The Role of Digital Organizational Culture in Organizational Development
In light of Digital Transformation adoption in Egypt

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Abstract

Purpose: The main purpose of this research is to examine the role of Digital Organizational Culture in Organizational Development, In light of Digital Transformation processes.

An applied study to the Egyptian ministries that undergo the digital capacity building preparation program for the transfer to the new administrative capital city held by the Egyptian ministry for communication & Information Technology (MCIT)

Design/ methodology/ approach: Discussion groups were held for experts in charge of training and qualifying governmental employees in light of the new digital environment in different Egyptian ministries. In addition, interviews for selected employees of different functional areas at different functional levels and an online research survey were conducted with various ministers' employees. The research has used SPSS statistical tool to statistically analyze the collected data and test research hypotheses, Pearson correlation, and multiple regression analysis tests have been used.

Findings: The findings of the research supported that Digital Organizational Culture has a significant impact on Organizational Development.

Research limitations: The research is undertaken on governmental organizations and therefore is not necessarily represent other private or Non-governmental organizations. This research relied on self-reported data from participants in a cross-sectional sample.

Empirical implications: In light of Digital Transformation and considering the unique characteristics of the new generation at work and the working environment in Egypt, the current research gives practical measurements and recommendations to the governmental sector in Egypt to support organizational development.

Originality/Value: While Digital Organizational Culture in human resource practices has found its place in research interest, this paper fills the gap in the governmental sector particularly in the Egyptian governmental sector.

Keywords: *Digital Organizational Culture, Organizational Development, Digital Transformation.*

Introduction

Emergent digital technologies began to influence culture at the end of the 20th century. Where technology generally influences societies' cultures through the content they interact with through computers and smart devices, and technology has evolved to a stage where there are many tools that became easily available to create various influencing products that can affect each society and benefit transmitting its cultural aspects, and sharing identity.

In 2015, the term "Fourth Industrial Revolution" or Industry 4.0 was popularized, which conceptualizes rapid change to technology, industries, and societal patterns and processes in the 21st century due to increasing interconnectivity and smart automation. Where the speed of technology change is accelerating exponentially, and since then, the way we live, work and relate to one another is fundamentally changing through using new technologies. (Egyptian IDSC, 2021).

Such fundamental shifts come as a result of the nowadays digital leap which employs modern smart technology, and large-scale communication, to enable automation and improved communications, which in turn improve the quality of human life and efficiency of organizations dramatically. This phenomenon is termed "Digital Transformation"

Living in the Digital Transformation era, Major concerns are there, where organizations might be unable to adapt; governments could fail to employ and regulate new technologies to capture their benefits. So, these key technologies driving this revolution, force governments to study its major impacts on governmental organizations, businesses, civil society, and individuals, and should radically respond to it & at a fast pace. (Anderson, 2009)

Adopting Digital transformation processes & projects in any organization, whether it is a commercial, governmental or non-profit organization, is a very promising process in terms of achieving the corporate goals of each organization and a real opportunity to keep pace with the world. However, it is challenging to create new business models, improve organizational processes, and change the way information is used

In an ITU (International Telecommunication Union) study on the reality of digital services around the world, among the results was that countries complain of non-technical obstacles such as lack of technological awareness, So, the concerns & efforts towards preparing the society to accept digital services are even of much more important than technical issues. (Marzook, 2017)

Such non-technical crucial factors for preparing society to accommodate Digital Transformation and accelerate its achievement are considered to be a great challenge for governments to succeed in their digital transformation journey from adoption to sustainability.

In Egypt, The Egyptian political leadership has an insightful future vision and consideration in strategic planning for the future of Egypt's digitalization in light of Egypt Vision 2030 for SDGs. The digital transformation initiative was launched by the Egyptian government and its institutions 3 years ago to reach a sustainable competitive digitally secured knowledge society and strong digital economy. The vision of the Egyptian Digital Transformation Strategy is a digital Govt. connected, participatory, and sustainable, centered on serving the citizen and increasing competitiveness through building an integrated secured digital society. (Egyptian IDSC, 2021).

In this regard, the Ministry of Communication & Information Technology (MCIT) states in its annual strategic plan the need to enhance digital skills as a main pillar for the "Digital Egypt Strategy", with the aim of reaching a digitally knowledgeable society. Whereas (MCIT) provides many digital services through its different sectors, and in order to benefit from these services, society must be prepared before providing technology as a condition for success in providing digital services, as the efficiency of digital services is not depending only on technical aspects such as Hardware, equipment, networks, and software issues, but it is

related to many societal aspects including citizens' technological awareness as well as governmental organizations and their employees (Ministries, Authorities, ...etc.)

In this context, Ghada Labib, Deputy Minister for Institutional Development, MCIT, stated that Digital transformation supports building effective, competitive, and sustainable societies. Researchers have defined "Digital Organizational Development" in various ways, generally being "The change based on digital technology that creates new opportunities for innovating customer experiences, streamlining processes and building new business models as well as saves pace, cost and time to prevent corruption. The most accurate definition of Digital Organizational development is the constant adaptation of organizations to a constantly changing environment." (Labib, G: Egyptian EACA, 2022).

Through the use of email, online forms, interactive platforms, and digital applications, culture has become increasingly participatory and inclusive. Consequently, the importance of disseminating and supporting the right "Digital Organizational Culture" among the organization became neither in vain nor a luxury, but rather seemed to be an indispensable act to keep pace with the requirements of life brought about by cognitive and technological changes.

LITERATURE REVIEW AND PREVIOUS STUDIES:

In contemporary business, information technology (IT) tools are fundamental to realizing processes in a faster and more efficient way. Global competition is demanding, and governments and organizations must use innovative ideas to stay competitive. Hence, Digital culture has become one of the necessary requirements for the efficient implementation of digital services, and thus its success. Moreover, it is necessary to ensure the sustainability of digital transformation projects, especially among ministries & authorities that provide digital services, and consider digital capacity building & raising employees' skills in the first place. (Dascal, 2006).

In some related previous studies, researchers discussed digital culture and organizational development; where some investigated the benefits of the application of digital culture and figured out the requirements and obstacles for probate adoption in the public sector, while others were applied in the private sector. Some of the previous studies agreed that there is an important role in digital culture related to electronic and online services using information technology, with the aim to provide an integrated ecosystem that includes both providers and recipients of digital governmental services through the organizational development's role. (Atallah Asmaa, 2016) Some studies have linked the application of electronic services and developing government performance in terms of increasing efficiency and effectiveness, enhancing transparency, and increasing the quality of government services. (Gere, Charlie, 2002)

This research is different from the previous studies, as it investigates the role of digital culture in changing organizational performance and creating a new business model that allows the organization to engage in digital transformation processes to achieve its goals and successful integration in all fields within the global technological development in a way that enhances its performance and outputs. It studies the role of digital culture in light of research proposed dimensions (Knowledge, Skill, Social and Ethical) in organizational development focusing on governmental digital service providers in different Egyptian ministries, considering the impact of E-services and E-government applications on formulating digital culture and practices.

DIGITAL ORGANIZATIONAL CULTURE

This section will start by reviewing the concept of culture, Organizational culture, and finally digital culture, and its characteristics, dimensions, and objectives.

OVERVIEW OF CULTURE

Despite the prevalence of this term, there is little agreement on its definition, and this plurality may be due to different schools, intellectual and cultural trends, as well as different environments, traditions, and customs. It often contributes to building perceptions and terminology, in addition to the difference in everyone's perception of culture according to his or her field.

In sum, the conventional definitions of culture varied among Eastern and Western scholars in ways that converge in the idea and vary in terms and wording, and culture can be procedurally defined as a set of knowledge, experiences, ethics, and behaviors that a person learns as a member of social influences and is affected by it. So, Culture is widely conceptualized as all that an individual learns from others that he endures generating customs and traditions.

Culture and cultural elements are the primary challenge for organizations to be successful in digital transformation (Oswald & Kleinemeier, 2017). That's why organizations should regard such crucial factors to succeed in developing a supportive culture in the Digital transformation process which secures sustainable organizational development.

ORGANIZATIONAL CULTURE

In the context of Organizational behavior, Culture is a pattern of basic assumptions taught and transferred to new members of a group to create similar thoughts, feelings, perceptions, and attitudes toward the same kind of situation (Kreitner & Kinicki, 1995).

Obviously, Organizational Culture cannot be ignored during organizational change, where it controls norms that show the attitudes, beliefs, assumptions, and expectations of the employees in the same organization (Akbaba, 2001). In brief, organizational culture is how activities are carried out in the organization or an indicator of how the organization works.

Moreover, Organizational culture not only provides a competitive strength but has become a determining factor for potential employees. Although many describe culture and participation as "soft" concepts, culture is at the center of every transformation and by far the most important obstacle to change, "Culture Eats Strategy for Breakfast" Peter Drucker.

1- **Importance of Organizational Culture in Change**

Organizational culture shapes organizational awareness and it has an important role in organizational change, especially in a such dynamic environment with a rapid technological pace. A strong and positive organizational culture is critical to promoting the sharing of skills, resources, knowledge, learning, and development (Bollinger & Smith, 2001).

According to Barutçugil (2004), change in an organization takes place in three main dimensions; Change in organizational structure: It is more related to formal organizational structure. Change in technology: Many elements such as the tools of the information age (computers, printers, scanners, ...etc.) and connections (such as the Internet, intranet, or extranet) as well as the software used in computers, other communication tools (mobile phone, tablets). Change in human beings: It is the change in people's behavior, knowledge, and experience.

2- **Organizational Readiness for Change**

Though changing organizational culture is very challenging & not necessarily a successful process it is very important to be considered & wisely managed to adapt to the internal & external fast pace environment to keep the organization's sustainability.

As people are the driving force of any subsystem, any change in an organization must be adopted & committed by its employees, this is considered to be one of the most organizational readiness factors for

change. All models relating to the assessment of organizational readiness for transformation contain the domain that specifies the level of organizational culture.

DIGITAL CULTURE

Computer culture, virtual culture, cyber-culture, e-culture, Internet culture, and digital culture are all relatively new terms that are today widely used in scientific and popular literature. The new possibilities created by Information and Communication Technology (ICT) - global connectivity and the rise of networks - challenge our traditional ways of understanding culture, extending it to digital culture as well. (Wonacott, 2001).

The ICT and especially the Internet, has given these interrelations a new dimension, by changing our relations towards a knowledge society, and by causing a new understanding of cultural creativity. (Hodge et al., 2010).

The aforementioned discussion indicates that the digital culture has different dimensions, for example, and not as a limitation:

- **The knowledge dimension**: includes broad knowledge to solve technical problems, the cognitive impacts of technology, and prior knowledge from other disciplines, in addition to the form and structure of technological knowledge.

- **The skill dimension**: includes practical skills and mental skills, such as evaluation skills, analytical thinking, creativity, problem-solving, research, and analysis skills.

- **The emotional dimension**: includes emotional skills, such as the ability to act, love of work, interest in technology, and concern for it.

- **The ethical dimension**: i.e. the ethical implications of technology, and acting in good faith.

- **The social dimension**: a sense of social responsibility, and positive work habits.

Digital culture dimensions must be met by the technologically educated person, in order to be able to use digital services and conduct services correctly and effectively (Deuze, 2006).

Table (1) will list some researchers' opinions on the dimensions of digital culture:

Based on the previous discussion, it can be said that digital culture is a multi-dimensional term, and given the multiplicity of those dimensions, this research focused on specific dimensions commensurate with the specificity of the entities under study (the knowledge dimension, the Skill dimension, the ethical dimension, the social dimension).

Table (1) Dimensions of Digital Culture

Study	Knowledge	Skill	Ethics	Social	Emotion	Decision Making
Wonacott (2001)	*	*	*	*	*	
Hodge, Sepelyak, & Becker (2010)	*	*				*
Zaqout (2013)				*	*	*
Abu Hassan (2014)	*	*	*	*		
Rambousek, Štípek, & Vaňková (2016)	*	*	*			

ORGANAIZATIONAL DEVELOPMENT (OD)

Organizational Development (OD) provides an emphasis on performance and results to bridge the gap between theory and practice (McLean, 2005), and recently, the focus of (OD) has expanded to include the alignment of organizations with the complex and rapidly changing working environment through organizational learning and knowledge transfer as an ongoing, systematic process of implementing effective organizational change (Kass, 2007).

Glanz and others (2008) provide a more thorough concept of (OD) as a process of ongoing evaluation efforts, including action planning and implementation that deal with transferring knowledge and skills to organizations that improve their ability to handle future change and solve problems. Moreover, Minahan defines it as an integrated knowledge and practice to enhance organizational performance, and individu-

als viewing for the organization as a complex system of systems that exist within a larger one where the process includes wide methodologies and approaches (Minahan, 2011). While, Anderson defines it as an organization-wide deliberately planned effort to increase the organization's effectiveness and efficiency (Anderson, 2012).

Accordingly, upon an organization's adoption of Digital Transformation, the role of Organizational Development (OD) should be expanded to provide an integrated ecosystem.

In this context, Ghada Labib, Deputy Minister for Institutional Development, MCIT, stated that Digital Institutional Development provides new innovative and creative but not traditional services, and helps organizations to expand and spread in a wider range to reach more customers and prevent corruption. There are many strategic pillars to achieve digital institutional development for government institutions, including a well-prepared digital environment, supportive technological techniques, a qualified government employee as well as sustainable operational excellence. (Labib, G: Egyptian EACA, 2022).

After reviewing (OD) concepts, it is to be mentioned that Organizational Development has various Challenges and is neither smoothly nor immediately implemented, whereas OD is long-range in perspective and is not a "quick-fix" strategy for solving short-term performance issues. One of the challenges appears in the necessity of the top managers' support to OD. After reviewing (OD) concepts, it is to be mentioned that Organizational Development has various Challenges and is neither smoothly nor immediately implemented, as OD is long-range in perspective and is not a "quick-fix" strategy for solving short-term performance issues. One of the faced challenges is the necessity of the top managers' support to OD. Where, despite the fact that OD efforts could be undertaken at any organizational level without direct top-management participation, OD is less likely to succeed if it does not have at least tacit approval from the top management.

Finally, OD emphasizes the necessity for employees' participation in assessing the current and a positive future state. Supporting free and collaborative choices on how implementation should proceed and empowering them to take responsibility for achieving and evaluating results, where the entire system is accountable rather than just the management. Where organizational effectiveness and humanistic values meet when employees' ownership increases in change processes and outcomes. (Mansour, Yahya, 2014)

DIGITAL TRANSFORMATION

Digital transformation is a highly promising and challenging process to create new business models, improve business processes, and change how real-time information is used. (Gere, Charlie, 2002). With the help of the latest technologies and applications, a fundamental change in business processes and services is created, achieving the corporate goals of each organization and availing a real opportunity to keep pace with the world, whether it is a commercial, governmental or non-profit organization. However, it is a real challenge to create new business models, improve organizational processes, and change the way information is used.

Hence, it is necessary to go in-depth on how this process can be successfully applied & managed in an organization and to determine the influence of organizational cultural elements in adapting to this radical technological change, as digital transformation is a new culture formed by digitalization.

In this regard, it is worth to be mentioned that: Culture is considered to be the determinant of challenges and potentials that could be faced by digital transformation, as when cultural problems arise, even the best-designed digital strategy of the organization can fail in its transformation process. For this reason, organizations should adapt their culture to this process and create the right digital culture that can adopt digital transformation in order to make its processes sustainable.

It is also worth to be mentioned that confusion is still there in the two concepts, although the two concepts are different, digital transformation & digitization. Where many people & organizations link digital transformation to only shifting from paperwork to digital dealing, but this is the concept of digitization, which is to come with auxiliary means to perform services professionally.

Whereas Digital Transformation is to be executed across a spectrum of areas such as technologies, data, human resources, and processes:

- **Technologies:** where the foundation for Digital Transformation is made up of a variety of hardware, software, operating systems, and storage devices that work together in technical settings and data centers to maintain the continuous operational efficiency of all assets. Additionally, it necessitates that the technical system and network infrastructure be managed by professional teams responsible for guaranteeing a suitable quality of service.

- **Data:** In order to provide accurate and comprehensive information and procedures, organizations must regularly and effectively manage and analyze their data. This requires the development of tools that are suitable for statistical analysis, data search, and future projection.

- **Human Resources:** Without HR, it would be challenging for businesses to achieve Digital Transformation. It is important to have qualified cadres who can use and analyze data to make wise judgments and plan and carry out visions. Along with human digital skills and knowledge of the concepts of change and development.

- **Operations:** It is a collection of coordinated and related actions or tasks that results in the organization's production. In order to ensure the best implementation of Digital Transformation, organizations must create an efficient technical framework that enables the development of processes at both the internal and external levels.

RESEARCH CASE STUDY

In Egypt, H.E. President Abdel Fattah El-Sisi launched the digital transformation initiative for the Egyptian government, it is to reengineer the processes, move governmental institutions towards new business models, provide E-services to the citizens 24x7 in a smart, efficient and effective digital way, implement governance, elimination of corruption, increase citizen satisfaction and saves time and money. (Egyptian IDSC, 2021)

The annual Egyptian Ministry of Communication and Information Technology MCIT strategic plan states the need to enhance digital knowledge in society as a main goal, in alignment with the "Digital Egypt strategy", through; Enhancing the concepts and culture of accepting change in governmental services procedures, in addition to, spreading awareness and culture in the field of electronic transactions among all sectors concerned with e-government (employees, citizens, organizations). MCIT's mission is to enable the development of a knowledge-based society and a strong digital economy relying on equitable and affordable access to knowledge; digital rights; and the development of a competitive, innovative national ICT industry. (MCIT: Egypt's ICT strategy 2030; Digital Egypt)

Based on this promising vision, where Digital transformation processes are targeted as a vital decision, an inside-out accommodation strategy for Digital Transformation processes should be implemented. Starting with Digital Organizational Development for governmental entities, who are in charge of implementing digital transformation projects & delivering digital services for citizens, through re-engineering their processes and qualifying their employees and representatives for best fitting in their new digital environment that would be reflected in the implementation of digital services.
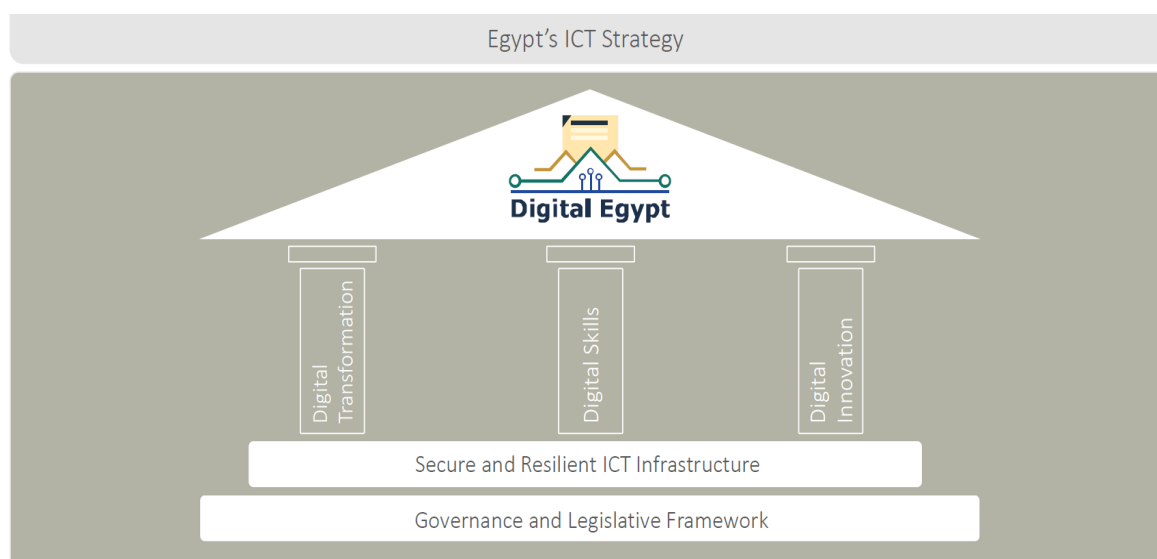
Figure (1): Egypt's ICT Strategy

In the same context and in light of the preparation for the transfer to the new administrative capital city, (MCIT) held a digital capacity building program including various digital skills levels applied to the Egyptian governmental employees from different Egyptian ministries who are nominated for the transfer, with the aim of establishing a local cornerstone for future organizational development and figuring out the means that must be used to enrich, promote, and disseminate digital culture among governmental organizations.

Accordingly, the Institutional Development at (MCIT) considered Digital Organizational Culture, in Egyptian organizations, is extremely important to be cultivated, supported & disseminated among the employees under study, in order to motivate employees to innovate and deal with digital applications and services, which in turn would accelerate tasks' achievement, improves the quality of services provided and develops moral values and positive habits regarding dealing with technology. Moreover, raising the employees' capabilities and motivating them to perform their duties to the fullest, will consequently affect positively organizational work.

As well as, addresses how to disseminate, enhance and promote digital culture and its tools in accordance with the Institutional Developments efforts at (MCIT) towards achieving preparations to accommodate digital transformation projects and ensure their sustainability.

MCIT's Institutional development plan considered organizational development challenges, in order to be avoided, by delivering a careful diagnostic action plan. One of those crucial factors was the digital culture resistance caused by hierarchy; upon which digital culture awareness programs were tailored for top managerial levels & team leaders, as they are the key factors for culture change in a digitalized environment, aiming to decrease the top down digital culture resistance & achieving efficient digital culture dissemination.

The plan included digital capacity-building preparation programs that had been diversified from the standardized digital skills level to relatively unique customized ones that were tailored to specific organizations or departments (in some cases) related to the core business functions. Programs skills level started with the basic digital skills level (The topic under study). Moreover, programs shed some light on financial inclusion as it is considered to be one of the main pillars of digital inclusion, where programs had enclosed some kind of security awareness that tackled the financial aspects.

In order to work efficiently, the plan started with employees' digital skills pre-assessment. Consequently, in guidance of the assessment exam's results, nominated applicants were assigned to the suitable digital skills training program(s) as per their digital skills level, and nominated employees were clustered in similar digital skills levels (Basic, intermediate & advanced). So, various digital skills training programs had been customized in order to satisfy each employee's digital skills level & work on leveraging these skills in an efficient & escalated pattern.

RESEARCH PROBLEM

As previously explained, however adopting Digital transformation processes is a very promising process, it is a challenging process. Where, major concerns are there, as organizations might be unable to adapt; governments could fail to employ and regulate new technologies to capture their benefits.

Governmental adoption of Digital Transformation processes aims to achieve Digital & financial inclusion for all societal segments. Which will need supporting capability for individuals or groups to enjoy the benefits of being online and use technology confidently to improve their day-to-day lives. Those who lack this capability are considered "digitally excluded". Where people who never go online at all or even people who lack the basic digital skills to use the internet effectively would face a rock-stone barrier to going digital and benefit from digital Transformation privileges.

When human capital is still lacking the knowledge & skills to cope with the digital environment, preparing society to accommodate Digital Transformation is considered to be a great challenge for governments to succeed in their digital transformation journey from adoption to sustainability. Where such a lack of Digital awareness would hinder the promising adoption of Digital Transformation and consequently affect its efficient implementation, especially if this is the reality among governmental employees who are in charge of implementing digital transformation projects & delivering digital services for citizens.

In the digital transformation era, Digital Culture (DC) dissemination is considered to be crucial and became a great concern for those who aim to achieve sustained Digital Transformation. Consequently, Organizational Digital Culture became one of the fundamental Organizational Development (OD) concepts.

So, the urgency for cultivating the proper Digital Culture with its various dimensions among societies generally & employees in organizations specifically become a must in order to benefit from such technological progress & at a secure pace. Citizen to be electronically literate, one must be aware of the importance of and the benefits of electronic literacy (Nair, 2013)

In this context, this research aims to investigate the significant relationship between Digital Organizational culture and organizational development in light of the adoption of digital Transformation processes, in order to overcome the lack of digital capabilities that hinder an organization's goals achievement and to formulate a positive digital culture to foster organizational development.

RESEARCH QUESTIONS AND OBJECTIVES

From above, this research investigates the role of **Digital Organizational Culture** in **Organizational Development** in light of Digital Transformation adoption; One main research question guiding this is:

Main question: **What is the Role of Digital Organizational Culture in Organizational Development in light of Digital Transformation adoption?**

Sub-questions
1- What are the main and deepest changes indicated by digital culture in organizational development assessment?

2- What are the attributes and key elements that affect organizational development? and how to manage them.

3- What is the impact of digital culture on organizational development?

4- How to formulate a positive digital culture to foster organizational development?

5- What is the level of knowledge of the recipient of the service from the point of view of the service provider?

6- What are the means used to promote and spread digital culture among the beneficiaries?

This paper will consequently achieve several objectives; To identify and review existing literature on digital culture, Organizational development, and social impact. Moreover, to contrast and compare digital culture and practices in the Egyptian ministries especially digital projects participants' perceptions and experiences and organizational development assessment. Finally, establishes a cornerstone for future digital organizational development and further research to examine its efficiency, and figure out the means that must be used to enrich, promote, and disseminate digital culture among the beneficiaries in digitalized organizations.

RESEARCH HYPOTHESES

In regard to the research objectives, the study makes a set of testable hypotheses; the main Hypothesis is:

"There is a significant statistical relationship between the level of digital culture and organizational development."

The following are sub-hypotheses:

1- H_1: There is a significant statistical relationship between the level of knowledge dimension of digital culture and organizational development.

2- H_2: There is a significant statistical relationship between the level of skills dimension of digital culture and organizational development.

3- H_3: There is a significant statistical relationship between the level of the social dimension of digital culture and organizational development.

4- H_4: There is a significant statistical relationship between the level of the ethical dimension of digital culture and organizational development.

5- H_{all}: There is a significant statistical relationship between digital culture dimensions and organizational development.

RESEARCH DESIGN

METHODOLOGY

Since the variables under investigation have been identified and previously validated and construct to measure them exist, A qualitative approach, as well as quantitative methods, were used; whereas a quantitative study with a self-administered online questionnaire was deemed the best way to test the hypothesis (Sekaran et al., 2016). The context for the research population, as well as specifics about the research sample, techniques, and measures used in this research, are provided in the next section.
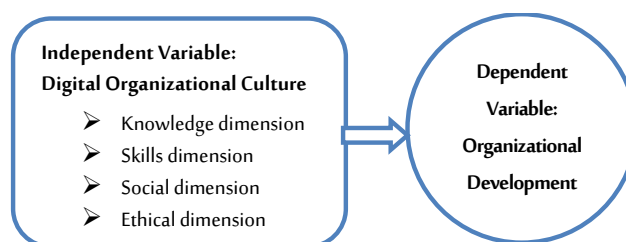
Independent Variable:
Digital Organizational Culture

➢ Knowledge dimension
➢ Skills dimension
➢ Social dimension
➢ Ethical dimension

Dependent Variable:
Organizational Development

Figure (2): The Research Model

POPULATION AND SAMPLING

As previously discussed, human capital lack of Digital awareness among governmental employees, who are in charge of implementing digital transformation projects & delivering digital services, would hinder the adoption of Digital Transformation and consequently affect its efficient implementation.

In this regard, the research population is the employees working in different Egyptian ministries, who only had been nominated to have the Basic digital skills training program, through MCIT, in light of the digital capacity building preparation program for the transfer to the new administrative capital city and in the application of the digital transformation in the Egyptian government.

A simple random sample was used to select the research sample, with the largest possible size by distributing the questionnaires to the targeted group. Whereas the population size was 4398 employees working in different Egyptian ministries. The next equation as shown below was used to determine the minimum appropriate sample size.[1]

$$n = \frac{pq}{\left[\frac{E}{Z\alpha/2}\right]^2 + \frac{pq}{N}} =$$

- Where, **n** is the sample size,   - **N** is the population size,

- **P** is population proportion; the research considers this ratio 50% to get the maximum sample size,

- **q** is the complement ratio which is equal to 50%.

- **E** is the degree of accuracy (margin of error)

- **Zα** confidence interval (1.96) at 0.05% level and one degree of freedom.

$$n = \frac{.50 * .50}{\left[\frac{.05}{1.96}\right]^2 + \frac{.50 * .50}{4398}} = \qquad n = \frac{0.25}{[\,0.000651\,] + \frac{0.25}{4398}} =$$

$$n = \frac{0.25}{0.000651 + 0.00005684} = \qquad n = \frac{0.25}{0.00070784} = 353$$

So, based on the previous equation, the appropriate sample size is 353 respondents, an online digital form was distributed among the targeted population, which ended up with 585 fully answered questionnaires, with a response percentage of 1.65% of the appropriate sample size.

A convenient sample size of 585 respondents was taken. The percentage of the research sample from gender group (60.3%) of respondents were males while (39.7%) were females, the age group (35-54) years reached (70.1%) of the total respondents, and from (21-34) years amounted to (15.9%) of the total respondents, and from (Above 55 years) reached (14%) of the total respondents. The respondents were asked if they have taken the basic skills course, 91.6% have taken the basic course, while 7.7% haven't yet. 85% have passed the basic course, while 5.1% didn't pass it; while 2.9% did not complete the basic skills course yet. In addition to a cumulative percentage (66.4%) of the respondents in the years of experience group range of "6 to 20 years".

MEASURES AND CHARACTERISTICS

To ensure the validity and reliability of the questionnaire, the items were adapted, as follows:

- The Digital Organizational Culture is a 28-item questionnaire that classifies them into four categories (knowledge, skills, social, and ethical). The response possibilities according to the five Likert scale range from 1 (completely disagree) to 5 (completely agree). The alpha coefficient for

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1 Glenn D., Determining Sample Size, University of Florida. Fact Sheet PEOD-6, November 2002, pp 1-5.

the independent variable (Digital organizational culture) is 0.961 and ranged from 0.870 to 0.938 to its sub-indexes.

- The Organizational Development is an 11-item questionnaire. The response possibilities according to the five Likert scale range from 1 (completely disagree) to 5 (completely agree), with Cronbach's alpha coefficients of 0.948.

The research tests the reliability of each section of the questionnaire to be sure of the results obtained. The analysis classifies the questionnaire into two main indexes digital organizational culture and organizational development.

Table (2) - Cronbach's Alpha Coefficients

No.	Item	Cronbach's Alpha
1	Knowledge dimension	0.893
2	Skills dimension	0.938
3	Social dimension	0.870
4	Ethical dimension	0.931
	Digital organizational culture	0.961
	Organizational development	0.948

SPSS statistical tool has been used to statistically analyze the collected data and test research hypotheses, Pearson coloration, and multiple regression analysis tests are used.

DATA COLLECTION METHODS

An inclusive approach through primary & secondary data was used as follows:

Primary data included interviews as a precursor to a quantitative stage, for determining relevant measures to be covered in the quantitative method. Where the issues that were covered in the structured interviews gave more insights into the problems as well as opportunities for the research problem. Discussion groups were held for selected group members, from experts in the field of organizational development governance. Questionnaires were conducted with employees.

The content of both interviews and the questionnaire were articulated based on the literature reviews. The questionnaire was conducted in the Arabic language. It consists of 3 sections. The first section is "Demographic variables" (Age - Gender - Educational level - Experience). The second section is "the Set of Statements Used to Measure digital culture" with four dimensions "knowledge - skills - social - ethics", and the third section is "organizational development". The last two sections use the five Likert-Scale (Completely Agree, Agree, Not Agree, and Completely not Agree).

The secondary data include Ministries' HR & consulting reports, Academic publications, Journal articles & books, Governmental reports, and Statistics from the Egyptian Ministry of Communications and Information Technology (MCIT).

DATA ANALYSIS AND HYPOTHESES TESTING

To test these research hypotheses, a multiple linear regression test has been used which attempts to explain the relationship between two or more variables using a straight line; one of them is considered an independent variable, and the other is a dependent variable. The next tables present the results regarding the impact of digital culture dimensions and OD.

1- **The First Hypothesis Test**

- H_1: There is a significant statistical relationship between the knowledge dimension of digital culture and organizational development.

- H_0: There is no significant statistical relationship between the knowledge dimension of digital culture and organizational development.

Analysis with linear regression model which attempts to explain the relationship between two or more variables using a straight line; one of them is the independent variable and the other is a dependent variable.

Table (3) shows that F-Statistics = 159.578 and it is statistically significant (P-Value = 0.00) which is lower than 0.05; therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accept-

ed which says that "There is a significant relationship between the Knowledge dimension and organizational development".

The Beta coefficient of the constant = 3.249, the coefficient of the model = 0.326, the value of R = 0.464, and R^2 = 0.215 which shows how well terms (data points) fit a curve or line. Adjusted R^2 = 0.214 also indicates how good terms fit a curve or line but adjusts for the number of terms in a model.

This means that 21.4% of the change in the dependent variable is explained by the independent variable, and the remaining percentage is due to other variables. The regression equation can be written as follows: Organizational development = 3.249 + 0.326 x (Knowledge dimension)

Table (3) - Regression Analysis between the Knowledge Dimension and OD

Model	R	R^2	Adjusted R^2	Std. Error The estimate	F	Sig.
Knowledge dimension and organizational development	0.464	0.215	0.214	0.38469	159.578	0.00*

Independent variable: knowledge dimension
Dependent variable: Organizational Development

Table (4) – Regression Equation Coefficient

Model	Beta coefficient	T-Statistic	Sig.
Constant	3.249	29.075	0.00*
Knowledge	0.326	12.632	0.00*

Independent variable: knowledge dimension
Dependent variable: Organizational Development

2- The Second Hypothesis Test

- H_2: There is a significant statistical relationship between the skills dimension of digital culture and organizational development.

- H_0: There is no significant statistical relationship between the skills dimension of digital culture and organizational development.

Table (5) shows that F-Statistics = 120.491 and it is statistically significant (P-Value = 0.00) which is lower than 0.05; therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_2) is accepted which says that "There is a significant relationship between Skills dimension and the organizational development".

The Beta coefficient of the constant = 3.563, the coefficient of the model = 0.259, the value of R = 0. 414, and R^2 = 0.171 which shows how good terms (data points) fit a curve or line. Adjusted R^2 = 0.170 also indicates how well terms fit a curve or line but adjusts for the number of terms in a model.

Table (5) - Regression Analysis between Skills Dimension and OD

Model	R	R^2	Adjusted R^2	Std. Error The estimate	F	Sig.
Skills dimension and organizational development	0.414	0.171	0.170	0.39523	120.491	0.00*

Independent variable: Skills dimension
Dependent variable: Organizational Development

Table (6) - Regression Equation Coefficient

Model	Beta coefficient	T-Statistic	Sig.
Constant	3.563	35.618	0.00*
Skills dimension	0.259	10.977	0.00*

Independent variable: Skills dimension
Dependent variable: Organizational Development

This means that 17.0% of the change in the dependent variable is explained by the independent variable, and the remaining percentage is due to other variables. The regression equation can be written as follows: Organizational development = 3.563 + 0.259 x (Skills dimension)

3- The Third Hypothesis Test

- H_3: There is a significant statistical relationship between the social dimension of digital culture and organizational development.

- H_0: There is no significant statistical relationship between the social dimension of digital culture and organizational development.

Table (7) shows that F-Statistics = 216.578 and it is statistically significant (P-Value = 0.00) which is lower than 0.05; therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_3) is accept-

ed, which says that "There is a significant relationship between the social dimension and the organizational development".

The Beta coefficient of the constant = 3.041, the coefficient of the Social dimension = 0.375, the coefficient of the value of R = 0.520, R^2 = 0.271, and Adjusted R^2 = 0.270 also indicates how good terms fit a curve or line but adjust for the number of terms in a model.

Table (7) - Regression Analysis between Social Dimension and OD

Model	R	R^2	Adjusted R^2	Std. Error The estimate	F	Sig.
Social dimension and Organizational Development	0.520	0.271	0.270	0.37073	216.578	0.00*

Independent variable: Social dimension
Dependent variable: Organizational Development

Table (8) - Regression Equation Coefficient

Model	Beta coefficient	T-Statistic	Sig.
Constant	3.041	27.598	0.00*
Social dimension	0.375	14.717	0.00*

Independent variable: Social dimension
Dependent variable: Organizational Development

This means that 27.0% of the change in the dependent variable is explained by the independent variable, and the remaining percentage is due to other variables. The regression equation can be written as follows: Organizational development=3.041+0.375x(Social dimension)

4- The fourth hypothesis test

- H_4: There is a significant statistical relationship between the ethical dimension of digital culture and organizational development.

- H_0: There is no significant statistical relationship between the ethical dimension of digital culture and organizational development.

Table (9) shows that F-Statistics = 231.461 and it is statistically significant (P-Value = 0.00) which is lower than 0.05; therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_4) is accepted which says that "There is a significant relationship between the ethical dimension and Organizational Development".

Table (9) - Regression Analysis between Ethical Dimension and OD

Model	R	R^2	Adjusted R^2	Std. Error The estimate	F	Sig.
Ethical dimension and Organizational Development	0.533	0.284	0.283	0.36740	231.108	0.00*

Independent variable: Ethical dimension
Dependent variable: Organizational Development

Table (10) – Regression Equation Coefficient

Model	Beta coefficient	T-Statistic	Sig.
Constant	2.875	24.461	0.00*
Ethical dimension	0.399	15.202	0.00*

Independent variable: Ethical dimension
Dependent variable: Organizational Development

The Beta coefficient of the constant = 2.875, the coefficient of the model = 0.399, the value of R = 0.533, and R^2 = 0.284 which shows how well terms (data points) fit a curve or line. Adjusted R^2 = 0.283 also indicates how good terms fit a curve or line but adjusts for the number of terms in a model.

This means that 28.3% of the change in the dependent variable is explained by the independent variable, and the remaining percentage is due to other variables. The regression equation can be written as follows: Organizational Development = 2.875 + 0.399 x (Ethical dimension)

5- Testing the whole model

- H_{all}: There is a significant statistical relationship between digital culture dimensions and organizational development.

- H_0: There is no significant statistical relationship between digital culture dimensions and organizational development.

Table (11) shows that F-Statistics = 72.302 and it is statistically significant (P-Value = 0.00) which is lower than 0.05; therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_{all}) is accepted which says that "There is a significant relationship between Digital Culture and Organizational Development ".

The Beta coefficient of the constant = 2.59, and the coefficient of the Knowledge dimension = 0.103, and it is statistically significant. The coefficient of the skills dimension = 0.001, and it is not statistically significant. The coefficient of the social dimension = 0.17, and it is statistically significant. The coefficient of the ethical dimension = 0.199, and it is statistically significant. The value of R = 0.577, and $R^2 = 0.333$ shows how well terms (data points) fit a curve or line. Adjusted $R^2 = 0.328$ also indicates how good terms fit a curve or line but adjusts for the number of terms in a model.

Table (11) - Regression Analysis between Digital Culture Dimensions and OD

Model	R	R^2	Adjusted R^2	Std. Error The estimate	F	Sig.
Digital Culture and Organizational Development	0.577	0.333	0.328	0.35557	72.302	0.00*

Independent variable: Digital Culture
Dependent variable: Organizational Development

Table (12) – Regression Equation Coefficient

Model	Beta coefficient	T-Statistic	Sig.
Constant	2.590	21.181	0.000*
Knowledge dimension	0.103	2.736	0.006*
Skills dimension	0.001	0.043	0.966
Social dimension	0.170	4.399	0.000*
Ethical dimension	0.199	4.976	0.000*

Independent variable: Digital Culture
Dependent variable: Organizational Development

This means that 35.8% of the change in the dependent variable is explained by the independent variables (Knowledge, skills, social, and ethical) dimensions of digital culture while the remaining percentage is due to other variables. The regression equation can be written as follows:

Organizational Development = 2.59 + 0.103 x (Knowledge) + 0.001 x (Skills) + 0.170 x (Social) + 0.199 x (Ethics)

DISCUSSION AND CONCLUSION

The aim of this current research is to examine the role of Digital Organizational Culture in Organizational Development, in light of Digital Transformation adoption in Egypt. This research findings confirm the significant relationship between the four proposed dimensions of Digital Organizational Culture and Organizational Development. The different data analysis tools had shown different results that are worth to be considered.

First: Results Related to Respondents' Survey:

Survey had shown different results regarding the two variables of the research; as follows:

1- **Results related to the first variable " Digital organizational culture"**

For the **knowledge dimension**, there is an increase in the level of the knowledge dimension among the participants in the questionnaire for digital culture awareness, as the relative weight of this dimension reached 85.81%. This covey that respondents do realize the importance and advantages of applying digital applications & services, though this is not a sufficient percentage, as the participants need to know more benefits that they can enjoy, upon using digital applications & services, such as facilitating and speeding up the delivery of business activities, as well as saving time, and effort that accelerate the achievement of work processes.

The **skills dimension** is considered good among the participants in the questionnaire for perceiving digital culture, as the relative weight of this dimension reached 83.77%. As participants possess the skill of surfing the Internet well, using e-mail, given that mail has become an important means of communication in business activities. As well as participants basically have the skill to use digital services & applications despite the fear of facing technical-related problems is still there, due to lacking a technical support system.

The **ethical dimension** increased for the users of the digital services & applications, with a relative weight of 88.76%, as a result of enacting laws that govern the digital processes control, thus providing confidence, credibility, and privacy in the protection and preservation of information. Where users enjoy their integrity when using digital services & applications, as it is an ethical value that is born by instinct and grows with persons through practical experience. As well as, avoid violating the regulations and trying to bypass them, as following the regulations is considered an ethical value that cannot be bypassed. However, the low degree of the users' commitment to legal procedures in the use of digital services & applications may be due to the fact that they are not constantly available to them.

As for the **social dimension,** there is an increase in the level of the social dimension of digital culture awareness among the participants in the questionnaire, where the relative weight of this dimension reached 85.57%. This reflects that employees are approaching the feeling of being a habit to using digital services & applications, as they live in the era of the technological revolution everywhere and they are a part of Digital transformation projects. Participants do not prefer to conduct work processes & transactions manually, as a real desire & passion have become there to dispense with paper. Though a kind of fear still there for conducting digital work processes is there, however, users have become convinced of dealing digitally, but the problem of fear still exists due to lack of practice.

It is noticed that discrepancy is there between the levels of the dimensions of digital culture awareness among the participants of the survey, where the ethical dimension ranked first, the knowledge dimension ranked second, then the social dimension ranked third, and last but not least the skill dimension ranked fourth.

2- Results related to the second variable "Organizational Development"

The results among the participants in the questionnaire conveying that employees' responses regarding IT-based organizational Development demonstrate a positive level among them. Where results showed that the statement "***The use of modern technological methods contributes to organizational development***" gets the highest mean (4.69) with (93.85%).

However, these results were not satisfying, as the acceptance scale of Organizational Development was the lowest scale. Maybe the reason behind the lowest acceptance is that the employees did not have enough experience to function within a digital environment, especially with technical problems that may occur during digitalized work processes such as technical problems that hinder communications with other parties. Also, due to the lack of exposure for employees to the digitalized work environment or the unavailability of some facilities provided to some employees during digitalized work processes in their work locations, such as the lack of developing an appropriate strategy for coordinating, designing and implementing integrated IT-based processes among different units in some organizations.

It is also worth to be considered that despite the respondents of the sample size of the survey which targeted respondents who were nominated to the Basic Digital Skills training courses, as per their digital skills pre-assessment, which reflects their lack of digital skills, however, the results had shown a percentage of (12.1%) of the respondents have five years of experience or less, and (22.9%) have six years to twelve years of experience. Such a lack of digital skills among the junior level with a cumulative percentage of (35%) would be a great obstacle for the organization to achieve its goals in a digital environment, where such groups are increasingly requested to achieve more digital work processes than the upper hierarchy.

Moreover, a percentage of (29.4%) of the respondents have 13 years to twenty years of experience, this group usually represents the middle management & team leaders' positions, accordingly, they are considered to be a crucial interface in the organizational hierarchy and a vital segment for an organization to successfully adopt and implement its digital transformation processes.

Due to the importance of such groups, this huge cumulative percentage of (64.4%) rings a bell for the importance of fostering their digital skills through several digital skills training programs of different skills levels further more than such basic courses that had been delivered, for empowering these important hierarchal segments, from junior level to middle management & team leaders from the fast-technological tools offered by digital transformation.

Fortunately, results had shown that employees found it was easy to benefit from the training programs and obtained the needed information they required, due to the presence of facilitating tools given to employees to complete their IT-based training program perfectly for connectivity & accessibility such as the internet networks, different computer devices, in addition to the availability of learning materials and up to date interactive learning platforms, as well as the participatory learning methodology. This reflects that choosing suitable channels of delivery & proper tools, after conducting a needs assessment that considers all targeted segments within an organization, would facilitate the process of cultivating efficient Digital Organizational Culture in the Organization and achieve employees' engagement within the transformation process. Such engagement is clearly significant with Organizational Development efforts in enhancing work efficiency and consequently reflected on Digital Transformation processes leading to efficient governmental digital services promotion.

Second: Results Related to the Discussion Group

The interaction among the discussion group members had shown consistency with the other research methods' results that had been reached, in addition to, extracting more prospective efforts & recommendations, pointing to the importance of employees' orientation of digital culture that would foster digital transformation achievement through their awareness of digital skills accompanied by their core business functions' needs. As group members had tackled the important interrelationship between digital job skills needed and the functional activities in light of the organizational hierarchy, it has come into surface the need to work on recommended model that encloses each organization's FAT model (Function-Activity-Transaction) woven with digital job skills needed in light of the main organizational hierarchy, as well as, this should be crucially reflected in the prompted qualifying digital skills training programs.

These results are consistent with (Dascal, 2006; Anderson, 2009; Hodge et al., 2010; Nair, 2013; Cummings 2013, Tan, Abu Hassan 2014; Xiaoai, Qiushi, & Chen, 2015; Atallah, 2016, Ngoc, 2016; Rambousek, Štípek & Vaňková 2016; Marzook, 2017; Oswald & Kleinemeier "ed.", 2017)

Finally, the research had shown that the change in the dependent variable (OD) is explained by the independent variable's dimensions (Knowledge, skills, social and ethical) of digital culture. Showing how important it is to consider employees' digital silks & digital culture orientation in order to sustain organizational development, in light of digital transformation adoption.

PRACTICAL IMPLICATIONS AND RECOMMENDATIONS

As the research had shown, there is a keen desire from the Egyptian government for digital transformation adoption and successful implementation, as well as working on digital integration among all governmental organizations, in order to accelerate & promote various digital services for the public. The matter that requires the prompting secured digital environment in organizations.

This research could assist in answering the question: How can Digital Transformation be applied smoothly in organizations that are newly adopting it? Especially among users. Once more, it is about the need for a Digital Organizational culture that is cultivated and supported by Organizational Development intervention through setting new digital organizational architecture that: (a) facilitates the flow of information through secured digital linkage, (b) digitized work processes, and last but not least (c) digital Capacity building - Job matrix upon which core business functions for each sector, department and business unit in the organizational hierarchy can rely on to achieve its goals.

In this regard, it is highly recommended to go for gap analysis for each organization to monitor the baseline architecture & the target architecture in order to Spotify the enhancements needed for work processes from the digital prospect.

To capitalize on the fieldwork results we summarize in the following points the derived practical implications which we believe will have a substantial impact on organizational development and sustain a positive Organizational digital culture in the transformational era in Egypt:

1- Raising "Digital culture awareness" to help in getting rid of negative thoughts that view computer & online digital applications & services as complex tools that cannot be dealt with easily.

2- Figuring out the means that must be used to enrich, promote, and disseminate digital culture among the employees in digitalized organizations.

3- Increasing employees' exposure to digital tools in their work environment, and facilities during digital work processes in their work locations, in order to create a positive experience for employees to function within a digital environment, and raise the employees' acceptance of the new digital environment.

4- Providing a technical support unit for all digital services and applications raised issues, in order to blur the employees' fear of facing technical-related problems and foster their proper usage, in which the following are available:

- To receive technical support requests and respond to them.

- To have a performance indicator.

- Response to the request according to the performance indicator.

5- Developing an appropriate strategy for coordinating, designing, and implementing IT-based integration among different units in some organizations.

RESEARCH LIMITATION AND FUTURE STUDIES

The current research's finding shows some limitations, which would be a good start for further research. Where current research used a self-administered questionnaire in a cross-sectional sample. As a result, there's a chance that common procedure bias will affect our results; even so, studies have shown that this is unlikely. Future studies could reduce this potential influence by gathering data from many sources and/or overtime periods. Second, in this research the empirical data includes a single instance of the basic skills level of employees in different ministries, the findings should not be seen as necessarily typical of the entire workforce. Future research might look into a variety of skill levels and contexts to see how generalizable the findings are.

Thirdly, the current research only investigated four dimensions of Digital culture that are seen as primary keys for cultivating a healthy and sustainable digital culture in an organization, (knowledge, skills, social, and ethical). However, some other dimensions on the individual level, such as gender, age, and educational level could be considered in further research that would substantially increase the understanding of the role of Digital Organizational culture in Organizational Development. Finally, while the research was planned as quantitative research, the complexities of the interconnected aspects lend themselves to additional qualitative and quantitative inquiries.

With regard to future research possibilities. The above research has been an eye-opening experience on other research questions in conjunction with the above research and findings. Therefore, it is suggested to replicate the research measures in different sectors such as the private and commercial sectors, where the process of using digital services and applications encourages competition among service providers. Another interest in the area of Digital Transformation is to examine the organizational readiness for digital transformation and to develop it to meet the needs of the planned digital transformation.

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