EasyChair Preprint

№ 5769

Overcoming Digital Transformation Challenges Past the Pandemic: a Case Study During the "New Norm"

Mohamed Omar Ezzat and Mona Kamal Khamees

June 12, 2021

OVERCOMING DIGITAL TRANSFORMATION CHALLENGES PAST THE PANDEMIC: A CASE STUDY DURING THE "NEW NORM"

PROF. MOHAMED OMAR EZZAT
Nile University /Management Of Technology, EGYPT
Mezzat@nu.edu.eg

Eng.MONA KAMAL KHAMEES
Nile University /Management Of Technology, EGYPT
Mona.kamal@te.eg

ABSTRACT

Digital Transformation (DT) is the usage of digital technology, such as process automation, cloud computing, Internet of Things (IoT), and Artificial Intelligence (AI) to transform government services and businesses, from a paper-based business to a paperless one. Through the smart and well-planned application of these techniques, digital solutions will definitely improve process efficiency, enhance "users" experience, and increase their satisfaction. In developed countries, it is proven that DT leads to new types of innovation and creativity in handling traditional activities.

Despite the recognition that DT has many benefits for the society as a whole, there are many challenges facing the transformation process. According to DELL Techno 2020 DTI Report, the study highlighted fourteen (14) of the most significant global challenges that hinder the digital transformation progress. These findings were based on the responds of more than 4,300 participants from multiple governments, 13 Industries, 18 Countries. The report reveals that the two primary barriers of DT are: 1) data privacy and security concerns, and 2) lack of sufficient budget and resources to carry out the transformation process. However, Dell report offered possible ways to ease the impact of these challenges on the implementation process such as the alignment of strategy with delivering value to society and changing the mindset and skillset of individuals involved.

Covid19 pandemic has impacted the whole world in a very dramatic way. Carrying on business-as-usual, past the pandemic, is not an option anymore. The world has to survive in a "New Norm" where digitization, wearing masks, and social distancing are way of live for the foreseeable future. Even though the current pandemic has numerous negative impacts on the health and well-being of many, one positive point is attributed to its occurrence. Governments and businesses have been forced to accelerate the DT activities to cope with the situation. However, the pandemic added more challenges and barriers in the DT process.

This study highlights the digital transformation journey in Egypt, summarizing the success and the pitfalls faced, and still facing, the nation on the way. Field investigation through structured surveys

and literature reviews are used to capture the existing challenges in the new norm and recommendations of strategies to overcome them.

Key Words: Digital Transformation, Covid19, New Norm, Digital Transformation Challenges, Egypt Digital Transformation Journey, Overcoming Challenges of Digital Transformation.

INTRODUCTION

Digital transformation is the process of using digital technologies to create new or modify existing business processes, culture, and customer experiences to diverse changing business and market requirements. This reimagining of business in the digital age is digital transformation.

It transcends traditional roles like sales, marketing, and customer service. Instead, digital transformation begins and ends with how you think about, and engage with, customers. As we move from paper to spreadsheets to smart applications for managing our business, we have the chance to reimagine how we do business how we engage our customers with digital technology on our side.

COVID-19 crisis is creating a stress test for the investments that organizations made in digital transformation and increasing the importance of certain areas that enable & reinforce the digital journey.

IMPACT OF DIGITAL TRANSFORMATION:

Digital transformation impacts every industry. Whether a business generates revenue through client services, digital media, or physical goods, technological innovations can transform the means of production, distribution, and customer service.

Digital transformation has vast effects on the society at many levels. It allows the automation of business operations resulting in operational efficiencies, such as the reduction of transaction costs, which ultimately impacts productivity. Furthermore, it offers new business opportunities, thus affecting employment and entrepreneurship. It also enhances the provision of public services, such as health care and education, and improves the interaction between citizens and their governments.

In addition, digital transformation affects human relationships and individual behaviour, through facilitating communication and social inclusion. Thus, enhancing digitization and creating digital markets can result in considerable economic and social benefits to societies and communities, through its potential to increase productivity, accelerate growth, facilitate job creation, and enhance the quality of life for society in general. According to Arab Countries Digital Economy "ACDE" study, the digital economy is estimated to contribute to around $ 1.2 trillion to the US economy and around 3.8 $ trillion to the Chinese economy.

The International Data Corporation "IDC" study found that the digital economy in Asia Pacific will be worth 1.16 $ trillion by 2021 accounting for 60% of the gross domestic product "GDP" up from about 6% from last year across 15 Asia Pacific Accreditation Cooperation "APAC" economies, also found that digital products and services enabled by mobility, cloud, the internet of things "IoT" and AI would grow the region's gross domestic product by 0.8% each year.

Digital Transformation Challenges

According DELL Techno 2020 DTI Report, it spotlights fourteen of the most important global challenges that hinder the digital transformation progress. referring to figure 1" which describe the highest challenges in each field. This chart was based on research and responds of more than 4,300 Quantitative governments, 13 Industries, 18 Countries. This report reveal that the Data privacy and security concerns and lack of budget and resources are the two primary barriers of the global digital transformation, as they ware in 2018.

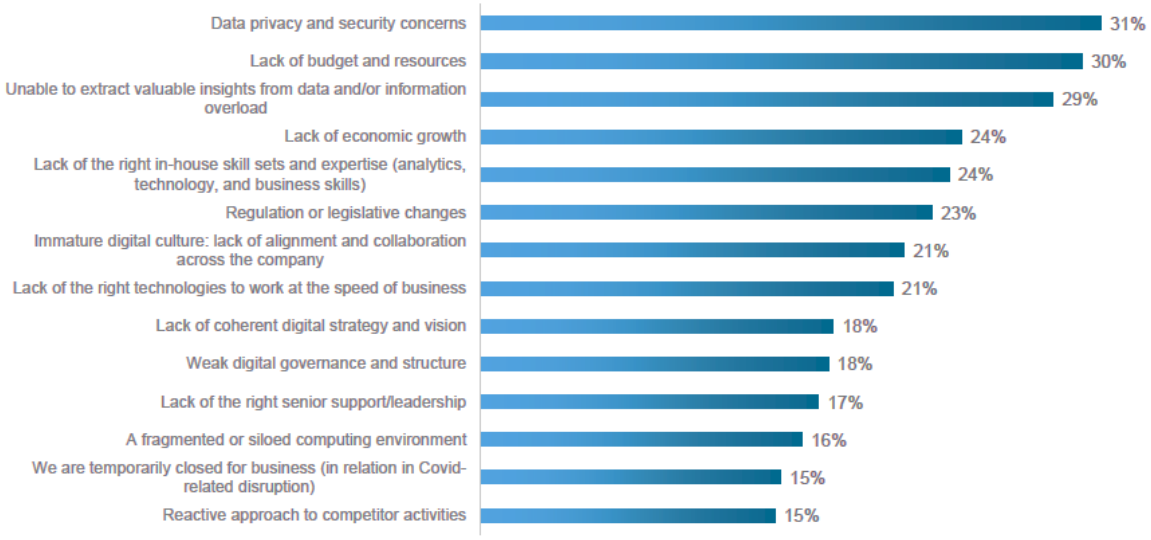

Figure 1:BARRIERS TO DIGITAL PROGRESS

Refer to "figure 2" this is barriers clarify the lag of digital transformation through the last 5 years. We can notice that the changing of priorities & challenging in that last 5 years, the more tendency for adapting digital transformation required data security, assigned budget & strategic vision.

2016	
1	Lack of budget & resources
2	Lack of the in-house right skills sets and expertise
3	Lack of senior support/leadership
4	Lack of the right tech to work at the speed of business
5	Data privacy & security concerns
6	Reactive approach to competitor activities
7	Lack of a coherent digital strategy & vision
8	Immature digital culture
9	Regulation & legislative changes
10	A fragmented or siloed computing environment
11	*Unable to extract valuable insights from data and/or information overload
12	Weak digital governance & structure

2018	
1	Data privacy & security concerns
2	Lack of budget & resources
3	*Unable to extract valuable insights from data and/or information overload
4	Lack of the in-house right skills sets and expertise
5	Regulation & legislative changes
6	Immature digital culture
7	Lack of the right tech to work at the speed of business
8	Lack of senior support/leadership
9	Lack of a coherent digital strategy & vision
10	Weak digital governance & structure
11	Reactive approach to competitor activities
12	A fragmented or siloed computing environment

2020	
1	Data privacy & security concerns
2	Lack of budget & resources
3	*Unable to extract valuable insights from data and/or information overload
4	NEW Lack of economic growth
5	Lack of the in-house right skills sets and expertise
6	Regulation & legislative changes
7	Immature digital culture
8	Lack of the right tech to work at the speed of business
9	Lack of a coherent digital strategy & vision
10	Weak digital governance & structure
11	Lack of senior support/leadership
12	A fragmented or siloed computing environment
13	NEW We are temporarily closed for business (in relation in Covid-related disruption)
14	Reactive approach to competitor activities

Figure 2: BARRIERS TO DIGITAL TRANSFORMATION, HISTORICAL COMPARISON

Digital Transformation Under Covid-19

Under COVID-19, the world has, by necessity, gone into isolation. Most businesses and public administrations were hit by the effects of COVID-19 since people were asked to work from home, which means more use of digital tools (e.g. delivery apps, video conferencing software, etc.). As a result, rather than only digitizing the relationship between firm and customer, it is today an obligation to also digitize the relationship between firm and employee.

"Microsoft CEO, Satya Nadella commented on rabid of Covid-19 impact on digitalization"

"We've seen two years' worth of digital transformation in two months "

Before the pandemic, several organizations understood DT's importance, yet the process of its implementation was slowed for most of them due to different factors such as complexity and cost, until COVID-19 turned digital transformation into an urgent priority. Statistics indicate that the pandemic was accompanied by an increase in the cell phone use by 50 %, and an increase in the data usage via the Internet by about 40 % in many countries, and Italy was the first country to enter a complete at-home lockdown, and as a result they have seen a 75 % rise in residential data traffic. Some of the habits may continue in the "new norm" or at least until a long-term solution to the current challenges. Hence, the need to access a reliable digital infrastructure has become increasingly important, and certain aspects of ICTs are critical in a period of isolation, such as increased ICT opportunities from telework, telemedicine, food delivery and logistics, online and contactless payments, remote learning and entertainment.

"Mckinsey report on digitalization 2020 represented in "figure 3" response of changes digitalization for some corporate expected 43 times verses normal"

Time required to respond to or implement changes,[1] expected vs actual, number of days

	Organizational changes / Industry-wide changes	Expected	Actual	Acceleration factor, multiple
Increase in remote working and/or collaboration	Organizational changes	454	10.5	43
Increasing customer demand for online purchasing/services	Industry-wide changes	585	21.9	27
Increasing use of advanced technologies in operations	Organizational changes	672	26.5	25
Increasing use of advanced technologies in business decision making	Organizational changes	635	25.4	25
Changing customer needs/expectations[2]	Industry-wide changes	511	21.3	24
Increasing migration of assets to the cloud	Organizational changes	547	23.2	24
Changing ownership of last-mile delivery	Industry-wide changes	573	24.4	23
Increase in nearshoring and/or insourcing practices	Organizational changes	547	26.6	21
Increased spending on data security	Organizational changes	449	23.6	19
Build redundancies into supply chain	Organizational changes	537	29.6	18

Figure 3: COMPANIES RESPONDED TO A RANGE OF COVID-19-RELATED

EGYPT DIGITAL TRANSFORMATION

As defined and communicated by Egyptian government, the new Egypt will possess a competitive, balanced and diversified economy, dependent on innovation and knowledge and based on justice, social integrity and participation. It will be characterized by a balanced and diversified ecological collaboration system, investing the ingenuity of place and humans to achieve sustainable development and to improve Egyptian's quality of life.

The sustainable development strategy comprises three dimensions. The economic dimension which highlights economic development, transparency and efficiency of governmental institutions, energy and knowledge. The social dimension highlights education and training, health, culture and social justice.

Egypt ICT 2030 strategy contributes to achieving the objectives of Egypt's vision 2030, through building Digital Egypt. These objectives entail developing the ICT infrastructure. Refer to “figure 4” the importance of integration for all field;

i. Fostering digital inclusion.
ii. Achieving the transition to a knowledge-based economy.
iii. Building capacities and encouraging innovation;
iv. Fighting corruption.
v. Ensuring cybersecurity.
vi. Promoting Egypt's position at the regional and international levels.

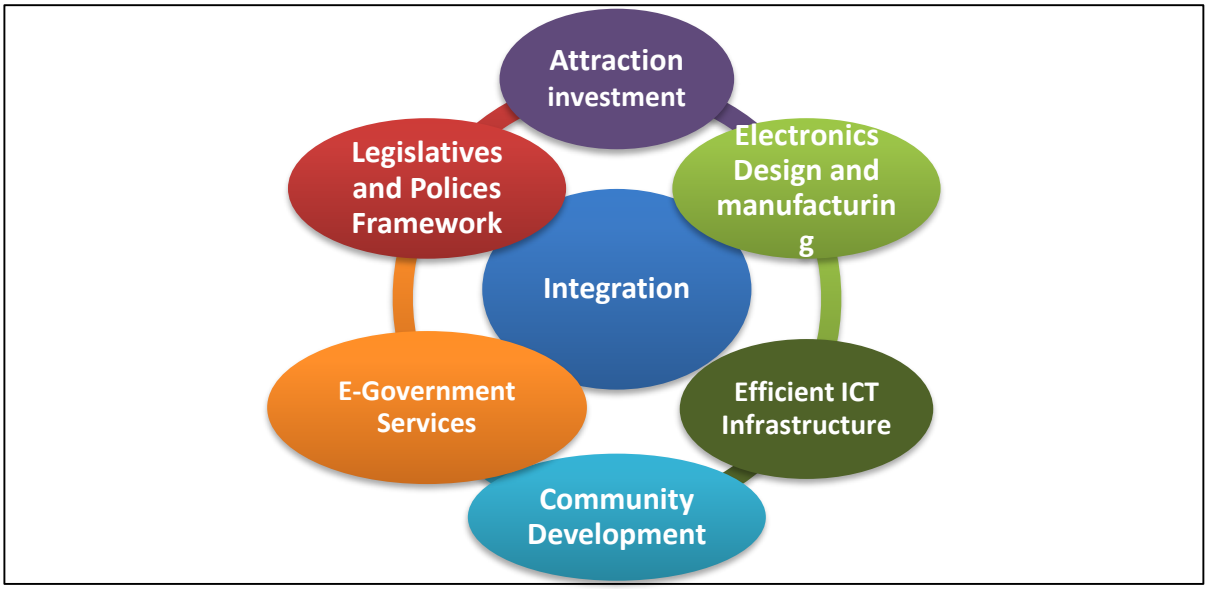

Figure 4: Egypt’s Sustainable Development Strategy

CURRENT STATUS OF DIGITAL TRANSFORMATION IN EGYPT

E-governance

The government seeks to move all ministries to the new administrative capital during 2021, while transferring all services and providing them through an electronic platform that combines various services, enabling citizens to conduct these services in the least possible time without using paper or the need to go to service delivery centres. In 2020 , Minister of ICT initiate a national project "Digital EGYPT" to assure a new different decade on the Egypt's 'digital transformation .

Apart from the move to the new administrative capital, to ensure the ability to provide the governmental service through the digital platform, the government needs to **provide adequate awareness to users of the digital platform** through which government services are provided, while **preparing the necessary infrastructure to ensure the provision of these services in a stable and uninterrupted manner**, such as raising the connectivity quality and providing proper security and **privacy of users' data through cybersecurity services.**

Banking Sector

Banking has been radically transformed by digital technologies in ways that have greatly benefited many consumers. More recently, PCs and mobile devices have given way to online and mobile banking, and cashless payment systems. Consumers now conduct more and more bank business via the web, including paying bills and sending funds directly to friends and family. Mobile banking apps let users take snapshots of paper checks to make remote deposits, and a new wave of payment systems, including PayPal and Apple Pay, let consumers pay for everyday purchases with accounts linked directly to their phones, no cash or plastic card required.

Educational Sector

With the repercussions of the Coronavirus and the commitment to precautionary measures, the importance of e-learning has increased, how to facilitate communication between teachers and students, and how to face this epidemic with the continuation of educational services and the ability to take exams on schedule.

It was difficult for the Egyptian government to adopt e-learning in the first period of the outbreak of the epidemic, as there are many difficulties it faced to complete the e-learning process, the most important of which is the failure to provide the infrastructure for connecting the Internet to schools of sufficient quality to ensure the continuity of service without interruption, the inability of faculty members to use technical means, and the failure to provide schools with computers, while ensuring precautions of social distancing among students.

The Egyptian government has worked to provide tablet devices for students to use in studying and reviewing educational materials without the need for constant connection to the Internet, and this guarantees access to study materials at any time. The Ministry of Education also conducted some experiments to conduct the exam for students. Indeed, the tests were conducted on the specified dates with some difficulties to access the exams through the ministry's website.

MEASURING THE PROGRESS OF DIGITAL TRANSFORMATION IN EGYPT

With the growing importance of the digital economy, it became essential to measure the status of advancements towards such a rising phenomenon. Many measurements and indices can be found on the international level. Mostly these indices focus on both the demand and supply sides of the digital economy; comprising three main agents, the citizens, the government and the businesses.

The World Bank Digital Adoption Index

Digital Adoption Index "DAI" is a composite index that measures the depth and breadth of adoption of digital technologies in 171 countries, spanning every region and income group. It is based on three sectoral sub-indices covering businesses, people, and governments, with each sub-index assigned an equal weight.

As example of the international indices that measure the digital transformation progress, The World Bank Digital Adoption Index "DAI" is a composite index measuring the extent of spread of digital technologies within and across countries. Figure 5 shows the different related KPIs for each agent representing the weight of each KPI and how it has an impact on digital transformation of the relevant sector.

DAI is a very good structured index from a renowned organization; however, the last edition was in 2016 and it was not issued since, rendering its data for Egypt outdated.

DAI (Economy) = DAI (Businesses) + DAI (People) + DAI (Governments)

DAI (Business): The Business cluster is the simple average of four normalized indicators: the percentage of businesses with websites, the number of secure servers, download speed, and 3G coverage in the country.

DAI (People): The People cluster is the simple average of two normalized indicators from the Gallup World Poll: mobile access at home and internet access at home.

DAI (Governments): The Government cluster is the simple average of three sub-indices: core administrative systems, online public services, and digital identification. Data for online public services are provided by the UN's Online Service Index. Data for core administrative systems and digital identification was collected by the World Bank.

Table 1. Business cluster, with weights by component

Component	Weight	Source
Business websites	1/4	WBG Enterprise Surveys
Secure servers	1/4	Netcraft
Download speed	1/4	Ookla NetIndex
3G coverage	1/4	GSMA

Table 2. Citizens cluster, with weights by component

Component	Weight	Source
Mobile-cellular access at home	1/3	Gallup World Poll
Internet access at home	1/3	Gallup World Poll
Cost of internet access	1/3	TBC (this is to be added)

Table 3. Government cluster, with weights by component

Sub-index	Component	Indicator	Weight	Source
Core administrative systems	Financial Management Information System	Budget execution	1/20	WBG
		Budget formulation	1/20	
		Treasury Single Account	1/20	
		Source of financial data	1/20	
	Human Resources Information System	HRMIS functionality	1/10	
		e-payroll functionality	1/10	
	e-tax	Tax management functionality	1/10	
		e-filing functionality	1/10	
	e-customs	e-customs functionality	1/5	
	e-procurement	e-procurement functionality	1/5	
Digital identification	Access to services	Range of services	1/2	WBG
	Digital signature	Signature functionality	1/4	
	Card features	Card type	1/8	
		Biometric functionality	1/8	
Online public services		Online Service Index	1	UNDESA

Figure 5: Digital Adoption Major KPIs, World Bank

For each of the sectoral indexes, composite indicators are normalized on a 0 to 1 scale to ensure they have an equal impact on variation in the overall index. Regarding to Egypt's rank in the WB DAI, we can find in the below table ranking of Egypt on 2016, which is 0.709 while after pandemic and strategic direction toward digitalization this index supposed to be enhanced in 2020.

Country	*Year*	*Rank*	*Digital Adoption Index*	*DAI Business Sub-index*	*DAI People Sub-index*	*DAI Government Sub-index*
Egypt	*2016*	***88*** *[out of 183]*	*0.526*	*0.492*	*0.377*	*0.709*

The Digital Intelligence Platform

In December 2020, a student group from The Fletcher School at Tufts University in America, Boston with collaboration with various partners.

i. Akamai Technologies Inc.
ii. Blue Triangle Technologies
iii. MasterCard
iv. The Private Capital Research Institute (PCRI)
v. Global Web Index prepared the Digital Intelligence Index to present the digital transformation status in in the time of covid.

The Digital Intelligence Index platform

Is built to encompass several scorecards measuring various aspects of the global digital economy. the Digital Evolution scorecard tracks the state of 90 economies comprising 95% of the world's online population over twelve years (2008-2019), to provide business and policy guidance for digital growth. Refer to "Figure 6" the roadmap for digital platform.

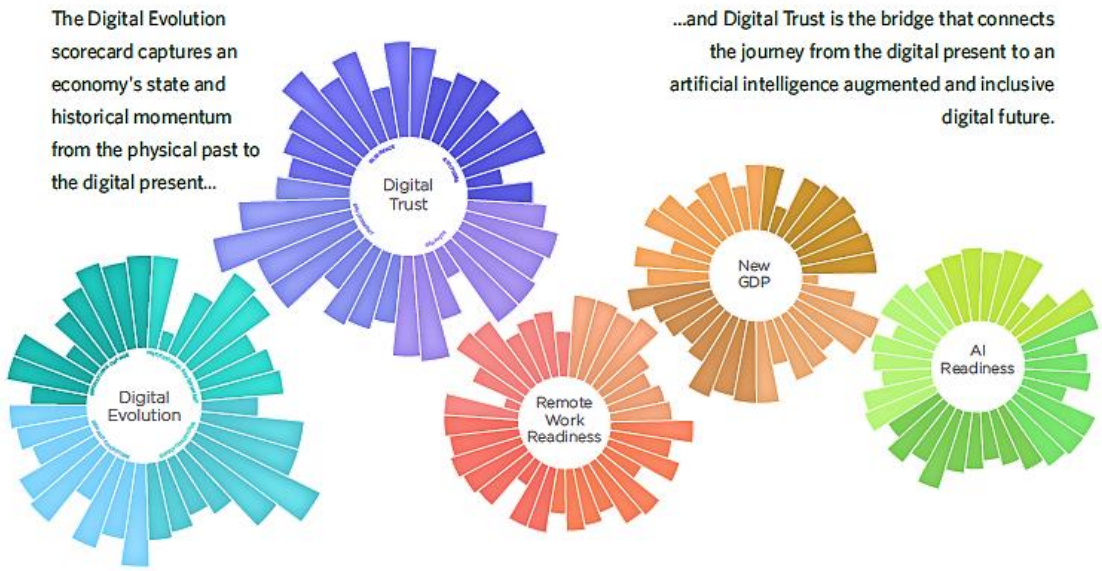

Figure 6: Digital Intelligence Platform

The Digital Evolution scorecard

Combining 160 unique indicators across four key drivers:

i. Supply Conditions.
ii. Demand Conditions.
iii. Institutional Environment.
iv. Innovation and Change.

The resulting framework captures both the state and rate (momentum) of digital evolution and identifies implications for:

i. Investment
ii. Innovation
iii. Institutions
iv. Inclusion
v. Infrastructure-related business and policy priorities.

The Digital Trust scorecard

Represents the bridge to "what's next," comparing national outlooks and behaviors around emerging technologies and evaluating the performance of the givers and guarantors of trust across 42 economies.

It examines the trustworthiness of the digital environment for each economy, the trustworthiness of the experience that users have, attitudes towards key institutions and organizations, and user behavior when interacting with the digital world and what it reveals about their trust in the digital system. The subject of Digital Trust is of emerging importance to participants and stakeholders in the digital economy, given growing concerns on many fronts.

i. The security of essential information.
ii. Cyberattacks.
iii. Consumers' apprehensions about digital systems and their reliability.
iv. Concerns about data privacy and the spread of misinformation.
v. Worries about the power of digital businesses and their growing dominance.
vi. The outsized influence of founders and leaders of digital enterprises.

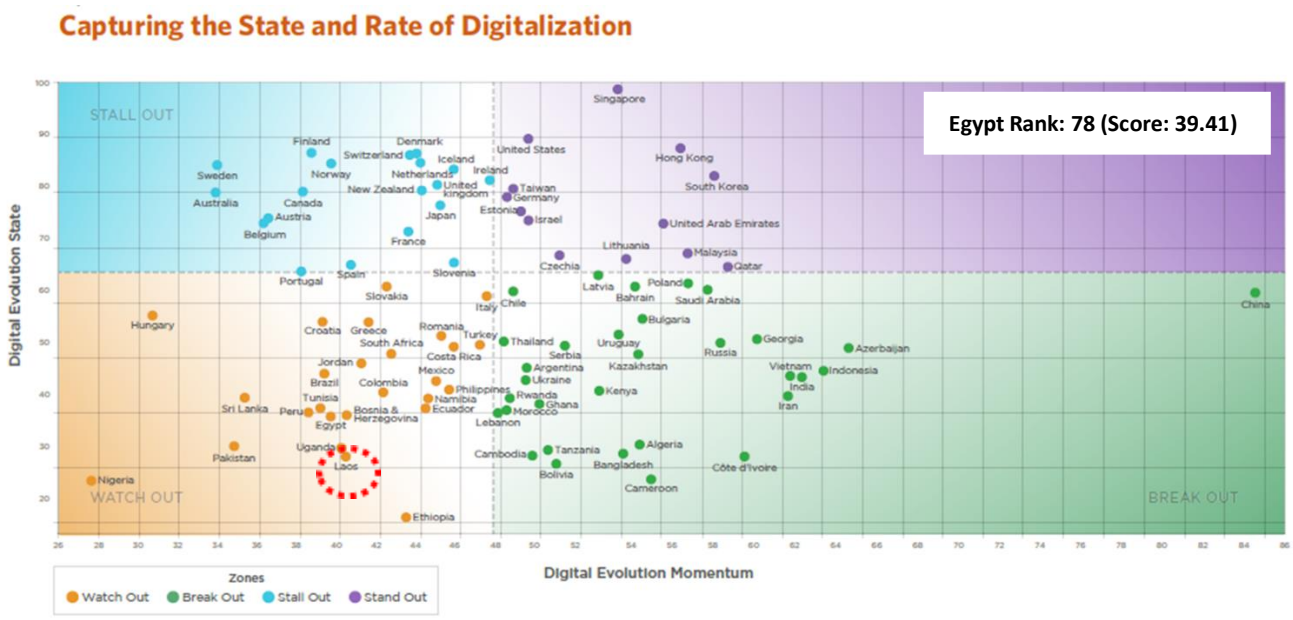

Figure 7: Charting Digital Evolution

MAIN CHALLENGES OF DIGITAL TRANSFORMATION IN EGYPT

A lot has been said with regards to the benefits of the implementation of E-governance in Egypt or what it has to offer. Scholars have mentioned that when e-governance is implemented, there will be accountability, awareness and transparency in the management of governmental business will be ensured. In addition, it is believed that it will also achieve an efficient, speedy and transparent process of disseminating information to the public and other agencies, enhance the performance of administrative activities both internally and externally and also enhance good governance.

Unfortunately, this is not the case in Egypt. However, we are not ruling out the tendencies of any challenge that will be peculiar to any policy of government but we are of the view that there are things that must be considered before we expect so much from the policy of E-governance in Egypt public service. After conducting a survey with different conferenced accountable members in digital transformation process in Egypt, it was clear, there are major challenges for the efficiency of digital transformation in Egypt.

i. *Bureaucratization*

The E-governance practice is bound to meet with strong opposition from the bureaucratic quarters of the policy. By this, we mean the over-bloated public service whose members will analyze this practice as a deliberate attempt by the government to throw majority of their members out of their jobs. Majority of the public servants are thus, likely to use their positions to minimize the effective application of E-governance in Egypt. They will definitely dislike a system that will reduce to the minimum, face to face contact between citizens and government service providers.

ii. *Untrained Staff*

The major challenge of e-governance in the Egyptian public service is lack of trained and qualified personnel to handle and operate its infrastructures. They further state that due to the high cost associated with the procurement and training of public servants with ICT skills, government sometimes feel reluctant in the actual implementation of e-governance in the public service. Similarly, the absence of skilled workers to handle various ICT services and their applications in bringing about the successful implementation of E-governance in the public sector. So, the effective and successful implementation of E-governance requires experts to coordinate and operate the ICT-related infrastructures.

iii. *Lack of ICT Infrastructure*

This is another crucial challenge to the implementation of e-governance in Egypt's public sector. As it has been explained in the definition of e-governance above, it is the application of ICTs in the operations of government business. The Egypt's public service is still lacking the basic ICT infrastructure. For instance, some of the offices still shortage of computers let alone the skills required for its operation public servant still known for doing a lot of paper work which if E-governance is embraced fully would have reduced. In a better case, you will see the combination of both the traditional way of doing things alongside the digital approach. There is still no access to internet network in most public sector offices, no regular power supply and so on. All these pose challenge to the implementation of e-governance in Egypt's public service.

iv. *Attitude or Resistance to Change*

This is also a challenge in the public sector. Most of them are still used to the old way of carrying out government activities. That is, they are still known to be working with a lot of papers, carrying of files from one desk to the other or from one office to the other. Their resistance to e-governance implementation in their services is what has culminated to the poor rating of the implementation of e-governance in the public service. Some of the reasons for this, is that most of the public servants are not computer literate, not qualified, have little or no training in the installation, maintenance, designing and implementation of ICT infrastructure.

OVERCOMING CHALLENGES OF DIGITAL TRANSFORMATION IN EGYPT IN THE NEW NORM"

As stated earlier, Covid-19 has changed the world drastically for good. It changed people's behaviour and their relationships, business's mode of operation, and the relationships between a company and its employees, and the company and its customers and suppliers. The "new norm" implies the new way a business, or any entity such as governmental or non-governmental organizations, will interact with its own people, its clients, and suppliers once this epidemic clears up. For example, it is imperative that digital transformation needs to occur more quickly than originally thought, and face-to face interaction will be maintained at a minimum level when providing services to other organizations or individuals. However, the major challenges discussed above will for sure slow down the progress for digital changes in the Egyptian government sector. The following sections present ways to overcome these challenges, as recommended by the experts that participated in the survey.

Enhancing Egyptian ICT Infrastructure

Upgrading and enhancing the quality and the reach of ICT infrastructure to wider clients are essential. The Egyptian government needs to encourage fixed and mobile telecom service providers to increase their invest in the Egyptian market. This could be achieved by creating a healthy climate that attract these service providers to increase their presence and through continuously improve the quality of the service. The Ministry of Communication and Information Technology (MCIT) has already started moving in this direction as it continue to expand the fiber infrastructure to government endpoints (5000 points) and consolidate the government data bases for all services offered to all citizens. Many other steps should be adopted such as:

i. Relaxing of license fees and easing of spectrum costs. This could allow operators to support high speed internet with high quality and enhancing the ability to introduce 5G technology.

ii. Simplifying mobile site rollout permits process. This can simplify fiber rollout permits process and the associated costs.

iii. Studying the allocation of government public funds to support gigabit broadband through extending the fiber infrastructure reach to rural areas and support the Fiber to the Home (FTTH) rollout process. By connecting fiber-optic access solutions that are designed for individual residential homes and multitenant buildings, usage of on-line service will be much easier and accessible to all.

iv. Supporting the creation of hyper-scale Data Centers in Egypt in order to provide a scalable and economic solution to digital applications and Digital content hosting.

v. Encouraging Cloud Integration Platforms as Cloud is an economical solution for a business offering Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS) through providing incentives to ICT Cloud service providers.

vi. Supporting Egyptian private and public R&D in new Digital Technology by providing experience sharing with international corporations and digital material, sponsoring and actively participating in national and international on-line conferences dealing with digitization and innovative solutions.

vii. Developing a clear plan and sponsoring projects with specific targets for tailoring the new digital technologies for the Egyptian market usage. Joint projects between government, major corporations, and universities could serve the purpose of increasing awareness of the new technologies and minimize the resistance to change in the new norm. Examples of these technologies include Artificial Intelligence, Block Chain, Internet of Things and Augmented Reality / Virtual Reality

viii. Encouraging the Egyptian academia, universities and research centers to focus on new ICT Digital Transformation technologies to produce new research and patents, by providing monitory incentives for new and innovative developments and sharing knowledge, both ways, between industry and the academia.

Technical training and Education

Skill of workforce is identified as the most challenging area for transformation of processes to digital format and sustaining these processes in the new norm. Many operators within the government agencies lack the skills to take full advantage of digital transformation. Strategists need to develop a comprehensive plan to assess the workforce capabilities, identify the gaps, and provide means to close these gaps. Just providing the workers with the necessary hardware to operate the new systems is not enough. The soft side of implementing the new technologies deserve a great deal of attention of government authorities responsible for the digital transformation activities. Training employees on the new systems and monitoring their progress are essential. Such training can be provided by the vendors of the new software.

With the relatively constrained pay scale for employees of the public sector pay, government agencies have trouble attracting computer talents they need. In order to overcome such dilemma, agencies need to train their own people and solicit temporary external support when needed, and search for other innovative approaches.

As related to the education and training of new generation in the new norm, the Egyptian Education Ministry has shifted its mode of operation from face-to-face classroom transfer of knowledge to the virtual format. In early 2019, the ministry started the e- learning system for all levels in order to cope with Covid -19 pandemic. The adopted system required many physical and intellectual “changes” such as:

i. Expanding fiber infrastructure to 2500 schools to grantee high speed and enhanced quality of connectivity

ii. Installation of internal wiring within these 2500 schools to all classrooms

iii. Installation of servers inside each school to host e-learning curriculum and online exams

iv. Providing the ability to connect, free of charge, to Egyptian Knowledge Bank (EKB), the largest digital library in Egypt, to help knowledge seekers to access the latest books, articles and published research in various fields.

More actions are recommended by the experts responding to the completed survey. These actions include:

i. Expanding the E- learning system and infrastructure to all schools including private schools.

ii. Adopting e-learning in the early childhood years

iii. Provide teachers with the basic and advanced training to cope with the new norm way of learning

iv. Digitalize the education process (admission, examination, and evaluation)

INCENTIVE SCHEMA FOR DIGITALIZATION

For organizations to mature digitally, they need to first "do the right things" to meet customer needs. This entails questioning their processes and institutionalizing the value-added activities only. Non-value-added actions must be eliminated. Secondly, the organization must "do the right things RIGHT" by searching for the technologies that enable them to "consistently" perform the activities properly. Deviations from these "standard activities" will result in delays, poor quality, and customer dissatisfaction. On the national scale, individuals, businesses, and government must do their part to adapt to the new norm as discussed below.

i. Individuals

Adults have to take the initiatives to learn on their own how to use the internet to get their "business" done electronically. This includes paying their bills electronically, minimizing the use of cash in their dealings, receiving and sending money electronically, shopping on-line, and the like.

ii. Businesses

a. Managers of large and small businesses need to learn about what digitization is all about and how can they benefit from adopting its tools, personally and businesswise. Specialists and consultants can provide awareness sessions to management and their employees. Hands-on workshops can also provide to "hold peoples' hands" through these learning processes.

b. Leaders of various organizations, regardless of their size, should set their companies' vision on making the shift to fully digitized entity within a reasonable time frame. The vision is then translated into mission with specific objectives, strategies, and projects to achieve that target. Leaders need to solicit the help from local and central government to guide them through that transfer from traditional to digitized business.

iii. Government

The Egyptian government has a major role to play to move the society to the new era of digitization. By making such transfer a win-win action, individuals and business will embrace the move and hopefully lead the way. Specific actions include:

a. Providing incentives for individuals and businesses to utilize the digitalized services offered by governmental entities. Examples of incentives might be reduced cost of service and/or speedy output.

b. Expand the Digital Egypt government platform in terms of number of government services.

c. Continue to enhance the quality of the government platform by ensuring the accuracy of the output and the timely delivery.

d. Speed-up and complete the linking of all government entities data into a centralized platform to minimize duplicate of effort and avoiding human errors

e. Increase expenditures by the government in digital connectivity and R&D in new Digital technologies.

LEGALIZATION:

Cyber security:

Recognizing the significance of cybersecurity in supporting national security, protecting the infrastructure of critical sectors and organizational assets, and contributing to business continuity, the Egyptian Supreme Cybersecurity Council (ESCC)— reporting to the Cabinet of Ministers, and chaired by the Minister of Communications and Information Technology —has been established. ESCC is the national supreme council for cybersecurity, with members representing relevant national security agencies and critical sectors. Its mandate is to formulate a national cybersecurity strategy, and to oversee the implementation of related initiatives and programs.

ESCC officially launched the National Cybersecurity Strategy (2017-2021), aiming to provide a safe and secure environment that would enable various sectors to deliver integrated e-services, in line with the State's efforts to support national security and develop the Egyptian society- www.escc.gov.eg. The strategy is in line with Article 31 of the Egyptian Constitution, stipulating that "The security of cyberspace is an integral part of the economic system and national security. The State shall take the necessary measures to preserve it as regulated by law." The strategy entails six programs that support the strategic cybersecurity objectives. It emphasizes the distribution of roles among government agencies, private sector, business institutions and civil society, and the measures to be established by the State to support progress towards achieving these objectives.

E- Signature:

With the COVID-19 pandemic, organizations across all industries have been forced to get creative in order to digitize processes and services to keep business running. The pandemic has accelerated the digital transformation plans for many government agencies and businesses, and e-signatures have emerged during this time as an essential technology that can help maintain business continuity while enabling the digitization of processes that have long remained manual and paper based. The need for electronic signatures has been present for a long time.

Because e-signatures are recognized as legally binding, businesses even in heavily regulated industries such as financial services can feel secure adopting this foundational technology to enable the remote signing of legal documents and further propel their digital transformation plans.

As part of Ministry of Communications and Information Technology (MCIT) efforts:

i. Has amended the executive regulations of the E-Signature Law, adding e-seal and time stamp services.

ii. The role and importance of e-signature in governmental, commercial and administrative transactions, highlighting that the E-Signature Law is the first Egyptian legislation for regulating e-transactions. Thus, helping protect users' rights and ensuring e-transactions' authenticity and legality.

iii. Stated that e-signature allows citizens and juridical persons to handle different governmental transaction, remotely, thus reducing the load borne by governmental authorities to provide and equip proper facilities for receiving citizens. Accordingly, separating the service request from the service provider will be a reality.

iv. These services include the electronic seal that is uniquely linked to the signatory and is capable of identifying the signer, thus allowing a widespread use of

v. e-signature applications in different entities and institutions.

vi. Amendments also included adding the timestamp service that links date and time with the electronic document/file, in a way that prevents changing the data without being detected, with referring to an accurate time source.

vii. Moreover, the term “smart card” has been changed to the “e-signature creation device,” and defined as the secure electronic medium used in creating and binding the e-signature on the electronic document or file, thus allowing the use of various types of crypto chips.

viii. The e-signature in Egypt helps create a digital identity for each citizen, allowing them to update and revise their personal data, and use e-signature in governmental transactions safely, without the need to submit paper documents. Citizens shall also be able to use e-signature embedded on the Citizen Smart Card, by which they will receive food subsidy, medical insurance and e-payment services, food subsidy, traffic and investment services.

CONCLUSION

The Digital transformation journey has vast effects on the society after” New Norm” at many levels enabling us to cope with all new habits. Egyptian government steps towards digital transformation to facilitate the communication process between citizens and public and private agencies and to improve citizens' experience in obtaining services quickly and easily.

Digitalization adoption in “New Norm “ is facing challenges that hinder the implementation of the digital transformation in Egypt, such as Bureaucratization ,the lack of awareness among citizens, the competencies of employees, resistance to change, the need to improve the infrastructure for communications and information technology in some governorates, setting KPI’s, track framework and methodology of measuring Digital Transformation success periodically as per a transparent methodology and global benchmarking. It is also important to encourage and improve the citizens digital experience to perform any service, this could contribute to accelerating the transformation process in Egypt.

REFERENCES

[1]: E-governance and digital Transformation – Egypt, National Management Institute

[2]: The impact of rapid technological change on sustainable development, Vienna, Jan, 2019

[3]: MCIT Yearbook 2020 and MCIT web site

[4]: Ookla report about the internet speed in Egypt

[5]: Egypt's ICT 2030 Strategy Report

[6]: 2020 the NRI Report

[7]: Deloitte's National Transformation in the Middle East A Digital Journey

[8]: Arab Commission for Digital Economy, Arab Digital Economy Strategy Report

[9]: World Bank, Digital Adoption Index (DAI), Measuring the Global Spread of Digital Technologies

[10]: DiGiX 2020 Update

[11]: DIGITAL IN THE TIME OF COVID, The Fletcher School report at Tufts University December 2020

[12]: RB's Digital Inclusion Index

[13]: The journey to government's digital transformation, Deloitte

[14]: McKinsey & Company's Report about How COVID-19 has pushed companies over

[15]: IDC 2021 Worldwide Digital Transformation Predictions

[16]: Delta Partners Analysis

[17]: African Union, Digital Transformation Strategy for Africa (2020 – 2030)

[18]: Portolans Institute's NRI Report 2020, Accelerating Digital Transformation in a post-COVID Global Economy