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Digital governance pathways: Multidimensional challenges in the absence of a scientific foundation are not a deterrent to successful implementation

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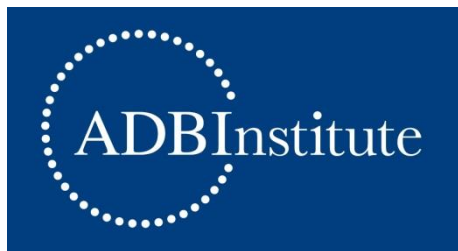
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DIGITAL GOVERNANCE PATHWAYS: MULTIDIMENSIONAL CHALLENGES IN THE ABSENCE OF A SCIENTIFIC FOUNDATION ARE NOT A DETERRENT TO SUCCESSFUL IMPLEMENTATION

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Abstract

It is challenging for policymakers to administer diverse technological, social, and cultural setups by expeditiously addressing local problems in a country. Successful digital governance encompasses norms, institutions, and standards to regulate the development and use of digital technologies to ensure equality by addressing multidimensional issues. By considering the evolution of digital governance, this study explains how the complexity of its successful implementation arises from issues at the digitalization level, the geopolitics of global cyberspace governance, stakeholder engagement, knowledge base augmentation, and an entanglement of the digital and physical worlds. This study proposes stakeholder participation through citizen-generated data and enabling digital logistic platforms to support the entanglement of the digital and physical worlds to unlock the potential of digital governance.

Keywords: digital governance, digitalization, networking, geopolitics, knowledge economy, citizen-generated data

JEL Classification: H11, H70, O1, O32, P2

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1. INTRODUCTION

Governance comprises a decision-making system that creates, reinforces or reproduces norms and institutions (Bevir 2012); therefore, it deals with forming rules, norms, and actions, as well as their sustained operation, while encompassing accountability. E-government, meanwhile, is a government that employs information and communication technology (ICT) to implement existing government activities effectively and efficiently (Caves 2004, UN E-Government Database 2022). Incorporating digital technology, however, reconfigures an existing system's structure and functioning, so digital governance encompasses the new norms, rules, and processes that result in a more diverse operation than conventional e-government practices (Bera et al. 2022).

Digital governance exerts ICT tools and applications to support efficiency in government activities and effectiveness for stakeholders. Intricacies stem from the complexity resulting from the uncertainty associated with the process and stakeholder heterogeneity (Sukhwai and Kankanhalli 2022). Despite the availability of solutions provided by technological innovation, the choice of appropriate technology remains conditional on the country's level of digitalization. In the digital governance process, two distinct agents addressing similar issues expect the same outcome (Charalabidis, Flak, and Pereira 2022). Digital governance thus has the potential to reduce inequality, especially when public organizations are predisposed to similar conditions.

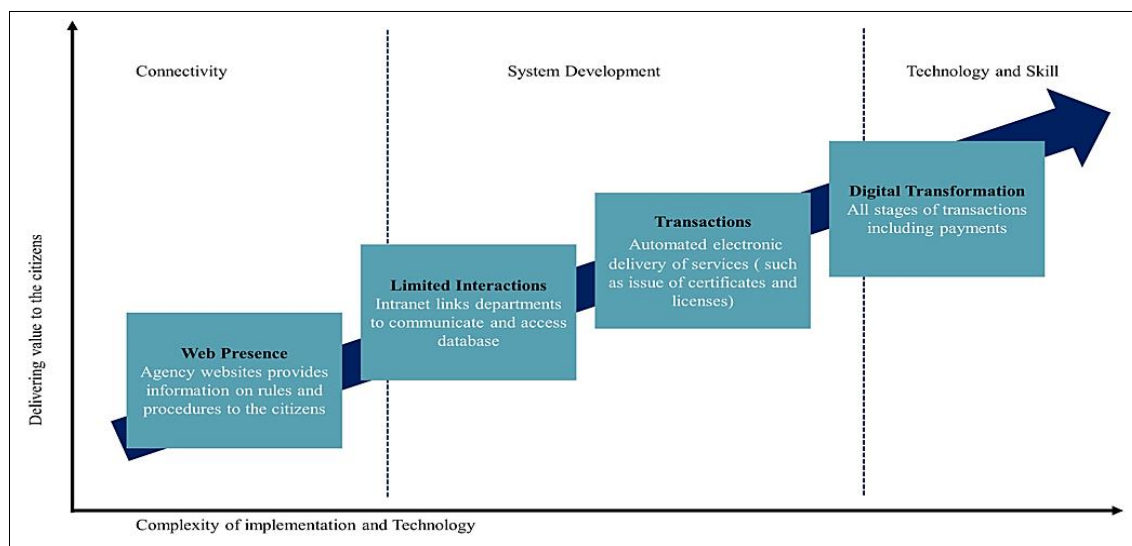
Digital technology is general-purpose technology. It provides scope for diverse forms of use, and multidirectional development may or may not be harmless for a society. Countries with heterogeneous technological, social, and cultural setups expeditiously addressing local problems (Pritchett and Woolcock 2004) may miss uniform strategies to bridge the socioeconomic gap (Straub, Keil, and Brenner 1997). Despite its potential to reduce costs, provide fast response, and offer transparent solutions (Welchman 2015; Linkov et al. 2018; Flyverbom, Deibert, and Matten 2019), digital governance also has long-term political and business implications (Randle and Ramanujam 2021). Evidence suggests that, despite the apparent importance of digital tools and technologies for information dissemination, digital governance stifles democratic dissent (Feldstein 2021; CIPESA 2021). Despite the potential to bring the world under the same umbrella, the digital world thus creates a divide that deters a segment of the population from procuring its benefits. As a consequence, adopting and executing a digital governance framework requires considering various interrelated issues. Contemplating the complexity of these interrelated aspects, this paper analyzed the challenges of dealing with the multiple dimensions of digital governance to find a tenable solution to enhance its rate of success.

This study differs from the previous literature in two ways. First, unlike previous studies that have focused on specific aspects of digital governance, this study analyzed multiple dimensions of digital governance and their interrelationships. Second, considering the researchers' claim that the lack of a scientific foundation has caused a low success rate for digital governance, this study analyzed the pathways to overcome this lack of a scientific foundation through the interaction between the physical and digital worlds.

2. GOVERNANCE AND DIGITAL EVOLUTION

Before proceeding further, it is essential to understand the stages of digital governance, as illustrated in Figure 1. A country in the nascent stage focuses on the infrastructure needed to connect all stakeholders (including business entities and citizens) digitally as a prerequisite for implementing digital governance. The next stage accentuates database sharing across the departments through digital interaction based on the available digital connectivity infrastructure. In contrast with the one-way communication in the first two stages, the third stage accentuates two-way communication ensuring the provision of electronic services (e.g., issuing licenses, certificates, and financial transactions). The final stage focuses on providing governance activities to all stakeholders by integrating the physical and digital worlds through technology and skill development.

Figure 1: Digital Governance: Stages of Evolution



Source: Authors' compilation (adapted from Bera et al. 2022; Gartner Dataquest 2000).

The challenges countries face in making digital governance successful therefore differ depending on the stage of implementation and the level of digitalization.

3. CHALLENGES OF DIGITAL GOVERNANCE

Although digital governance has the potential to solve diverse predicaments, the governance system often fails to acquire the required knowledge (e.g., pertaining to the real-time status of stakeholders, including business entities and citizens), institutions, or skills (Erkut 2020). This failure stems from complex, nonlinear, heterogeneous, uncertain future challenges and the various interpretations of available knowledge. Therefore, for the accumulation of real-time data and valuable knowledge, the government must encourage citizens to generate data and participate in the development of digital governance by facilitating the required infrastructure. Although challenging, the importance of citizens' participation in the development process has encouraged many countries to experience the benefits of citizen-generated data.

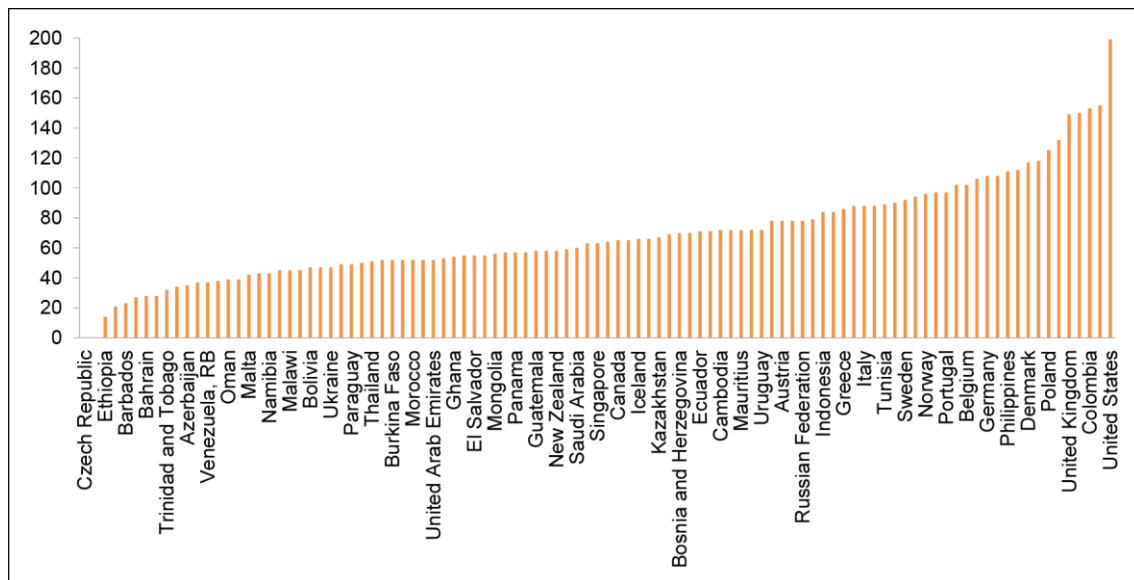
The multidimensional complexity of the system drives digital governance to be more responsive than identifying the ostensible root cause (Chandler 2019). Consequently, the focus shifts from solving the conflict to managing conflict. The logical thinking required for managing conflict has become weightier through numerous international policies and, as a result, limits its effects (Department for International Development, Foreign and Commonwealth Office and Ministry of Defence 2011). Curiously, solutions to this problem do not emphasize being alert or securing precautional measures (Beck 1992), so an unpredictable outcome for stakeholders may stem from the entanglement of humanity with the current environment (geographical, social, economic, and political). Policy formulation thus requires an integration of the understanding and discourse on the emergence of the problem (Latour 2011). The entanglement of humanity with digital technology highlights the necessity for a new form of governance.

3.1 Digital Technology Infrastructure Preparedness

Successful digital governance is conditional on the level of digitalization to support two-way communication among stakeholders. Different studies and reports have measured the status of digital adoption (World Bank), digital readiness (CISCO Digital Readiness Index), ICT development (ITU), and e-government (World Bank) to understand the basic preparedness for digital governance. According to the statistics, a large pocket of the population, mainly in remote rural areas, is yet to gain internet access. While various studies have considered affordability and infrastructure as the main reasons for this divide, policy formulation requires consideration of factors other than the cause-and-effect relationships between income level and internet access, as ICT boons also increase income. The failure of the market mechanism due to the lack of viable business propositions for infrastructure investment in sparsely populated areas forces the government to adopt alternative measures to keep market competition intact to optimize resource allocation and reduce the cost of digital access.

The absence of universal access to the internet results in a digital divide in terms of access, socioeconomic status, and digital skills. Although digital skills affect the degree of satisfaction obtained from government services, the supply side of digital governance has disregarded the participatory design approach (Helsper and Deursen 2015). Despite initiatives to bridge the gap, this divide is likely to remain in future and require government interventions. To understand the supply side preparedness of digital governance, we used a Google Search algorithm to count the countrywise government websites providing information to stakeholders. As shown in Figure 2, numerous countries are at the nascent stage of digitalization and are yet to transform existing governance mechanisms into digital governance to nurture their development pathways.

Although several countries have implemented early digital applications to build information management systems to monitor and formulate plans, Heeks's (2008) survey revealed that only 15% of e-government projects are successful, while total and partial failures are 35% and 55%, respectively.

Figure 2: Countrywise Government Websites

Source: Authors' calculations (2022).

3.2 Geopolitics of Global Cyberspace Governance

Because the internet comprises systems, protocols, standards, hardware (Blum 2012), and organizations (O'Hara and Hall 2018), it is impossible to segregate the technical aspects of this socio-technical system, and it is essential to consider the technical aspects of the internet after ensuring universal internet access. In the absence of significant control over technical aspects, the success of digital governance remains conditional on cyberspace governance. Four types of cyberspace governance currently coexist based on the degree of openness,¹ and any of these can become dominant in the future and alter the assemblage of systems (O'Hara and Hall 2018). Although digital governance begets the openness of technology, it does not always guarantee equitable outcomes. The functioning of the democratic world is conditional on reasonable privacy for individuals to associate without surveillance and to organize actions. Because tracking a device by its IP address is built into the design of the internet, there is scope to compromise privacy. This tracking is the basis of revenue generation through the internet and maintains internet activity as a source of revenue to run the internet. As a result, there is a call to balance between privacy and openness based on trust.

Much of the internet centers around standards and accountable, open, and transparent standard-setting processes. To control the trust factor, the government need to intervene to shape the internet and reconfigure online trust relationships by controlling the content and bandwidth for certain types of content.² Although many countries are

¹ These four types of governance are the open network (mostly in the United States), the bourgeois network (in EU), the authoritarian network (in the People's Republic of China [PRC]), and the commercial network (DC commercial network).

² This is to control the bandwidth traffic, as video content requires higher levels of bandwidth and may cause access interruption for others.

still liberal in controlling the internet, an increasing number of countries have imposed strict censors on the internet (Table 1).³

Table 1: Levels of Internet Censorship

Internet Restriction Score	Number of Countries
1	30
2	49
3	32
4	19
5	14
6	8
7	14
8	6
10	1
11	2

Source: comparitech.com.

Based on these statistics, only a few countries have entities to deal with data governance. Data collected through surveillance on IP addresses require infrastructure to deal with big data. Because big data can exacerbate inequality by differentiating two seemingly equal people, the government must implement transparency for disclosure and accountability (Hacker and Petkova 2017). While disclosure entails different methods for collecting and using personal information by providing a clear, formal notice at the time of information collected from the citizen, accountability incorporates transparency as a constituent element while also relying on citizen participation. Although big data can discriminate between two individuals in the digital age, reducing the availability of information about some users to lower the potential for discrimination is not feasible. To tackle this discrimination, Hacker and Petkova (2017) suggested four proposals: (1) provide the user with a mandatory choice between payment with data or money, (2) ex-post evaluation needs to be mandatory through privacy notices, (3) democratization of data, and (4) financial status responsive fines.

3.3 Stakeholder Engagement

The rapid innovation in digital technology and globalization have altered development dynamics. The entanglement of humanity and digital technology has, however, enhanced communication and interaction among stakeholders. Consequently, the prerequisites of a successful digital governance initiative are more prudent tests and humble experiments than straightforward cause-and-effect modalities. The success of experiments is contingent on two-way communication—hence, stakeholder engagement. Many governments have implemented digital governance at the municipal level. Rutger's studies on digital governance at the municipality level worldwide showed an increase in citizen participation in governance. Citizen participation is conditional on the incentives and quick government response addressing the issues. The speed of government response can vary subject to the efficiency of the local government, geographical proximity, population size, and the nature of the problem to be addressed. As an example of best e-governance, Seoul's

³ The score is based on six criteria (torrents, pornography, political media, social media, VPNs, VoIP, and messaging), with less weight assigned to messaging/VoIP apps.

model offers a multitude of tools, is easy to use, and provides citizen and social engagement. Concerning privacy/security, the efforts of Prague have been exemplary in making its privacy policy comprehensive.

3.4 Augmented Knowledge Base

Although openness and stakeholder participation encourage gathering more information, response speed has remained less than desirable due to the lack of knowledge of the circumstances. Lundvall (2016) emphasized that mainstream economic modelling assumes that agents have full information about the world. According to Hayek (1948), there is a basic difference between information and knowledge. While information entails a codified proposition, knowledge encompasses tacit and cognitive categorization. However, researchers incorrectly treat capital and technology as a metaphor for this knowledge, mistreating technological innovation as a synonym for knowledge (Spender 1996). Moreover, because pieces of information are dispersed and subjective, policy researchers cannot accumulate all of the necessary pieces that are determinants of the market process (Hayek 1989). Collecting information by observing a few limited real-world features and incorrectly modelling them as knowledge in government planning thus has consequences for policy formulation. The importance of knowledge in policymaking emphasizes creating a knowledge base for an economy; however, using existing knowledge remains problematic because of its complexity and contextuality, which are subjective (Thomsen 1992). This subjective nature of knowledge makes the interactions among economic agents unanticipated (Kiesling 2015), and the problem becomes complicated because of the unavailable knowledge. Due to the complexity of economic phenomena, “epistemic opacity”⁴ (Humphreys 2019) remains a major hindrance to the success of multi-layered digital governance encompassing democracy, government structure, and the business environment.

Researchers (Charalabidis, Flak, and Pereira 2022) have argued that the lack of scientific foundations in the realm of digital governance prevents stakeholders from realizing the actual transformative value and its full potential. Because digital governance is highly reliant on scientific disciplines as well as neighboring domains (such as management science, humanities, economics, law and computer science), the inclusion of experts from these fields remains essential to the success of digital governance. Multidimensional aspects also require expertise in diverse governance activities based on natural and social amalgamation (Chandler 2019). These processes, therefore, necessitate additional time and further investment. Nevertheless, the paucity of financial support for digital governance deters actual transformational value from materializing and offering the total benefit to all stakeholders.

3.5 Entanglement of the Digital World and Physical World

Agamben (2014) highlighted the association between conceptual discussions of governance and knowledge’s epistemic status, considering it a depoliticizing move. This movement toward digital governance is an impetus to respond to the risk and indeterminacy effects inherent in a complex and interdependent world. This movement, therefore, aims to cope with unanticipated shocks and unforeseen threats. Digital governance enables new high-technology assemblages to make extensive use of new remote sensing known as “the Internet of Things”, where sensors provide real-time

⁴ Epistemic opacity is a process in which an agent lacks the knowledge of full detail and is unable to trace the relevant link between input and output (Humphreys 2019).

detection of change through the internet. This technology helps build a digital logistic platform to connect the physical and digital worlds. Johnson (2017), in an experimental study, observed that digital governance can make imperceptible harms perceptible and provide an alert even if the source of the problem is unknown. Within this form of governance, differences between individual entities and scientific disciplines blur despite the dependence on organic conceptions of causation.

4. WAY FORWARD

Stakeholders indubitably require empowerment regarding the consequence of participation in digital governance, but the choice to participate in governance activities is conditional on internet availability, access facilities, and affordability. The participation and receptiveness of stakeholders (e.g., citizens, business entities, civic society, and government) remain essential for successful digital governance. However, the reluctance of many stakeholders to provide information for community development stems from their inability to identify the incentives they can receive. Governments should therefore address stakeholders' concerns and reward them for their participation. Participation and receptiveness also require consideration of future risks and uncertainty to achieve sustainable development. Countries need to prioritize a national digital governance plan to secure connectivity, strengthen stakeholder interactions, and ultimately materialize digital transformation, enabling digital logistic platforms to entangle the physical and digital worlds and unleash the potential of digital governance.

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