



Research Article

Measuring Digital Transformation Impact in Jordan: A Proposed Framework.

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ABSTRACT

The digital transformation vision (REACH 2025) is essential for transformation and enabling individuals, sectors, and companies in Jordan to adopt digital solutions and build a robust ground in conducting business. The government in Jordan launched the REACH2025 Vision in 2016, and it has taken many serious measures to bring sectors, companies, and individuals to virtual digital by 2025. This government's vision consisted of seven dimensions (Smart Specialization and demand-driven innovation, Public Sector Innovation, Tech Start-ups and Entrepreneurs, ICT Skills, Capacity and Talent, Enabling Business Environment, Smart digital economy infrastructure, and Governance), and 18 actions to implement over ten years. The researchers used these dimensions to build a framework to measure the impact of government progress on enabling individuals, sectors, and companies, on productivity, and encouraging investment. The researchers used a sample of 196 respondents from various disciplines to figure out attitudes and evaluate government actions. The researchers also used responses to validate the proposed theoretical framework in the components of the digital economy. The results revealed positive attitudes towards the development and implementation, and excellent in some areas, while some measures need strengthening and re-evaluation. The study recommended employing the proposed framework to measure the actual impact of the digital transformation. The study also advises leading future research towards further empirical examination to validate the framework proposed.

I. Introduction

Digital transformation in Jordan requires a shared ground that includes enabling information and communication technology (Ministry of Information and Communications Technology, 2016; Lukonga, 2020), as well as digitizing the market and its actors, that lead to the creation of the skills and capabilities necessary KEYWORDS

Digital transformation, digital transformation impact, REACH2025, Jordan, digitization, digital businesses, innovative business

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to shape innovative digital future in Jordan. Jordan seeks to floor the centers for various economic sectors to move to a knowledge economy. Numerous decision-makers and experts see healthcare, education, energy & clean energy, transportation, financial sector / FinTech, and telecommunications and security as the principal driving sectors regarding



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the digital economy (Dutta & Lanvin, 2020; Nielsen et al., 2013). Private businesses considered a leader in digitization and a pioneer supplier of skills and capabilities in Jordan. While there are more than 600 ICT companies, the government has helped create a mature ecosystem in partnership with international technology companies, incubators, and accelerators. Jordan is a country with few natural resources; consequently, early investments have been directed towards venerable technologies and infrastructure as enablers to accelerating innovation and collaboration across sectors (Wimpenny et al., 2018; Lukonga, 2020; iBASEt, 2016).

Jordan presumes the digital transformation vision as a ground for the national economy (Innovation ordan Committee, 2020; Gerlach & Eisheh, 2020). The digital transformation vision concentrates on driving economic development in chief knowledge sectors and increasing job creation. Several incentive plans towards digital transformation embodied the government as a policymaker and organizer for innovation and technology adoption (Lukonga, 2020). Jordan attracts new investments in newly developed areas and sectors and works to strengthen the partnership between public and private sectors to expand joint ownership. To achieve global consent and influence in global value chains and increase the economic and social value, The government strives to integrate all citizens and ensure better access to primary services at the lowest cost. The plan tries to provide better health, education, financial services, transportation, and many other solutions in other sectors (Dutta & Lanvin, 2020).

More than five years have passed since the launching of the transformation plan, the government continues to implement the projects of its transformation plan, which began in 2016. None of the studies evaluated the effectiveness of the achievement and the extent of development in projects, also no studies evaluated feedback on implementation plans by stakeholders. Noting that the digital transformation plan followed a design thinking approach that focused on exploring end-user needs for policy formulation, this study also took the same approach to assess stakeholder reactions affecting digital transformation and business. This study also used the procedures followed in the plan to formulate questions that measure feedback. These questions were gradually revised to provide a voice to the end-users. Communicating stakeholder feedback to policymakers can contribute to their participation in shaping current or future decisions. In addition, the government can make necessary changes to operational procedures in a way that does not conflict with the overall objective(s) of digital transformation. No model fits all companies, sectors, or even individuals, but the framework proposed in this study can be considered as a comprehensive national diagnosis of government practices and takes

Deriving from the previous introduction, this study seeks to achieve a set of objectives, namely: shedding light on the government procedures included in the digital transformation plan, measuring the reactions of stakeholders (individuals, companies) on the development taking place in government procedures to implement the digital transformation plan, and finally, building A general framework for measuring the impact of digital transformation in Jordan on a set of performance indicators (productivity, investment promotion, impact on individuals, companies, and sectors).

into account stakeholder input.

Generally, the digital transformation plan was based on a set of leading global digital economy models and was formulated based on leading trade-offs to ensure compatibility with global value chains. Most of the pioneered plans focused on how to take advantage of high-level strategic partnerships (Ministry of Information and Communications Technology, 2016), to produce specialized talent in the field of information and communications technology (Dutta & Lanvin, 2020; Lukonga, 2020). Leadership and Governance, Smart and Demand-Oriented Digital Innovations (Gerlach & Eisheh, 2020). Also, the digital models in the surrounding and global economies have included the creation of integrated solutions for content platforms for the Arab market (Organization for Economic Co-operation and Development, 2013). The digital transformation plans adopted strategies that were included and repeated in many digital models in the global and regional economies. To ensure that the benefits of the digital economy are realized, a robust monitoring and evaluation process is necessary, as this plan contains certain details related to the necessary monitoring procedure that is reflected in the procedures and key performance indicators. The general objective of this research paper is to establish a clear basis for information on which progress and performance can be evaluated later. It also contributes to providing solutions for continuous monitoring and review based on lessons learned. Finally, previous studies did not present these indicators as reliable items in measuring the opinions of stakeholders, as they did not include an empirical measurement of the repercussions of these indicators on performance, nor did they monitor the current status of development. Measuring these indicators leads to regular review of the objectives as part of the continuous monitoring and review process and to provide recommendations for good practices.

This paper has anticipated contributions. The study provides insight into government practices and measures taken to achieve Jordan's vision regarding digital transformation and its transference to a knowledge economy. Additionally, explaining the concepts and trends of stakeholders and measuring their conviction in their usefulness, the extent of achievement, and moving toward the future. This paper reflects international experiences involved in the digital transformation plan, whereby, development of relevant recommendations for decision-makers to define assumptions and directions of stakeholders towards the digital transformation vision, consequently, the amendment of measures if possible. This paper also contributes to developing a measurement tool that policymakers can use in the field of digital transformation. It sought to explore the most important dimensions of digital transformation to build a comprehensive framework for measuring the success of government procedures in achieving the vision that reflects on individuals, companies, and sectors, and consider the impact on investment and increase productivity.

2. Background

The digital transformation plan explored wide-ranging international trends. Feedback from stakeholders,

experts, and practitioners is also incorporated to develop a solid foundation for the before-mentioned vision. The potential and distinct characteristics of the ordanian digital economy were also considered. Drawing from global economic models, enablers, and accelerators, the Jordanian Digital Transformation Model in the Jordanian Economy (REACH, 2025) formulated. This plan attempts to adjust to global value chains and face challenges. Jordan is moving continuously from perceiving ICTs as an isolated sector, digitizing the entire Jordanian economy focusing on niche markets and global value chains (Gerlach & Eisheh, 2020; World Economic Forum, 2015). The digital transformation plan also aims to accelerate digitization, empower and inspire the next generation of digital entrepreneurs, support and accelerate economic goals, create job opportunities for all Jordanians, empower women, and place Jordan in the future of the global digital economy.

The fourth digital revolution draws enormous opportunities for interconnected societies. It portrays a threat if appropriate and timely measures are not perceived. The Digital revolution covers broad areas such as but not limited to artificial intelligence, robotics, the Internet of things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing (Organization for Economic Co-operation and Development, 2013). Data and information are also the central components of future digital transformation. Data analytics will drive production processes and help guide, manage, and improve value chains within and across sectors. Advanced machine learning is what makes smart machines perform smart by enabling them to understand learn concepts in the environment (Foray, 2014; Ayre, 2012). Advanced machine learning allows a host of intelligent machine applications - including robots, autonomous vehicles, virtual personal assistants (VPAs), and smart advisors - that operate autonomously (or at least semiautonomous). The emergence of artificial intelligence (AI) is related to this debate exactly (Aladayleh et al., 2020), Al-driven by massive increases in computing power and the availability of large amounts of data.

Organizations can utilize these in a wide range, including new digital marketing applications, which can support the customization of products and services, even at home or in a corporate environment (Janbout, 2020). This technological development considered a challenge for Jordanian companies, as digitalization will cover all sectors at different times and with different intensities.

With the interconnectedness of everything, largescale innovations will be demand-driven (International Monetary Fund, 2016; World Economic Forum, 2015) . It means the transformation of products and services should not focus on price and efficiency but rather the continuous interaction between customers and suppliers. Furthermore, how to create extended added value for customers without increasing in prices. Communication and collaboration are critical sources of innovation (Aladayleh et al., 2020). The full potential of the digital revolution depends on the use of digitization to achieve or drive cost-effectiveness. Some digital businesses in Jordan understand the keys to competitiveness, which are not in line with rapidly changing markets for digital products and services. The disruption that the Fourth Industrial Revolution will wreak on existing political, economic, and social paradigms will require that empowered actors recognize that they are part of a broader ecosystem that requires more collaborative forms of interaction to achieve success (Organization for Economic Co-operation and Development., 2014).

Another significant trend in digital transformation is how innovation dynamics are changing globally. The elements are essential such as demand-driven innovation, the influence of technology start-ups and entrepreneurs, the movement of manufacturers, and ecosystems and networks (Ministry of Information and Communications Technology, 2016). Regarding these trends, the increasingly digital world requires that Jordan exploit its advantages and find its place in global value chains. The real difference lies in unleashing potential and combining these areas by leveraging high-level strategic partnerships, producing specialized ICT talent, building on pioneering leadership and imagination, Smart leadership, and demand-driven digital innovation across critical sectors, pioneering the maker revolution, creating integrated and open solutions for content platforms for the Arab market (Ministry of Information and Communications Technology, 2016).

The Six sectors that drive the digital economy are health, education, energy, clean technology, transportation, financial / fintech, telecommunications, and security (Ministry of Information and Communications Technology, 2016). For instance, according to World Economic Forum (2015), The global e-health market expected to grow at an annual growth rate of 7% from 2011 to 2020, and the MENA market anticipated to grow at a compound annual growth rate of 16% from 2014 to 2022. In the education sector, the market is expected to grow Global smart education and learning at a compound annual growth rate of 24.4% from 2015-2020. Globally, the clean technology market worldwide will double in value to 4.4 trillion euros by 2025. The latest forecast shows an increase in market size from \$ 601 billion in 2014 to \$1.3 trillion in 2020. The market is also preparing a Global smart transportation system to grow at a compound annual growth rate of about 13.1% over the next decade to reach \$49.2 billion by 2025. Shortly, the global fintech market continues expected to grow at a compound annual growth rate of 55% during 2016-2020, but with a massive amount of untapped potential in the MENA region. In the Middle East and North Africa region, composite annual growth rates increase by about 23% from 2016 to 2022 (International Monetary Fund, 2016).

These trends suggest global opportunities that Jordan can employ as they establish a future challenge towards digital transformation. It demands the adoption of several advanced and innovative technologies, besides the introduction of successful technologies adopted in best international practices. For instance, countries use big data, learning analytics, and artificial intelligence to maintain education and e-learning. In the health sector, there will be an intersection between e-health, artificial intelligence, and the pharmaceutical industry supported by the capacity of digital analytics that Jordan can develop, for example, utilizing inter-

national big data platforms (World Economic Forum, 2015).

In the energy and clean energy sector, learning analytics, artificial intelligence, collective LED lights, onshore winds, solar photovoltaics, hybrid, and electric vehicles offer a range of advanced technologies that are rapidly capturing market share in global lighting (69% in 2020), and new energy generation (51% by 2025), and cars (22% by 2025), this creates enormous new opportunities (Aladayleh, 2020; Business Insider, 2017). The Internet of Things, Big Data, and Sensors are the technologies needed to enable energy and clean technology and sensors, mobile data, and 5G. In the financial services sector and FinTech, blockchain technology. Moreover, in the telecommunications and security sector, secure digital communications and specific technologies may use. These technologies are subject to change with future technical progress. Jordan to define focus areas and verify their relevance to the local context with the growth of digitalization in the key sectors (Ayre, 2012; Organization for Economic Co-operation and Development, 2016).

Jordan views the targeted opportunities to accelerate growth by 2025 by accelerating growth in the gross domestic production (at the national level) and achieving an additional 3% to 4% annual growth according to International Monetary Fund figures. Revenue growth across the digital economy sectors expected to increase by 25-30% over 2025 when the regulatory and enabling environment is complete. Jordan endeavors to achieve job growth in the digital economy by creating 130,000 - 150,000 additional jobs by 2025, encouraging existing companies, and creating job opportunities in emerging companies and new entrants. The suspected growth for new businesses as a result of digital economy interventions. Nearly 5,000 to 7,000 new emergent businesses are estimated in the digital economy ten years ahead, assuming a robust acceleration boost. Digitization is having an impact on GDP growth. A recent study showed that increasing digitization by 10% contributes to a 0.59% increase in GDP for a transitional economy like Jordan, according to International Monetary Fund (2016).

3. Methodology

This paper seeks to build a framework for measuring the digital transformation impact from the stakeholder's perspectives towards the digital transformation vision in Jordan that extends to 2025. It highlights the most substantial measures developed by the Jordanian government towards achieving that vision. To achieve these objectives, the researchers investigated areas that drive the digital economy and introduced them in the REACH2025 plan. Jordan inaugurated this plan in 2016 as a road map for digital economy transformation. The seventh focus areas that will lead the initiatives and actions included Smart specialization and demand-driven innovation, Emerging technology and entrepreneurial projects, public sector innovation, Enabling business environment, ICT skills, Capabilities and talent, and Smart infrastructure.

These areas contain detailed procedures as the research employed them for generating field survey questions and personal interviews. According to the government, these measures intend to create an institutional, sustainable and transformative ecosystem for the digital economy to open Jordan to be a regional hub for manufacturers and emerging technology companies.

Stakeholders, experts, practitioners, academics in related disciplines in universities, and public service employees selected. This sample is significant for the results because certain individuals are in direct contact with digital government services, and their attitudes may influence the formulation of concepts and focus of government actions towards implementing the vision of digital transformation. Additionally, the study surveyed emerging companies operating in the digital field and a group of employees working in these companies. The respondents' profile is shown in Table I.

This large-scale investigation is considered a diagnostic attempt for the government measures exercised since launching the REACH2025 initiative for digital transformation in 2016. The government plan included 18 actions for the transition towards a digital economy by the year 2025. These measures consider end-users needs when formulating policies and

Table I. I. Demographic	distribution of the
respondents	

Work fieldFrequency %Information Technology3116%Education2915%Telecommunications2312%Higher Education.2211%Services1910%Hospitals/Healthcare168%Tourism158%Banks and Financial institutions147%Engineering / Infrastructure /84%Energy42%Construction32%Trading32%Agriculture11%Total19610%			
Information Technology3116%Education2915%Telecommunications2312%Higher Education.2211%Services1910%Hospitals/Healthcare168%Tourism158%Banks and Financial institutions147%Engineering / Infrastructure /84%Energy42%Construction32%Trading32%Agriculture11%Total196	Work field	Frequency %	
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Engineering / Infrastructure /84%EnergyManufacturing84%Transport42%Construction32%Trading32%AgricultureI1%Total196196	Banks and Financial institutions	14	7%
EnergyManufacturing84%Transport42%Construction32%Trading32%Agriculture11%Total196196	Engineering / Infrastructure /	8	4%
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Construction32%Trading32%AgricultureI1%TotalI96	Transport	4	2%
Trading32%AgricultureI1%Total196	Construction	3	2%
AgricultureII%TotalI96	Trading	3	2%
Total 196	Agriculture	I	1%
	Total	196	

identify the multiple causes of technical problems, different perspectives and solutions, and user involvement in the final decision-making process. These procedures considered the best international practices, and the inputs of stakeholders in line with international standards in the Jordanian environment (Nielsen et al., 2013; Matar et al., 2020). This study aimed to develop a general framework that illustrates how the impact of digital transformation is measured in Jordan. The variables that consist of the proposed framework derived from the REACH 2025 digital transformation plan. The researcher proposed 18 measures included in the digital transformation plan as independent variables. The researchers measured the impact of digital transformation through four main variables; namely individuals' impact, sector, and companies' impact, impact on productivity, and the impact on investment.

Based on the above, this paper is keen to achieve validity for this general framework. As it developed a set of questions, then directed to experts from various sectors for validation. The interview questions demonstrated governmental procedures through 21 questions, and four questions to measure the impact. The researcher formulated the interview questions in a way that was easy to read, comprehend and answer. Face and content validity verified through a group of experts, practitioners, and academics in the digital field in Jordan and abroad. The verifying also included experts from the government and private sectors, all expert recommendations adapted to make improvements to the interview questions. Interview's process performed with specialists in the government and private sectors, corporate employees, owners of digital companies, e-commerce companies, social media companies, technology, and network service providers, and other jobs in the related technical field.

The researcher adopted the purposive sampling procedure to achieve the study objectives. The researchers targeted and interviewed stakeholders individually at their worksites or communicated them via phone calls. This study is extensive in scope as it includes people in multiple disciplines. The sample size received reached (196), which is considered just for such type of studies. The researchers justify the low sample size because the purpose of this study is to explore and investigate stakeholders' ideas and perspectives. Non-response bias was checked, a random sample of 20 non-responders, who agreed to a telephone survey was called. According to Borg and Gall (1989), 20 cases are considered sufficient to compare the responses of both groups to determine whether the non-responders were biased. The results of the t-test showed that there were no significant differences between response and non-responses (t= 3.44, p=0.104).

Given the exploratory nature of this study, the researcher used descriptive analysis of the data received from the experts. This is the first study that evaluated government actions from experts' points of view. This study handled the experts' perspectives on the progress in achieving the government's goals. Therefore, measuring these attitudes through descriptive statistics is considered appropriate, as there are no empirical studies to assess government performance concerning digital transformation, also there are no studies to measure the impact of transformation dimensions on sectors, corporate, individuals, investment, and productivity.

The researchers used descriptive statistics (frequencies) to measure the degree of respondents' approval of achievement in government procedures. The study did not use inferential statistics because this stage is considered exploratory and the questionnaire items have not been experimentally tested previously. This exploratory study aims to measure interaction with the proposed elements in the general framework. It is also considered a precursor to an empirical study to confirm the proposed general framework. The researcher needs to make sure that these elements are effective to build a measurement model that is valid and reliable. In the next section, the researcher presents the results while analysing the data. Moreover, these results need confirmation, and researchers have advised some recommendations for future research that focus on conducting empirical studies to confirm the findings in this study.

4. Finding

Initially, the study reviewed the experts' perspectives about their expectations towards the vision of digital transformation through the following question " Digital transformation in Jordan is capable of creating a digital economy by the year 2025 that enables individuals, sectors, and companies to increase productivity and encourage investment". A total of 196 experts answered this question, and among the sample, 30% of them agree that the vision of transformation is capable, 21% believe nearly a reasonable degree, while 15% of them think it is relatively for a little degree. Around 34% believe that this vision is incapable. According to experts in the digital field, these results designate relative certainty regarding digital transformation efficacy to build that supports increased productivity and boost investment in most digital sectors.

4.1. Smart Specialization and demand-driven innovation

Regarding the key drivers of digital transformation, Smart Specialization and demand-driven innovation included three questions, namely:

Q1. Adopting the Digital Economy Framework in Jordan's economy by launching a Digital Economy Catapult and Launchpads in sectors and verticals.

Q2. Creating globally relevant, high-value digital applications, solutions, and IP by supporting in-licensing and the reuse of IPs.

Q3. Driving global partnerships and bridges with international digital hubs through a network of international innovation centers in key markets.

Figure 1 shows the results of analysing the sample responses to the first three questions. According to the first question, the analysis indicates that the Jordanian government transformation has not succeeded enough in adopting the framework that launching the catapult and launching-pad in the digital economy sectors and verticals. The experts in the technology sector have answered this question, nearly 6.7% of the respondents believe that not succeed, while remarkable is promising as 62.2% of experts exhibited sound and fairly successful, plus 11.1% indicated a good attempt for this measure. 8.9% believed that the vision succeeded in adopting the general framework through which digital economy platforms can launch excellently. These answers express the opinion of experts in the technology sector.

Question 2 reports the ability of the Jordanian digital economy to create high-value and globally relevant applications and solutions by supporting licensing and reuse of intellectual property. The researcher examined the perspectives of experts in the technology sector and those interested in property rights, licensing, and reuse of property rights. Approximately, 4% of the experts think that Jordan did not take a real step towards creating applications of local or global value, and has not utilized licensing or employing intellectual property reuse rights. That assumes Jordan's experience in this is fair to a remarkable extent since 53.3% of the sample confirmed this, moreover others indicated that Jordan was able to succeed in establishing digital applications and solutions in a good to excellent ratio, perceiving that their percentage does not exceed 22% of the total sample.

The third question examines the attitudes towards building global bridges through innovation centres, " Driving global partnerships and bridges with international digital hubs through a network of international innovation centres in key markets". The experts' answers varied as 2% indicated that the government had succeeded in leading global partnerships and bridges with international digital centres through a network of international innovation centres in over markets. While 15.6% believe that it achieved a good, about 55.6% believe that the leadership of global partnerships and bridges with international digital centres is somewhat fair. Finally, 22% believe that the digital economy has not succeeded in establishing those partnerships. The results of the first drivers figured below (See Figure.1).

4.2. Public Sector Innovation

The second key driver for digital transformation is Public Sector Innovation. The researcher chose to scale the innovation of the public sector through the following question:

Q4. Transforming government and public sector to be "digital by default" by 2020 by developing open data policy.

Q5. Changing models of implementation based on Public-Private Partnerships

Q6. Leading and accelerating digital innovation across government



Right to left, Blue=Q1, Red=Q2, Green=Q3

Figure 1. Smart Specialization and demand-driven innovation

Sample responses about the public sector innovation

(Q4, Q5, Q6) are shown in Figure 2. Throughout 27% of experts believe that the government efforts remain fair to good in transforming the public sector into a virtual digital. The government has not taken inevitable measures in developing open data policies, which are the essential component of digital transformation. (See Figure.2). Moreover, the government did not improve implementation models to meet the partnership needs with the private sector, which does not qualify it to lead digital development and innovation across government sectors. The result in Figure 2 shows the statistics regarding the question " Changing models of implementation based on Public-Private Partnerships". Driving and accelerating digital innovation across government seems a bit underwhelming, as 30% believe it is below average in embedding digital innovation across government.



Right to left, Blue=Q4, Red=Q5, Green=Q6

Figure 2. Public Sector Innovation

4.3. Tech Start-ups and Entrepreneurs

According to the third key drivers of digital transformation, Tech Start-ups, and Entrepreneurs, this driver included three questions, namely:

Q7. Boosting digital economy start-ups in Jordan and special zones, by increasing incubation, acceleration & support capacity

Q8. Making Jordan the regional hub for makers by giving all makers access to the innovation infrastruc-

ture/ecosystem

Q9. Enabling a culture of digital entrepreneurship & intrapreneurship across Jordan by launching a national campaign

The results in Figure 3 revealed that the government's measures to promote technology start-ups and entrepreneurs were fair to poor in most of the expert responses. Only 33% of the experts believe that the government succeeded in promoting the emerging digital economy in distinct regions by increasing the incubation, acceleration, and support capacity. On the other hand, the experts' evaluation of Jordan's position as a regional hub for businesses by giving all manufacturers access to the innovation infrastructure/ecosystem did not exceed 28% of all experts in the same field. Finally, 42% of the experts believe that Jordan can build and enable a digital entrepreneurship culture and internal entrepreneurship throughout Jordan by launching a national campaign.



Blue=Q7, Red=Q8, Green=Q9

Figure 3. Tech Start-ups and Entrepreneurs

4.4. ICT Skills, Capacity, and Talent

the fourth key drivers of digital transformation is ICT Skills, Capacity, and Talent, this driver included three questions, namely:

Q10. Implementing 21st-century skills to support the digital economy by linking digital economy skills needs to the nation-wide overhaul of the education sys-

tem

Q11. 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

Q12. Creating models and tools for better women participation in the digital economy in workplaces and as active users

The results in Figure 4 confirm that Jordan has been reasonably successful in providing ICT skills, capabilities, and talent. Jordan is moving towards including the skills of the twenty-first century by focusing on education in technical fields in addition to encouraging training in those areas. Comprehensive reform to engage in the digital economy needs to transform the educational system. The results indicated that 46% of the experts believe that the government has made efficient steps to reform the educational system. On the other hand, 62% percent believe that Jordan has managed, through changes in the educational system, to create a talent pool that drives the demand for the digital economy. lordan encouraged training to increase qualifications and take practical steps to empower open employment.

Finally, note that 31% of the experts believe that the Jordanian government was able to transform government models through which the participation of Jordanian women in the digital economy increased, as the government supported the inclusion of women in the labor market, especially in digital fields, and women became active members.

4.5. Enabling Business Environment

The fifth key drivers of digital transformation are Enabling Business Environment included three questions, namely:

Q13. Creating an open, stable, and enabling business environment for the digital economy by streamlining and revising processes, legislation, and regulations.

Q14. Building a high-performance and attractive investment environment with an emphasis on the availability of scaling and growth capital and FDI

Q15. Becoming an early adopter country and





Figure 4. ICT Skills, Capacity, and Talent

regional beta-tester for key emerging technologies by supporting experimentation

Figure 5 shows the answer to the questions Q13, Q14, Q15. In terms of enabling the business environment, the Jordanian government has also taken decisive steps in reviewing the processes, legislation, and regulations that would create an open, stable, and enabling business environment for the digital economy. Approximately 38% believe it has managed to do so, and about 20% believe it has succeeded. Also, these legislations can build a high-performance investment environment in the digital field, where more than 53% of experts believe that the Jordanian government has taken positive steps to facilitate the provision of capital and obtain foreign investment. It also remarked that the percentage is close in the early adoption of technical and scientific experiments in this field (see Figure 5).

4.6. Smart digital economy infrastructure

Figure 6 represents the response analysis for the sixth key drivers of digital transformation namely Smart digital economy infrastructure which included three questions:

Q16. Establishing a state-of-the-art secure digital infrastructure by developing information and cybersecurity practices and regulations, revising spectrum pricing and investing in the national broadband infrastructure, and laying the path for 5G



Blue=Q13, Red=Q14, Green=Q15

Figure 5. Enabling Business Environment

Q17. Revising spectrum pricing and investing in the national broadband infrastructure and laying the path for 5G

Q18. Leading nationwide focus on data-driven transformation by developing regional standards and secure operational models for open data.

Around 50% of experts in the field believe that successive governments in Jordan have provided the requirements for preparing infrastructure to accommodate the smart digital economy. By developing regulations related to information and sharing and laws to protection and cybersecurity, and reviewing the pricing mechanisms for national broadband infrastructure, which facilitates and paves the way for adopting 5G technologies. Jordan has adopted regional and international standards in its governmental practices related to reporting and relying entirely on data (See Figure 6).

4.7. Governance

The final key drivers of digital transformation are governance and included three questions, namely:

Q19. Establishing co-owned leadership and ownership by implementing a strong but agile governance structure to ensure accountability.

Q20. Reforming the regulatory system to support





Figure 6. Smart digital economy infrastructure

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.

Q21. Exercising strong program accountability and progress monitoring by establishing a systematic but dynamic program monitoring and evaluation system.

Results in figure 7 represents the results of response about the digital transformation in Jordan which derived from the top leadership in moving towards adopting appropriate legislation, laws, and infrastructure for reaching the digital economy in the year 2025. Nearly 50% of the experts believe that Jordan has managed to build and implement a governance structure that ensures accountability. The government exercises relevant measures to attain an integrated framework for the digital economy by focusing on a comprehensive review of the regulatory bodies and delivering the necessary dynamism to enrol in a competitive market. Finally, the organizational reformation has focused on establishing a systematic and dynamic arrangement to facilitate the evaluation of the results that have been achieved and focus on aspects of failure in the implementation of plans, and suggest an improvement (See figure 7).

4.8. Digital transformation impact

Individuals, sectors, and companies are the engines of digital transformation. This section explores the aspi-



Blue=Q19, Red=Q20, Green=Q21

Figure 7. Governance

rations towards the digital transformation vision to enable individuals, sectors, and companies, increase productivity and encourage investment. In Figure 8, Experts' answers varied as nearly 49% agreeing that digital transformation can create an economy capable of enabling individuals to encompass digital transformation. Also, 57% of them believe that this vision can enable sectors and companies. Approximately 60% of experts remain confident about the capacity of this vision to create a digital economy and contribute to productivity for individuals or sectors and companies. Finally, the significant aspect of the digital transformation vision is encouraging investment, as 58% of experts believe that this vision will encourage investment. Encouraging investment in the digital economy is a vital outcome for driving digital transformation and engaging individuals, sectors, and companies in digital transformation because it opens many opportunities for individuals to develop their skills and technical capabilities and make the best use of available resources (See Figure 8).

Finally, the results of the descriptive analysis for responses confirm that there is satisfaction with government measures in a digital transformation action plan. However, these measures should be strengthened to reach the goals of digital transformation. The analysis of demographic variables was not covered in this



Blue=Q22 (Enabling individuals, Red=Q23 (enables sectors and companies), Green=Q24 (increase productivity), Dark blue= Q25 (encouraging investment)

Figure 8. The ability of Digital Transformation Vision 2025 to create a digital economy that enables individuals, sectors, and companies, productivity, and encouraging investment

research because the field of study is different, and that is one of the determinants that the researcher hopes to address in future and empirical research.

5. Discussion and Implication

5.1. Discussion

This study investigated trends in the aspirations of stakeholders towards digital transformation in Jordan by 2025 to develop a robust framework for measuring its impact on individuals, sectors, and companies, impact on productivity, and impact on investment. Seven factors included in the digital transformation plan studied and used to develop the framework; Digital transformation in Jordan focuses on supporting demand-driven innovation across main sectors and as ecosystems in collaboration with the ICT sector, start-ups, and educational institutions.

The digital transformation plan includes building world-class talent; It focused on skills and capabilities related to the digital economy and collaboration between the information technology sector and other sectors that stimulate digitalization (Accenture, 2017; Broekhuizen et al., 2018; Verhoef & Bijmolt, 2019).

The government must provide a work environment and build dynamic ecosystems. It must be open to new technologies, direct the transformation of government models, and lead the development of content and solutions that cater to local and international culture as indicated by Zhu et al. (2006); Lamberton and Stephen (2016); and Accenture (2017). Finally, the role start-ups play in supporting digital transformation by revolutionizing the adoption of new technologies cannot be ignored (Broekhuizen et al., 2018; Christensen et al., 2016; Dong & Yang, 2020).

There is no doubt that the Jordanian government's vision focuses on four areas that create a digital economy capable of empowering individuals, sectors, and companies to improve productivity and encourage investment. The expert indicated that digital transformation vision can achieve the required empowerment, as more than 50% of the respondents support this claim. Referring to the digital transformation plan, most experts demonstrate critical gaps that must address. For instance, the results showed that the government did not take actual steps towards building a general framework for the digital economy, either at the official government level or in the sectors. This framework helps create high-value digital applications and solutions and establishes partnerships with digital centers and international innovation centers.

They indicated that an innovative government should encourage change in the public sector and accelerating digital innovation through government institutions. The results revealed poor innovative government; The government should establish general frameworks to drive innovation and focus more on developing open data policy and changing its models to be meet participation requirements with the private sector. The private sector is considered a pioneer in developing and using Open- data to achieve digital leadership (Eggers & Park, 2018; Gensler et al., 2017).

Emerging technology and entrepreneurship reflect public sector innovation. The researchers also note that government policies have not contributed to strengthening the emerging digital economy in Jordan and the regions, as the government did not contribute to incubation, acceleration, and support services. Also, up to the present time, researchers find that a small percentage of experts believe that Jordan has succeeded in making Jordan a regional center for makers, as it has not succeeded in providing the infrastructure for innovation and providing ecosystems. Nor has it promoted a culture of innovation, digital entrepreneurship, or internal entrepreneurship by launching national programs to promoting innovation culture (Pagani & Pardo, 2017; Kübler et al., 2017).

On the other hand, stakeholders pointed out that Jordan has attained a satisfactory degree in providing skills and talents regarding ICT. Since Jordan was able to deliver the high capacity of the skills needed to support the digital economy, Jordan has taken vital measures towards a comprehensive reform of its education and student training systems and creating a regional pool of talent to drive the demand for the digital local and global economy by supporting open employment and women's participation.

Furthermore, the results also show that Jordan is in an in-between in creating and enabling a business environment that facilitates creating an open, stable, and enabling environment for the digital economy by simplifying and reviewing processes, legislations, and regulations. It pertains to a high-performing investment environment that is attractive to foreign direct investment. It is still striving to be a regional experimental laboratory for major emerging technologies, but it needs serious measures to achieve this.

5.2. Implication

Jordan needs to provide a secure infrastructure for a smart digital economy by developing legislation related to information and cybersecurity, investing in national infrastructure, flooring the way for 5G, data-driven transformation by developing regional and secure standards. According to Data models, Stakeholders indicated that government efforts are still weak and should focus on strengthening this area. Finally, stakeholders recognize that governance and the government's ability to build a robust structure are still under development, as digital transformation needs a strong, resilient, and agile arrangement to administer the required digital transformation. A strong governance structure ensures that the foundations devised to support and reform the governing and prevailed over the foundations for accountability, create a more dynamic future system, and create a competitive market (Lamberton & Stephen, 2016; Venkatraman, 2017; Zhu et al., 2006). The strong governance structure also helps monitor progress, evaluating government programs and procedures through periodic review of achievements (Zhu et al., 2006).

Digital transformation is inevitable and must accelerate actions to keep speed with the rapid changes in the world. There are ever-evolving and innovative ways of doing things, as well as more opportunities to harness data and new ways to engage companies, individuals, and industries. The proposed general framework in Figure 9 revealed seven government measures adopted as independent variables, while the impact of digital transformation is the dependent variable. Several researchers supported this framework (e.g., (Svahn et al., 2017) (Zhu et al., 2006) (Venkatraman, 2017) (Zhu et al., 2006).

The vision for digital transformation is a dream for companies doing business, as digital innovations create opportunities faster every day. Firms in every sector need to benefit from technological advances not only to remain competitive but to survive (Kübler et al., 2017; Broekhuizen et al., 2018; Dong & Yang, 2020). Digital transformation is not a cakewalk, so the government must adopt bold and big ideas and promote a culture of digital transformation as technological progress is widely accepted and understood by all individuals, sectors, and companies, yet cultural changes are necessary to make digital transformations often overlooked (Eggers & Park, 2018; Kübler et al., 2017). Lack of interest in culture results in 84% of organizations failing to achieve digital transformation. Therefore, the Jordanian government should seek to bring the required cultural change and provide insight into organizational structures, governance, operating models, and products and services (Gensler et al., 2017; Christensen et al., 2016; Pagani & Pardo, 2017).

Finally, if Jordan achieves the vision of digital transformation 2025, it will create a competitive market and remove geographical barriers. Additionally, recruit effective employees, create a distinctive user experience, improve business strategy, improve global presence as a center for attracting talent, and increase the effectiveness of Government strategies and improving the value of the service provided (Broekhuizen et al., 2018; Christensen et al., 2016; Eggers & Park, 2018; Gensler et al., 2017; Pagani & Pardo, 2017; Kübler et al., 2017). However, to fully embrace digital transformation, the government should periodically review its digital strategy, capitalizing on new technology opportunities, and implement certain technologies (Broekhuizen et al., 2018; Kübler et al., 2017; Gensler et al., 2017).

Jordan should centre on future social and economic indicators, such as viability, happiness, sustainability, and resilience, in addition to the potential for social innovation. The growth strategy aims to capture the social and economic value that the digital economy can achieve. Among indicators that must perceive is the inclusiveness of migrants and refugees, and include all parts of the country instead of focusing on the capital Amman. The empowerment of women and the contribution of digital to the green economy are the most considering issues. And improve transparency and business processes for the government and the non-profit sector. These before-mentioned indicators attract much international attention (Innovation Jordan Committee, 2020), there is significant potential for Jordan to become a regional leader in demonstrating impact and solutions operating in the MENA region. The international literature indicates several social and economic indicators that may be taken into consideration in the future to track progress, which is the impact of information and communication technology on access to essential services, use of information and communication technologies, government efficiency, participation, women in ICT jobs, and the ability to decentralize innovation, and the impact on the green economy (Organization for Economic Cooperation and Development, 2013, 2016).

Additional indicators that can help Jordan lead the digital economy and provide leadership in independent international standards are also available (Ministry of Information and Communications Technology, 2016). The assessment should not focus on measur-





ing economic, but also a specific social value. It also instill investor confidence and helps regarding Jordan as an attractive country for creating business. Jordan has delivered success stories in the effectiveness of lawmaking and the preparation of investment capital; On the other hand, Jordan needs to simplify government procedures while establishing a new business, introducing new technologies into education and curricula, and increasing the impact of information and communication technology on organizational models. These indicators include the political and regulatory environment, business and innovation environment, infrastructure, affordability, skills, individual mobile phone use, business use, government use, economic impacts, and social impact (Gerlach & Eisheh, 2020).

The results of this study may be considered a platform for policymakers in the Jordanian government. As there is no general framework for measuring government measures and their impact on individuals, sectors, and companies. These bodies are of the importance that calls for their participation in decision-making, and therefore their opinion and attitudes about the achieved achievement should be diagnosed. Also, knowing their opinion leads to systematic thinking about plans and the possibility of benefiting from developments in digitization. These results can be used to build plans and focus on the positive aspects of the field of digital transformation. The general framework proposed in this study can also be used for the periodic evaluation of the achieved achievement, where the focus is on the negatives and is addressed according to developments, meaning that the current results are considered as inputs for the years of implementation in the next years.

5.3. Implication for digital marketing

The growth in digital marketing advanced due to rapid improvements in technology and changing market dynamics. Accordingly, in the developed world, many companies have realized the importance of digital marketing (Mergel et al., 2019; Harazneh et al., 2020). For companies to be successful, they must integrate traditional online methods to better meet customer needs. This indicates the need for a stronger application of digital marketing in markets where it has not been developed strongly. The introduction of new technologies due to digital transformation and entry into the era of digitization has created new job opportunities for marketers to use in achieving their business goals (Hess et al., 2016).

Several researchers (Mergel et al., 2019; Hess et al., 2016) have indicated that one of the most prominent manifestations of digital transformation is the close link between it and digital marketing, as the concepts of digital transformation and digital marketing are intertwined through different ways of using information technology to develop service provision. Thus, it is changing organizational processes and organizational culture and influencing value creation.

The impact of modern technologies and successive developments on information exchange technology such as the Internet and creative technologies and their perceptions in the minds of workers in companies and limited by institutional arrangements and their general impact on organizations (Garzella et al., 2021; Manesh et al., 2021). The impact of digital transformation in digital marketing is related to organizational change, organizational culture, new ways in which society deals with information, and the contemporary requirements of government services.

The era of digitization has arisen as a result of the rapid development of information technology capabilities, which have affected every aspect of society. To exploit the great benefits of digital transformation requires a rapid adaptation in line with social and economic changes and poses additional challenges in how companies conduct their business in this way (Garzella et al., 2021). According to Caputo et al. (2019) and Manesh et al. (2021), new business models are needed to produce and achieve a competitive advantage. The era of digitization represents a shift from tangible resources to intangible resources and calls for creativity, cooperation, and intellectual capital as a basis for creating a successful business model, so the original focus on internal resources has now shifted towards obtaining external resources through cooperation with many independent topics. Digital marketing is widely used to promote products or services and reach consumers through digital channels. In terms of conceptual definition, it can be said that digital marketing is the use of technologies when it comes to aiding marketing activities and improving customer knowledge by matching their needs (Adaileh et al., 2020).

To keep pace with the era of digitization and digital transformation, external changes require the development of new management strategies that focus on formulating and developing collaborations with companies, indicating the importance of establishing and maintaining reliable relationships between multiple stakeholders. Thus, effective communication with stakeholders supports this competitive advantage, highlighting the importance of digital marketing and the benefits it provides.

5.4. Implication for future research

Finally, the study recommends directing future research towards the different sectors that make

up the digital economy and assessing the impact of digital transformation dimensions on individuals and companies. Researchers also recommend addressing the transformation impact on key performance elements in the digital economy such as productivity, investment, competitiveness, and other performance indicators.

Given the exploratory nature of this study, the researcher used descriptive analysis of the data received from the experts. The researcher recommends testing the general framework empirically through quantitative data to identify the interrelationships between the dimensions of the general framework and provide more accurate recommendations.

This paper had several limitations that could be considered as future opportunities for managerial implication or even for future research. Due to the lack of studies that provided empirical solutions to measure the opinions of stakeholders, this exploratory study covers the lack of literature in the same field. The results of the study can be used in designing mechanisms for monitoring, control, and diagnosis of governmental policies and procedures. As a result, future researchers can use the items explored in conducting confirmatory studies, and they can use the proposed framework in conducting empirical studies to measure the impact of digital transformation on several performance indicators.

The researcher also suggests using the questions that were used in this study to develop a model to measure the impact of digital transformation and its impact on performance indicators or other performance indicators. Other exploratory studies may be conducted to explore new factors or to confirm existing factors through empirical and confirmatory studies.

This study was not able to include large sample size, as the sample obtained is considered small, but it can be considered appropriate for exploring the main items needed to measure the impact of digital transformation, knowing that most of the interviewed individuals are specialists and have greater insight. This limitation leads future researchers to include larger samples since to confirm the proposed framework, it is necessary to conduct an empirical study with the inclusion of a large sample.

To ensure the validity of the questions to measure attitudes, the paragraphs were presented to a group of academics in several universities. Also, it was presented to a group of practitioners and experts in the governmental and private sectors to ensure face and content validity. The questions were reformulated based on the recommendations, where some paragraphs were deleted, the current paragraphs were modified, other paragraphs were added, and the measurement model settled on 25 paragraphs to measure 8 dimensions. The study seeks to investigate the opinions of a group of experts to lay the appropriate ground for a theory that will be verified using an empirical study. The current study recommends conducting future studies to build a reliable and valid measurement model. As for reproducibility, the questions were used in this study to measure the dimensions and impact of digital transformation have been validated. Future studies can be conducted using these questions, where the dimensions of digital transformation can be considered as independent variables and the impact of digital transformation as a dependent variable. Validity and reliability can also be checked by performing a multivariate analysis to estimate the interrelationships between study variables.

6. Conclusion

This study investigated the aspirations of the concerned stakeholders towards the vision of digital transformation 2025 initiated by the government in 2016. The study explicated that the government measures taken are slightly hesitant and need much support to speed up procedures. It needs to enhance the adoption of innovation in government and various sectors and adopting new technologies. The Innovative technology in the world stimulates distinct technical talents and capabilities to achieve this vision.

This study contributed to shedding light on the features of the digital transformation vision in Jordan and highlight stakeholders' adjustments and evaluation of government achievements through the proposed framework. This study contributes to building awareness of individuals and companies about the progress made in implementing the vision. From the principle of transparency, citizens know where things go in performing and how various investments can help achieve societal well-being. An important implication of this study is that the government procedures included in the digital transformation plan are variables used to develop a measurement model through which variables affect individuals and sectors, productivity, and investment manifested. Thus, estimated the impact of digital transformation on the digital economy

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