016): Top 10 Strategic Technology Trends For 2016, <http://www.ibaset.com/blog/gartner-top-10-strategic-technology-trends-for-2016-define-the-future-of-manufacturing/>

¹⁴ Nielsen, Niels Christian, Jonathan Murray, and John Zysman (2013): The Services Dilemma: Productivity Sinkhole or Commoditization? Book Manuscript

a young nation with much idea generating and support around the start-up culture, which provides an enabling innovation DNA to unleash the full benefit of digitization.

Furthermore, the disruption that the fourth industrial revolution will have on existing political, economic and social models will require that **empowered actors recognize that they are part of a wider ecosystem** that requires more collaborative forms of interaction to succeed¹⁵. Close collaboration not only entails cooperation among tech companies, but also among the tech companies and the companies in the key disrupted sectors, and among the public sector and companies, to succeed with a digital revolution. These leadership competences can be built through high-level strategic partnerships with other nations and at firm level, to fully exploit the potential that digitization has to create sustainable growth in Jordan.

Another key trend is how the dynamic of innovation is changing globally. In particular, the following elements are key:

- **DEMAND DRIVEN INNOVATION** – Demand side innovation is an inclusive paradigm shift away from supply side innovation to serving the needs of supply chains and customers. As the Arab region is digitizing exponentially, culturally sensitive content and solutions will be a particular opportunity to lead in the region. To support demand driven innovation, demand-side innovation policies – from public procurement of innovation, to standards and regulations, to lead markets and user-/consumer-driven innovation initiatives needs to be in place¹⁶.
- **THE IMPORTANCE OF TECH START-UPS AND ENTREPRENEURS** – Start-ups and entrepreneurship can create a culture of innovation, of developing ideas and solutions and adding value in entirely new ways. Start-up programs play a key role in the attraction of international, talented and high impact entrepreneurs to come and boost the local ecosystem.
- **THE MAKERS MOVEMENT** – With the advent of digital manufacturing, fabrication laboratories, or FabLabs, are spreading around the world. These centers provide access to hardware, machines, and open-source software, along with affordable training and mentoring. They encourage collaboration among stakeholders and across disciplines, and are increasingly seen as a powerful way to spur entrepreneurship, address the skills gap, and alleviate youth unemployment while revolutionizing production processes¹⁷.
- **ECOSYSTEMS AND NETWORKS** – the increased digitization of the economy supports a more efficient way of collaborating, sourcing and developing human capital. Particularly large companies can take advantage of leveraging their scale advantages and investing in their ecosystem of start-ups and SMEs by acquiring and partnering with smaller and more innovative

¹⁵ Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

¹⁶ OECD Competences to innovate > Stimulating demand for innovation > <https://www.oecd.org/sti/outlook/e-outlook/stipolicyprofiles/competencestoinnovate/stimulatingdemandforinnovation.htm>

¹⁷ World Economic Forum (2015): the Global Information Technology Report 2015

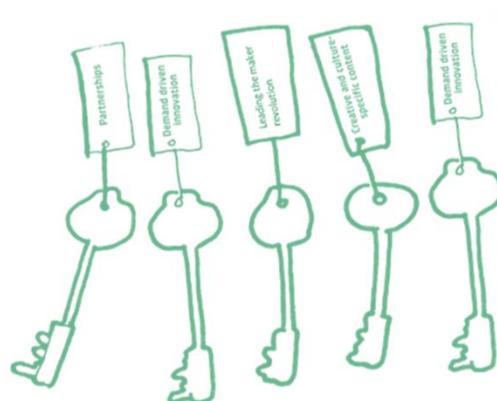
businesses. This will enable them to maintain autonomy in their respective businesses while also allowing for more efficient and agile operations. Small and medium-sized enterprises, on the other hand, will have the advantages of speed and the agility needed to participate in these ecosystems¹⁸.

JORDAN'S ROLE WITH RESPECT TO KEY TRENDS

The increasingly digitized world requires that Jordan exploits the advantages that the country has and finds its place in the global value chains. Below are discussed five key areas with which to unlock Jordan's potential. Jordan's true differentiator lies in the combination of these key areas.

LEVERAGING HIGH-LEVEL STRATEGIC PARTNERSHIPS

As mentioned in the key trends section above, digital global value chains today are a dominant feature of the world economy. This means that the production of goods and services is carried out wherever the necessary skills and materials are available at competitive cost and quality, creating growing fragmentation of production across borders¹⁹, and thereby increasingly relying on digitization for collaboration across borders. To deliver according to the required quality and time specifications, lead companies in global value chains increasingly rely on specialized sub-suppliers, which become knowledge and innovation partners, and provide the small companies privileged access to global markets. In an upcoming publication from the OECD, they conclude that the winning companies and countries in a digital economy are those who understand how to leverage resources and overcome limitations of size through networking and collaboration²⁰. Jordan has a good ICT infrastructure and historically, a strong focus on skills and education due to a lack of natural resources²¹, particularly to be found among professionals with some years of work experience. In addition, Jordan is a source of IT talent for major companies in the Middle East²². Building on the ICT infrastructure and the human capital, with the steps that already have been taken to reform the curricula to the needs of the digital economy and Jordan's ICT sector²³, as well as future steps for further reforming, Jordan will have a strong role to play



18 Schwab, Klaus (2016): The Fourth Industrial Revolution, World Economic Forum

19 OECD (2013): Implications of global value chains for trade, investment, development and jobs

20 OECD (2016) Committee on Digital Economy Policy: Stimulating Digital Innovation for Growth and Inclusiveness: The Role of Policies for the Successful Diffusion of ICT (Draft background report for ministerial panel)

21 int@j: Jordan ICT sector profile

22 int@j: Jordan ICT sector profile

23 Current work is being done on this. In collaboration with industry and universities, a process has started to develop industry based occupational profiles, which will be piloted and the model can be replicated to other ICT occupations and across clusters.

in these value chains. In the future, Jordan should use the partnerships to become the platform for digital innovation by being an innovation creating center for digital solutions driven by these strong partnerships.

In this regard, Jordan has a long and solid relationship with the US, with a large diaspora situated in the US and GCC. This relationship could be further utilized to leverage high-level strategic partnerships with clear task leaders and milestones, although it requires clear tasks and owners.

PRODUCING SPECIALIZED ICT TALENT, BUILDING ON ENTREPRENEURIAL DRIVE & IMAGINATION

One of Jordan's strong differentiators is the country's talent, entrepreneurial drive and imagination. 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 is being highlighted as one of the country's major strengths. Good human capital is particularly found among professionals with some years of work experience. However, skills are a two-edged sword in Jordan. While Jordanian ICT specialists are increasingly being hired in other countries in the region, for instance in Dubai and Saudi Arabia, there are still barriers to overcome with regard to higher education modernization, in particularly curriculum relevance to the industry, and modes of cooperation between university and industry. These barriers are of a nature so that they can be addressed and a modernization process can be set fully in motion within a relatively short period.

DRIVING SMART, DEMAND-DRIVEN DIGITAL INNOVATION ACROSS KEY SECTORS

Smart specialization entails innovative combinations of existing and latent resources in new ways, which can be enabled further by digital technologies to create outreach and scale with new types of services. Addressing the issue of specialization in R&D and innovation is particularly crucial for regions/countries that are not leaders in any of the major science or technology domains.²⁴ Leading benchmark countries such as the UK have driven growth in their entire economy through a focus on smart specialization and a digital economy. However, the focus on smart specialization still means that the tech verticals in the ICT sector (Internet of Things, Cloud Computing, Hardware and Artificial Intelligence) are of the utmost importance to drive growth – the market for such solutions has the potential to grow bigger. A key trend mentioned above is that the ICT sector is no longer viewed as a stand-alone sector, but that digitization is highly embedded in other sectors as well. Moreover, there will be a substantial focus on selected tech verticals, that is, certain areas of the tech sector where Jordan has a comparative strength.

Thus, in Jordan, smart specialization focuses on unlocking the potential for digitization in areas where Jordan has – or has the potential to develop – a competitive advantage, and through key tech verticals where Jordan currently has a stronghold. It can also be in areas/sectors of global importance, where Jordanian firms can be positioned in global value chains and can become a development partner, which can open up to further market opportunities. The increased digitization of the global economy provides

²⁴ Foray, Dominique et al (2009): Smart Specialization – the concept

an opportunity for Jordan to focus on further developing digitally enabled solutions to meet demands from key sectors. A focus on smart specialization is therefore of key importance for linking the ICT sector and the overall economy, and for assisting Jordan in shifting its effort towards the digital economy, which can drive productivity and service innovation.

In the following, we present the six key sectors and key tech verticals that are of relevance to Jordan, and it will be argued why they are key to Jordan. To sum up, the driving sectors of the digital economy in Jordan are shown in the table below.

Table I: Proposed focus areas and niche sectors for the digital economy in Jordan

| Key sectors | Global markets opportunity | Jordan strengths | Market enablers | Vertical technologies |
|------------------|--|---|---|--|
| Health | The global eHealth market is expected to grow at a CAGR of 7% from 2011-2020, and the MENA market is expected to grow at a CAGR of 16% from 2014-2022. ²⁵ | <p>Jordan is viewed as a regional center for health and should take advantage of this position.²⁶ To reap this potential in Jordan, opportunities include unified eHealth records, e-health exchange, telemedicine, Arabic content in health, health insurance exchange and records, and online booking for doctors, to maximize Jordan's competitive edge in medical tourism.</p> <p>Big data will be transforming the healthcare and integrated care sector to offer personalized solutions and new ways of providing diagnostics and care from the preventive care market to the intensive care.</p> | Integrated healthcare solutions, cloud based services | <p>Big data, learning analytics, AI</p> <p>Building on the existing eHealth program, a particular niche will be the intersection of eHealth, AI and the pharma industry powered by digital analytics capacity that Jordan can develop, for instance by using international big data platforms.</p> |
| Education | The global smart education & learning market is expected to grow at a CAGR of 24.4% from 2015-2020. ²⁷ | <p>Personalized and collaborative digital learning environments will revolutionize how education will be delivered globally. The latest advances in learning science, artificial intelligence, learning analytics, mobile platforms/services, and maker spaces, should enable this. Jordan will have a world-leading role in developing these types of solutions and platforms responding to the global need for scalable solutions that match 21st century skills demands. Jordan pioneered the adoption of technology as a means to innovate education several years ago and should exploit this. In Jordan, there are opportunities around digital curricula, entrepreneurship and digital skills for kids in schools, makerspaces in education, and online education for refugees, or in rural areas.</p> | Mobile platform solutions based on cloud technology, as digital educational content through advanced techniques in gamification and simulations | Learning analytics, AI |

²⁵ <http://www.grandviewresearch.com/industry-analysis/e-health-market>

²⁶ int@j: Jordan ICT sector profile

²⁷ <http://www.marketsandmarkets.com/PressReleases/smart-digital-education.asp>

| | | | | |
|-------------------------------|---|---|---|--|
| Energy & Cleantech | <p>Globally, the worldwide cleantech market is expected to double in value to €4.4tr by 2025.²⁸ Another prediction shows an increase in market size from \$601bn in 2014 to \$1.3tn in 2020.</p> | <p>Jordan has an impressive history of dealing with scarce resources and creating livable urban environments in a desert environment. Jordan will take a leading role in “innovating towards zero”, testing energy efficient solutions in close collaboration with the construction industry, adopting smart mobility solutions and delivering optimized tech-enabled solutions for water resource management. To reap this benefit, Jordan should exploit that it has more than 300 sunny days per year for solar power energy. Other opportunities include energy storage solutions, energy management and monitoring, and smart cities/buildings and houses.</p> | <p>Low-carbon led disruption now slowing in lighting, in full swing in the power sector, and still in the early innings in autos. Require products, components and applications & services.</p> | <p>Collectively LEDs, onshore wind, solar PV, and hybrid & electric vehicles present a set of breakthrough technologies that are rapidly taking market share in global lighting (69% by 2020 vs. 28% today), new power generation (51% by 2025 vs. 20% today), and autos (22% in 2025 vs. 3% today). This creates significant new opportunities. IoT, big data and sensors are technologies required to enable energy & cleantech.</p> |
| Transport | <p>The Global Intelligent Transport System Market is poised to grow at a CAGR of around 13.1% over the next decade to reach approximately \$49.2 billion by 2025.²⁹</p> | <p>The public transportation system in and around Amman as well as in the rural areas is relatively poor, which gives a strong incentive to improve public transportation and focus on Smart City Amman by GAM. Building on its smart city Amman initiative, Jordan will take a leading role in developing an effective digital transportation system, using for instance IoT sensors, Big Data and other new technologies. Opportunities include traffic management solutions, smart cities solutions, online ride sharing and booking.</p> | <p>Next generation products, components and applications will need to be integrated in back office services and solutions to enable real-time data analysis.</p> | <p>Sensors, mobile data and 5G.</p> |

²⁸ <http://cleantechnica.com/2012/09/17/global-cleantech-market-expected-to-expand-to-e4-trillion-by-2020s-germany-to-capitalize/>

²⁹ <http://www.businesswire.com/news/home/20160617005375/en/Global-Intelligent-Transport-System-Market-Worth-49.2>

| | | | | |
|------------------------------------|---|---|---|--|
| Financial Sector/FinTech | In the near future, the global FinTech market is projected to grow at a CAGR of 55% during the period 2016-2020 ³⁰ , but with a large untapped potential in the MENA region. | Good internet uptake and 75% of Jordanians unbanked leaves a great potential for enabling mobile payment solutions in Jordan. Jordan possess the potential to become the regional FinTech hub, and can be at the forefront of delivering FinTech solutions and transforming industry areas like retail banking, investing, and peer-to-peer lending. | Next generation payments, lending, HR solutions and banking systems. | FinTech, block chain technology |
| Communications and security | Particularly in the MENA region, CAGRs are high at around 23% from 2016-2022. ^{31,32} | Jordan has strong incentives to drive tech-led/digital security-related solutions and enable communications and connectivity in rural areas. Opportunities for Jordan in communications include for instance online and mobile payment solutions. Also, with the conflict in Syria and Iraq at its borders, Jordan will take a leading role in driving ICT led security-related solutions. In terms of security, with Jordan currently deploying smart IDs, this can include digital signatures as well for authentication into all applications. | Advanced techniques in gamification and simulations, as well as more donor-oriented products and services such as identification and registration solutions | Secure digital communications, specific niche technologies |

Source: DTI

All content in the table above are examples of trending technologies adopted in international good practice. They are subject to change with the advancement of technologies. Moreover, the focus areas can be customized and validated to the local context as the sectors' digitization grow, to ensure alignment with stakeholders' needs and national priorities.

³⁰ http://www.researchandmarkets.com/research/bl7gn8/global_fintech
³¹ http://www.lucintel.com/security_services_market_2018.aspx
³² <http://www.marketsandmarkets.com/PressReleases/cyber-security.asp>

Smart specialization across key sectors in Jordan needs the ongoing support of key enablers and key vertical tech areas, which help build *capacity*, *expertise* and *excellence* to drive the digital economy. Jordan already has existing products, services and actors within the enabling sectors predicted to grow exponentially in terms of market in the MENA region by 2025,³³ i.e., **digital content & gaming**, **ecommerce** and **professional services** (*integration and support services*), which need to be encouraged to invest in becoming regional leaders and of relevance to global digital value chains. Given particularly the ongoing trend of mobile device uptake in the whole MENA region, and the young population, Jordan should strive to lead demand-driven innovation across the region. Similarly, key technologies of relevance across the sectors and the enabling sectors are the vertical tech areas, i.e., **IOT**, **cloud computing**, **hardware** and **artificial intelligence**. Here forecasts are predicting growth in the relevant tech markets and disruptive new business models that may emerge from these technologies. This needs to be complemented with significant capacity to lead the data revolution and be able to offer secure and reliable digital products and services.

The above sectors are examples of international trends of sectors that have grown as a result of the opportunities of digitization. These sectors have been related to the Jordan differentiators and opportunities. However, the sectors should be seen as input to a wider dialogue and may change in the course of this strategy.

LEADING THE MAKER REVOLUTION

The maker revolution, where entrepreneurs use open source design, 3D printing etc. to bring manufacturing, architectural design etc. and technology together³⁴, brings opportunities for small companies that can address markets much more easily, at a lower cost. The maker market allows small companies to prototype ideas, get funding, and then access manufacturing to scale up³⁵. Moreover, crowdfunding platforms, where a large number of supporters fund projects and ideas, typically online, have further boosted the development, as makers can now approach supporters directly and receive funding for their work.

Jordan is a young nation with much idea generating and support around the start-up culture. In the MENA region, Jordan, Lebanon and Egypt lead the seed investment culture for start-ups. Incubators such as Oasis 500, iPark, the incubator Darat Al Reyadah which was recently launched by int@j, the Amman Chamber of Commerce and MoICT, Zain Innovation Campus (ZINC) by ZAIN, Business Innovation Growth (BIG) by Orange, the Tank by UMNIAH and others are drivers behind this. Young entrepreneurs sees Jordan as a good place to build on new ideas³⁶.

³³ For example, gaming is expected to nearly triple in size in the coming years — from \$1.6 billion in 2014 to \$4.4 billion in 2022. Demand for local content will spur rapid MENA media growth. See for example <http://www.arabiangazette.com/demand-local-content-spur-mena-media-growth-20141119/>

³⁴ The Maker Revolution is a term first coined in Chris Anderson's 2012 book "Makers: the new industrial revolution". See also <http://techcrunch.com/2012/10/09/wireds-chris-anderson-todays-maker-movement-is-the-new-industrial-revolution-tctv/>

³⁵ <http://techcrunch.com/2012/10/09/wireds-chris-anderson-todays-maker-movement-is-the-new-industrial-revolution-tctv/>

³⁶ <http://globalriskinsights.com/2015/03/middle-east-sees-rise-of-start-up-incubators/>

With the advent of digital manufacturing, FabLabs are spreading around the world. These are key elements of the maker revolution. Jordan also has a strong focus on providing the right facilities such as incubators and fab labs to its entrepreneurs, and Jordan is the 5th best place in the MENA region to start a business³⁷. Therefore, Jordan is in a strong position to lead the maker revolution. It is in this connection important that Jordan embrace an open source system to allow internal and external resources to access information, technology and talent, as a way to trigger competitiveness and become a real leader of the maker revolution regionally. However, there are currently challenges in Jordan related to the bureaucratic challenges of introducing new technologies such as 3D printing. It is important that these challenges are overcome to reap the full potential of new technologies and to create the best conditions for makers in Jordan.

CREATING AND INTEGRATING SOLUTIONS FOR CONTENT PLATFORMS FOR THE ARAB MARKET

Content and digital commerce solutions are not new trends, but persistent trends. At the same time, very little content is actually available in Arabic language and the region still has a large potential for growth in eCommerce uptake. The best guesstimate of the actual content available in Arabic is around 3%, according to MIT³⁸, whilst on average, 60 % of Arabs prefer digital content to be in Arabic³⁹. In 2015, Jordan's eCommerce market was worth 40 million USD, and the eCommerce market in the MENA region is projected to double its value by 2020⁴⁰. Jordan has strong knowledge and long tradition in the field of online content and eCommerce, as a large percentage of digital content and e-commerce engines are either based or have back-offices in Jordan⁴¹. This means that there is a huge gap in supply and demand and that Jordan has a competitive advantage in addressing this gap. Jordan's strength lies in building the platforms and technologies that manage e-content and eCommerce. Content creation per se can continue to grow in parallel but is not perceived to be of high impact compared to the volume and level of content created in other Arab countries focusing on digital content as well (such as Egypt and Lebanon). However, with Jordan focusing on building platforms and technologies for managing content, there might be a potential for regional partnerships with Egypt and Lebanon, where much content is created, to support these countries in managing and digitizing the Arabic content.

REACH2025 – JORDAN'S DIGITAL VISION AND MISSION

The REACH2025 vision is based on Jordan's strengths and opportunities for responding to the current digital strengths and for making Jordan relevant in the global digital economy.

37 <http://www.doingbusiness.org/rankings>

38 <https://www.technologyreview.com/s/535591/the-online-language-barrier/>

39 <http://www.wamda.com/2015/06/gaps-digital-arabic-content-sector-infographic>

40 <https://www.entrepreneur.com/article/247836>

41 http://www.nytimes.com/2012/05/09/opinion/friedman-jobsatarabiadotcom.html?_r=0. The figure from this source is not repeated in the text, as there are no certain figures on the exact percentage.

The digital vision statement is as follows: In 2025, Jordan will:

...be the *platform for digital innovation* by being an innovation creating center for next generation solutions driven by strong partnerships between Jordanian champions and global IT companies.

...have *world-class talent* that can compete and collaborate on the global digital skills market with an emphasis on applied solutions driving value added creation.

...drive *globally competitive and innovative digital solutions* in the following key sectors:

- **HEALTH** – Jordan is viewed as a regional center for health and should take advantage of this position. To reap this potential in Jordan, opportunities include unified eHealth records, e-health exchange, telemedicine, Arabic content in health, health insurance exchange and records, and online booking for doctors. Building on the existing eHealth program, a particular niche will be the intersection of the Health sector, AI and the pharma industry powered by digital analytics capacity.
- **EDUCATION** – Personalized and collaborative digital learning environments will revolutionize how education will be delivered globally. The latest advances in learning science, artificial intelligence, learning analytics, mobile platforms/services, and maker spaces, should enable this. Jordan will have a world-leading role in developing these types of solutions and platforms responding to the global need for scalable solutions that match 21st century skills demands. Jordan pioneered the adoption of ICT as a means to innovate education several years ago and should exploit this. In Jordan, there are opportunities around digital curricula, entrepreneurship and digital skills for kids in schools, makerspaces in education, and online education for refugees.
- **ENERGY & CLEANTECH** – Jordan has an impressive history of dealing with scarce resources and creating livable urban environments in a desert environment. Jordan will take a leading role in “innovating towards zero”, testing energy efficient solutions in close collaboration with the construction industry, adopting smart mobility solutions and delivering optimized tech-enabled solutions for water resource management. To reap this benefit, Jordan should exploit that it has more than 300 sunny days per year for solar power energy. Other opportunities include energy storage solutions, energy management and monitoring, and smart cities/buildings and houses.
- **FINANCIAL SECTOR** – Jordan possess the potential to become the regional FinTech hub, and can be at the forefront of delivering FinTech solutions and transforming industry areas like retail banking, investing, and peer-to-peer lending.
- **TRANSPORT** – building on its smart city Amman initiative, Jordan will take a leading role in developing an effective digital transportation system, using for instance IoT sensors, Big Data and other new technologies.
- **COMMUNICATION AND SECURITY** – Jordan has strong incentives to drive ICT-led security-related solutions and enable communications and connectivity in rural areas. Also, with the conflict in Syria and Iraq at its borders, Jordan will take a leading role in driving ICT led security-related solutions. In terms of security, with Jordan currently deploying smart IDs, this can include digital signatures as well for authentication into all applications.

Moreover, there will be a substantial focus on selected tech verticals. Tech verticals such as IoT, cloud computing, hardware (including electronics design) and artificial intelligence (AI) are among the verticals where Jordan is perceived to have a stronghold.

...lead the **maker revolution across the region**. Led by the established hardware industry, product innovation will be increasingly supported by embedding cutting-edge technologies directly into industrial zones and tech hubs.

...establish itself as the **leading solutions builder and integrator for content platforms for the Arab market**, which will serve the demand of the exponentially growing young digital Arabic speaking customer base across the region and beyond.

...be the preferred place in the region for **starting, scaling & growing a tech company** by ensuring clear rules, procedures and policies, as well as acceleration and incubation.

The above vision statement translates into the following vision and mission statements:

Vision

A digital economy that empowers people, sectors and businesses to raise productivity and ensure growth and prosperity, creating a highly attractive business destination for investments and international collaboration.

Mission

Jordan will

- Ensure a highly stable, nurturing business environment.
- Drive creative and innovative technologies in key niche sectors and markets.
- Strengthen the entrepreneurial mindset of the country, supported by specialized skills.
- Support the transformation towards being a platform for innovation in international partnerships.
- Spur innovation through open access in technology, people, standards and data.

By focusing on these areas, Jordan will increase its relevance to regional and global niche markets.

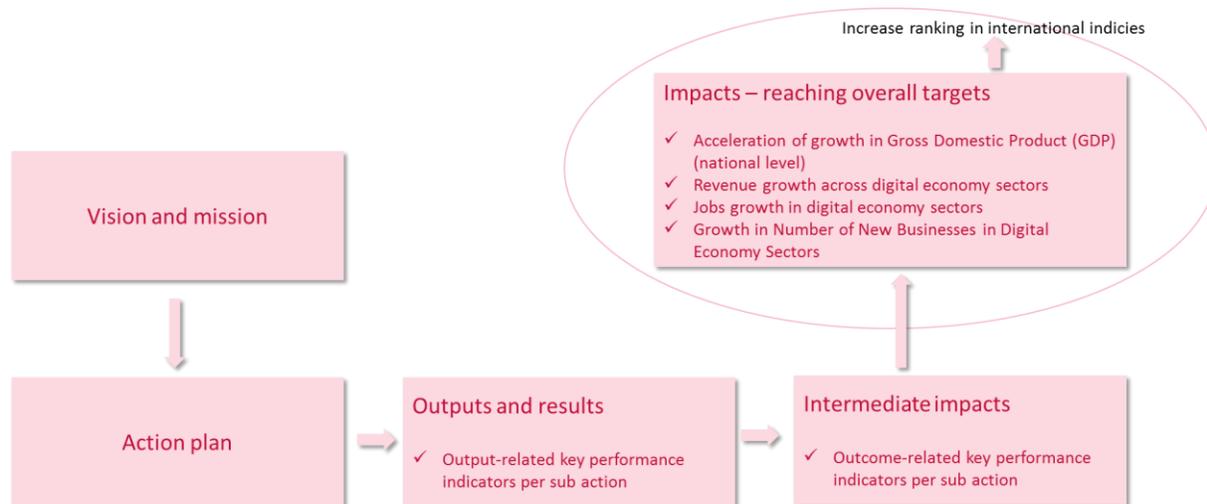
GROWTH TARGETS TO ASPIRE TO BY 2025

It is imperative to secure growth in Jordan's economy and, subsequently, to measure this growth to ensure progress. Consequently, the vision and action plan are accompanied by the development of concrete, realistic and measurable targets.

The Key Performance Indicators (presented under each action in Annex I) are the outputs and the immediate results of the actions if implemented to the required scope and within the proposed timeframe. As part of the assessment phase, relevant key benchmarks were assembled that reflect key indicators of

the digital economy and the necessary business environment. Here, further positive change is expected to be seen. Finally, the overall targets of growth in GDP, revenue, jobs and digital economy businesses are expected to be reached by 2025. Figure 1 illustrates the logic behind the need for an intervention/action plan, the actions, KPIs and targets.

Figure 1: Intervention logic



Source: DTI

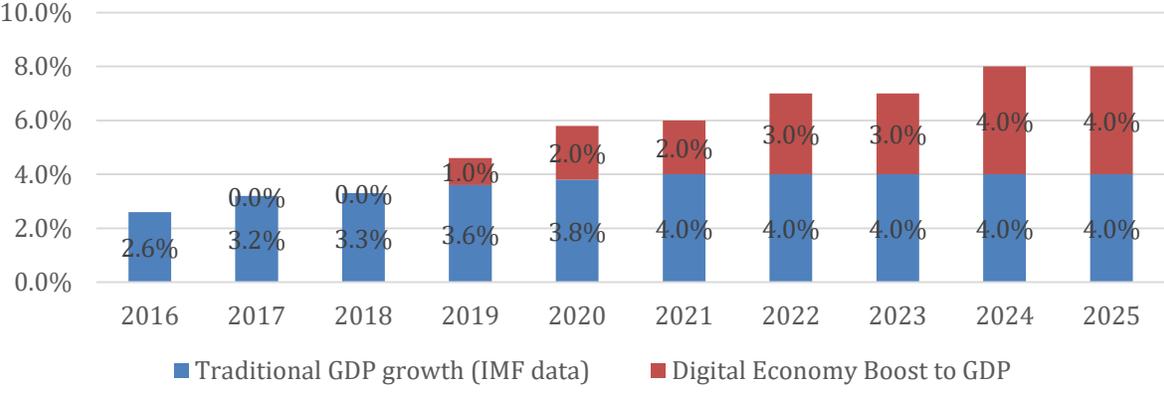
In the following, we present the overall target opportunities to aspire to by 2025 as well as Jordan's position in key indices.

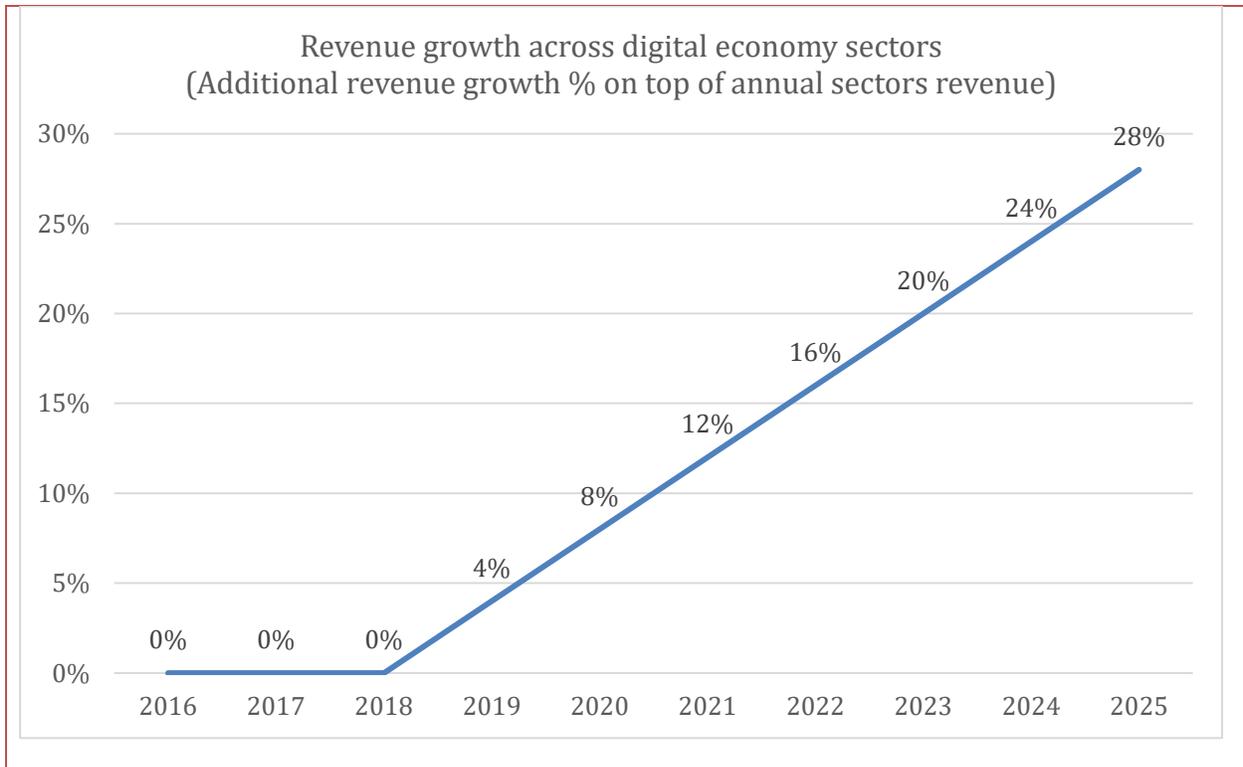
TARGET OPPORTUNITIES TO ACCELERATE GROWTH IN JORDAN BY 2025

The overall targets are built on benchmarks from international good practice countries. This means that they are based on growth figures from other countries that have invested heavily in the digital economy and benefitted from it. This also means that the targets should be seen as growth opportunities for Jordan, if the country succeeds in the transformation to a digital economy. This requires a full implementation of the proposed action framework within the proposed timeframe. If timely action is not taken immediately, other key sectors will not benefit from digitization and the tech sector will continue to decline and lose relevance on the global market.

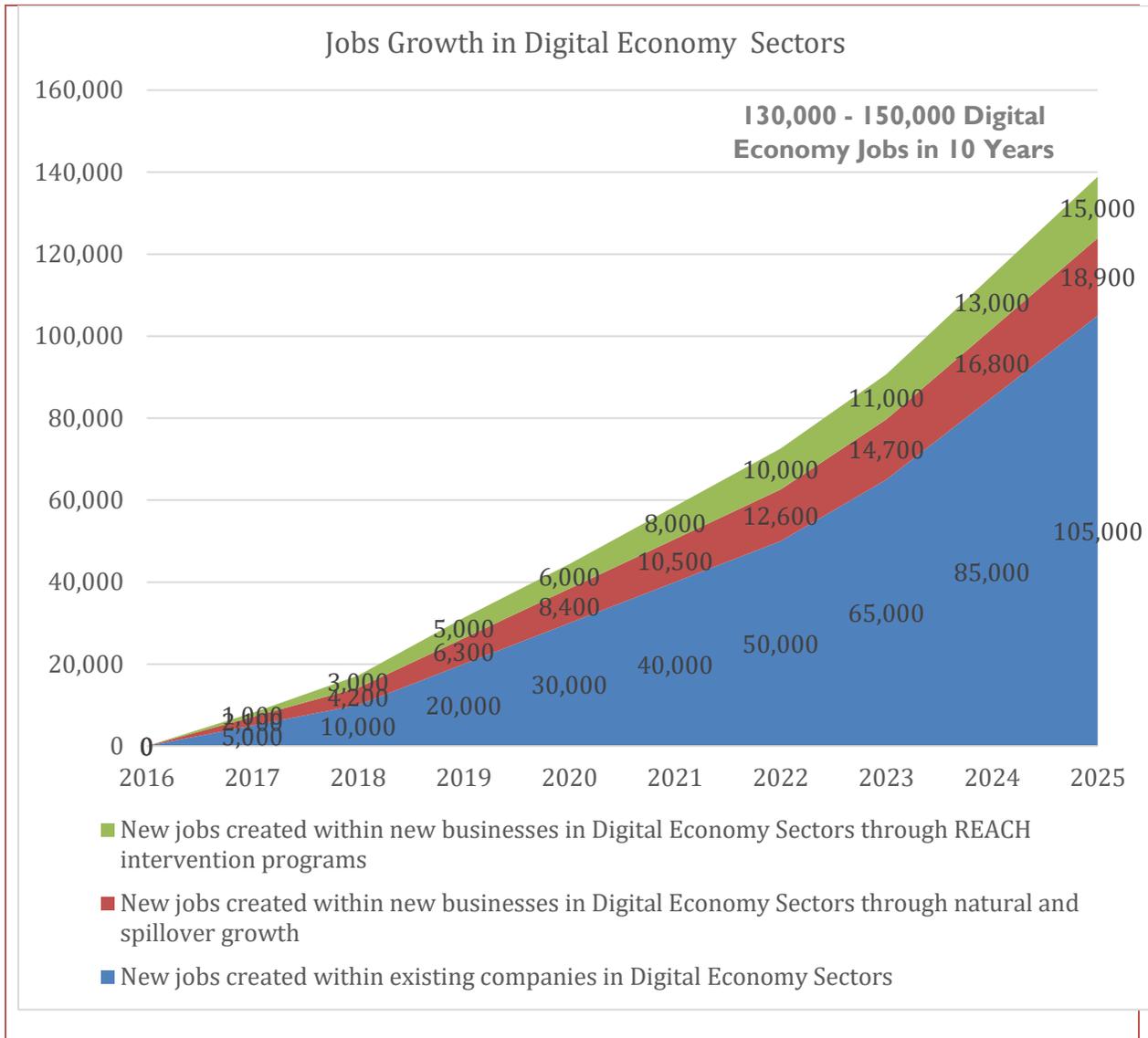
The key proposed high-level targets to be set up for each of these high-level areas are shown in Table 2. The targets set are assuming a serious implementation effort starting in the first year and constant push for results and impact.

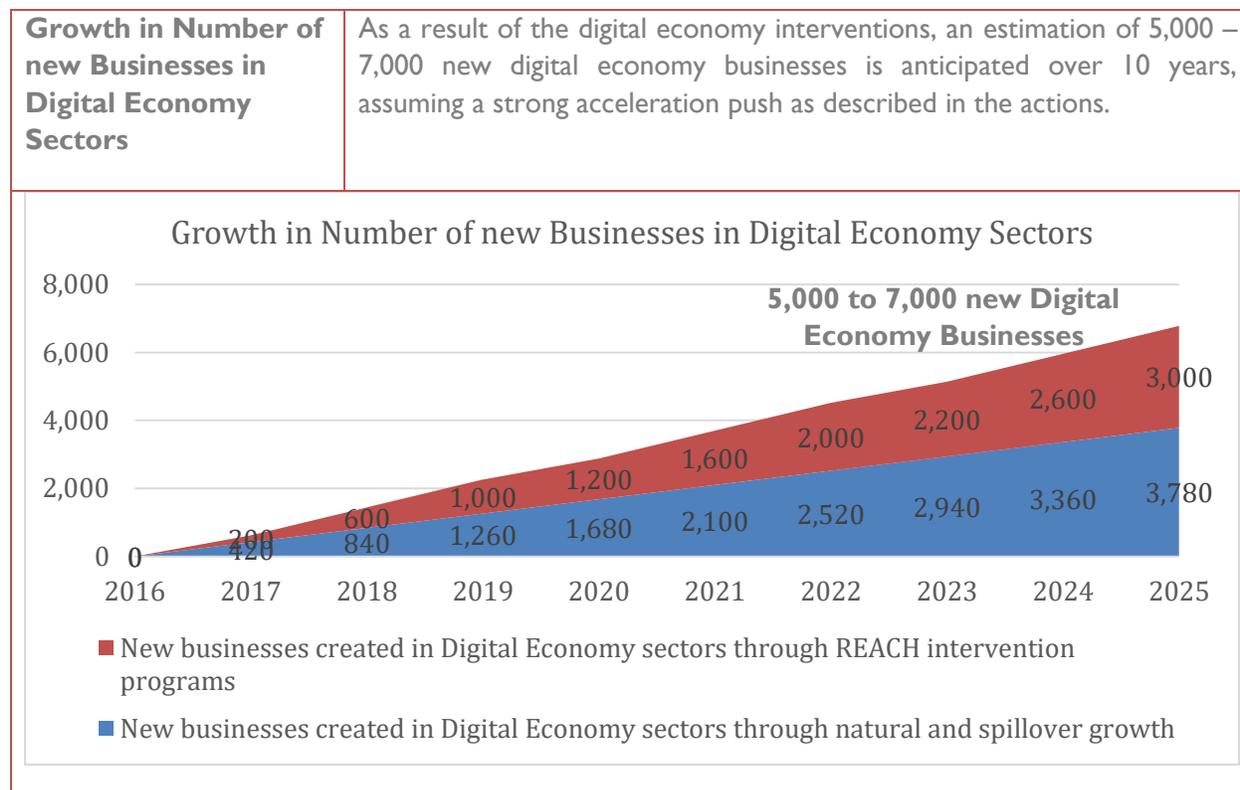
Table 2: Key proposed high-level targets

| Type | Target | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|------------------------------|-----------------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <p>Acceleration of growth in Gross Domestic Product (GDP) (national level)</p> | <p>3%-4% extra growth annually by 2025. This will be effective after two years and will gradually increase to up to 4%. First two years will see an estimate of 3% growth rate in accordance with IMF figures, but no extra growth from digital economy interventions.</p> <p>In year 3, it is predicted to see a growth rate of 1%, In year 4 and 5, an annual growth on minimum 2% is expected. In year 6 to 9, an annual growth of 3%-4% is expected.</p> <p>This corresponds to a 6%-8% overall GDP growth by 2025 (A 3-4% extra growth annually plus the 3-4% IMF projected growth that will happen regardless of an intervention, according to IMF figures).</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p style="text-align: center;">Digital Economy Boost to GDP (Additional GDP growth % on top of annual growth)</p>  <table border="1" data-bbox="224 835 1388 1228"> <thead> <tr> <th>Year</th> <th>Traditional GDP growth (IMF data)</th> <th>Digital Economy Boost to GDP</th> </tr> </thead> <tbody> <tr><td>2016</td><td>2.6%</td><td>0.0%</td></tr> <tr><td>2017</td><td>3.2%</td><td>0.0%</td></tr> <tr><td>2018</td><td>3.3%</td><td>0.0%</td></tr> <tr><td>2019</td><td>3.6%</td><td>1.0%</td></tr> <tr><td>2020</td><td>3.8%</td><td>2.0%</td></tr> <tr><td>2021</td><td>4.0%</td><td>2.0%</td></tr> <tr><td>2022</td><td>4.0%</td><td>3.0%</td></tr> <tr><td>2023</td><td>4.0%</td><td>3.0%</td></tr> <tr><td>2024</td><td>4.0%</td><td>4.0%</td></tr> <tr><td>2025</td><td>4.0%</td><td>4.0%</td></tr> </tbody> </table> | | Year | Traditional GDP growth (IMF data) | Digital Economy Boost to GDP | 2016 | 2.6% | 0.0% | 2017 | 3.2% | 0.0% | 2018 | 3.3% | 0.0% | 2019 | 3.6% | 1.0% | 2020 | 3.8% | 2.0% | 2021 | 4.0% | 2.0% | 2022 | 4.0% | 3.0% | 2023 | 4.0% | 3.0% | 2024 | 4.0% | 4.0% | 2025 | 4.0% | 4.0% |
| Year | Traditional GDP growth (IMF data) | Digital Economy Boost to GDP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2016 | 2.6% | 0.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 2018 | 3.3% | 0.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 2020 | 3.8% | 2.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2021 | 4.0% | 2.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2022 | 4.0% | 3.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2023 | 4.0% | 3.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2024 | 4.0% | 4.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2025 | 4.0% | 4.0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Revenue growth across digital economy sectors</p> <p>Revenue is defined as the total income a company generates – domestically and internationally (export)</p> <p>(Additional revenue growth % on top of annual sectors revenue)</p> | <p>Accumulative increase by 25%-30% in digital sector's revenue by 2025.</p> <p>Growth is expected to start after 2 years when regulatory and enabling environment is fully in place.</p> <p>From 2019-2025, an annual average growth in sector's revenue is expected to be app. 4% on average, reaching a 28% increase in 2025.</p> <p>Absolute figures should be constructed as baseline measurement.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| | |
|--|---|
| <p>Jobs Growth in Digital Economy Sectors</p> | <p>Creation of a 130,000 - 150,000 additional digital economy jobs in 10 years, mainly through boosting existing companies but also through job creation in digital economy startups, spinoffs, and new entrants into digital economy sectors.</p> <p>Target only reflects job creation, not potential job loss as a result of the digital economy.</p> |
|--|---|





Source: DTI

ACCELERATION OF GROWTH IN GDP

From the international literature⁴², it is clear that digitization used with a view to both being more effective and more innovative creates growth in companies and for the economy as a whole. One way of monitoring growth due to increased digital economy presence is to measure the contribution to Gross Value Added (GVA)⁴³ or Gross Domestic Product (GDP)⁴⁴.

Table 3: International examples of targets for acceleration of growth in GDP/GVA

The UK has chosen to focus on GVA and has seen an increase of 27% between 2010 and 2014 in its digital tech industries (the UK term). This translates into a yearly growth rate of approx. 7%.⁴⁵

A Parliament-led enquiry in the UK found that the digital economy in the United Kingdom is a success story: the British economy has the highest percentage of gross domestic product attributed to the digital economy of all European

⁴² Hanne Shapiro, Martin Eggert Hansen og Simon Fuglsang Østergaard, DTI (2014): Kortlægning af kompetencebehov og barrierer for videregående VEU for faglærte inden for det tekniske og produktionsrettede område

⁴³ Defined as output minus intermediate consumption

⁴⁴ Defined as market value of all final goods and services produced in a period

⁴⁵ http://www.techcityuk.com/wp-content/uploads/2016/02/Tech-Nation-2016_FINAL-ONLINE-1.pdf?utm_content=buffer2e58f&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

nations; UK digital industries grew two and a half times as fast as the economy as a whole between 2003 and 2013; and the United Kingdom has the highest percentage of individual internet usage of any G7 economy.⁴⁶

Dubai, which is also a very ambitious country and currently the leading MENA country in many international indices such as World Economic Forum, has set a yearly GDP growth target (exclusive of oil) of 5% up to 2021.⁴⁷

Digitization clearly has an impact on GDP growth. A recent study shows that a 10% increase in digitization contributes to a 0.59% increase in GDP for a transitional economy like Jordan.⁴⁸ Jordan clearly has to be ambitious in its goal setting. At the same time, the country has much catching up to do before it can have similar growth rates as the UK or even Dubai, which are both advanced economies in terms of digitization and thus experience higher GDP growth rates than transitional economies⁴⁹. Based on international literature and Jordan's strengths, opportunities, and weaknesses, it is estimated that a yearly growth rate of between 3% and 4% on top of the traditional GDP growth (currently estimated by IMF at 2.8 % increase for 2016 and 3.2 % increase for 2017⁵⁰) is the target for Jordan by 2025. This digital economy target will be effective after two years and will gradually increase to up to 4%. The first two years will see a 3% growth rate in accordance with IMF figures, but no extra growth from digital economy interventions. Year 3, with the assumption that the digital economy action plan has been implemented at the proposed speed and extent, is predicted to see a growth rate of 1% additional growth on top of IMF projections. In year 4 and 5, an annual additional growth on minimum 2% is expected. In year 6 to 9, an annual additional growth of 3%-4% is expected. This corresponds to a 6%-8% total increase in GDP by 2025 (A 3-4% extra growth annually plus the 3-4% projected growth that will happen regardless of an intervention, according to IMF figures).

GROWTH IN REVENUE

To measure digitization in companies, other countries are focusing on revenue, or turnover as it is termed in the UK. Revenue is defined as the income of a company, both including domestic and international (export).

Table 4: International example of targets for growth in turnover

The UK's Tech Nation initiative clearly shows that digital tech industries grew 32% faster in terms of turnover than the national average in a five-year time span.⁵¹

⁴⁶ <http://www.publications.parliament.uk/pa/cm201617/cmselect/cmbis/87/87.pdf>

⁴⁷ <https://www.vision2021.ae/en/national-priority-areas/national-key-performance-indicators>

⁴⁸ Strategy& (2012): Maximizing the impact of digitization

⁴⁹ Strategy& (2012): Maximizing the impact of digitization

⁵⁰ IMF World Economic Outlook 2016, <http://www.imf.org/external/country/JOR/>

⁵¹ http://www.techcityuk.com/wp-content/uploads/2016/02/Tech-Nation-2016_FINAL-ONLINE-1.pdf?utm_content=buffer2e58f&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

Thus, if digitization is used proactively in sectors and companies in Jordan, growth can be expected within the period between now and 2025. However, for digital companies to grow it is necessary to have an open and sound regulatory business environment, which the assessment has shown that Jordan does not yet fully have and need to focus on. Therefore, Jordanian digital economy companies cannot be expected to grow as much as their UK counterparts. However, once the regulatory environment is in place, Jordan has the advantage of a creative population and a strong setup around a startup culture that can boost growth in digital economy industries. The regulatory environment is assumed to be fully in place within the first two years, meaning that Jordanian digital economy companies can be expected to start growing faster after two years. After 10 years, it is estimated that the accumulative and gradual growth for digital economy industries should be between 25% and 30% for Jordan, giving Jordanian companies a few more years to reach a growth similar to the British companies.

GROWTH IN JOBS

The proposed focus of Jordan on selected sectors where digitization has the potential to create a competitive edge is expected to drive job creation and growth in these sectors. At the same time, international experience from Europe shows that digitization will drive productivity increase, which will have a negative impact on jobs in the short term. Nevertheless, benchmark countries have largely experienced high growth in digital economy jobs as a result of digital economy.

Table 5: International examples of targets for growth in jobs

In the UK, digital tech economy jobs grew approximately 11% between 2011 and 2014, which is an average yearly increase of nearly 4%. The UK has experienced a 2.8 times faster job growth in the digital tech economy compared to the rest of the economy.⁵²

Ireland, a leading European ICT hub, expects a yearly increase in tech jobs of approx. 5%, between 2014 and 2018.⁵³

The digital economy is expected to create new jobs in two different categories: by scaling up existing new companies in key sectors and by either creating new companies or registering new branches (new entrants), in addition to the spill-over effect.

To estimate jobs created in existing companies, the following calculation has been made: The International Labor Organization (ILO) estimates that there are 1.2 million working Jordanians, 463,000 of whom are in the public sector. That leaves a little over 700,000 people in the private sector.⁵⁴ It is estimated that half of these jobs potentially pertain to the future digital economy – the ICT sector as well as the six

⁵² http://www.techcityuk.com/wp-content/uploads/2016/02/Tech-Nation-2016_FINAL-ONLINE-1.pdf?utm_content=buffer2e58f&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

⁵³ [http://www.ictireland.ie/Sectors/ICT/ICT.nsf/vPages/Papers_and_Sector_Data~ict-skills-action-plan-2014-14-03-2014/\\$file/ICT+Skills+Action+Plan+2014.pdf](http://www.ictireland.ie/Sectors/ICT/ICT.nsf/vPages/Papers_and_Sector_Data~ict-skills-action-plan-2014-14-03-2014/$file/ICT+Skills+Action+Plan+2014.pdf)

⁵⁴ Jordan's National Employment Strategy 2011-2020

selected key sectors (totaling 350,000 jobs). It is widely recognized that digitization creates both direct and indirect jobs. For instance, in the US, one digital job creates 5 indirect jobs⁵⁵. In the international benchmark examples above, the yearly job growth in the digital economy in the UK and Ireland are between 4% and 5%. In Jordan, the service industry is not necessarily entirely local, which means that the job growth in the digital economy will be a little less. Therefore, it is estimated that Jordan can manage an average yearly job growth of 3%-3.5%. This amounts to the digital economy creating a multiplier effect of 1.3 over 10 years, amounting to 105,000⁵⁶ jobs.

To estimate new digital economy jobs created, the following estimations have been made: As a result of the acceleration programme under action 5, 1,000 digital economy start-ups would be incubated in the first three years. For the next 3-year period, an additional 1,000 start-ups would be incubated and for the last 3-year period, another 1,000 start-ups would be incubated. This amounts to 3,000 digital economy startups in total which are created within the acceleration programme. It is estimated that on average these start-ups will create on average five jobs each (15,000 jobs in a 10-year life span). Moreover, approximately 700 new businesses are created in all sectors every month outside of the acceleration programme, representing new businesses, spinoffs from existing companies and/or universities, and companies coming from outside registering as new companies in Jordan. Of these companies, it is expected that 10% of these pertain to sectors relevant in the future digital economy. This amounts to 840 businesses annually. Assuming that half of these companies survive (amounting to 420 companies), this amounts to the creation of 4,200 companies in ten years. Assuming that these companies create 5 jobs each on average, this is an additional 21,000 jobs.

The total job creation is the following:

- the new jobs within existing companies within core sectors & tech sector (105,000 jobs in 10 years) PLUS
- the jobs created in digital economy startups or spin offs outside of the acceleration programs (18,900 jobs in 10 years) PLUS
- the new jobs created by digital economy start-ups within the acceleration program (15,000 jobs in 10 years).

This totals 138,900 jobs. This means setting a political goal of between 130,000 and 150,000 new jobs over a 10-year period. This figure does also factor in possible growth in university spin-outs and non-for-profit sector jobs, which may also potentially be growing. However, the figure does not factor in the potential job loss that Jordan may experience as a result of digitization.

⁵⁵ See for instance Moretti, Enrico (2012): The new geography of jobs

⁵⁶ 350,000 x 0.3 equals the extra job growth of 105,000

GROWTH IN DIGITAL BUSINESSES

Closely linked to the growth in jobs is the growth in digital businesses. As of 2016, Jordan has a baseline of 600 digital economy companies according to int@j estimates. In all sectors, approximately 700 new businesses are created in all sectors every month, representing new businesses, spinoffs from existing companies and/or universities, and companies coming from outside registering as new companies in Jordan. Of these companies, it is expected that 10% of these pertain to sectors relevant in the digital economy. This amounts to 840 businesses annually. From international benchmarks, it can be seen that approximately half of the companies survive. Assuming that half of these are expected to survive, which amounts to 420 digital companies created every year. In ten years, this will amount to 3,780 companies. In addition, 3,000 new digital economy companies are created under Action 5. In total, this amounts to 6,780 digital companies. For the purpose of setting a target, the range of 5,000-7,000 new digital businesses is set. Digital businesses can be companies in key sectors that venture into the digital economy as well as newly created digital companies.

FUTURE SOCIO-ECONOMIC INDICATORS

The healthiness of the future society and the attractiveness of an economy are increasingly being measured in additional socio-economic indicators such as livability, happiness, sustainability and resilience as well as the potential for social innovation. Actual indicators in this field are at the explorative stage and aim to capture the socio-economic value the digital economy can deliver. Relevant trackers that Jordan should be considering are inclusiveness of the digital economy with a specific emphasis on the inclusion of immigrants and refugees as well as fostering a digital economy that is nationwide rather than focused on Amman, the empowerment of women, the contribution of the digital economy to the green economy and as a very important issue the impact of the digitization to improve transparency and working processes of government and the non-for-profit sector. All of these outcome indicators attract huge international attention currently and there is significant potential to become a regional leader in demonstrating impact and solutions that work in the MENA region. International literature point to a number of socio-economic indicators that could be taken into consideration in the future to track progress. Examples of these indicators are found below.

Table 6: Indicators related to the social value of the digital economy

| Indicator | Source |
|---|---|
| Impact of ICTs on access to basic services | WEF Global Information Technology index |
| ICT use & gov't efficiency | WEF Global Information Technology index |
| eParticipation | WEF Global Information Technology index |
| Women in ICT jobs | int@j Industry Statistics Yearbook |
| Decentralized innovation capacity | consider developing |
| Impact on green economy | consider developing |

Source: WEF Global Information Technology index 2015, int@j Industry Statistics Yearbook 2014

DRIVING THE DIGITAL ECONOMY IN JORDAN BY PROVING LEADERSHIP IN INTERNATIONAL, INDEPENDENT BENCHMARKS

Reflecting on the digital economy, these high-level targets will be accompanied by an additional set of indicators that will allow the monitoring of the key drivers of the transformation required as well as the key outcomes that Jordan would like to achieve with its digital economy focus. Value derived from the digital future are beyond GDP, not only measured in economic value but also in specific added social value.

We have selected key metrics from independent global rankings that should be monitored to track Jordan's performance. The reason for choosing to measure Jordan's performance in these key areas is to instill investor confidence and help ensure that Jordan is perceived to be an attractive country to work and do business in.

Table 7: Jordan's position in selected international indices

| Indicator | 2016 | Trend | Source |
|--|-----------|--------------|---|
| Selected Sub-Indicators | RANK /140 | 2015 to 2016 | |
| Political and regulatory environment | | | |
| Effectiveness of law-making bodies* | ★ 45 | ↑ 20 | WEF Global Competitiveness Report |
| No. procedures to enforce a contract | ★ 89 | ↑ 2 | World Bank Doing Business |
| No. days to enforce a contract | ★ 104 | ↑ 2 | World Bank Doing Business |
| Business and innovation environment | | | |
| Availability of latest technologies* | ★ 47 | ↓ -6 | WEF Global Competitiveness Report |
| Venture capital availability* | ★ 19 | ↑ 4 | WEF Global Competitiveness Report |
| No. days to start a business | ★ 72 | ↓ -3 | World Bank Doing Business |
| No. procedures to start a business | ★ 74 | ↑ 4 | World Bank Doing Business |
| Intensity of local competition* | ★ 57 | ↓ 0 | World Bank Doing Business |
| Gov't procurement of advanced tech* | ★ 42 | ↓ -7 | WEF Global Competitiveness Report |
| Infrastructure | | | |
| Mobile network coverage, % pop | ★ 67 | ↓ -1 | International Telecommunications Union ICT Indicators |
| Secure Internet servers/million pop | ★ 75 | ↓ -4 | World Bank Development Indicators |
| Affordability | | | |
| Prepaid mobile cellular tariffs, PPP \$/min | ★ 7 | ↑ 46 | International Telecommunications Union ICT Indicators |
| Skills | | | |
| Quality of educational system* | ★ 32 | ↓ -8 | WEF Global Competitiveness Report |
| Quality of math & science education* | ★ 64 | ↓ -25 | WEF Global Competitiveness Report |
| Individual usage | | | |
| Mobile phone subscriptions/100 pop | ★ 24 | ↑ 9 | International Telecommunications Union ICT Indicators |
| Use of virtual social networks* | ★ 57 | ↑ 1 | WEF Global Competitiveness Report |
| Business usage | | | |
| Firm-level technology absorption* | ★ 35 | ↑ 1 | WEF Global Competitiveness Report |
| Capacity for innovation* | ★ 47 | ↑ 11 | WEF Global Competitiveness Report |
| Government usage | | | |
| Importance of ICTs to gov't vision* | ★ 35 | ↓ -9 | WEF Global Competitiveness Report |
| Government Online Service Index, 0-1 (best) | ★ 62 | ↓ 0 | UNDESA UN E-Government Development |
| Economic impacts | | | |
| Impact of ICTs on new services & products* | ★ 50 | ↓ -9 | WEF Global Competitiveness Report |
| Impact of ICTs on new organizational models* | ★ 56 | ↓ -25 | WEF Global Competitiveness Report |
| Social impacts | | | |
| Impact of ICTs on access to basic services* | ★ 43 | ↓ -8 | WEF Global Competitiveness Report |
| ICT use & gov't efficiency* | ★ 47 | ↓ -17 | WEF Global Competitiveness Report |
| E-Participation Index, 0-1 (best) | ★ 70 | ↓ -1 | UNDESA UN E-Government Development |

The table above shows that there are success stories in Jordan, particularly in respect to the effectiveness of the law-making bodies and venture capital availability, which have both increased. However, Jordan is declining in a number of areas central to the digital economy. The business environment in terms of number of days, procedures, and cost to start a business and number of days to enforce a contract are at a level too low for Jordan to excel, even though two of the indicators show signs of increasing. In addition, in the skills area, particularly the quality of mathematics and science education, the indicator is dropping at an alarming rate. The impact on ICTs on new organizational models also dropped quite alarmingly, clearly showing a need for immediate action if Jordan is to fulfil its

digital economy vision. Lastly, the level of the eGovernment indicator is a clear sign that government needs a more active role in developing a digital economy for Jordan. All of the above clearly shows a need for immediate action, if Jordan is to be perceived as a leading digital economy in the future.

KEY QUESTIONS/ISSUES TO ADDRESS

The insights above leads to a number of key questions or issues to address for Jordan to move in the direction of the vision towards an action plan. The following key questions have been identified:

1. How can Jordan shift its efforts to support demand driven innovation across key sectors and ecosystems in Jordan in collaboration with the ICT sector, tech start-ups and universities?
2. How can Jordan ensure world-class talent and build relevant skills and capacity for tomorrow's global digital economy?
3. How can Jordan ensure collaboration within the ICT sector, and among the ICT sector and other key sectors to leverage its strategic partnerships to stimulate digitization in key sectors?
4. How can Jordan facilitate an environment that provides companies with the most favorable business environment and laws/regulations?
5. How can Jordan be inclusive and open to new technologies and new technologies business models transformation?
6. How can Jordan ensure a strong leadership position in the development of culturally adapted and localized Arab content and solutions?
7. How can Jordan ensure the right conditions for startups leading a maker revolution?



COST OF INACTION

The above questions require that actions are taken immediately. If Jordan continues without changes, it will imply that the tech sector will continue to be challenged. Already now, the sector is witnessing a decline in turnover. The average development from 2011-2014 has been a decline of 9 percent⁵⁷. Also, exports to key markets have declined, both to Saudi Arabia and the US, which are the two major export

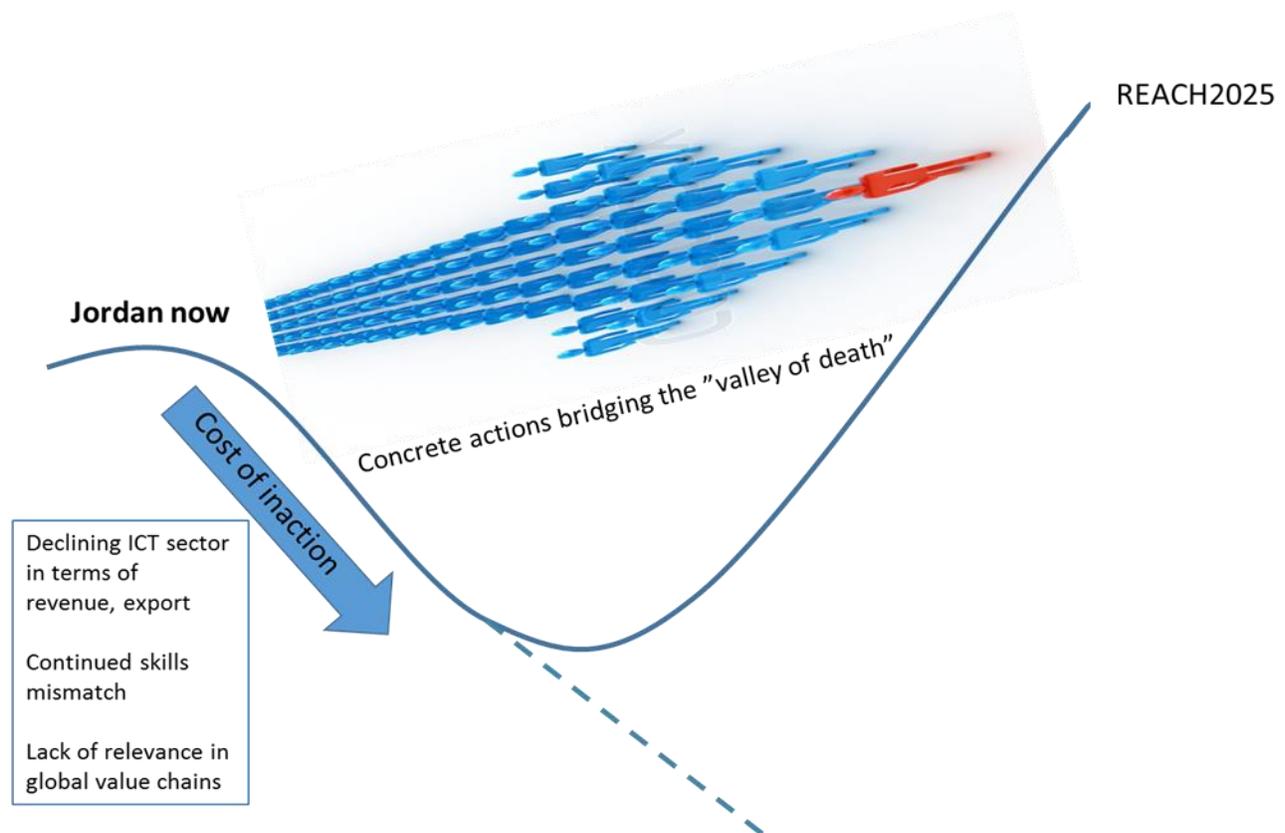
57 int@j (2014): ICT & ITES Industry Statistics & Yearbook

destinations⁵⁸. This situation clearly needs to be turned around if Jordan is to prosper and to play a key role in the digital economy.

Key weaknesses that need to be rectified for Jordan to turn around the above situation include the relative mismatch between the university curricular and the requirements from the industry, and the lack of a unanimous interpretation of the regulatory framework in Jordan. However, if action is taken, Jordan can take advantage of its good human capital and strong conditions for startups and position itself as a strong digital player in the MENA region.

Therefore, the stepping stones for bridging the gap between the current situation and Jordan's place in the digital economy in 2025 is illustrated below.

Figure 0.1: Bridging the "valley of death"



Source: DTI

58 int@j (2014): ICT & ITES Industry Statistics & Yearbook

It is clear that Jordan faces a number of declining indicators, such as declining revenue in the ICT sector, a skills mismatch and lack of collaboration among companies and sectors. If nothing is done to revitalize the tech sector and move the country as a whole towards a digital economy, the declining figures are expected to continue and the cost of inaction will be paramount to Jordan, resulting in a lack of relevance in global value chains.

KEY FOCUS AREAS THAT DRIVE INITIATIVES LEADING TO TRANSFORMATION

To bridge the cost of inaction – or “valley of death” – a number of focus areas have been identified that drive transformation change and are the pillars of the digital economy. These focus areas have been based on two assessments: They are drivers of the digital economy addressed in comparative transformational national strategies, and they are key drivers and indicators used in recognized digital economy benchmarks, such as by the OECD’s Measuring the digital economy⁵⁹, the World Economic Forum’s global competitiveness index⁶⁰, the World Economic Forum’s information and communication technology benchmark⁶¹ and ITU’s ICT development index⁶².

The six key focus areas that will drive the initiatives and actions are as follows:

- Smart Specialization and demand-driven innovation
- Tech Start-ups and Entrepreneurs
- Public Sector Innovation
- Enabling Business Environment
- ICT Skills, Capacity and Talent
- Smart Infrastructure

The key focus areas are elaborated more below. In addition, in placing Jordan on the path towards excellence, a number of high-level actions have been identified. These high-level actions are linked to the aforementioned focus areas. Each high-level action will inform a number of concrete actions, with clear owners and targets attached to them.

SMART SPECIALIZATION⁶³ AND DEMAND-DRIVEN INNOVATION focuses on unlocking the potential for digitization in areas where Jordan has – or has the potential to develop – a competitive advantage. It can also be in areas/sectors of global importance, where Jordan can be relevant in global value chains. The increased digitization of the global economy provides an opportunity for Jordan to focus on further developing digitally enabled solutions to fit the demands from key sectors.

TECH START-UPS AND ENTREPRENEURS sets out to build on the strength of the tech startup environment in Jordan, and to give the companies the best possibilities for scaling and growing. The startup

59 http://www.keepeek.com/Digital-Asset-Management/oeed/science-and-technology/measuring-the-digital-economy_9789264221796-en#page1

60 <http://reports.weforum.org/global-competitiveness-report-2015-2016/>

61 <http://reports.weforum.org/global-information-technology-report-2015/>

62 <http://www.itu.int/net4/ITU-D/idi/2015/>

63 We are aware that our use of this term conflicts with how for instance the European Commission uses it.

companies – and later on, the growing companies – will typically need to have a regional and/or global focus, as the Jordan market is typically too small and poor for companies to prosper. However, a key barrier in Jordan is the concrete legal and regulatory challenges that make starting and closing a tech business too risky and unattractive.

PUBLIC SECTOR INNOVATION: Government plays a large role in ensuring that a digital strategy can unfold and become a reality on the ground. As a lawmaker, but also as enabling partner and a law enforcer or interpreter, and as a market, where digital solutions can be tested and unfolded.

ENABLING BUSINESS ENVIRONMENT: To be an important player in the global digital economy, Jordan needs world-class companies. To support these, Jordan needs to have favorable business conditions spanning from opening a business and running it to closing it down, but clearly also the most transparent laws. These business conditions are not only pertaining to ICT, but should be favorable to companies across the economy.

ICT SKILLS, CAPACITY AND TALENT: Building on one of the other clear strengths that Jordan has, namely its human capital, is also important for positioning Jordan in the global value chains and in the region. The skills should be further developed to ensure that Jordan has the innovative skills for bringing ICT verticals into other key sectors. One of the current initiatives to build on is the Jordan Skills Standardization Organization (JSSO) focusing on bridging the gap between universities' graduates and private sector requirements and working on improving skills of unemployed resources according to the unique sector needs and trends⁶⁴ based on a qualifications framework. Another is the int@j initiative, offering - through its international partners and local training centers - a certification program related to IoT, Cloud Computing and Big Data. The aim of this is to better equip ICT professionals and fresh graduates.

SMART INFRASTRUCTURE is highly relevant for the uptake and use of digital solutions among businesses and its employees. The digital infrastructure should be in place in Jordan and should be able to meet the demands and enable the advancement to a digital economy, for the benefit of the tech sector and the wider digital economy sectors.

APPROACH AND LOGIC FRAMEWORK TO DRIVE THE TRANSFORMATION FORWARD

The action plan builds on a strong foundation in Jordan as highlighted in the vision paper:

- The first REACH Initiative, which was launched in year 2000 as the official kick-start of a comprehensive public-private partnership, aimed at developing the country's ICT sector and pave the way for the other economic sectors to move into the Knowledge Economy.

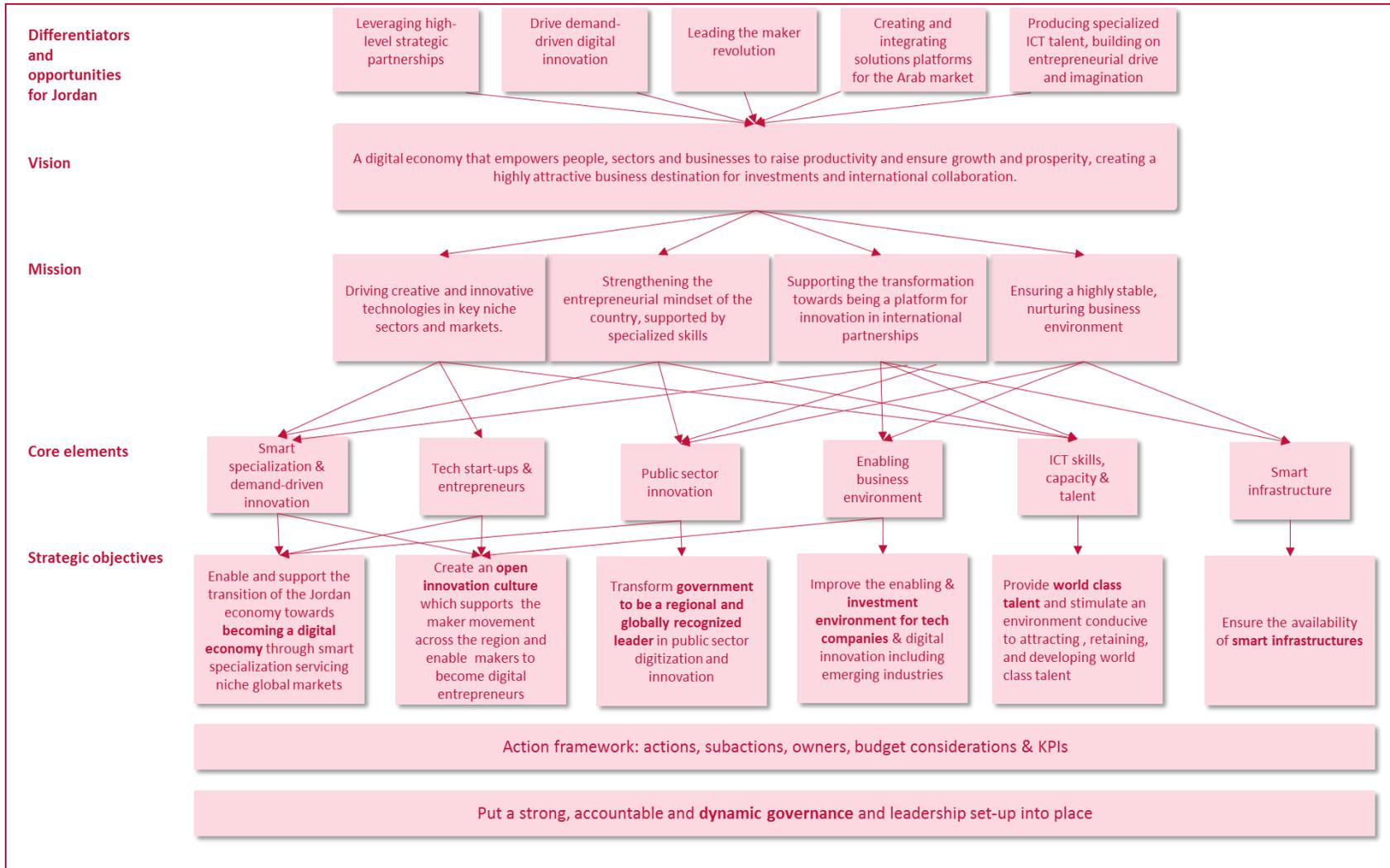
⁶⁴ <http://www.intaj.net/content/jordan-skills-standardization-organization-jssso>

- There are over 600 Jordanian ICT companies in the ICT cluster, which drive digitization and are a key resource for skills and capacity in Jordan.
- As a country with few natural resources, Jordan's economy diversified early based on investments in new technologies and infrastructure. The key to reaching the future will be to build on these enablers and accelerate digital innovation through cross-sectoral collaboration.
- Jordanians are a people that have shaped their future over centuries. There is a deeply engrained tradition to make the future happen through informed decisions and enable the future to the benefit of everyone.

Additionally, there is a tradition in Jordan for collaborative effort across industry, government, non-for-profit organizations and even the Royal Court to drive change and to ensure that Jordan is globally competitive and not 'left behind'. This action plan has been compiled and built based on a review of existing initiatives and programs and clearly identifying where they can be scaled, accelerated or expanded, as well as based on good practice and benchmarks with other economies' and countries' key actions.

To reach the vision statements presented above, a number of actions were developed. These actions build on stakeholder and expert input as well as international good practice. The following logic framework explains how the actions relate to the vision statements and key differentiators for Jordan.

Figure 2: Logic framework linking vision and action



Source: DTI

As can be seen from Figure I, the differentiators/opportunities, vision, mission and core elements translate into a set of strategic objectives as well as high-level actions with specific objectives, sub-actions, owners, budget considerations & KPIs. The high-level actions are specified in further detail below and in Annex I.

The actions set out to put Jordan amongst the leading digital economies of the world. Focus is on creating an institutionalized and sustainable, transformative ecosystem for a digital economy, opening up Jordan to be a regional hub for makers and tech start-ups. Steps on the way include delivering a policy push to enable the ICT sector and the key economic sectors to grow Jordan through a digital economy, and leveraging existing platforms and programs with a focus on strengthening the Jordanian start-ups and companies.

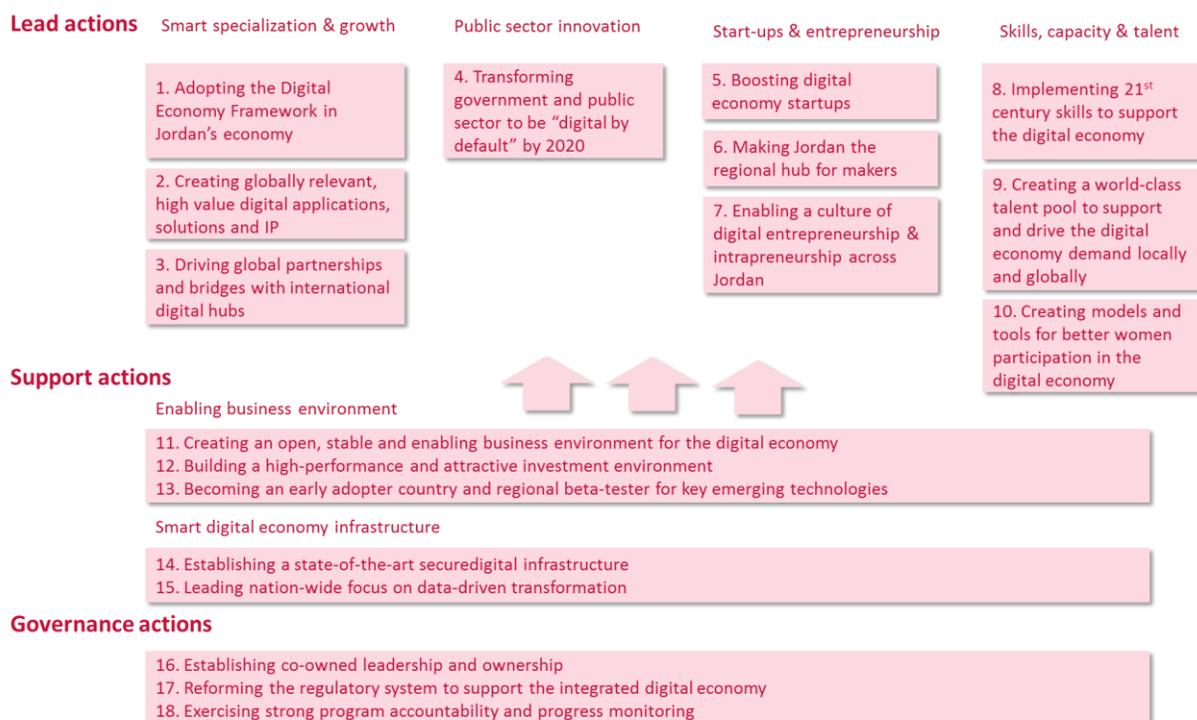
THE ACTION FRAMEWORK

The digital economy in Jordan has four key focus areas, i.e., smart specialization, tech start-ups & entrepreneurs, public sector innovation, and skills capacity & talent. Under smart specialization, the digital economy can be accelerated by focusing on **three driving core elements to enable the digital economy**:

- The six leading sectors (Health, Education, Energy & Cleantech, Transport & logistics, Financial sector, and Communications & security)
- The key enablers (Content & gaming, E-commerce and Professional services)
- The vertical tech areas (IOT, Cloud Computing, Hardware and Artificial Intelligence)

Taking an ecosystem perspective, emphasis of lead actions need to be further on activating and motivating **makers** and their transition to become **startups** or inform the innovation system around Jordan's companies. Startups need to be increased in numbers and encouraged to venture into the digital economy focus areas, whilst both startups and Jordan companies need to investigate partnerships with international companies and shift to a demand-led market development paradigm informed by considerations across global value chains and markets. Finally, activating **public sector innovation** is also of key importance for government to act as a market for Jordanian innovations. Underlying this is open access to **world-class talent** (both talent graduating from educational systems and talent in the active labor force).

Figure 3: Framework for the actions



Source: DTI

The **supporting actions** towards the transformation of a digital economy in Jordan are the enabling business environment and smart digital economy infrastructure. Here, particularly the accessibility and adoption rate of emerging technologies as well as continuous updating of underlying telecommunications business models matter.

Underlying the effort of accelerating smart specialization in Jordan is also the establishment of a strong, visible, accountable and fundamentally co-owned governance structure. For this reason, Jordan needs to consider a governance structure that will directly oversee the performance and impact of the lead actions. This document presents an ideal governance model highlighting three specific **governance actions** in developing and maintaining multiple layers of leadership, smart regulation and strong monitoring and evaluation. To finalize the governance model, all relevant actors, roles and mandates should be reviewed in the near future to ensure an effective implementation set-up.

THE ACTIONS

Based on the core elements and strategic objectives presented above, 15 high-level actions and 3 governance actions have been developed. They are based on Jordan's key differentiators/opportunities, strengths, opportunities, and weaknesses, as well as international experience in terms of how other benchmark countries have set the path for achieving a digital vision. The sub-actions with clear owners and timelines are specified for the 15 high-level actions and 3 governance actions later in the report.

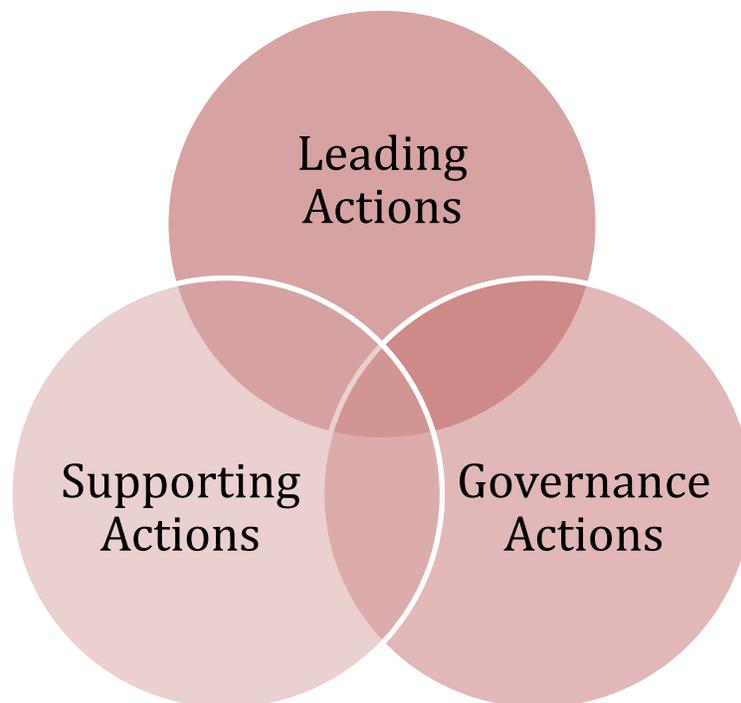
To set a roadmap for the high-level actions to reach their KPIs, it is important to further spell out how the actions will be specified. This section presents the high-level actions and a short explanation of the

detailed sub-actions underlying each of the high-level actions. The sub-actions are designed for the next three years. After a period of three years, the action plan will have to be revised and new sub-actions identified. Owners – or coordinators – have been assigned for each of the sub-actions. These will lead the transformation of Jordan towards a digital economy.

The 15 high-level actions and 3 governance actions have owners, budget indications and clear KPIs to ensure the progress and success of the digital strategy. The actions are presented below. For a full overview of the details for each action, please see Annex I.

As can be seen from the figure below, the lead, supporting and governance actions are closely interlinked. The lead actions sets out to drive smart specialization whilst the support actions are the prerequisites for the lead actions to succeed. The governance actions ensure visibility and accountability.

Figure 4: The linkages between the lead, supporting and governance actions



Source: DTI

Lead actions

The first set of leading actions a strategic objective of enabling and supporting the transition of the Jordan economy towards becoming a digital economy through smart specialization, serving global niche markets. Moreover, they are important for reaching the concrete vision of social change and a sustainable digital economy. They are presented below. It should be noted that some of the actions are already being initiated.

Box 2: Lead actions

Smart Specialization & Growth

Action 1 – Adopting the Digital Economy Framework in Jordan’s economy
 ...by launching a Digital Economy Catapult and Launchpads in key sectors and verticals

Create an independent digital economy catapult – a platform for the digital economy in Jordan. It should be established as a network of specialized centers of excellence with one headquarter/umbrella. A digital economy catapult will be established with one headquarter and nine catapults in the six leading sectors (Health, Education, Energy & Cleantech, Transport & logistics, Financial sector, and Communications & security) and three key enablers (Content & gaming, E-commerce and Professional services). The vertical tech areas (IOT, Cloud Computing, Hardware and Artificial Intelligence) will be embedded in the relevant catapults.

Action 2 – Creating globally relevant, high value digital applications, solutions and IP
 ... by supporting in-licensing and the reuse of IPs

Create national agreement on utilizing local intellectual property/innovations/solutions for the digital economy. The action is building on the differentiator of leveraging high-level strategic partnerships. A way of doing this is to reuse IPs from international companies. Leading countries are experimenting with the reuse of local intellectual property/existing solutions to create an open economy that facilitates digital innovation.

Action 3 - Driving global partnerships and bridges with international digital hubs
 ... through a network of international innovation centers in key markets

Strengthen and promote Jordan’s digital solutions and market development potential in key export markets. The main focus is to enable business-to-business partnerships between Jordanian digital economy companies and international partners, to create international awareness of Jordan’s strengths, differentiators and capabilities.

Public sector innovation

Action 4 – Transforming government and public sector to be “digital by default” by 2020
 ...by developing open data policy, changing models of implementation based on Public-Private Partnerships and leading and accelerating digital innovation across government

Transform government and public sector to be a regionally and globally recognized leader in public sector innovation and digitization by going digital by default. The aims for Jordan are to achieve a strong and open public infrastructure key for developing a strong digital economy and create a more efficient government as shown by leading countries. Moreover, the actions are responding to the weakness of government not acting as a competent market and user that can drive digital economy.

Startups & entrepreneurship

Action 5 - Boosting digital economy startups
 ...in Jordan and special zones, by increasing incubation, acceleration & support capacity

Support and scale tech start-ups, particularly in venturing into the digital economy. This is done through physical and/or virtual tech zones, where companies enjoy special benefits.

Action 6 – Making Jordan the regional hub for makers
 ...by giving all makers access to the innovation infrastructure/ecosystem

The maker movement, where entrepreneurs use open source design, 3D printing etc. to bring manufacturing, architectural design etc. and technology together⁶⁵, brings opportunities for small companies that can address markets much more easily, at a lower cost. Jordan has an opportunity of leading the maker movement in the region by building a national program co-owned between local industry, foundations, universities and other educational institutions. The action is responding to the key differentiator of leading the maker revolution and aims at strengthening the local innovation and entrepreneurship culture.

Action 7 – Enabling a culture of digital entrepreneurship & intrapreneurship across Jordan
 ...by launching a national campaign and through building specialized corporate funds and action for intrapreneurship

To create awareness and support of the culture of entrepreneurship; launch national campaign, support program for entrepreneurs & intrapreneurs, and integrate the concepts of entrepreneurship into education. The action is building on Jordan's differentiator on leveraging high-level strategic partnerships, with the aim of creating ecosystems and collaboration including the public sector, private sector, and universities, around the digital economy.

Skills, capacity & talent

Action 8 - Implementing 21st century skills to support the digital economy
 ...by linking digital economy skills needs to the nation-wide overhaul of the education system

Link digital economy to the nation-wide overhaul of the education system, linking the education policy framework to the digital economy and 21st century skills needs. The action is building on the differentiator of producing specialized tech talent, entrepreneurial drive and imagination. It is also addresses the weakness of the mismatch between the university curricular and graduates and industry requirements.

Action 9 – Creating a world-class talent pool to support and drive the digital economy demand locally and globally
 ...by supporting training & qualifications and enabling an open labor market

Create an attractive labor market by focusing on key smart specialization areas and supporting knowledge transfer programs. Create an open (for local and foreign investors and employees) labor market linked to the global skills market and actively focused on export of Jordanian products and solutions and services-built Jordanian skills. The aim of this action is to enable the industry to access the right talent at the right time.

Action 10 – Creating models and tools for better women participation in the digital economy
 ...in workplaces and as active users

⁶⁵ The Maker Revolution is a term first coined in Chris Anderson's 2012 book "Makers: the new industrial revolution". See also <http://techcrunch.com/2012/10/09/wireds-chris-anderson-todays-maker-movement-is-the-new-industrial-revolution-tctv/>

Empower women to work more in the digital economy and support women in being part of digital services. The aim of this action is to unlock the untapped potential the educated female workforce. According to UN and int@j figures, the current percentage of women in tech sectors is 30%, but the potential is 50%. Moreover, the action sets out to empower women to be part of the digital economy, allowing women to drive usage and demand for digital services.

Source: DTI

Support actions

The supporting actions have the purpose of ensuring that the lead actions can be reached. In other words, they can be said to be the prerequisites for the success of the lead actions.

The supporting actions have the strategic objective of improving the enabling and investment environment for tech companies and digital innovation, including emerging industries.

Box 3: Support actions

Enabling business environment

Action 11 – Creating an open, stable and enabling business environment for the digital economy
...by streamlining and revising processes, laws and regulations

Lead government-wide overhaul of policies and regulations to develop enabling legislative framework for digital companies, products and services, reduce administrative burden on companies and create regulatory stability and visibility.

Action 12 – Building a high-performance and attractive investment environment
...with an emphasis on the availability of scaling and growth capital and FDI

Significantly increase the availability of growth capital (Seed and follow-on investments). The action aims to address the weakness of gaps in funding cycles, and provides a potential for the market to make up to the lack of government funding and drive one of the most competitive digital economies of the world.

Action 13 - Becoming an early adopter country and regional beta-tester for key emerging technologies
...by supporting experimentation

Map and drive the adoption of new technologies and support experimentation, in particularly by the public sector. The action addresses the weakness of several key technologies being heavily controlled in Jordan. Controlled openness is necessary to allow for the experimentation needed to be the beta tester of the region.

Smart digital economy infrastructure

Action 14 - Establishing a state-of-the-art secure digital infrastructure
...by developing information and cyber security practices and regulations, revising spectrum pricing and investing in the national broadband infrastructure and laying the path for 5G

Create a competitive, privately owned infrastructure with a focus on data traffic across networks. Leading digital economies continuously focus on supporting commercially feasible models for the development of future telecommunication networks, and so should Jordan, to ensure a state-of-the-art digital infrastructure for its businesses and citizens.

Action 15 – Leading nation-wide focus on data-driven transformation

...by developing regional standards and secure operational models for open data

Drive data-driven solutions across the MENA region, linked to higher education and developing digital economy solutions. International benchmark countries show that the backbone of the digital economy is data-led. This requires standards, security and interoperable business protocols across the economy for example FinTech and eHealth protocols.

Source: DTI

Governance actions

The governance actions sets out to ensure a strong, visible and accountable governance structure to attract investor confidence and assure business leaders and those considering to start a company in Jordan.

Box 4: Governance actions

Action 16 – Establishing co-owned leadership and ownership

...by implementing a strong but agile governance structure to ensure accountability

Demonstrate strong leadership and establish a strong governance structure across the whole of government with support at private sector level.

Action 17 - Reforming the regulatory system to support the integrated digital economy

...by launching a review process of the existing regulators and shifting towards a more dynamic ex-post system focusing on enabling a competitive market

Establish smart regulation for the digital economy to ensure that the regulatory system supports the digital economy in the best way possible.

Action 18 – Exercising strong program accountability and progress monitoring

...by establishing a systematic but dynamic program monitoring and evaluation system

Create a strong accountability structure to effectively and dynamically manage the transformation towards a digital economy, and to ensure continuous progress.

Source: DTI

The recommended next steps to operationalise and implement these actions are:

- Ensure commitment from recommended main owners and ensure their willingness and ability to drive the actions on time and required scale of impact.
- For the targets and Key Performing Indicators (KPIs) to be met, it is imperative that:
 - actions are executed together (no picking and choosing)
 - actions are delivered within the specified timeframe
- Focus on the identified required immediate actions.
- Ensure in particular the impact of the smart specialization aim initiate pilots as quickly as possible.

Lastly, a sound communications and change management process needs to be put in place for the action plan to move at the required speed and with the necessary commitment and owners to create the growth that Jordan needs to prosper.

DRIVING THE ACTIONS FORWARD IN A 3-YEAR TIMEFRAME TO FACILITATE TRANSFORMATION

From the actions and KPIs presented earlier, it is clear that the actions are interlinked. Some of the actions are prerequisites for others, and some institutions – such as the digital economy catapult – will have to be set up to drive other actions.

In Annex I under each high-level action and its corresponding sub actions, the 3-year timeframe for setting in place the actions and its sub-actions is presented. Please note that the sub-actions are designed for a 3-year period only. This timeframe has been selected, because three years is estimated to be the maximum timeframe for which detailed actions in a dynamic digital economy can meaningfully be designed. After three years, the action plan should be revisited and new detailed actions should be determined.

For the lead actions, it is clear that much action needs to be taken immediately. Identifying the champions to drive REACH2025 and establishing Digital Economy Catapults and Launchpads are among the top priorities for these actions.

For the supporting actions, it is equally important that a number of initiatives be initiated within the first year. For instance, the supporting actions related to skills and enabling environment need to be addressed quickly for the digital economy catapults to reach their goals.

Please see Annex I for further details on the timeframe.

Having briefly discussed the time line for the action, it is now presented how the action plan should be governed and monitored to ensure continuous progress.

FUTURE SUCCESS BUILT ON STRONG GOVERNANCE

The effort of accelerating smart specialization in Jordan to increase the significance of the Jordan digital economy in global value chains is based on the fundamental principle of **co-ownership of this action plan between the private sector (the tech sector and the key sectors of the digital economy) and the government.**

The emphasis of the transformation path towards a strong digital economy is for Jordan to become an 'open access' country – open to technologies, talent, and investment and particularly for global collaboration. Whilst actors have concrete role to play, the key to the digital economy will be that Jordan becomes a platform for digital innovation and supports, in particular, communities of experts and talents and smart specialization across the country focusing on strong and systematic support of regional and global partnerships.

Box 5: Important considerations for a governance model

- Digital Economy Catapult (led by industry) to be institutionalized, thus creating independent and stable push environment
- Strong focus on key market enablers and a strong market push by co-creating (industry and government) assessments and recommendations
- Establishment of a digital economy fund to seed-fund further investment or directly fund pre-commercial procurement of innovation processes/Public Procurement of Innovative Solutions (PPI)⁶⁶.
- Jordan as a driver for regional development of the digital economy and open for business leaders to come to Jordan
- Strong focus on exports and supporting international partnerships and the activation of the Jordanian diaspora
- Establishment of smart regulation across all regulators in key sectors, including at local level to enable digital economy business models
- A strong accountability structure includes the involvement of the Cabinet/Economic Policies Council as an oversight body and to establish strong legal basis for the digital economy (Digital Economy Bill⁶⁷)

Source: DTI

GOVERNING THE DIGITAL ECONOMY IN JORDAN BY CREATING A DYNAMIC AND YET ACCOUNTABLE NETWORK OF CHAMPIONS, MOVERS & SHAKERS THAT DRIVE THE AGENDA TOGETHER

The key to attracting investor confidence and ensure business leaders and those considering to start a company in Jordan must be a strong, visible and accountable governance structure that will work together to drive impact and reach the envisioned outcomes. This action plan and roadmap toward the digital economy requires collaborative leadership across the spectrum of industry, government and the non-for-profit organizations. Moreover, it requires that the digital economy is seen as relevant for the entire economy, and that the Tech/ICT sector must become an integral part of this economic reality for Jordan. For this reason, there needs to be a high-level governance structure driving smart specialization

⁶⁶ Pre-commercial procurement or PPI refers to the procurement of research and development of new innovative solutions before they are commercially available. <https://ec.europa.eu/digital-single-market/en/pre-commercial-procurement>

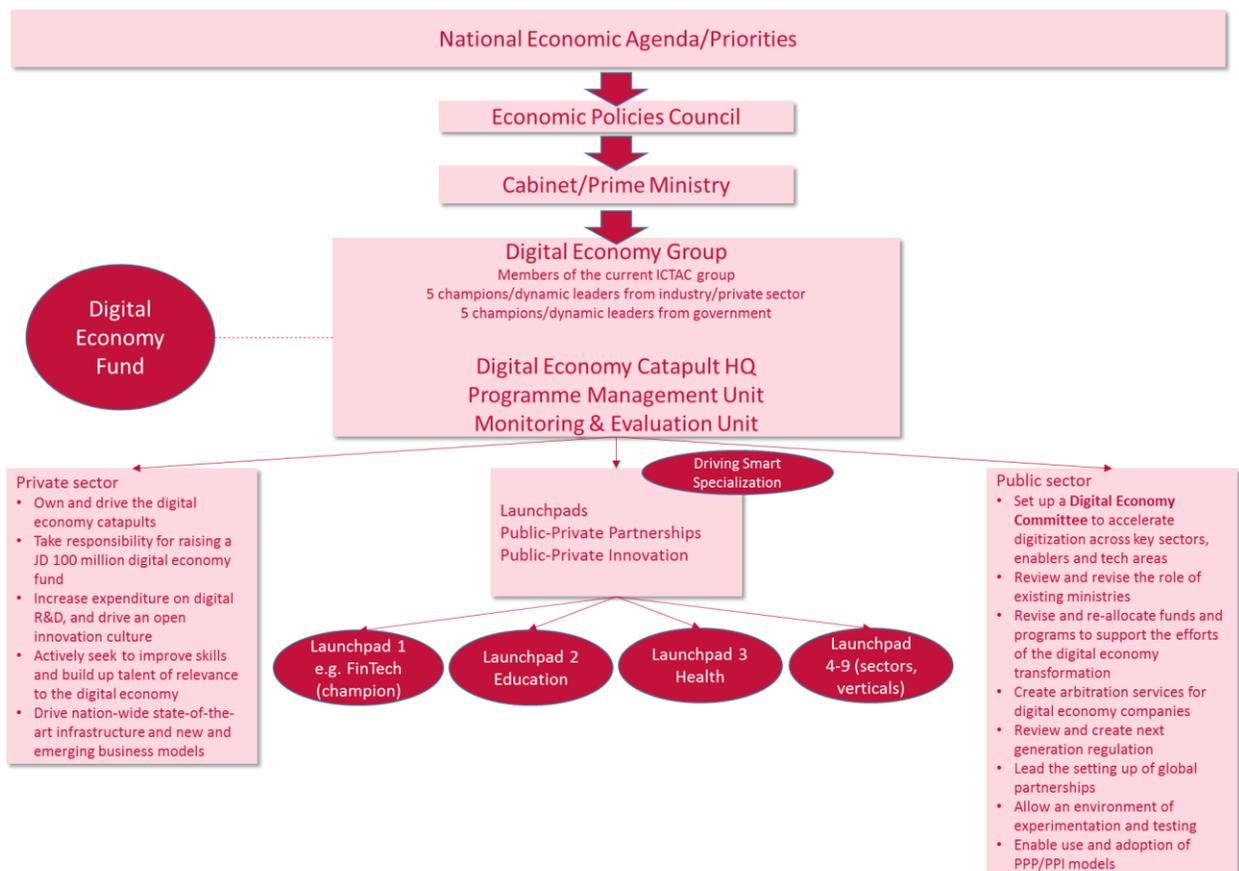
⁶⁷ The Digital Economy Bill is inspired by the UK. The country decided that if it is to remain ahead and be a world leader in the digital economy it needs to continue to raise its ambition. The tool for this is introducing a Digital Economy Bill, which includes a range of measures in support of this. The bill will 1) empower consumers and provide better connectivity so that everyone has access to broadband wherever they live, 2) build a better infrastructure fit for the digital future, 3) enable better public services using digital technologies, and 4) provide important protections for citizens from spam email and nuisance calls etc. <https://www.gov.uk/government/collections/digital-economy-bill-2016>

throughout the Jordan economy. This also requires fundamental changes in the way government operates and needs to be supported by the non-for-profit sector to enable the society's transformation towards a digital Jordan.

Setting up a short-term governance structure to drive the right and sustainable governance model for Jordan's transformation

The following figure outlines the key layers, roles and responsibilities underlying the proposed short-term governance structure that should drive the dialogues and process adopting a more sustainable governance model and advanced economic structure in Jordan that addresses the digital economy as a key growth pillar.

Figure 5: Governance structure to lead the digital economy



Source: DTI

The key drivers of the short-term governance structure are:

- To identify the right governance set-up and at the same time create immediate momentum following the announcement of the action, it is recommended that the **Cabinet** takes ownership in the short-term to review and advise the Jordan government on the sustainable governance set-up to drive the commitment towards the digital economy in Jordan.

- At the same time it is recommended to immediately set-up the **digital economy catapult and immediately start piloting 1-3 digital launchpads** in key priority sectors to define the structural requirements and required conditions for successful smart specialization and acceleration.
- At the heart of the transformation is the commitment of a **co-funded digital economy fund**. It would be recommended that a 100Mio JDs fund can be launched immediately. This fund should be co-owned.
- The digital economy catapult and all other activities leading to smart specialisation laid out in this action plan should be in the short-term overseen by a **digital economy group**. It is advisable to include a high-level reporting mechanism on a monthly/quarterly basis to the royal court and to the prime minister to ensure progress.

Within the first period of the digital economy action plan, all relevant roles and mandates of key leading institutions need to be investigated and potentially revised (int@j, MoICT, etc.) leading to the following key elements of a strong governance model for the digital economy in Jordan.

STRONG LEADERSHIP AT NATIONAL LEVEL

The vision is national transformation supported by high level steering groups across the private sector, government and non-for-profit sector to create and sustain momentum in partnership with each other.

The leadership required by government is across three action areas: 1) enabling the digital economy, 2) becoming a leader in digital government services and solutions itself (see action 3), 3) smart regulation to enable state-of-the-art infrastructure and new tech business models for the digital economy.

As part of the shift away from focusing on ICT/Tech as a sector and towards a digital economy, Ministry of ICT will increasingly become more focused on the digital economy instead of ICT. We recommend that focus be on this development at ministerial level and the potential necessary changes be supported.

Furthermore, in supporting the digital economy, it is important that the ICT association int@j moves away from being an ICT sector organization only and expands into at least the key digital economy sectors of this action paper. Therefore, it is recommended that int@j's mandate be reviewed to include additional sectors to become more inclusive and representative.

Furthermore, the government needs to demonstrate leadership across the supporting actions as laid out in the actions above.

SMART SPECIALISATION PUSHED BY THE PRIVATE AND PUBLIC SECTOR ACROSS KEY SECTORS

The **digital catapult** will require a headquarter and the establishment of a network of individual launch pads working on the different focus sectors, enablers and vertical tech areas. A qualified high-performing individual should lead the digital catapult. Moreover, an executive board consisting of the current ICTAC group, 10 leading next generation digital economy leaders as well as the economic team under the Cabinet, should support it. It needs to be evaluated whether each catapult also has external advisory boards to ensure effective diffusion and maximization of impact of the catapults.

As opposed to the previous REACH models, it is important that strong champions drive the individual launch pads, which will accelerate digitization in priority sectors, across enabling sectors and in key vertical tech areas. The strong champions should be young leaders with new ideas and drive, who will in turn put together working groups across key partners to diffuse digitization, create capacity, drive excellence, and experiment with new products, services and approaches. A key task for the catapults will be to seek to set up global partnerships to drive knowledge and tech transfer as well as drive digitization and innovation capacity across the relevant sectors ecosystems. These champions are accountable to the Executive Board of the Digital Economy Catapult.

Closely related, the entire **ecosystem supporting start-ups** will need to be strengthened and collaboration and coordination improved. Moreover, there is a particular need to support the scaling and growth of start-ups more effectively.

A key mechanism to drive smart specialization is the establishment of a **JD 100 million digital economy fund**, which should be co-financed by public and private funds.

Eventually, the innovation system should also include close collaboration between industry players, universities in local, regional and global partnerships. This capacity will be supported by government-led innovation centers in key markets and should be revised and further expanded after the initial 3 years.

Overall, the commitments of the different actors can be summarized as follows:

Box 6: What is needed for the next digital revolution in Jordan - commitment of different actors

Private sector will...

- Own and drive the digital economy catapults and thus create strong innovation partnerships and collaborations across the smart specialization agendas (related to the key sectors, enablers and vertical tech areas) to enable the digital economy in Jordan
- Take responsibility for raising a JD 100 million digital economy fund
- Increase expenditure on digital R&D, and drive an open innovation culture to support digital innovation in companies and at start-ups and entrepreneurs
- Actively seek to improve skills and build up talent of relevance to the digital economy
- Drive nation-wide state-of-the-art infrastructure and new and emerging business models for tomorrow's state-of-the-art infrastructure

Government will...

- Set up a Digital Economy Group/Committee to accelerate digitization across key sectors, enablers and tech areas
- Review and revise the role of existing ministries
- Revise and re-allocate funds and programs to support the efforts of the digital economy transformation, particularly by creating an enabling business environment, investing in

relevant education and skills and fostering a nation-wide digital entrepreneurship & maker culture

- Create arbitration services for digital companies to ensure the ongoing resolution of regulatory conflict
- Lead the setting up of global partnerships for businesses and start-ups in leading target markets
- Allow an environment of experimentation and testing, and lead innovation in public sector
- Enable use and adoption of PPP and PPI models to accelerate the implementation of the digital economy

Source: DTI

Finally, the non-for-profit sector (particularly foundations, but also funds and universities) also has a key role to play, particularly in driving some of the launch pads. The non-for-profit sector will be particularly engaged in driving the maker revolution and the entrepreneurial culture across the region, in supporting youth in creating ideas for digital business for the future, and in disseminating social goals such as green economy goals, bringing women into the active workforce, becoming a regional hub and for digital innovation to become a nation-wide strength.

HOW TO MEASURE SUCCESS – CONSIDERATIONS FOR A DYNAMIC FRAMEWORK FOR MONITORING AND EVALUATION

To ensure progress towards reaping the benefits of a digital economy, it is imperative to have a solid monitoring and evaluation process in place. While the action plan contains a certain detail of the necessary monitoring arrangements, particularly reflected in the detailing of the actions and KPIs, it should be stressed that not everything can or should be included in this document. Hence, the first phase of this action plan should be used to confirm and refine this. Moreover, at the very beginning of the action plan, a clear baseline of information should be established, against which progress and performance will be subsequently assessed. In addition, both the action plan and the monitoring arrangements should be subject to ongoing review and revision during the next ten years, based on experience and lessons learned.⁶⁸

Monitoring focuses on collecting and using information to help determine if project objectives are being achieved. It is therefore important that the project objectives are the right ones from the outset and are clearly specified. As a first step, the institutions responsible for the monitoring exercise should double-check this. Likewise, the final selection of appropriate **indicators** should be carried out by those responsible for collecting and using the information, as they are the only ones having enough insight to

⁶⁸ European Commission (2007): Strengthening project internal monitoring

ensure the appropriateness of the indicators.⁶⁹ In setting up the monitoring and evaluation system, it is advisable to develop a digital economy impact forecast and assessment model to establish a dynamic measuring framework across the economy. Such a task is a major task, and it should be carefully considered at the very beginning of the entire action plan to set up a sound model capturing the right baseline, KPIs, targets, etc.

As with the selection and use of indicators, it is important that those responsible for implementation on the ground take the lead in the setting of **targets**. Ownership of targets by implementing partners is critical. In addition, the targets need to be reviewed regularly, as part of the ongoing monitoring and review process. This helps ensure their continued relevance.⁷⁰

Summing up, the following recommendations for a strong governance structure for the digital economy emerge from international good practice:

Box 7: Recommendations for the future sustainable governance structure to support the digital economy in Jordan

- Engage strong public and private sector leaders to be **champions of the digital economy** and its potential across Jordan.
- Manage the digital economy as a **cross-cutting policy priority across government**. Key ministries aligned with the priority sectors should be leading this effort. This could take the form of a committee or a working group, and could be chaired by a private sector leader or a high-level government figure. It is important that the digital economy is driven by an economy or industry relevant ministry (ies).
- Consider strong government leadership by nominating a **digital economy minister**.
- Prove to the world that you can create a vibrant and dynamic digital economy with re-prioritising existing funds only and by smartly working in close partnership with the private sector to build value for Jordan together.
- To create the transformative push required to create the digital economy in Jordan a **strong accountability structure** is required, including the mandate to withhold funds and roles and mandates if performance is not met. This needs to apply to the private and the public sector and rules for enforcement need to be clearly laid out.
- In the long-term the **parliament could have an oversight role** into how the digital economy is functioning and how it could be approved as a regular mechanism to advise the government. Similarly, international reviews or competitions could be held to bring in scrutiny.
- **Celebrate** digital economy success stories.

⁶⁹ European Commission (2007): Strengthening project internal monitoring

⁷⁰ European Commission (2007): Strengthening project internal monitoring

INSPIRING INTERNATIONAL EXAMPLES OF CONCRETE TRANSFORMATIONAL ACTIONS

Faced with the digital future, many countries have taken concrete actions to create a competitive advantage. Here are some examples of concrete transformational actions that Jordan could consider adapting to its own context:

- **DENMARK - DIGITIZATION OF SUPPLY CHAINS AND SMART PRODUCTION** - Market Development Fund (2013-15), a new type of initiative, supports the development process just before commercialization, when a functioning prototype must be customized to fit the demands of the market. The fund co-finances facilitation of end-consumer testing and adaptation of the new product or service, thereby shortening the developer's time to market and strengthening the potential for growth and employment.
- **DENMARK - FOCUS ON SMART CITIES** - Copenhagen Smart City Solutions lab - The Copenhagen Solutions Lab will be a new governing body for smart city projects across all sectors in the city and will have focus on creating triple helix partnerships. Copenhagen Solutions Lab will lead the implementation of innovation and smart city development in close collaboration with knowledge institutions and companies as well as citizens. New intelligent transportation system solutions, reduced carbon emissions, implementation of sensors that create real time data and information on current situations in the city and the buildup and architecture of a new 'Big Data Digital Infrastructure Platform' that shares data across public and private sectors will all be working focus points within the Lab.
- **DUBAI – THE NATIONAL INNOVATION STRATEGY:**
The strategy sets out specific strands of action:
 - Developing government innovation by institutionalizing innovative practices with the support of an integrated system of modern tools, requiring all government entities to reduce spending by 1 percent and to dedicate the savings to research and innovation projects;
 - Encouraging private sector innovation by stimulating companies to establish innovation and scientific research centres, to adopt new technologies and to develop innovative products and services;
 - Qualifying individuals with highly innovative skills by concentrating on science, technology, engineering and mathematics, including the creation of educational material for schools and universities.

The Dubai National Innovation Strategy includes the following focus areas:

- In the field of renewable energy, the strategy will establish a new organisation to facilitate decentralised power generation projects such as small-scale solar installations. The strategy will also encourage innovation in the renewables industry while also supporting applied research in clean technology.

- In transportation, the strategy will stimulate innovation in air and sea travel as well as logistics. The aim is to provide new products and services, make procedures more effective, and save time. The strategy will also focus on innovation in the field of unmanned drones.
 - In education, the strategy will establish innovation labs in schools and universities as part of a drive to equip students with targeted skills such as critical thinking, problem-solving, creativity, perseverance and adaptability.
 - In health, the strategy will promote advanced technologies in healthcare services. It will stimulate the growth of the biotechnology and pharmaceutical industries while also working with strategic partners to support medical research.
 - On the topic of water, the strategy will seek innovative solutions to the challenge of water scarcity.
 - Finally, the strategy will support space technology for the purpose of exploration as well as satellite communications and specialised research on terrestrial applications.
- **IRELAND – HELPING SMES ONLINE** - Grow small businesses and create jobs by helping micro and small enterprises to trade online and access new markets. By mid-2015, get 10,000 businesses online for the first time and through the Trading Online Voucher Scheme help 2,000 more small businesses trade online for the first time.
 - **IRELAND – GRAND COALITION FOR ESILLS** - The ICT Skills Working Group of Northern Ireland is a regional coalition of stakeholders. The ICT Skills Working Group brings together a wide range of stakeholders, including representatives from relevant government departments, higher education, further education, employers, employer representative bodies, sector skills councils and trade associations. The Group manages an Action Plan setting out the short, medium and long term actions required to ensure that the local ICT industry has access to the skilled workforce it needs to grow and flourish, both now and in the future.
 - **IRELAND – COMMUNICATION & AWARENESS CAMPAIGNS TO PROMOTE THE DIGITAL SOCIETY** – Ireland has been running a number of campaigns to promote trust, safety and skills. Similar aspects could promote wide-scale digital innovation.
 - **UK – DEVELOPING OPEN DATA** - The Open Data Institute is already championing innovation in industry and society through open data. A growing body of evidence points towards the economic benefits of open data, and the trend of public and private organizations opening up their data sets should be encouraged to continue.
 - **UK – TECH NATION VISION AND BENCHMARKING APPROACH** – The strategy focuses on areas like digital skills, smart capital investment, infrastructure, international development and leadership to support the tech industry in the UK.

INTERNATIONAL EXAMPLES - GOVERNANCE AND IMPLEMENTATION

The platforms, systems and supply chains that underpin the emerging digital economy in Jordan will need consistent investment, a shared innovation strategy and a broad-based cross-industry collaborative approach. Concrete actions and commitment will be the transformatory engine in Jordan. However, this roadmap to excellence, which is currently being developed, will require joint leadership from the private sector as well as government. To assure all partners and stakeholders, a strong governance and implementation model will need to be set in place to ensure follow-through and guide effort in a dynamic way based on consistent monitoring of impact achieved against key targets. To determine the right model international approaches and best practice will be taken into consideration.

Different approaches and components displayed by leading countries include the following:

- **UK** - The UK currently has a tech nation strategy at city level, led by an independent organization called Tech City UK. Launched in 2010, Tech City UK focusses on areas like digital skills, smart capital investment, infrastructure, international development and leadership to support the tech industry in the UK focusing on the ICT clusters in key cities. At the same time, the UK has national digital economy strategy focusing on unlocking digital growth, transforming government, transforming day-to-day life, and building the foundations – infrastructure, emphasis on cybersecurity, privacy, trust, skills. The strategy is led by the Digital Economy Minister in the Department for Culture, Media & Sport.
- **DENMARK** - The focus of the current digital vision in Denmark is on Digitization of Supply Chains and Smart Production. The vision is to enable the rapid design, implementation and evaluation of innovative value creating automated digital business solutions in the supply chain. There is a particular emphasis on key sectors and on SMEs. This is supported by policy, investment solutions and by a set-up of tech transfer organizations, for instance the GTS institutes. GTS stands for Godkendt Teknologisk Service (approved technology service provider) and are independent not-for-profit organizations whose purpose is to spread technical know-how, new methods and knowledge to industry and society. The GTS institutes are independent from political or economic interests and profit is reinvested in research and development.
- **DENMARK** - The Copenhagen Solutions Lab is a new governing body for smart city projects across all sectors in the city and will have focus on creating triple helix partnerships. Copenhagen Solutions Lab leads the implementation of innovation and smart city development in close collaboration with knowledge institutions and companies as well as citizens. New intelligent transportation system solutions, reduced carbon emissions, implementation of sensors that create real time data and information on current situations in the city and the build-up and architecture of a new 'Big Data Digital Infrastructure Platform' that shares data across public and private sectors are working focus points within the Lab.
- **DUBAI** - Dubai has a strong top-down, government led approach. In 2014 His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, launched a National Innovation Strategy with a seven-year plan that aims to make the UAE among the most innovative nations in the world. Innovation strategy focusses on 7 key constituents: Innovative products and services, knowledge and technology, infrastructure, competitive environment,

funding and investment, human capital and research, institutions and regulatory environment. To support the transformation within government, the UAE has announced the creation of a new job post – CEO of Innovation – for every government department and has announced multiple private sector, or zone relevant partnerships or targets such as the Dubai Global Innovation Centre in partnership with Dutch technology firm Philips for the 3D printing targets.

- **IRELAND** - Historically, Ireland set its ambitions to become the European ICT hub in the late 1990. This received high level backing from the Irish Information Society Commission (ISC), which was established in 2001. This was an independent advisory body to the Irish Government, reporting directly to the Taoiseach (Irish prime minister). It drew on high-level representation from the business community, the social partners, and government itself. The ISC had a key role in shaping the evolving public policy framework for the Information Society in Ireland. It contributed to the policy formulation process, monitored progress, and highlighted issues that needed to be prioritized. The Commission served until the end of 2004.
- **IRELAND** - In 2014, major industry players including General Motors, Johnson & Johnson and Kerry Group got together with UL, LIT, Limerick City & County Council and IDA Ireland and formed a unique IT skills partnership ‘Limerick for IT’. Since its establishment, the initiative has created over 200 high skilled IT jobs and has been acknowledged as a major FDI skills innovation developer.

Further inspiration can be derived from the private sector⁷¹, and from emerging smart cities, which increasingly look to collaborative governance models⁷² to lead the digital transformation. Such international best practices will be further investigated as to their relevance to Jordan.

Summarizing, the governance for the digital economy requires a collaborative approach, specific approach to handling data, creation of digital building blocks and platforms, working with acceleration & digital champions, clear commitment to impact measurement and continuous alignment of policies and programs based on real-time evidence.

71 See for instance an overview of central components to manage a successful digital transformation four example companies display - https://www.capgemini-consulting.com/resource-file-access/resource/pdf/Governance__A_Central_Component_of_Successful_Digital_Transformation.pdf

72 See for instance the BSI Standards Publication (2014) Smart city framework – Guide to establishing strategies for smart cities and communities

ANNEX I: DETAILED ACTIONS

The actions are based on Jordan's key differentiators, strengths and weaknesses, as well as international experience in terms of how other benchmark countries have set the path for achieving a digital vision. Under all actions, other actions and responsibilities can be added based on need.



Action I Smart Specialization and Growth

Recommended main owner
Government (Cabinet/Economic Policies Council)

Adopting the Digital Economy Framework in Jordan's economy

...thus driving the digital economy in Jordan

Create an independent digital economy catapult – a platform for the digital economy in Jordan. It should be established as a network of specialized centers of excellence with one headquarter/umbrella. Establishing the digital economy catapult puts Jordan among the frontrunners of the digital economy and allows Jordan to develop relevant digital products and services across leading sectors of relevance to global digital value chains. Building on the Jordan differentiators of leveraging high-level strategic partnerships, drive demand-driven digital innovation, creating and integrating solutions for the digital economy, the catapults set out to diffuse and accelerate digitization across sectors that are lagging behind currently, and where linkages between sectors and the tech sector are not yet established.

A digital economy catapult will be established with one headquarter and nine catapults in the six leading sectors (Health, Education, Energy & Cleantech, Transport & logistics, Financial sector, and Communications & security) and three key enablers (Content & gaming, E-commerce and Professional services). The vertical tech areas (IOT, Cloud Computing, Hardware and Artificial Intelligence) will be embedded in the relevant catapults. The catapults will be working across the horizontal and vertical emphasis areas and the digital enablers.

The digital economy catapult HQ will have the following responsibilities:

- Provide tech innovation support service to entrepreneurs, intrapreneurs and makers
- Develop understanding of value of in-licensing and create support program
- Support prototyping and service design, for instance through an innovation fund
- Create a disruption program for the existing tech sector which should lead to the immediate development of a pipeline of new products services targeting the digital economy
- Provide advocacy support for digital economy
- Initiate cross-sectoral digital economy standards development
- Initiate communications campaign & promotion of the digital economy across sectors
- Establish an open data center to drive the opening of data and the development of new solutions based on this data.

The nine sector/enabler catapults/launchpads will have the following responsibilities:

- Market development & match making (national and international) within the relevant key digital sector/enabler and across the relevant verticals

| | |
|--|---|
| <p>Action specified (3-year timeframe)</p> <p>Immediate actions</p> <p>Establish Digital Economy Catapult HQ (including a Programme Management Unit and a Monitoring and Evaluation unit). The catapult HQ will be tasked to set up nine catapults in the six key sectors and three enabling sectors.</p> <p>Pilot one launchpad with good leadership. While multiple sector- and tech vertical-based catapults should be built, one with good leadership should be fast-tracked (could be FinTech (CBJ) or Health (Hakeem)).</p> <p>Subsequent actions</p> <p>Establish Digital Economy Launchpads in remaining key sectors and enablers. There is no one Launchpad model fits all sectors; it depends on the stakeholders and dynamics of each sector in terms of how to drive dialogue and transformation.</p> | <p>Recommended owner</p> <p>Government (Cabinet/EPC) to set up a new independent body (Digital Economy Catapult HQ with its own branded identity). Program work in policy/economic considerations could include the Jordan Strategy Forum and int@j.</p> <p>MolCT/Government and Digital Economy Committee should pinpoint sector and owner/leader for piloting the catapult</p> <p>Individual catapults led by key digital sector champions</p> |
| <p>Regulations/Instructions/Decisions:</p> <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Decision for EPC to adopt REACH2025 and suggested governance model ● Decision to establish the PMU & M&E at entity X under EPC/Cabinet supervision ● Instructions for CBJ to lead FinTech ● Instructions for MolCT to lead Government Digitization ● Instructions for Digitization PPP model ● Instruction to Cabinet on key regulatory changes within 6 months – 1 year <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Instructions for GAM to lead Smart Cities Digitization ● Instructions for Y to lead Health Digitization ● Instructions for Y to lead Education Digitization ● Instructions for Y to lead Transportation Digitization ● Instructions for Y to lead Communications and Security Digitization | |
| <p>Scalability/sustainability</p> <p>Additional catapults can be established following the same model.</p> | |
| <p>Budget Consideration:⁷³</p> <p>Based on the figures from the UK Digital Catapult, the following considerations apply:</p> <p>Setting up a Digital Economy Catapult with six sectoral catapults, three enabling sectors and three tech verticals: JD 12-14 million (Purchasing Power Parity (PPP)⁷⁴ adjusted)</p> <p>Yearly costs of running the catapults: Approx. JD 1.5 million per catapult and headquarter (PPP adjusted) amounting to JD 16.5 million in total per year. This is based on a team of 15 people at the Catapult HQ and five people in each of the other catapults.</p> | |
| <p>Selected KPIs</p> <p>Catapults to set own KPIs to be signed off by board</p> | |

⁷³ <https://www.catapult.org.uk/>

⁷⁴ <http://data.worldbank.org/indicator/PA.NUS.PPPC.RF> The same source has been used for all PPP calculations

- Launch pilot catapult within 6 months, and remaining within 1 year
- Create 10-15 international partnerships annually, starting from year 2
- Make 3 of the top 5 exporters a tech company (10 yr.)
- Increased digitization in key sectors (3 yrs.)
- Establish clear linkages between tech sector/solutions and key sectors (3 yrs.)

Timeframe

| Action | Year 1 | | | Year 2 | | | Year 3 | | |
|---|--------|---|---|--------|---|---|--------|---|---|
| Identify champions to drive REACH 2025 | ■ | | | | | | | | |
| LEAD ACTIONS | | | | | | | | | |
| Action 1: Adopting the Digital Economy Framework in Jordan's Economy | | | | | | | | | |
| Establish Digital Economy Catapult HQ | ■ | ■ | | | | | | | |
| Pilot one Launchpad with good leadership | | ■ | ■ | | | | | | |
| Establish Digital Economy Launchpads in remaining key sectors and enablers | | | | ■ | ■ | ■ | ■ | ■ | ■ |



Action 2 Smart Specialization & Growth

Recommended main owner

Digital Economy Group/Committee, Sector Launchpads

Creating globally relevant, high value digital applications, solutions and IP

... by supporting in-licensing and the reuse of IPs to create and grow Jordanian/local IPs

Create national agreement on utilizing local intellectual property/innovations/solutions for the digital economy. The action is building on the differentiator of leveraging high-level strategic partnerships. A way of doing this is to reuse IPs from international companies. Leading countries are experimenting with the reuse of local intellectual property/existing solutions to create an open economy that facilitates digital innovation.

| Action specified | Recommended owners |
|--|---|
| <p>Immediate actions</p> | |
| <p>Organize an inventory exercise and a series of 10 'co-creation' workshops to kick-start innovation within companies</p> | <p>Digital Economy Group/Committee to coordinate, Digital Economy Catapults to execute</p> |
| <p>Publish inventory of relevant and possible international licenses & IPs and support universities and schools in reusing them</p> | <p>Digital Economy Catapults</p> |
| <p>Subsequent actions</p> | |
| <p>Create special program at key accelerators to support the creation of new IPs/innovations/solutions and re-use of local solutions; this is to happen in support of the vertical catapults built in key sectors</p> | <p>Digital Economy Catapults, existing accelerators, innovation centers at universities</p> |
| <p>Identify opportunities for utilizing existing IPs/innovations/solutions across tech transfer programs</p> | <p>Ministry of Industry, IP commercialization offices (IPCO/RSS, TTUs at universities)</p> |
| <p>Expand the mandate of King Abdullah Center for Excellence to bring together tech expertise and market needs to include as a requirement under their institutions award</p> | <p>King Abdullah II Center of Excellence and relevant bodies</p> |
| <p>Regulations/Instructions/Decisions:</p> | |
| <p>Within 6 months:</p> | |
| <ul style="list-style-type: none"> ● Revise funding process and instructions for the R&D Fund to accept Private Sector Applications and decision within 1 month | |
| <p>Within 1 year:</p> | |
| <ul style="list-style-type: none"> ● Instructions to expand the mandate of King Abdullah Centre for Excellence to include Digitization and usage of local IP together with tech expertise according to market needs | |

| |
|---|
| <p>Scalability/sustainability The initiative can be scaled to encompass more accelerators</p> |
| <p>Budget Consideration: Within budget of Digital Economy Catapult HQ</p> |
| <p>Selected KPIs</p> <ul style="list-style-type: none"> ● Special program at key accelerators to support the creation of new innovations/solutions and re-use of existing solutions set up within 6 months ● Reuse of 100 existing innovations/solutions annually ● 300 companies have taken advantage of existing opportunities ● More innovative digital solutions are being developed in Jordan, using existing solutions ● More international new innovation partnerships |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 2: Create globally relevant, high value digital applications, solutions and IP | | | |
| Organize an inventory exercise and a series of 10 'co-creation' workshops to kick-start innovation within companies | ■ | ■ | |
| Publish inventory of relevant and possible international licenses & IPs and support universities and schools in reusing them | ■ | ■ | |
| Create special program at key accelerators to encourage creation and re-use of IP | | ■ | ■ |
| Identify opportunities for utilizing existing IPs/innovations/solutions across tech transfer programs | | ■ | ■ |
| Expand the mandate of King Abdullah Center for Excellence to bring together tech expertise and market needs | | ■ | |

Action 3 Smart Specialization & Growth

Recommended main owner

Jordan Investment Commission, Ministry of Industry & Trade,
Ministry of Foreign Affairs, int@j, accelerators

Driving global partnerships and bridges with international digital hubs

... through a network of international innovation centers in key markets

Strengthen and promote Jordan's digital solutions and market development potential in key export markets. The main focus is to enable business-to-business partnerships between Jordanian digital economy companies and international partners, to create international awareness of Jordan's strengths, differentiators and capabilities.

10 innovation centers will be created in key export markets for Jordanian companies. The specificities of the innovation centers are:⁷⁵

- Partners, funding and scaling opportunities: Assistance for finding partners, funding, and scaling opportunities through meetings, seminars, and networking with key players
- Collaboration with institutions of higher education - international networks, partnerships and agreements, i.e., facilitation of international networks, partnerships, and agreements between you and key players
- Access to international knowledge by connecting local companies with international key players and create a strong network
- Business Development: Developing businesses by, for instance, finding partners, accessing research and knowledge, to developing the entrepreneurial spirit in an organization.

Action specified

Immediate action

Launch 10 innovation centers in international strategic partnership markets (important/relevant markets to Jordan). Innovation centers have targets for business development

Build mentoring and coaching programs with international startups and corporates in the digital hubs

Recommended owners

Jordan Investment Commission together with Ministry of Industry and Trade and Ministry of Foreign Affairs, link with diaspora

MoICT, int@j

Regulations/Instructions/Decisions:

Within 6 months:

- Instructions to JIC to establish 5 centres in international strategic partnership markets (important/relevant markets to Jordan). Innovation centres have targets for business development
- Ensure visa facilitation through MoFA for targeted markets

⁷⁵ <http://icdk.um.dk/en/whatweoffer/>

Within 1 year:

- Instructions to JIC to establish 5 centres in international strategic partnership markets (important/relevant markets to Jordan). Innovation centres have targets for business development
- Budget for an annual event in various regions to promote digital companies and IPs and facilitate business development, linkages with diaspora and funding in key markets

Scalability/sustainability

The number of innovation centers can be increased as necessary

Budget Consideration:

In the national budget, Denmark set aside a budget amounting to JD 460,000 per center on a yearly basis. For 10 centers, this amounts to a yearly budget of **JD 4.6 million**. The figure has not been PPP adjusted since the centers will be set up in the US, UK, Dubai, etc., similarly to the Danish model.

Selected KPIs

- 10 innovation centers in international strategic partnership markets established within 3 years
- 500 Jordanian companies have increased their export as a result of the program after 5 years
- 50% increase in awareness of Jordanian strengths in a survey with companies in the 10 key markets (3 yrs.)

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 3: Driving global partnerships and bridges with international digital hubs | | | |
| Launch 10 innovation centers in international strategic partnership markets | ■ | ■ | ■ |
| Build mentoring and coaching programs | ■ | ■ | ■ |



Action 4 Public Sector Innovation

Recommended main owner
EPC, MoICT and MoPSD to lead process

Transforming government and public sector to be 'digital by default' by 2020

...by developing open data policy, changing models of implementation to be based on Public-Private Partnerships and leading and accelerating digital innovation across government

Transform government and public sector to be a regionally and globally recognized leader in public sector innovation and digitization by going digital by default. The aims for Jordan are to achieve a strong and open public infrastructure key for developing a strong digital economy and create a more efficient government as shown by leading countries. Moreover, the actions are responding to the weakness of government not acting as a competent market and user that can drive digital economy. Strengthening government innovation will give access to world-class government services, which is a driver for the digital economy companies to grow and/or settle in Jordan, and it will stimulate eGovernment products and services within existing tech companies to sell/export regionally. Lastly, it will generate accountability and transparency for FDI into Jordan.

Action specified (3-year timeframe)

Immediate actions

Issue an overall digital policy for Digital Economy and separate digitization policies for each target sectors

- Emphasis on Public-Private partnerships; mainly to drive implementation of digitization in key sectors
- Address procurement rules and potential need for revision
- Identify key enablers of the digital economy such as authentication, online transaction services, digital health record and agree plan for implementation
- Address key security and capacity-building concerns

Support and grow public sector innovation through appointing an innovation officer in each ministry, with a clear framework and responsibility to drive innovation forward

Align the eGovernment Strategy & Action Plan with the needs of the digital economy as well as government efficiency goals. Create an inventory of all government services and their status (end-to-end) of digitization. Prioritize service transformation according to usage and benefits to citizens and businesses.

Recommended owners

MoICT in close collaboration with Economic Policies Council, Ministry of Finance, Ministry of Public Sector Development, Ministry of Industry and Trade, and relevant Economy Ministry and sector catapults

PM, Ministry of Public Sector Development

MoICT, Ministry of Finance, Ministry of Public Sector Development

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| <p>Launch a public sector accelerator program in collaboration with the key line ministries driving the digital economy to support a policy driven transformation of the economy.</p> <p>Develop an open data policy across government and program to activate the market by pushing open data uptake.</p> <p>Subsequent actions</p> <p>Establish commitment to become digital by default within existing budgets with all ministries.</p> <p>Create 'government as a platform' and move towards an open & transparent e-procurement platform working significantly with Public-Private Partnerships</p> | <p>Led by Economic Policies Council, carried out by MoPSD and MoICT</p> <p>Ministry of Public Sector Development, MoICT</p> <p>Economic Policies Council to coordinate/appoint lead</p> <p>Ministry of Public Sector Development in collaboration with MoICT</p> |
| <p>Regulations/Instructions/Decisions:</p> <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Instructions for Digitization PPP model ● Issue an overall digital policy for Digital Economy ● Revise procurement rules and potential need for revision ● Appointing an innovation officer in each ministry ● Establish data privacy and protection law <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Align the eGovernment Strategy & Action Plan with the needs of the digital economy ● Issue digital policy for Digital Economy and digitization policies for each target sectors (Health, Education, Financial, Transportation, Smart Cities) ● Review regulations to identify key enablers of the digital economy such as authentication, online transaction services, digital health record ● Launch a public sector accelerator program in collaboration with the key line ministries ● Develop an open data policy across government ● Move to e-procurement platform | |
| <p>Scalability/sustainability</p> <p>Can involve all parts of Government with time.</p> | |
| <p>Budget Considerations⁷⁶:</p> <p>Can we identify an eGovernment budget?</p> <p>In 2009, Estonia, the most advanced digital economy, had a forward-looking yearly budget amounting to approx. JD 11 million (PPP adjusted). This included, for instance:</p> <ul style="list-style-type: none"> - Improving skills of and widening opportunities for participation - Development of eBusiness environment | |

⁷⁶ European Commission (2009): eGovernment in Estonia

- Development of public e-services, including information services
- Increasing the interoperability of the state information system

Selected KPIs

- 80% usage of digital services within 5 years
- Enable 100% access to government services on mobile phones and tablets within 3 years
- No more printed forms or letters in 8-10 years (digital by default)
- Require all public authorities to use public sector solutions promoting open market solutions and reuse, within 3 years
- 10 Public-Private Innovations including Jordanian companies per year

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 4: Transforming government and public sector to be "digital by default" by 2020 | | | |
| Issue an overall digital policy for Digital Economy | | | |
| Support and grow public sector innovation through appointing an innovation officer in each ministry | | | |
| Align the eGovernment strategy & action plan with the needs of the digital economy | | | |
| Launch a public sector accelerator program | | | |
| Develop an open data policy and program | | | |
| Establish commitment to become digital by de-fault within existing budgets with all ministries | | | |
| Create "government as a platform" and move towards an open & transparent e-procurement platform working significantly with PPPs | | | |



Action 5 Startups & Entrepreneurship

Recommended main owner
Jordan Investment Commission/MoICT

Boosting digital economy start-ups

...in Jordan and special zones, by increasing incubation, acceleration & support capacity

Support and scale tech start-ups, particularly in venturing into the digital economy. The start-ups are a main driver of growth and jobs and one of Jordan's key strengths. By supporting these, Jordan will be pushing the boundaries towards innovative and disruptive breakthroughs. This is done through physical and/or virtual tech zones, where companies enjoy special benefits. In some instances, such as for setting up 3D-printers, it is most appropriate that zones are physical, in other cases, they may be virtual and encompass all digital economy companies within sectors.

Conditions in the zones could include:⁷⁷

Tax Incentives

- 100% corporate tax exemption
- 100% import and export tax exemption

Investment Incentives

- 100% foreign company ownership

No capital gains

- No currency restrictions
- Doing business process (registration → closure) ease process of closing to allow failure and trial
- No Municipal license for first 3 years, or at all inside the zone
- Foreign labor recruitment and hiring
- Technology Access
- Loan guarantees
- Access to VC funds

Action specified (3-year timeframe)

Immediate actions

Create start-up zones across Jordan, e.g., tech start-up and health 4.0 zone (e.g., in Amman), e-commerce zone (e.g., in Irbid), future logistics solutions and gaming (e.g., in Aqaba). The zones are not bound to be physical zones only, but can also be vertical depending on the benefiting segment

Recommended owners

Jordan Investment Commission

⁷⁷ <http://www.dafz.ae/en/benefits>

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| <p>Launch match-making program to match Jordanian start-up with international market leaders/investors</p> <p>Review and improve the non-financial support programs, for instance:</p> <ul style="list-style-type: none"> ● Establish linkages to the key digital economy sectors and international leading experts/diaspora by, for instance, including digital economy advisors/mentors ● Include peer-to-peer mentoring ● Create and maintain mentoring programs for serial entrepreneurs to tap into ecosystems <p>Subsequent actions following set-up of zones</p> <p>Incubate 1,000 digital economy start-ups within 3-year bursts (3,000 companies within 10 years).</p> <p>Develop a digital economy acceleration program at established incubators and accelerators to help tech companies see possibilities in key sectors</p> | <p>Existing and new incubators/accelerators, Innovation Centers created under Action 3</p> <p>Digital Economy Catapults established under Action 1</p> <p>Existing and new incubators/accelerators</p> <p>Existing and new incubators/accelerators</p> |
| <p>Regulations/Instructions/Decisions:</p> | |
| <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Change Tax law to eliminate Goodwill tax ● Eliminate minimum capital for foreign investment ● Investments in Digital economy startups as deductible from income tax ● Exempt Startups from Municipal licenses for 3 years ● Create Startups Zone in Amman for Digital Economy startups from focus sectors <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Issue incentive to remove withholding tax on international licenses and international hosting services ● Exempt Startups from Social Security contributions for 3 years increased gradually ● Amend Export exemption bylaw to acknowledge applications sales online as exports ● Create 3 Startups Zone outside Amman for Digital Economy startups from focus sectors ● Revise Press and publications law to remove restrictions for digital content companies | |
| <p>Scalability/sustainability</p> | |
| <p>Additional start-up zones with additional sector or tech vertical focus can be established subsequently.</p> | |
| <p>Budget Consideration:</p> | |
| <p>Resources for setting up zones?</p> <p>25 million JD for existing incubator/accelerator in exchange for committing to incubating 500 digital economy start-ups within 3 years (would come from the Digital Economy Fund set up in Action 6 and would require co-funding of the same amount)</p> <p>25 million JD for an additional incubator/accelerator in exchange for committing to incubating 500 digital economy start-ups within 3 years (would come from the Digital Economy Fund set up in Action 6 and would require co-funding of the same amount)</p> | |
| <p>Selected KPIs</p> | |
| <ul style="list-style-type: none"> ● Establish four digital economy start-up zones within 1 year ● Commit to the incubation of 1000 digital economy start-ups (3 yrs.) ● 8-10 partnerships between Jordanian companies and international leading companies per year (starting year 2) ● Expand mentoring programs by ensuring mentoring for scaling and growing (within 1 year) ● Expand mentoring programs by ensuring mentoring for linkages into key sectors, peer to peer mentoring (within 1 year) ● More tech start-ups to have ventured into digital economy in key sectors (3 yrs.) ● More tech start-ups to have developed cutting-edge and globally competitive digital products & services (3 yrs.) | |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 5: Boosting digital economy startups | | | |
| Create/develop digital start-up zones in Jordan | ■ | ■ | ■ |
| Scale to network of startup zones | ■ | ■ | ■ |
| Launch match-making program | ■ | ■ | ■ |
| Review & improve non-financial support programs (such as mentoring) | ■ | ■ | ■ |
| Incubate startups | ■ | ■ | ■ |
| Develop a digital economy acceleration program | ■ | ■ | ■ |



Action 6 Start-ups & Entrepreneurship

Recommended main owner
Crown Prince Foundation

Making Jordan the regional hub for makers

...by giving all makers access to the innovation infrastructure/ecosystem

The maker movement, where entrepreneurs use open source design, 3D printing etc. to bring manufacturing, architectural design etc. and technology together⁷⁸, brings opportunities for small companies that can address markets much more easily, at a lower cost. Jordan has an opportunity of leading the maker movement in the region by building a national program co-owned between local industry, foundations, universities and other educational institutions. The action is responding to the key differentiator of leading the maker revolution and aims at strengthening the local innovation and entrepreneurship culture.

Action specified (3-year timeframe)

Immediate actions

Grant special start-up license in zones for experimentation phase and link program to tech start-up acceleration program

Give tax incentives for open innovation projects to support industry in experimenting with distributed digital innovation (could be at zone level)

Develop manifesto from key digital sectors and the tech sector on how to lead the maker revolution

Subsequent actions

Build a national, community driven program 'Jordan, the regional hub for makers', co-owned between key digital sector representatives and ICT sector representatives, foundations and educational institutions.

Program to:

1. Connect universities & industry with makers to experiment with innovation methodologies
2. A network of FabLabs in Jordan (including in the start-up zones) and regionally to foster collaboration
3. Create industry-led programs (starting in the key sectors) to engage with makers

Recommended owners

Crown Prince Foundation with accelerators

Ministry of Industry, Ministry of Finance

Champions from key digital industries and tech sector

Crown Prince Foundation in collaboration with Jordan Chamber of Commerce, appoint partners from key digital sectors and ICT sector, educational institutions

⁷⁸ The Maker Revolution is a term first coined in Chris Anderson's 2012 book "Makers: the new industrial revolution". See also <http://techcrunch.com/2012/10/09/wireds-chris-anderson-todays-maker-movement-is-the-new-industrial-revolution-tctv/>

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| <p>4. National innovation support service of mentors to support FabLabs in identifying and scaling from idea to start-up</p> <p>5. Facilitate access of relevant technologies (3D printers, drones...etc) (at least pilot it within a zone)</p> |
| <p>Regulations/Instructions/Decisions:</p> <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Instructions on adopting and allowing new technologies (3D printing, Drones, IOT, and other new technologies) <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Instructions for all Zones and Universities in Jordan to have FabLabs ● Establish a national technology standards committee to unify tech-digital standards across, and list new technologies frequently for reference of relevant bodies (TRC, JISM, Customs, Security Bodies...) |
| <p>Scalability/sustainability</p> <p>The program could be piloted regionally (in Amman, Irbid or a third city) and scaled subsequently.</p> |
| <p>Budget Consideration⁷⁹:</p> <p>Set up costs per FabLab: approx. 70,000 JDs (PPP adjusted)</p> <p>Operating costs per FabLab: approx. 40,000 JDs annually (PPP adjusted)</p> |
| <p>Selected KPIs</p> <ul style="list-style-type: none"> ● Ecosystem support program established within 1 year ● 800 people have engaged with the FabLabs annually (starting from year 2) ● 20 companies started per year (starting from year 2) ● 100 jobs created in existing companies (3 yrs.) ● Jordan is able to attract more makers (3 yrs.) ● More innovative ideas, products and services are started in Jordan (3 yrs.) |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 6: Making Jordan the regional hub for makers | | | |
| Establish non-for-profit organization to hold start-up license in its experimentation phase and link program to tech start-up acceleration program | | | |
| Give tax incentives for open innovation projects to support industry in experimenting with distributed digital innovation (could be at zone level) | | | |
| Develop manifesto from key digital sectors and the ICT sector on how to lead the maker revolution | | | |
| Build a national, community driven program 'Jordan, the regional hub for makers', co-owned between key digital sector representatives and ICT sector representatives, foundations and educational institutions | | | |

⁷⁹ Figures are from the Fab Foundation



Action 7 Start-Ups & Entrepreneurship

Recommended main owner
Digital Economy Group/Committee

Enabling a culture of digital entrepreneurship & intrapreneurship across Jordan

...by launching a national campaign

To create awareness and support of the culture of entrepreneurship; launch national campaign, support program for entrepreneurs & intrapreneurs, and integrate the concepts of entrepreneurship into education. The action is building on Jordan's differentiator on leveraging high-level strategic partnerships, with the aim of creating ecosystems and collaboration including the public sector, private sector, and universities, around the digital economy.

Action specified

Immediate actions

Run communications campaign to promote success stories of digital economy for the overall public (joint private and public sector campaign)

Promote and publicize entrepreneurship activities in young age at community and school level

Run series of hackathons in every school, university and town

Build specialized corporate funds for intrapreneurship

Subsequent actions

Integrate entrepreneurship concepts within school curricula and activities

Run a bi-annual challenge to develop digital solutions to pressing societal issues

Create a broad communications strategy to inform the public of the opportunity and the requirements to become a tech entrepreneur

Recommended owners

Digital Economy Group/Committee to coordinate, key actors from key digital sectors, ICT sector and public sector to commit to driving the campaign forward

Digital Economy Group/Committee to coordinate key actors from key digital sectors, ICT sector and public sector to commit to driving the campaign forward

Digital Economy Group/Committee to coordinate

Digital Economy Group/Committee to coordinate

Digital Economy Group/Committee, Ministry of Education

Digital Economy Group/Committee with King Abdullah II Fund for Development (KAFD)

Digital Economy Group/Committee to coordinate

Regulations/Instructions/Decisions:

Within 6 months:

- Instructions on including Entrepreneurship within Schools and Universities Curricula
- Instructions on including Coding Bootcamps within Schools and Universities Curricula
- Instructions on including Makerspaces within Schools and Universities Curricula

Within 1 year:

- Revise Press and publications law to remove restrictions for digital content companies
- Revise Income tax on companies branches outside Jordan
- Build partnerships with international providers to run training programs/ boot camps and enable
- Establish spinoffs and intrapreneurship fund from corporates...etc
- Strengthen existing start-ups platforms and scale them ; Amman TT
- Create a national TV show for digital entrepreneurs to share ideas and facilitate investments /scholarships (ex. Dragons Den)

Scalability/sustainability

Start with pilot cases and scale subsequently

Budget Consideration:

Tbc, but needs to be co-funded between private and public sector

Selected KPIs

- Engage 2,500 people in the hackathon annually (starting year 2)
- 100% of schools teach entrepreneurship in 2025
- In an annual public survey, 80% of people have a good understanding of the digital economy and 60% aspire to be/are entrepreneurs (3 yrs.)

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 7: Enabling a culture of digital entrepreneurship and intrapreneurship across Jordan | | | |
| Run communications campaign to promote success stories of digital economy for the overall public | | | |
| Promote and publicize entrepreneurship activities in young age at community and school level | | | |
| Run series of hackathons in every school, university and town | | | |
| Build specialized corporate funds for intrapreneurship | | | |
| Integrate entrepreneurship concepts within school curricula and activities | | | |
| Run a bi-annual challenge to develop digital solutions to pressing societal issues | | | |
| Create a broad communications strategy to inform the public of the opportunity and the requirements to become a tech entrepreneur | | | |



Action 8 Skills, Capacity & Talent

Recommended main owner

National HRD Committee with Queen Rania Foundation and HRD Monitoring Unit

Implementing 21st century skills to support the digital economy

...by linking digital economy skills needs to the nation-wide overhaul of the education system

Link digital economy to the nation-wide overhaul of the education system, linking the education policy framework to the digital economy and 21st century skills needs. The action is building on the differentiator of producing specialized tech talent, entrepreneurial drive and imagination. It also addresses the weakness of the mismatch between the university curricular and graduates and industry requirements. The aim is to reestablish Jordan's credentials of being *the* place for talent and skills in the MENA region.

Action specified (3-year timeframe)

Immediate actions

Establish industry needs and inventory of requirements by industry and align educational policy and learning outcomes plans

Offer digital skills courses across all key sectors identified at universities and talent associations. This could be supplemented by coding boot camps

Build up collaboration with global universities, to increase research capacity with universities

Build linkages for internships in other tech hubs with other universities by making industry internships of 4-6 months mandatory for ICT graduates mid-study

Offer applied sector research projects for BA, Masters and PhD level (Industry PhD)

Subsequent actions

Review education system in light of digital economy skills and identify challenges, needs and recommendations

Recommended owners

National HRD Committee

Ministry of Higher Education to coordinate, universities and talent associations to execute

Ministry of Higher Education to coordinate, universities to execute

Ministry of Higher Education to set up, commitment needs to be led by companies in key sectors and ICT sector

int@j to coordinate, commitment needs to be led by companies in key sectors and ICT sector

National HRD Committee to lead, Ministry of Education, Ministry of Higher Education to contribute

Regulations/Instructions/Decisions:

Within 6 months:

- Make industry internships of 4-6 months mandatory for ICT graduates mid-study
- Revise Universities curricula in line with Digital Economy for key focus sectors

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| <ul style="list-style-type: none"> ● Establish periodic review process for Universities curricula and education plans <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Adopt 21st Century skills framework for Education and qualifications ● Review education policies, strategies and outcomes criteria in light of digital economy skills and identify challenges, needs and recommendations ● All universities to offer Digital Economy Tech courses within key sectors 3 years from now ● Universities to allow and encourage sectoral internships 6 months from now |
| <p>Scalability/sustainability</p> <p>To be aligned with the National Strategy for Human Resources Development for sustainability & scalability</p> |
| <p>Budget Consideration:</p> <p>Estimate resources to align efforts with National Strategy for Human Resources Development</p> |
| <p>Selected KPIs</p> <ul style="list-style-type: none"> ● The percentage of unemployable graduates should decrease to 20% in a 10-year perspective (aligned with the National HRD strategy) ● 100% of graduates from high school have completed a coding course, STEM education, classes in English, entrepreneurial skills, social/managerial skills 3 years from now ● All universities to offer ICT courses within key sectors 3 years from now ● ICT courses to allow and support sectoral internships 6 months from now ● In an industry survey, 80% of companies employing Jordanian graduates are satisfied or very satisfied with the skills level and work ethics of their graduates (3 yrs.) |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 8: Implementing 21st century skills to support the digital economy | | | |
| Establish industry needs and inventory of requirements by industry and align educational policy and learning outcomes plans | | | |
| Offer digital skills courses across all key sectors identified at universities and talent associations. This could be supplemented by coding boot camps | | | |
| Build up collaboration with global universities, to increase research capacity with universities | | | |
| Build linkages for internships in other tech hubs with other universities by making industry internships of 4-6 months mandatory for ICT graduates mid-study | | | |
| Offer applied sector research projects for BA, Masters and PhD level (Industry PhD) | | | |
| Review education system in light of digital economy skills and identify challenges, needs and recommendations | | | |



Action 9 Skills, Capacity & Talent

Recommended main owner

National HRD Committee with Queen Rania Foundation

Creating a world-class talent pool to support drive the digital economy demand locally and globally

...by supporting training & qualifications and enabling and open labor market

Create an attractive labor market by focusing on key smart specialization areas and supporting knowledge transfer programs. Create an open (for local and foreign investors and employees) labor market linked to the global skills market and actively focused on export of Jordanian products and solutions and services-built Jordanian skills. The aim of this action is to enable the industry to access the right talent at the right time.

Action specified

Immediate actions

Key digital sectors to commit to digital economy training opportunities (could be IoT, AI, etc.) for existing employees in key sectors and tech sector

Give incentives (tax breaks) to the provision of training opportunities

Implement the National Qualifications Framework for the ICT sector in Jordan

Create simple and accessible tech sector Green Card (residency) scheme to allow the tech sector to bring in foreign talent linked to zones to build the capacity of local talent

Subsequent actions

Develop specialized ICT skills monitor based on needs of local and international companies based on scanning job descriptions across the entire economy

Develop knowledge transfer agreements as part of collaboration partnerships to drive skills development

Recommended owners

National HRD Committee, Ministry of Labor, Queen Rania Foundation to coordinate, int@j to ensure commitment from key digital sectors

Ministry of Industry & Trade and Ministry of Finance

National HRD Committee, Queen Rania Foundation, and Ministry of Higher Education

Ministry of Labor

National HRD Committee, Queen Rania Foundation, Ministry of Labor to coordinate, commitment from key digital sectors (process could be tendered to market)

Digital Catapults in key sectors established under Action I

Regulations/Instructions/Decisions:

Within 6 months:

- Tax law to allow deductions on Digital economy skills training

- Adopt Digital Economy Skills national qualifications framework for Vocational and Higher Education
- Create simple and accessible tech sector Green Card scheme to allow the tech sector to bring in foreign talent to build the capacity of local talent
- Build market labor intelligence unit to capture market demand locally and internationally and map to local supply and qualifications to address demand and areas for improvement
- Look into international models for digital skills standardization and support establish a center of excellence to build up capacity accordingly and ensure alignment of educational institutions

Within 1 year:

- To be determined upon initial implementation

Scalability/sustainability

To be aligned with the National Strategy for Human Resources Development for sustainability & scalability

Budget Consideration:

Estimate resources to align efforts with National Strategy for Human Resources Development

Selected KPIs

- Digital economy training opportunities in place within 6 months
- Create a Green Card scheme for the digital economy within one year
- 80% of available digital work force to hold international certifications within 3 years
- In a survey, 80% of companies in key sectors state that they have access to the right talent at the right time (3 yrs.)

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 9: Creating a world-class talent pool to support and drive the digital economy demand locally and globally | | | |
| Key digital sectors to commit to digital economy training opportunities (could be IoT, AI, etc.) for existing employees in key sectors and tech sector | | | |
| Give incentives (tax breaks) to the provision of training opportunities | | | |
| Implement the National Qualifications Framework for the ICT sector in Jordan | | | |
| Create simple and accessible tech sector green card scheme to allow the tech sector to bring in foreign talent linked to zones to build the capacity of local talent | | | |
| Develop specialized ICT skills monitor based on needs of local and international companies based on scanning job descriptions across the entire economy | | | |
| Develop knowledge transfer agreements as part of collaboration partnerships to drive skills development | | | |



Action 10 Skills, Capacity & Talent

Recommended main owner
Digital Economy Group/Committee

Creating models and tools for better women participation in the digital economy

...in workplaces and as active users

Empower women to work more in the digital economy and support women in being part of digital services. The aim of this action is to unlock the untapped potential the educated female workforce. According to UN and int@j figures, the current percentage of women in tech sectors is 30%, but the potential is 50%. Moreover, the action sets out to empower women to be part of the digital economy, allowing women to drive usage and demand for digital services.

Action specified

Immediate actions

Develop mentorship program for female tech sector leaders

Establish tax incentives starting with 25% female employment and increasing to > 40% female employment

Subsequent actions

Develop 'safe' commute programs for women from homes to internship venues in areas outside Amman

Expand internship program for women at incubator premises

Support women in using digital services and transact online through an information campaign

Focus on women participating in economy outside Amman using digital services

Recommended owners

Digital Economy Group/Committee in collaboration with incubators & accelerators, key tech industry leaders to commit to becoming mentors

Ministry of Labor and Ministry of Finance

Ministry of Transportation

Universities, incubators

Digital Economy Group/Committee, tech industry to carry out campaign

Digital Economy Group/Committee

Regulations/Instructions/Decisions:

Within 6 months:

- Establish tax incentives for companies employing more than 25% then increase gradually to 40% female employment in Digital Economy areas and sectors
- Allow Home Businesses for digital businesses

Within 1 year:

- Revise flexible working hours within the labor law in digital sectors

Scalability/sustainability

Start with Amman as a pilot and gradually scale to include the entire country

Budget Consideration:

Tbc, some of action within budget of existing incubators

Selected KPIs

- Reach 50% of women in the workforce by 2025, corresponding with the level of female ICT graduates
- 20% increase in female usage and demand for digital services (3 yrs.)
- 20% more women are part of the digital economy (3 yrs.)
- Increased demand for digital services through increased female uptake

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| LEAD ACTIONS | | | |
| Action 10: Creating models and tools for better women participation in the digital economy | | | |
| Develop mentorship program for female tech sector leaders | | | |
| Establish tax incentives for > 40% female employment | | | |
| Develop 'safe' commute programs for women from homes to internship venues in areas outside Amman | | | |
| Expand internship program for women at incubator premises | | | |
| Support women in using digital services and transact online through an information campaign | | | |
| Focus on women participating in economy outside Amman using digital services | | | |



Action 11 Enabling Business Environment

Recommended main owner
Ministry of Industry & Trade

Creating an open, stable and enabling business environment for the digital economy

...by streamlining and revising processes, legislation and regulations

Lead government-wide overhaul of policies and regulations to develop enabling legislative framework for digital companies, products and services, reduce administrative burden on companies and create regulatory stability and visibility. Jordan needs an excellent business environment to make the most of its differentiators, and the aim of this action is therefore to address the weakness of unstable enforcement of legislation to secure a level playing field for businesses. This action should co-ordinate with action 17 and ensure that the enabling business environment and the smart regulation address digital economy issues such as data transformation, privacy and security issues.

Action specified (3-year timeframe)

Immediate actions

Identify key barriers for companies to open, operate and close businesses, and publish inventory and commitment to resolve these. Issues involve (but are not limited to), according to international indices:⁸⁰

- No. of days to start & close a business (tech businesses as special case)
- No. of procedures & cost to start a business
- No. of days to enforce a contract
- Availability of latest technologies

Establish ombudsman (official appointed to investigate individuals' complaints against a company or organization, especially a public authority) for tech companies to file issues

Establish single point for registration of tech companies and compliance with legislation and regulations

Subsequent actions

Create special taskforce, led by an influential business leader, to make recommendations to government on how to enable start-ups and smart

Recommended owners

MolCT and Ministry of Industry to lead, representatives from key digital sectors and ICT sector to be included in working group

MolCT OR Ministry of Industry & Trade/Jordan Investment Commission

MolCT with Ministry of Industry & Trade, and Jordan Investment Commission

⁸⁰ World Bank Doing Business, WEF Global Competitiveness Report

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|---|--|
| specialization better and how to create a simple and reliable regulatory environment | Jordan Strategy Forum to set up taskforce with representatives from key digital sectors and ICT sector |
| Regulations/Instructions/Decisions: | |
| <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Allow companies to register/license in Digital Economy areas and sectors with no pre-approvals or requirements and focus on post inspection ● Establish single point for registration of Digital Economy tech companies and compliance with legislation and regulations ● Establish ombudsman (official appointed to investigate individuals' complaints against a company or organization, especially a public authority) for tech companies to file issues <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Establish bankruptcy law ● Remove mandate to have lawyers representatives for Startup companies ● Create special taskforce, led by an influential business leader, to make recommendations to government on how to enable start-ups and smart specialization better and how to create a simple and reliable regulatory environment | |
| Scalability/sustainability | |
| The teams in each ministry and the taskforce should help keeping a continuous focus on this issue | |
| Budget Consideration: | |
| What are the resources needed for this? | |
| Selected KPIs | |
| <ul style="list-style-type: none"> ● Key policies and regulations to drive the digital economy and develop unanimous interpretation and guidelines for ministries developed within 1 year ● Establish ombudsman/external team for companies to file issues with within 6 months ● Companies experience easier processes and fewer barriers in setting up, operating & closing businesses ● Companies experience easier processes when filing issues ● Companies experience easier access to latest technologies | |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| SUPPORTING ACTIONS | | | |
| Action 11: Creating an open, stable and enabling business environment for the digital economy | | | |
| Identify key barriers for companies to open, operate and close businesses, and publish inventory and commitment to resolve these. | | | |
| Establish ombudsman for tech companies to file issues | | | |
| Establish single point for tech companies registration and laws and regulations compliance | | | |
| Create special taskforce on how to enable start-ups and smart specialization better | | | |



Action 12 Enabling Business Environment

Recommended main owner
Central Bank of Jordan

Building a high-performance and attractive investment environment

...with emphasis on the availability of scaling and growth capital and FDI

Significantly increase the availability of growth capital (Seed and follow-on investments). The action aims to address the weakness of gaps in funding cycles, and provides a potential for the market to make up to the lack of government funding and drive one of the most competitive digital economies of the world.

Action specified (3-year timeframe)

Immediate actions

Launch a Jordan Digital Economy Fund focusing on tech start-ups & tech innovation funding

Enable the funding market to offer innovative finance products such as crowd-funding and peer-to-peer lending

Allow venture capital funds to be established in Jordan through a change in legislation, with a focus on the current gap in funding cycles; could start in the startups zones

Subsequent actions

Create a support program to systematically attract Foreign Direct Investment with a stable business environment

Create a one-stop-shop for tech investments and regularly publish pipeline

Recommended owners

Central Bank of Jordan in collaboration with private VCs

Central Bank of Jordan, Jordan Strategy Forum, Ministry of Finance, Ministry of Industry & Trade, private VCs

MoICT with Central Bank of Jordan and Ministry of Industry & Trade, Jordan Investment Commission

Ministry of Industry & Trade and Jordan Investment Commission, coordinated with start-up zones

Ministry of Industry & Trade and Jordan Investment Commission

Regulations/Instructions/Decisions:

Within 6 months:

- Launch a Jordan Digital Economy Fund focusing on tech start-ups & tech innovation funding
- Enable the funding market to offer innovative finance products in crowd-funding and peer-to-peer lending
- Introduce legislation for Venture Capital and investment Funds to be set up in Jordan
- Create a Low interest rate facility for Digital Economy Sectors companies
- Create a one-stop-shop for tech investments and regularly publish pipeline

Within 1 year:

- Create a support program to systematically attract Foreign Direct Investment with a stable business environment

Scalability/sustainability

The Digital Economy Fund can be supplemented with other funds, for instance targeting specific sectors or specific tech verticals

Budget Consideration:

Digital Economy Fund should have **JD 100 million** (suggested figure based on expert discussions in Jordan, open to change). The fund will be distributed with JD 50 million for the catapults and JD 50 million earmarked for the start-up zones. Funding will be released only if the funding is matched with a similar amount in private co-funding.

Resources needed for support program?

Selected KPIs

- Launch of the digital innovation fund within 3 to 6 months
- Introduce legislation for Venture Capital Funds to be set up in Jordan within 3 months
- One-stop-shop for tech investments set up within 3 months
- Support program to systematically attract Foreign Direct Investment set up within 6 months
- More foreign investors to invest in Jordan
- Easier access to capital for Jordanian companies at all stages of a company's life time

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| SUPPORTING ACTIONS | | | |
| Action 12: Building a high-performance and attractive investment environment | | | |
| Launch a Jordan Digital Economy Fund with a focus on tech start-ups & tech innovation funding | | | |
| Enable the funding market to offer innovative finance products such as crowd-funding and peer-to-peer lending | | | |
| Allow VCs and funds to be established in Jordan through a change in legislation | | | |
| Create a support program to systematically attract Foreign Direct Investment with a stable business environment | | | |
| Create a one-stop-shop for tech investments and regularly publish pipeline | | | |



Action 13 Enabling Business Environment

Recommended main owner
Digital Economy Group/Committee

Becoming an early adopter country and regional beta-tester for key emerging technologies

...by supporting experimentation

Map and drive the adoption of new technologies and support experimentation, in particularly by the public sector. The action addresses the weakness of several key technologies being heavily controlled/regulated in Jordan. Controlled openness is necessary to allow for the experimentation needed to be the beta tester of the region. The aim is to give the best conditions for fully utilizing the differentiator of specialized ICT talent, entrepreneurial drive and imagination to fulfil the ambition of becoming the beta tester of the region.

Action specified

Immediate actions

Create an inventory of the key emerging technologies of relevance to the Jordan digital economy and establish instructions on adopting and allowing new technologies (3D printing, drones, Internet of Things, block chain)

Create a mechanism and process to assess key emerging technologies and collaborate with relevant ministries on an operating model to create open access

Shift the regulatory regime towards an ex ante mechanism for new technologies

Subsequent actions

Continuously monitor and identify potentially radical technology innovations that could disrupt established sectors, markets and value chains

Set up experimentation labs and centers of excellence to test the opportunities of emerging technologies with an easy mechanism to access emerging tech (either at FabLabs or catapults or universities)

Recommended owners

int@j in collaboration with MoICT and relevant sectoral ministries and Ministry of Industry & Trade

Digital Economy Catapult HQ in collaboration with relevant ministries, TRC, relevant regulators and industry working groups (to be set up by Digital Economy Catapult HQ)

TRC and relevant regulators

Digital Economy Catapult HQ

Digital Economy Catapult HQ to coordinate, universities and/or zones to execute

Regulations/Instructions/Decisions:

| |
|--|
| <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Instructions on adopting and allowing new technologies (3D printing, drones, Internet of Things, block chain) ● Shift the regulatory regime towards an ex ante mechanism for new technologies ● Revise existing security and privacy laws (Cybercrime and privacy act laws), and capacity in the country <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Universities to open FabLabs to access emerging technologies in key focus sectors ● Start the process to opening up more opportunities through the initiation of a Bid Data Policy...etc |
| <p>Scalability/sustainability</p> <p>Continuously monitoring to ensure sustainability</p> |
| <p>Budget Consideration:</p> <p>Relevant government resources?</p> |
| <p>Selected KPIs</p> <ul style="list-style-type: none"> ● System for identifying potentially radical technology innovations set up within 6 months ● Experimentation labs to test the opportunities of emerging technologies established within 1 year ● In a survey, 95% of companies are satisfied with the possibility of importing and using new technologies (3 yrs.) |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| SUPPORTING ACTIONS | | | |
| Action I3: Becoming an early adopter country and regional beta-tester for key emerging technologies | | | |
| Inventory of the key emerging technologies of relevance to the Jordan digital economy and establish instructions on adopting and allowing new technologies | | | |
| Create a mechanism to assess key emerging technologies and collaborate with relevant ministries on an operating model to create open access | | | |
| Shift the regulatory regime towards an ex ante mechanism for new technologies | | | |
| Continuously monitor and identify potentially radical technology innovations that could disrupt established sectors, markets and value chains | | | |
| Set up experimentation labs and centers of excellence to test the opportunities of emerging technologies with an easy mechanism to access emerging tech (either at FabLabs or catapults or universities) | | | |



Action I4 Smart digital economy infrastructure

Recommended main owner
MoICT, TRC & other sector's regulators

Establishing a state-of-the-art secure digital infrastructure

... by developing information and cyber security practices and regulations, revising spectrum pricing and investing in the national broadband infrastructure and laying the path for 5G

Create a competitive, privately owned infrastructure with a focus on data traffic across networks. Leading digital economies continuously focus on supporting commercially feasible models for the development of future telecommunication networks, and so should Jordan, to ensure a state-of-the-art digital infrastructure for its businesses and citizens.

Action specified

Immediate actions

Make investment in fiber network mandatory for government and make it mandatory to put out bids for connectivity in ministries and agencies for competition

Lay out clear roadmap to Very High-Speed Broadband and 5G in collaboration with telecom sector. To include data commitments by the telco sector.

Create private sector-led working group to develop new business models to move the telco sector from Voice Dependency to data service

Subsequent actions

Complete the fiber-optic broadband high-speed network within 3 years and develop approach to privatization of the network. The environment for IoT is present in Jordan, but it needs investments in fiber optics and 5G

Shift the regulation from ex post to ex ante

Adopt national standards for the security of data and information

Develop ambitious IT security response and create vision of network resilience

Revise spectrum and related pricing

Revise regulation and taxation for mobile and telco operators, and explore new communications and connectivity markets for new investments

Recommended owners

MoICT

MoICT, TRC and other sector regulators

MoICT, int@j, and Jordan Chamber of Commerce & Industry to set up working group, TRC, Central Bank to participate

MoICT, TRC

MoICT and relevant regulators

MoICT, TRC and other sector regulators

MoICT, Ministry of Defense

MoICT, TRC and other sector regulators

MoICT, TRC and other sector regulators

| | |
|--|---------------|
| Accelerate the e-signature process | MoICT and TRC |
| <p>Regulations/Instructions/Decisions:</p> <p>Within 6 months:</p> <ul style="list-style-type: none"> ● Lower special tax on Telecom sector ● Remove sales tax on mobile phones and digital tools such as 3D printing ● Setup regulations for Very High-Speed Broadband and 5G ● Establish regulations to move the telco sector from Voice Dependency to data service, upgrade to data based models ● Revise all telecom markets and identify new potential markets <p>Within 1 year:</p> <ul style="list-style-type: none"> ● Complete the National Fiber Network connecting all government entities ● Instructions to privatize the National Fiber Network ● Establish regulations to allow and expand Internet of Things ● Shift the regulation from ex post to ex ante ● Adopt national standards for the security of data and information ● Develop ambitious IT security response and create vision of network resilience ● Revise spectrum and related pricing ● Revise regulation and taxation for mobile and telco operators ● Revise the Value Added Services (VAS) regulations from TRC ● Simplify instructions for type approvals from TRC | |
| <p>Scalability/sustainability</p> <p>Should be scaled nation-wide from the beginning</p> | |
| <p>Budget Consideration:</p> <p>-</p> | |
| <p>Selected KPIs</p> <ul style="list-style-type: none"> ● Fiber-optic broadband high speed network completed within 3 years ● Approach to privatization of the network developed within 1 year ● Privatization executed within 3 years | |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|--|--------|--------|--------|
| SUPPORTING ACTIONS | | | |
| Action 14: Establishing a state-of-the-art secure digital infrastructure | | | |
| Make investment in fiber network mandatory for government and make it mandatory to put out bids for connectivity in ministries and agencies for competition | | | |
| Lay out clear roadmap to Very High-Speed Broadband and 5G in collaboration with telecom sector. To include data commitments by the telco sector. | | | |
| Create private sector-led working group to develop new business models to move the telco sector from Voice Dependency to data service | | | |
| Complete the fiber-optic broadband high-speed network within 3 years and develop approach to privatization of the network. The environment for IoT is present in Jordan, but it needs investments in fiber optics and 5G | | | |
| Shift the regulation from ex post to ex ante | | | |
| Adopt national standards for the security of data and information | | | |
| Develop ambitious IT security response and create vision of network resilience | | | |
| Revise spectrum pricing | | | |
| Revise regulation and taxation for mobile and telco operators, and explore new communications and connectivity markets for new investments | | | |
| Accelerate the e-signature process | | | |



Action 15 Smart digital economy infrastructure

Recommended main owner
Digital Economy Group/Committee

Leading nation-wide focus on data-driven transformation

... by developing regional standards and secure operational models for open data

Drive data-driven solutions across the MENA region, linked to higher education and developing digital economy solutions. International benchmark countries show that the backbone of the digital economy is data-led. This requires standards, security and interoperable business protocols across the economy. Therefore, it is of utmost importance that Jordan focuses on a data-driven transformation of the economy for example FinTech and eHealth protocols.

Action specified

Immediate actions

Assess the required reforms to drive data-driven transformation and enable the market potential of the data markets in the MENA region

Define standards & interoperability conditions in areas critical to the digital economy in Jordan, such as the financial market (for instance, insurance exchange), health exchange, energy and water monitoring, etc.

Subsequent actions

Introduce open data policies

Lead the investigation and proposal of a regional MENA cloud, big data, IoT initiative

Set up collaboration between international universities and local universities to create a 'research cloud'

Establish smart city data protocols to enable tomorrow's business models and services

Recommended owners

Digital Economy Group/Committee

Digital Economy Catapult HQ set up in Action 1, coordinate with working groups across key sectors

MoICT

Digital Economy Group/Committee in collaboration with MoICT

Digital Economy Group/Committee in collaboration with universities

GAM and relevant regulatory bodies

Regulations/Instructions/Decisions:

Within 6 months:

- Review regulations to drive data-driven transformation in key focus sectors
- Introduce open data policies starting with government

Within 1 year:

- Define standards & interoperability conditions in areas critical to the digital economy (in financial market, insurance exchange, health exchange, energy and water monitoring, etc.
- Establish smart city data protocols and standards of relevance to the launchpads e.g., eHealth protocols and standards for health, etc.

| |
|---|
| <p>Scalability/sustainability Start with Amman as a pilot and gradually scale to encompass the entire country</p> |
| <p>Budget Consideration: Within budget of Digital Economy catapult, HQ</p> |
| <p>Selected KPIs</p> <ul style="list-style-type: none"> ● Assessment completed within one year ● Collaboration between international universities and local universities to create a 'research cloud' set up within 1 year ● In a survey, 90% of companies assess that they have competitive standards and interoperable business protocols |

Timeframe

| Action | Year 1 | Year 2 | Year 3 |
|---|--------|--------|--------|
| SUPPORTING ACTIONS | | | |
| Action 15: Leading nation-wide focus on data-driven transformation | | | |
| Assess the required reforms to drive data-driven transformation and to enable the market potential of the data markets in the MENA region | | | |
| Define standards & interoperability conditions in areas critical to the digital economy in Jordan | | | |
| Introduce open data policies | | | |
| Lead the investigation and proposal of a regional MENA cloud, big data, IoT initiative | | | |
| Set up collaboration between international universities and local universities to create a 'research cloud' | | | |
| Establish smart city data protocols to enable tomorrow's business models and services | | | |



Action 16 Governance

Recommended main owner
TBD

Establishing co-owned leadership and ownership

... by implementing a strong but agile governance structure to ensure accountability

Demonstrate strong leadership and establish a strong governance structure across the whole of government with support at private sector level.

Action specified

Immediate actions

Create a high-level Digital Economy Committee within government under EPC across the key ministries MoICT, MoF, MoP, MoI&T, MoH, MoE, MoEnv, GAM, CBJ, JIC and int@j

Key ministries to respond to REACH2025 with a concrete digital economy policy paper

Develop coordinated implementation plan for the digital economy across ministries

int@j to expand mandate into key digital economy sectors

Subsequent actions

Pass a digital economy bill to enable the digital economy

Review ministerial roles and capacities to drive the digital economy and consider structural alignment

Consider nominating a Minister of the Digital Economy (could be a combined position with industry & trade or a new mandate for the Minister of Economy)

Recommended owners

PM to nominate, Digital Economy Group/Committee to work across sectors

Digital Economy Group/Committee to coordinate, can be done by external consultants

Owners of each of the actions, Digital Economy Committee to coordinate

int@j & MoICT to revise mandate

Parliament

Digital Economy Group/Committee to coordinate

Digital Economy Group/Committee to coordinate

Regulations/Instructions/Decisions:

Immediate

- Create a high-level Digital Economy Committee within government across the key ministries MoICT, MoF, MoP, MoI&T, MoH, MoE, MoEnv, GAM, CBJ, and JIC
- Key ministries to respond to REACH2025 with a concrete digital economy policy paper
- int@j to expand into key digital economy sectors

In 3 years

- Pass a digital economy bill⁸¹ to enable the digital economy
- Review ministerial roles and capacities to drive the digital economy and consider structural alignment
- Consider nominating a Minister of the Digital Economy (could be a combined position with industry & trade)

⁸¹ The Digital Economy Bill is inspired by the UK. The country decided that if it is to remain ahead and be a world leader in the digital economy it needs to continue to raise its ambition. The tool for this is introducing a Digital Economy Bill, which includes a range of measures in support of this. The bill will 1) empower consumers and provide better connectivity so that everyone has access to broadband wherever they live, 2) build a better infrastructure fit for the digital future, 3) enable better public services using digital technologies, and 4) provide important protections for citizens from spam email and nuisance calls etc. <https://www.gov.uk/government/collections/digital-economy-bill-2016>



Action 17 Governance

Recommended main owner
TBD

Reforming the regulatory system to support the integrated digital economy

...by launching a review process of the existing regulators and shifting towards a more dynamic ex-post system focusing on enabling a competitive market

Establish smart regulation for the digital economy to ensure that the regulatory system supports the digital economy in the best way possible. Focus needs to be on the resilience of the infrastructure, data and data privacy, security issues as well as the enabling of digital economy business models.

Action specified

Immediate actions

Review mandate of relevant regulators in light of international examples of smart regulation for the smart economy

Subsequent actions

Develop push model establishing platform model for proactive regulation in key areas of enabling technologies such as IOT

Recommended owners

Digital Economy Group/Committee to coordinate

Digital Economy Group/Committee to coordinate, involve TRC plus relevant sector regulators, can be done by external consultants

Regulations/Instructions/Decisions:

Immediate

- Review mandate of relevant regulators in light of international examples of smart regulation for the smart economy
- Develop push model establishing platform model for proactive regulation in key areas of enabling technologies such as IOT



Action 18 Governance

Recommended main owner
TBD

Exercising strong program accountability and progress monitoring

...by establishing a systematic but dynamic program monitoring and evaluation system

Create a strong accountability structure, to effectively and dynamically manage the transformation towards a digital economy, and to ensure continuous progress.

Action specified

Immediate actions

Ensure ownership of actions, KPIs and targets

Ensure agreement and mandate of owners of actions

Consider developing a digital economy impact forecast and assessment model using new data collection mechanisms such as big data or new data collection mechanisms to establish a dynamic measuring framework across the economy

Create baseline

Subsequent actions

Collect information on progress and report back on progress in relation to KPIs and targets (monitoring of progress)

Carry out independent annual review and adjust action plan, KPIs, targets, etc., accordingly

Carry out international review after 3 years (e.g., the OECD) and set up actions for the next timeframe based on the recommendations

Recommended owners

Digital Economy Group/Committee

Digital Economy Group/Committee

Digital Economy Group/Committee to coordinate, can be done by external consultants

Owners of each of the actions, Digital Economy Group/Committee to coordinate

Owners of each of the actions, Digital Economy Group/Committee to coordinate

Digital Economy Group/Committee to coordinate, could be tendered to market

Digital Economy Group/Committee to coordinate and tender to market

ANNEX 2: ACTIONS, SUBACTIONS, OWNERS, BUDGET CONSIDERATIONS AND TIMELINE

Attached as Excel-sheet