

## Public sector digitalization: an analytical case study to Egypt's Petroleum Digitization

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### Abstract:

This paper aims to provide a comprehensive exploration of the process of digitizing the public sector in Egypt, with a particular focus on the oil and gas sector. In an era where digital transformation is reshaping governance and public administration, the study employs the concept of digitalization to elucidate the significant models of decision-making and communication among various relevant organizations. This understanding is crucial, as it highlights how digitalization influences the public sector's ability to maintain societal stability, especially during times of crisis. The study draws on empirical data collected through in-depth interviews with key stakeholders involved in the digitalization efforts within Egypt's oil and gas provisions. These interviews reveal insights into the challenges and opportunities associated with the integration of digital technologies in public services, particularly how they facilitate communication and enhance decision-making processes. Furthermore, the paper emphasizes the imperative role of digitalization in bolstering the resilience of inter-organizational networks. By analyzing the dynamics of these networks, the study demonstrates how effective digital communication and decision-making can ensure a sustainable supply chain in the petroleum sector. This resilience is vital not only for economic stability but also for maintaining public trust and confidence in government institutions. Ultimately, this research contributes to a deeper understanding of the strategic importance of digitalization in reinforcing the capacity of public systems to respond to challenges and ensure the seamless delivery of essential services in Egypt.

**Key words:** Public sector, digitalization, societal stability, Egyptian petroleum digitization

### 1. Introduction



In 2003 and 2005, the World Summit on the Information Society called for the adoption of information and communications technologies (ICTs) as development tools. This prompted countries as Egypt to begin developing information society agendas, focused mainly on narrowing the digital divide and boosting e-government and on raising awareness of the possibilities offered by ICTs, particularly in the areas of health and education. The enthusiasm of the early years resulted in institutional adjustments aimed at implementation; over time, however, these agendas lost priority in policy debates and actions (ECLAC, 2021). Digital technologies are one of the most transformational factors of our time, including their impact on effective public governance and potentially economic competitiveness. To reap the benefits, policies on the use of digital technologies need to be adequately embedded in public sector reform strategies. The OECD Recommendation of the Council on Digital Government Strategies (2014) offers guidance on their design and implementation.

Relatively, successfully implementing information and communication technology (ICT) in time, within budget and as intended has proven to be difficult in public service supply chains in many developing countries as Egypt. Despite huge governmental investment in ICT, there is little evidence that the many years of spending on ICT infrastructure have led to long-term gains in either efficiency or effectiveness (Karwan & Markland, 2006); Venkatesh et al., 2012). For instance, amid COVID-19 as turbulent time, some inefficient and ineffective supply chain strategies and operations became more evident when the delay of essential supplies, like Personal Protective Equipment, put lives at risk (KPMG, 2021). Until now, research on the use of ICT in public services has mainly focused on single organizations or on digitizing citizen-government linkages, e.g. using e-mail in internal and external communications, moving from paper-based to electronic record-keeping or implementing electronic self-service systems (Dunleavy, Margetts, Bastow, & Tinkler, 2006); (Lindgren & Jansson, 2013); (Lupo & Velicogna, 2018).

Accordingly, as part of Egypt's Vision 2030, the Egyptian petroleum sector and its subsidiaries are adopting sustainable digital management practices. This strategy is aligned with the 17 Sustainable Development Goals (SDGs) that were established by the United Nations in 2015. It is necessary to strike a balance between sustainable development and economic growth even at turbulent time. It is a trade-off between the costs associated with implementing environmental, social, or resilient practices versus the benefits they provide. There is a growing concern about sustainability both internationally and domestically. As a result of its broad nature and application across a wide range of specializations, this topic is considered to be an interdisciplinary topic.

Consequently, using analytical qualitative methodology, this article seeks to find the answer to the following research question: 'how may digitalization contribute to petroleum sector performance in Egypt?' The research aims to show how resilient digitalization influences Egyptian petroleum sector stability at crises time; how the digitalization responds to the relevant hurdles; and how this yields the organizational change necessary for resilience societal stability. To this end, the study starts by exploring the notion of public sector digitalization and its relationship to stability at nowadays turbulent time. It then proposes a framework that draws on digitizing petroleum sector to better understand and assess inter-organizational resilience to maintain societal stability at turbulent time in Egypt. The study concludes with

a discussion of digitalization resilience and its pursue to maintain stability in the context of current turbulent time in Egypt, along with the challenges, consequences and outcomes.

## **2. Digitizing public sector**

The (OECD, 2017) Recommendation calls for a progressive and innovative approach to using technology that goes beyond the mere support of better public sector operations, to the full integration of digital technologies in shaping overarching strategies and agendas for public sector reform. It highlights the need for governments to reach new levels of maturity in the use of ICT: moving from e-Government to Digital Government. This concept of Digital Government implies an important paradigm shift in how the use of technologies in the public sector is conceived and implemented. Earlier on in the e-Government movement, the use of ICT focused on improving the efficiency of specific operations and areas of work. However, OECD countries have since realized that, with the rapid progress of digital, mobile and cloud technologies, this approach fails to take advantage of the full potential of digital technologies. The new digital paradigm recognizes the opportunity offered by new technologies to radically transform back-office operations in order to: improve public sector agility, enhance data management, and create more open and innovative societies that can drive social inclusiveness, and improve government accountability and effectiveness. All of these factors contribute to long-term inclusive and sustainable development.

Relatively, Central to the analysis of public sector digitalization is the concept of electronic government (e-government), which blurs the borders between public administration, new technology and changing administrative methods (Giritli, 2012). The concept has been defined in a variety of ways in the literature. (Bovaird, 2003) broadly refers to e-government as encompassing the «electronic enablement of all the services provided or commissioned by the public sector». More precisely, the concept captures the delivery of information and services via the Internet or other digital devices (Tolbert, Mossberger, & McNeal, 2008); (West, 2005). (Lau, Aboulhosen, Lin, & Atkin, 2008) add to these conceptualizations by including the service users and, therefore, provide a dynamic understanding of the concept by defining e-government as the process of connecting citizens digitally to their government in order that they might access information and services offered by government agencies. The use of ICTs redefines information sharing and exchange.

Accordingly, it is intrinsically linked to transformation and reform of governments (Homburg, 2018). Echoing definitions by the World Bank (2002), the OECD (2003), and the European Commission (2003), which see digitalization as a tool for achieving a more efficient government, (Asgarkhani, 2005) provides a normative conceptualization of digital government, defining it in relation to its advantages. In this sense, e-government consists of the use of digital technologies in government to promote efficiency and cost-effectiveness; it facilitates public access to information for citizens and businesses, favors economic development, and makes government more accountable. The current article adopts a more neutral definition of digital government as the government's use of the Internet and other ICTs to deliver information and public services to citizens. Thus, the operational definition of the concept and, therefore, specify what the main content of digital government is and what it means in practice. Indeed, operational definitions are crucial for observing, analyzing, and measuring the phenomenon under study empirically.

In the same context, the OECD Public Governance Committee released in 2014 the Recommendation on Digital Government Strategies (Committee, 2014). The document contains policy guidance to support the use of digital technologies in the public sector. In particular, it sets out 12 basic principles – which are ensure transparency, encourage engagement, protect privacy, ensure coherent use of digital technology, establish effective organization and governance frameworks to coordinate, strengthen international cooperation, develop clear business cases, reinforce ICT project management capabilities, procure digital technologies, ensure the appropriate legal and regulatory framework- for the successful development and implementation of digital government strategies. These are the main aspects that have to be assessed to measure countries' progress in implementing digital government. Building on the Recommendation, the OECD has developed the Digital Government Index, which is a composite measure of governments' progress toward digitalization.

Meanwhile, indicators for measuring digital government have also been developed by the European Commission (EC). Through the monitoring instrument entitled «the eGovernment Benchmark», the EC evaluates the state of play in relation to digital public services in the European Union. Progress in digital government is measured in terms of user centricity (extent to which a service is provided online), transparency (extent to which governments are transparent in service delivery), cross-border mobility (extent to which users of public services from another country can use the online services), and key enablers (extent to which technical and organizational conditions for digital service provision are in place) (Commission, 2019).

Consequently, the use of ICT in service delivery processes has been empirically studied in general service settings (Ponsignon, Smart, & Maull, 2011) and public settings (Karwan & Markland, 2006); (Iannacci, 2010); (Iannacci, F., 2014) . Both streams of literature identify criteria and aspects for consideration but lack a general overarching framework. It is clear that digital redesign and use of inter-organizational ICT in service settings are under-investigated. To investigate digital public sector, they are considered as service systems. The foundational work of (Roth & Menor, 2003) provides an exhaustive list of service delivery design aspects, namely, structure (i.e. facilities, layout, technologies and equipment), infrastructure (i.e. roles of service providers, people, policies, practices, processes and performance systems) and integration (i.e. operations organization and coordination, service supply chains, integration technologies and learning and adaptive mechanisms), which should be taken into account in the provision of the final service to the recipient (Machuca, González-Zamora, & Aguilar- Escobar, 2007); (Meyer, Johnston, Duffy, & Rao, 2002); (Roth & Menor, 2003). The service delivery system aligned with the service concept (i.e. what is offered to the service recipient) and target market requirements provide the basis for service delivery (Giannakis et al., 2018; (Machuca, González-Zamora, & Aguilar- Escobar, 2007); (Meyer, Johnston, Duffy, & Rao, 2002); (Roth & Menor, 2003).

### **3. Egypt's Petroleum Digitalization at turbulent times: challenges and implications**

Egypt has experienced dynamic population growth (1.6 % annual growth rate) and is becoming increasingly urban, as are most parts of the world. Urban population growth for MENA region – where Egypt is located- in 2014 was 2.47%, reaching 63.74% of the total population (World Bank, World Development Indicators, 2014). This growth already poses significant organizational challenges in large urban areas and exerts pressure on Egyptian government, which must look for new ways of providing access to basic services. Governments must also create the necessary conditions to promote economies of scale and the competitive entry into global value chains. This population growth becomes more challenging when considering the unequal access to services and economic opportunities that exist across the region, particularly in rural areas. Not ensuring access to digital technologies is likely to lead to uneven development and missed opportunities in the form of productivity gains, economic growth and social inclusion. Ensuring access to and the use of ICT in rural areas is a necessary basis for favorable integration into today’s globalized economy (OECD, 2021). It can also improve access to information and services.

Certain regional challenges are making Egypt more prone to economic uncertainty and political instability. These include: inequitable income distribution and access to public services, poor market conditions, falling commodity prices, insufficient private sector development and economic diversification, political unrest, massive migration flows and stocks (of different nature and unequally distributed across countries), and other forms of conflict. These challenges require the Egyptian government to improve their data collection, sharing and processing capabilities in order to enhance public sector intelligence. New data collection and processing techniques, such as big data analytics or business intelligence, can help governments use predictive analytics to spot trends, create knowledge and take strategic action to prevent or address upcoming challenges. Leveraging the potential of government data to transform the public sectors requires the establishment of a context in which a “big data”-prone mentality and environment is nurtured among civil servants through a set of policy decisions, capacity building efforts and provision of incentives (OECD, 2021).

Consequently, in a world that is undeniably digital, the Egyptian oil and gas sector is advancing through the digital transformation program, which comes as the seventh pillar of a modernization project. Then, since 2016 the ministry of petroleum and mineral resources in Egypt had a leading vision for leveraging the transformative power of digital transformation to enhance the sector value chain activities, and support unlocking its full value. The program aims to transform the oil and gas sector into one that operates digitally on a wider scope. Recently, the Egyptian oil and gas sector has been operating digitally. This digital adaptation can be seen in the technologies that have been used in the oil and gas sector, such as the Supervisory Control and Data Acquisition (SCADA) systems, the Distrusted Control Systems (DCS), and the smart and digital instruments used in companies and fields. Thus, achieving the digital transformation to petroleum and gas supply chain; is of strategic importance for Egypt especially at current turbulent time.

Then, a successful petroleum digitization requires key enablers to be in place to support the creation of a dynamic digital government ecosystem that can drive digitization, cultural change, and innovation. In order for the government to deliver digital public services, collect data and crowd source ideas, the broader public must have access to information and communication technology (ICT). Creating a networked



society requires governments to provide the necessary conditions for the development of ICT infrastructure, including a sound legal and regulatory framework and the establishment of a policy environment that supports optimal market conditions for the sustainable development of ICT infrastructure. These efforts should look at the supply of ICT services as well as the demand side, which can guarantee economic and social returns on investment.

Relatively, the petroleum and gas digital transformation portfolio has major pillars that support it in achieving its objective. These pillars include Enterprise Resource Planning (ERP) systems, as well as establishing command centers, such as the Executive Command Center (ECC) that is under construction at the new headquarters of the Ministry of Petroleum and Mineral Resources (MOP) in Egypt's New Administrative Capital. Additionally, other command centers will be established at main oil and gas holding companies.

Hence, in this study, the researchers implemented the practical aspect through in-depth interviews with a number of petroleum experts working at the senior management of the ministry of Petroleum and Mineral Resources, some public, private and foreign petroleum/gas companies working in Egypt; who played a role in the digitalization program, which comes as the seventh pillar (P7) of the Ministry of Petroleum's modernization project in Egypt. Then, a qualitative research design was used to conduct this study and find out the significance of digital public service supply chain and its essential requirements; to ensure the resilience and sustainability of petroleum and gas provisions which will contribute apparently to political and social stability in Egypt. Thus, interviews were conducted with actors (n=14) at senior organizational positions with deep experience who have played or play a role in the resilience management of digital public service supply chain of petroleum and gas products.

Relatively, it is essential to identify the span of the empirical analysis in this paper. Firstly, the paper does not make any claims of the representation of the Egyptian case to public digital supply chain actual performance. Secondly, the empirical analysis will focus only on the aforementioned actors. Furthermore, the paper attempted to hold the conversations as open as possible; the interviews then lasted between 30 and 45 min and were handled in the respondents' particular environment in an open "conversational" way—known as narrative interviewing.

## **Findings**

In this part, the paper describes how digitalization has put the governance of the Egyptian oil and gas supply chain on the agenda and how the various actors involved in this work were able to consolidate their position at the same time as facing the challenges associated with handling the digital transformation program. At the end of this part, the paper illustrates how these actors responded to these challenges and how this has resulted in digitizing the Egyptian oil and gas sector supply chain to be resilient and sustainable even at turbulent time.

## **Technology capability**

There is need of accurate exchange of data and information as effective integration and collaboration, among the supply chain stakeholders (Errassafi, Abbar, & Benabbou, 2019). Developing technological capability of the firms, the information exchange system will be improved within the supply chain system helping to mitigate the uncertainty enabling the firms to promptly address any turbulent environment; the firms are needed to adopt appropriate supply chain strategy under such dynamic situation (Mofokeng & Chinomona, 2019).

*“The digital transformation program has evolved throughout the course of the sector’s modernization journey, where phase 1 of the digital transformation program primarily focused on utilizing data to support decision making and increasing data flow across the sector entities,” (an officer at minister’s technical office).*

*The petroleum sector further adapts to technology “by setting the appropriate roadmap and with the help of specialized consultants.” This way “the sector is adopting the philosophy of business transformation, not just digital transformation. Through which work methods are developed to eventually lead to the integration between them, in order to obtain the complete information in real time in order to make the right decision at the right time,” (General Manager of Systems, Information and Communications, Agreements Manager – Digital Transformation Projects Management Office).*

### **Innovation capability (IC):**

Innovation capability (IC) of public organizations is considered to comprise of technological innovation and social innovation in the context of addressing any turbulent environment for keeping the digital public service supply chain system sustainable (Sarkis, 2020). In response to address any turbulent environment for sustaining supply chain, organizations needs to adopt industry 4.0 technologies like IoT, AI, cyber physical system (CPS), block chain technology, cognitive computing technology and so on (Kumar, K., Singh, Naugriya, Gill, & Buyya, 2020); (Chatterjee, 2020). It is important to realize that social and environmental crisis will occur in future. None knows when and in what level such turbulent incident would take place. But having necessary data driven system like big data, a firm can quickly and aptly respond and react to such social and environmental crisis (DesJardine, Bansal, & Yang, 2019).

*“The sector has been working on adapting to new technologies, paving the way for the digital transformation goals. “Luckily enough, the sector has developed a growing appetite for adopting technology more than ever before. This plan was divided into two main parallel routes. The first was to launch a sector-wide technological infrastructure upgrade project, making sure that all gaps that could hinder digital transformation was addressed and resolved. Its second route was to utilize high-end technologies in huge data analytics, artificial intelligence and predictive analytics solutions which would enable precise and correct information decisions (data-driven), resulting in better operational visibility, and leading to increased profitability, and the achievement of the sustainability goals of the petroleum and gas sector,” (assistant General Manager for Information Technology and Telecommunications at a Public Petroleum company)*

*When it comes to the objectives of the digital transformation program, one can see that they are convenient and feasible. “We are very honored to be working closely with the Egyptian Ministry of*

*Petroleum & Mineral Resources on its focused efforts in its Digitization Program which aims at improving the efficiencies, reducing costs and improving the workforce; by developing IT infrastructure, which includes network services, composite hardware, software, and resources. This comes as the sector recognizes the software and technologies that are crucial for digital transformation. The digitalization program also includes Data Analytics Software and field development. Hence, to develop a resilient oil and gas sector that could cope with the opportunities and challenges on the domestic, regional and global levels,” (Head of Business Process Intelligence (BPI) at a foreign petroleum company).*

### **Relationship management capability (RC):**

Relationship management capability (RC) of a firm is considered as a communication among different stakeholders of the firms in the context of relational view that would improve the sustainability of supply chain system in any turbulent environment (Paulraj, Lado, & Chen, 2008). RC has the power to acquire new skills and can enhance the collaborative activities among the stakeholders involved in supply chain. RC is also conceptualized as the ability to tighten relationship through development of trust and sharing knowledge (Park, 2015). RC includes the qualities like dedication, mutual trust as well as benefits which strengthen supply chain performance enhancing coordination among the partners (Wu et al. 2014).

*The digital transformation of the petroleum sector is not only about using digital methods in operation, it is a culture to be spread among people. “The digital transformation process and the cultural change that make it successful is a multi-stage process that requires in-depth planning and keen follow-up. Therefore, while implementing a sector wide digital-transformation program, building a digital culture within every company is a necessity to drive sustainable action and create value for all stakeholders,” (Chairman and Managing Director, Digital Transformation Program Sponsor).*

*In order to ensure a digital-oriented culture across the oil and gas sector, several directions have been followed. “First direction is to build proficient human capacity across the sector who will be capable to grasp and utilize these new emerging technologies and lead the digital transformation journey of the Egyptian Oil and Gas Sector. The second direction is to always be acquainted and familiar with the latest proven technologies in the field of digitalization. This is achieved by building and maintaining a partnership with world-class technology providers and constantly engaging them in the different technology-related projects within the sector,” (CEO Deputy Assistant for Planning and Projects, ERP Projects Management Office)*

### **Contingency plan (CP):**

What steps would be taken by a firm to address a turbulent environment depend on the nature of turbulence and on the firms’ internal and external situation (Pratono, 2016). This is the main theme of contingency theory. Accordingly, it can be said that a firm must have an appropriate contingency plan to address any turbulent environment for sustaining supply chain management (Fredericks, 2005). Effective contingency plan is perceived to help a firm to adopt appropriate digital supply chain strategy (Sheshadri & Ranjan, 2022). Firms adopt strategies to sustain digital public service supply chain resilience and the



specific strategy to be adopted depends on the nature and level of the uncertain turbulence (Pratono, 2016); (Salam, Seny, & Kan, 2017).

*Digitalization of the oil and gas operations is a significant approach to enhance field performance. "Oil & Gas value chain has a wide operation technology landscape responsible for running the core operational services. Our commitment is to provide the command centers with real time automated data to reflect one single version of truth and build a complete picture of the Oil & Gas sustainable Value chain to support decision making processes especially at crisis time." (General Manager of Information Technology and Communication, Field Development Projects Group Manager)*

*The oil and gas sector adopt a flexible strategy that meets business goals at turbulent time, "while avoiding environmental impacts and eliminating process bottlenecks, maximizing throughputs and revenues, increasing process flexibility, and minimizing emissions. All this should be done provided that the targeted return-on-investment goals of each company are met with no safety issues nor suboptimal production rates," (Strategy and Technical Affairs Unit Head, Technical Office, Ministry of Petroleum and Mineral Resources).*

### **Leadership team support (LS):**

leadership team support (LS) has an effective influence on the innovation abilities of a firm to address any turbulent environment ( (Zheng, Ma, & Wu, 2018) et al. 2018). For sustaining digital supply chain management of a firm at the time of turbulent environment, the firm needs to adopt a particular strategy that depends on the characteristics of the turbulence which is the concept of contingency theory (Fiedler, 1993). In such situation, the firm requires financial help and that can be ensured by the leadership team support (Lei, Phouvong, & Le, 2018). To implement a strategic plan, a firm needs appropriate fund and considerable efforts of the employees of the firm (Venkatraman, 1989); (Smart, Hemel, Lettice, Adams, & Evans, 2017).

*"key design, resources planning and project management systems are used throughout the phases of the digitalization program, and a strategic work track that is receiving a lot of executive attention is the development and training of the sector's human assets in technology leadership roles to ensure continuity and future-proof the project's strategic outcomes." (Chairman Assistant for Information Technology and Communications)*

*"Digital transformation needs sector leaders support throughout the entire digital transformation journey. During the change management process, organizations and people tend to fall back to the conventional way of doing business, and without the sector leaders and executives constant support to realize the digital transformation no progress would have been achieved," (Digital Transformation Program Manager; at a petroleum company).*

### Supply chain strategy (SS):

Value of digital supply chain can be perceived from the fact that how a firm is being able to use its supply chain management as a strategic weapon (Ketchen & Hult, 2007). Flexibility is conceptualized as how the digital supply chain could estimate the nature of uncertainty it might have to face, and it could create an alignment by adopting effective strategy (Schlittgen, Ringle, Sarstedt, & Becker, 2016). Thus, the digital supply chain is needed to measure the operational performance of its process in the context of turbulent environment that can evaluate the effectiveness of its strategy (Ringle & Sarstedt, 2016).

*Digitalization of the oil and gas operations is a significant approach to enhance field performance. "Oil & Gas value chain has a wide operation technology landscape responsible for running the core operational services. Our commitment is to provide the command centers with real time automated data to reflect one single version of truth and build a complete picture of the Oil & Gas Value chain to support decision making processes." (General Manager of Information Technology and Communication at a petroleum company)*

*"the value that command centers can bring into the oil and gas industry, where an immense amount of data and information covering all sector operations can be collected, monitored, analyzed, and processed further to drive the business value chain." (Digital Transformation Program Manager, and Business Development General Manager at a Petroleum company)*

### Moderating role of government regulation (GR):

It is recognized that the supply chain flow depends on the natural environment where it is embedded (Chopra & Meindl, 2013). Digital public service supply chain involves multiple firms dispersed geographically and as such, the firms are influenced by the regulations of that land where they are operating (Manning, Boons, Von Hagen, & Reinecke, 2012); (Montabon, Pagell, & Wu, 2016). Consequently, regulatory policies at one place in the chain may be different for the other firms connected in the chain but functioning in another place. Three types of regulatory policies are there which are market-based policies, command-and-control regulations, and non-regulatory approaches (Darnall, Welch, & Cho, 2019). The regulatory authorities always encourage the forms' involvement in supply chain activities to reduce the environmental impacts throughout the process. In the turbulent environment, the firms encounter several constrains in the supply chain process and over this, if the impacted firms are to adhere to obey all the regulatory checks in the process in such situation, it is likely that supply chain sustainability in the turbulent environment is impeded (Gupta & Piero, 2013).

*"Egypt's oil and gas sector applies technology across all its value chain activities at different geographical areas, from exploration and production activities to refining and petrochemicals," Ahmed Osama stated, setting the Egypt Upstream Gateway (EUG) as an example. "The sector is also implementing multi-client and seismic survey projects to support in unlocking Egypt's full potential of oil and gas resources through applying sophisticated data processing and interpretation. The sector is similarly expanding use of the latest technologies across the other value chain activities*

*to continuously improve performance and add more value,” (Field Development Projects Group Manager at a petroleum company).*

*One of the digital solutions adapted in this level is installing GPS on fuel trucks. “A central control room at the Egyptian General Petroleum Corporation (EGPC), is actively tracking more than 4000 fuel trucks types all across Egypt, beside monitoring system at each marketing and transportation company tracking its owned trucks, through a GPS monitoring and tracking system comprising of GPS devices installed on board each vehicle and a central control application,” (Assistant General Manager for Information Technology and Telecommunications, Data Analytics Projects Group Manager).*

Thus, the digital transformation pillar significantly affects several levels of the industry as it aims to develop the different operations of the oil and gas sector. Following the integrated digitalization strategy will help the Egyptian oil and gas sector supply chain to be resilient and sustainable even at turbulent time, while it meets the goals of the country’s vision 2030.

## **Conclusion**

In this article, the digital public sector significance role is explored. Relatively, achieving the digital transformation to effective digital public service supply chain; is of strategic importance for countries of the Middle East and North Africa (MENA) region as Egypt especially at current turbulent time. A successful digital transformation requires key enablers to be in place to support the creation of a dynamic digital government ecosystem that can drive digitization, cultural change, and innovation.

Relatively, a qualitative research design was used to conduct this study and find out the significance of digital public service supply chain to ensure the resilience and sustainability of oil and gas provisions which will contribute apparently to political and social stability in Egypt. Then, the requirements to digital public sector; which develop the conceptual framework to ensure resilient sustainability during turbulent environment are identified as follows: Technology capability, Innovation capability, Relationship management capability, Contingency plan, Leadership team support, Supply chain strategy and Moderating role of government regulation.

Hence, creating a networked society requires governments to provide the necessary conditions for the development of ICT infrastructure, including a sound legal and regulatory framework and the establishment of a policy environment that supports optimal market conditions for the sustainable development of ICT infrastructure. Eventually, the sustainable flow of needed oil and gas supply can be ensured by developing proper resilient digital public service system necessary to enable societal stability in the Egypt.

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