W10 / Innovation Policies in the Digital Era: Trends and Challenges

Topic : Policy Process, Policy Making

Chair : Pedro Cavalcante (Brazilian Institute of Education, Development and Research (IDP))

Second Chair : Fernando Filgueiras (Federal University of Goiás)

CALL FOR PAPERS

To address the challenges imposed by social, economic, environmental, and technological dynamics, innovations, particularly those related to digital transformation, have become a strategic cornerstone in processes, services, and policies within the public sector over the past two decades. Consequently, the concept of digital government has permeated various spheres and government sectors, affirming the perception that this trend is no longer just a novelty but has indeed become the new normal in public management.

The adoption of digital technologies as a framework for the public sector has become a global phenomenon, extending to both developed and emerging countries, including a vast range of digital innovations based on a complex legal framework and guided by principles of networking. In brief, it is evident that digital transformation is a process that empowers governments to harness technology's potential to reinforce fiscal transparency and accountability, boost the effectiveness of public expenditure, and enhance outcomes in education, healthcare service delivery, and social welfare. This represents a foundational shift in how governments function, utilizing technology to streamline operations, facilitate decision-making, manage data, engage with society, and provide better citizens' experience. This transformation is achieved through the development of modern digital platforms and the adoption of innovative technologies, including machine learning, artificial intelligence (AI), blockchain, the internet of things (IoT), and others.

Indeed, despite the well-known benefits, not everything is rosy. Digital transformation has ushered in a host of intricate challenges, risks, and setbacks for governments, society, and businesses alike. The roster of cyber-related crimes and issues is extensive and continually expanding. Moreover, two issues pose substantial threats to the government's ability to deliver public services effectively, transparently, and equitably: digital divide or exclusion and algorithmic discrimination.

Hence, digital transformation is undeniably a positive and largely irreversible paradigm. Nevertheless, it is equally evident that the outcomes of these innovations, particularly concerning the digital divide and the indiscriminate deployment of algorithms, are not always foreseeable and can have adverse effects on the effectiveness of processes and services, the safeguarding of citizens' rights, and the levels of public trust in government.

In this context, this workshop focuses on exploring the trends and challenges of policy innovation in the Digital Era observed worldwide. The workshop welcomes papers with various approaches - theoretical, methodological, and empirical - that: i) analyze initiatives leveraging digital transformation to enhance public sector performance; ii) Present case studies highlighting setbacks or risks associated with digital innovation in the public policy; iii) examine how governments worldwide are designing transparency and accountability instruments to adapt to the impacts of digital transformation. These efforts should align with ethical and integrity standards, as well as the participatory and inclusive principles valued by society.

ABSTRACT

The adoption of digital technologies as a guideline for the public sector has become a global phenomenon, extending to both developed and emerging countries, including a vast range of digital innovations based on a complex legal framework and guided by principles of networking. Despite the well-known benefits, not everything is rosy. Digital transformation has ushered in a host of intricate challenges, risks, and setbacks for governments, society, and businesses alike.

Digital transformation is undeniably a positive and largely irreversible paradigm. Nevertheless, it is equally evident that the outcomes of these innovations, particularly concerning the digital divide and the indiscriminate deployment of algorithms, are not always foreseeable and can have adverse effects on the effectiveness of processes and services, the safeguarding of citizens' rights, and the levels of public trust in government.

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Session 1Digital transformation and innovations in government

Wednesday, June 26th 10:15 to 12:00 (AULA 8)

Discussants

Fernando Filgueiras (Federal University of Goiás)

Digital Government Transformation in the MENA Region: Trends, Challenges, Policy Solutions and Theoretical Implications

Anis Ben Brik, PhD (Hamad Bin Khalifa University)

Rapid technological advances are driving public sector transformation worldwide through digital government initiatives prioritizing online service delivery, data-driven governance, and technological innovation. However, digital maturity varies substantially across regions influenced by economic, social, and policy environments. The Middle East and North Africa (MENA) context remains under-explored in existing literature that tends to focus on Western e-governance models, despite the region's nascent yet accelerating adoption of emerging technologies. This study therefore analyzes the contemporary trends, persistent challenges, and potential solutions for digital government transformation specifically in the MENA region using mixed methods integrating computational analysis of regional e-governance databases with semi-structured expert elite interviews.

The technology-organization-environment (TOE) theoretical framework structures the investigation of technological, institutional, and contextual factors influencing the adoption and impacts of digital government. TOE provides a holistic lens encompassing barriers related to digital divides, data protection, algorithmic transparency, and participation. Meanwhile, the principles of value-sensitive design (VSD) guide the ethical policy recommendations centered on inclusion, justice, welfare, accountability, and human rights. Integrating both perspectives allows for examination of complex regional challenges alongside targeted, ethical solutions tailored to public sector contexts.

Trend analysis reveals steady adoption of e-government services and smart city technologies across MENA, with higher penetration rates in the Gulf countries. Yet utilization continues lagging among vulnerable demographic segments. Technological innovation has outpaced development of oversight mechanisms with minimal auditing of automated decision-systems and limited progress on open data policies restrictive data localization requirements persist in many countries.

The study reveals uneven digital government advancement influenced by wealth, education, and technological capacity differences at the regional and national levels. Gulf countries grapple more with emerging risks related data privacy, surveillance, and automation bias given their advanced technical infrastructure. Meanwhile non-Gulf countries continue struggling with basic digital divide challenges, skills shortages, and cybersecurity threats.

Findings suggest digital government transformation remains mostly government-centric and technology-driven without sufficient public consultation and participation in tech governance. Adoption of emerging technologies appears poorly aligned with social, ethical and value considerations for human rights, inclusion non-discrimination – as evident in the widening digital accessibility divide.

Recommendations include adopting human-centric design principles for citizen-centric e-services, enacting algorithmic transparency standards, boosting data literacy programs focusing on vulnerable groups, targeted capacity-building for non-Gulf countries through regional cooperation, developing comprehensive data protection legislation, embedding ethics in public procurement frameworks and establishing centers of

excellence guiding evidence-based governance of emerging technologies.

By highlighting trends and barriers influenced by technological, institutional and contextual dimensions factors through an integrated TOE-VSD lens alongside actionable policy solutions, this study delivers both theoretical and practical value. It provides a novel perspective on the distinct opportunities and risks of digital government specifically in the MENA region for researchers and decisions-makers aiming to equitably leverage technology's potential.

Data-driven public policies; 2 Digital Transformation projects deployed at Guadalajara Metropolitan Area

Gerardo Rodríguez Barba (CIATEQ)

Public Administrations must move towards the formulation and implementation of public policies based on data and evidence, from their design to the evaluation of their results. For this transition, the use and implementation of technologies associated with what is called "Digital Transformation" is essential, such as information monitoring and control systems for the provision of public services, with orientation to the generation, analysis, and use of those data to establish a "Data-based Policy Making". Public Administrations require resources and capabilities related to technologies associated with Digital Transformation, such as the Internet of Things (IoT), Big Data (Smart Data), Cloud Computing. and models based on Artificial Intelligence such as Machine Learning.

The great challenge for Digital Transformation projects in Public Administration is to generate valuable information that they can convert into knowledge for the formulation of evidence-based public policies. The papers talk about 2 specific examples of technological deployments based on an identified need and with a strategic vision of two Public Dependencies of the Government of Jalisco, both developed in the Guadalajara Metropolitan Area (GMA). The projects required the articulation of Government Agencies and 2 institutions of the academic-technological community of Jalisco, CIATEQ Advanced Technology Center and the Institute of Technology and Higher Studies of Monterrey, Guadalajara Campus.

One project was the AIOT Platform for the generation of the epidemiological risk index based on environmental and health variables in the southern zone of the GMA. In this project the Secretariat of Environment and Territorial Development of Jalisco (SEMADET) identified the need to develop a digital transformation project that would allow it to carry out real-time measurement of air and water pollution variables, through the deployment of monitoring stations using different IoT devices. Once the data is collected, the application of algorithms was needed to predict the risks and try to reduce and avoid them with joint actions between the different actors in society and the government. Different Machine Learning and Deep Learning algorithms were developed to generate future projections generated by short-term predictive models of air quality. In the project, an AIoT platform was generated in accordance with NOM-172-SEMARNAT-2019, mandatory for state or municipal governments responsible for monitoring air quality.

The second project was an AIoT platform to monitor explosive levels in the drainage system of the Intermunicipal System of Drinking Water and Sewage Services of the GMA (SIAPA), in this project the combination of the prevention and control of accidents in pipelines with digital transformation technologies such as IoT, Artificial Intelligence and Smart Data, can achieve the prevention of urban disasters. A platform for real-time monitoring harmful sewer gases as well as explosive levels to provide alarm or alert signals in emergency conditions was developed. With the help of IoT and Artificial Intelligence, which generated robustness to the system by integrating the existing measurement points, as well as the development of a new measurement point, with local technology, that will allow SIAPA to expand in the future the platform with low costs, high precision and easy operation.

(Virtual) Reforming Public Service through innovative E-governance practices: Public Service Logic Perspective

Mahnoor Farooq (Quaid-i-Azam University)

Governments around the world introduce reforms to improve the performance of public sector. Introduction of innovative practices and digitalization of services is another way these reforms are introduced in the public sector. Innovative e-governance strategies are adopted by the developed countries followed by the developing world. The literature suggests a shift from the traditional theoretical perspectives of Public Administration to the new Public Service Logic through value creation in the e-government practices. In this regard, this study is conducted to explore the reforms in the practices of Police services in Pakistan. Following a qualitative approach to unearth the shift from a typical police station to a model modern police

Khidmat Markaz in Punjab province of Pakistan, this study is conducted by studying the case of Police Khidmat Markaz in Lahore. Semi structured interviews, content analysis of the online reviews, and participant observation were the data collection tools for this study. The results are based on the opinion of first-hand users and citizens which highlight the value creation and innovation introduced through the digitalization of services of Punjab Police. The study is explained through the lens of Public Service Logic Perspective in the developing countries.

Keywords: Public service logic, value creation, innovation, e-governance, Police

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Session 2Sectoral transformations, digital technologies and policy implementation

Wednesday, June 26th 14:00 to 17:15 (AULA 8)

Discussants

Pedro Cavalcante (Brazilian Institute of Education, Development and Research (IDP))

Research on the policy environment of China's healthcare big data development based on PMC index model

Gu Yichun (Shanghai Health Development Research Center (Shanghai Institute of Medical Science and Technology Information))

He Da

Against the backdrop of the current digital era, the development of health big data is flourishing, bringing tremendous opportunities and challenges to China's healthcare industry. Therefore, it is particularly important to conduct in-depth analysis of the policy environment for the development of health big data in China and explore the trends and challenges of innovation policies in the digital age. The purpose of this study is to provide theoretical basis for decision-making and improvement in China's healthcare industry and provide guidance for the high-quality development of the health big data industry. This study adopts the method of text mining, primarily relying on official websites of government departments such as the National Health Commission of the People's Republic of China as the main source of information. By conducting keyword searches such as "health big data," "medical big data," and "healthcare big data," the study aims to analyze policy trends and grasp the government's guidance. In terms of policy text mining analysis, the RostCM6.0 and VOSviewer software were used to conduct in-depth mining and analysis of policy texts related to health big data in China, obtaining high-frequency vocabulary and constructing a high-frequency word network. In addition, the Policy-Making Cycle (PMC) index model was used for policy evaluation. Based on the existing model, this study constructed a PMC index model that suits the characteristics of health big data in China for the evaluation of relevant policies. Expert consultations were also conducted, including the Delphi method. Based on the high-frequency vocabulary obtained through text mining, a questionnaire was developed and Delphi expert consultations were conducted to evaluate the selection and scoring of indicators in the indicator system. The expert consultation evaluation of indicators was divided into two parts: quantitative scoring of indicators based on importance, obtainability, and sensitivity, and qualitative evaluation of the connotation and attributes of indicators. The research results show that China has a total of nine policies related to health big data, with an average PMC index value of 4.72. Among them, two policies performed well, while seven policies passed the evaluation. Overall, the quality of national-level health big data policies in China is good, but there is still room for improvement. In summary, China's management policies for health big data are generally sound, with clear nature and functions of the policies. This study focuses on specific analysis from three aspects: policy content, incentive constraints, and lifecycle, and provides improvement suggestions to address the trends and challenges faced by innovation policies in the digital age.

(Virtual) The Effects of E-commerce on Rural Income Inequality: Evidence from China

Xiaokang Li (Central China Normal University)

Dawei Zhang (Institute for Political Science Advanced Study?Institute of China Rural Studies?,CCNU)

Problem Statement

The potential of e-commerce to improve agriculture profits and farmers' income has aroused the attention of

the Chinese government. The National Rural E-Commerce Comprehensive Demonstration Project (RECD) has been put forward to promote e-commerce expansion in rural areas of China since 2014. The project is aimed to increase rural income levels and alleviate poverty. Although many studies suggest that promoting e-commerce increases rural households' income and reduces poverty, other researchers are worried that the exacerbating digital gap may lead to worse income inequality. **Whether and to what extent do government-led rural e-commerce expansion projects affect rural income inequality? What underlying mechanisms and complementary interventions are necessary for program implementation?** The RECD in China provides a unique opportunity to estimate the impacts of a government-led large-scale e-commerce expansion policy on income inequality in the countryside of a developing country, which is essential for both academia and policymakers.

Conceptual Framework
According to the implementation guidelines for the RECD, we expect that the project may reduce rural household income inequality through the more prominent effects for rural households that initially have lower income levels. Possible channels: **1)** by reducing the cost of logistics, transportation, and information search; **2)** by providing e-commerce training for farmers to increase their e-commerce knowledge and skills; **3)** by providing formal financial credit.

Data Sources
The database combines three sources: the China Family Panel Studies (CFPS) 2010-2022, the 2010 National Census data by county, and the 2013 China County Statistical Yearbook. Specifically, our micro household data are five rounds of follow-up CFPS data from 2010 to 2018 covering 162 counties in 25 provinces of China, of which 46 counties are RECD counties. The baseline survey was conducted in 2010, and the target sample size was 16,000 households.

Estimation Strategy
First, we excluded the effect of other critical concurrent policies (*the construction of the national-level E-commerce Demonstration Cities* and *the Information Technology into Villages project*) launched after 2010. Then, we simulate the inequality index results of the RECD counties if they were not selected in the project and compare them with the real indexes of both RECD counties and ordinary counties to see whether the project affects income inequality. **Second**, we employ the DID method to examine the causal relationship between the project and the income inequality indexes. **Third**, we employ the Shapley value decomposition based on regression to calculate the distribution of the project on household income inequality and identify the key mechanism of the three channels mentioned above.

Potential for Generating Discussion
Given that the overall scale of China's e-commerce is the world's largest, this paper can provide credible evidence of the effectiveness of an e-commerce promotion project implemented by a central government. Since many developing countries have also implemented policies to encourage the development of rural e-commerce growth, aiming to alleviate poverty and reduce inequality, what is the implication that the evidence from China provides for the development of e-commerce in developing countries? Can the experience be expanded?

Optimizing Digital Health Equity in Smart and Connected Healthcare Ecosystem: a Transaction Cost Economics Perspective for Implementation Strategies

Chin-Fun Chu

As technology continues to revolutionize the healthcare system, it presents new challenges to health technology governance. This paper explores the intersection of innovation policy, smart and connected health (SCH) technologies, and the importance of fostering health equity within this eHealth ecosystem. SCH has shown promising potential to improve health outcomes by managing chronic conditions, accessing real-time health information, accelerating treatment and testing procedures, and delivering remote health services to marginalized communities in resource-constrained settings. From mission- and system-oriented perspectives, technical and human resources play a significant part in developing SCH technologies during the early stages of the innovation process. As SCH becomes increasingly essential to healthcare organizations and medically underserved communities, individuals in leadership roles and digital health developers need to recognize and understand how digital determinants and design processes could impact health equity. For instance, the availability and accessibility to digital technologies and their related health services could create a "digital divide" that may affect health outcomes and contribute to further health inequality at the population level. Therefore, we must carefully consider the challenges that digital technologies present and ensure that we are not inadvertently exacerbating existing health disparities. To address health equity within SCH system, we need to recognize the issues with transaction costs (TC), which are an integral part of the development and implementation of digital health technologies in health services organizations. Some of the issues and challenges associated with TC in this context include complex integration into existing healthcare systems, engagement with multiple stakeholders and service providers, regulatory compliance, investment in training programs, data privacy and ownership, and risk and

uncertainty. Using the framework of Transaction Costs Economics (TCE) grounded in neo-institutionalism, this paper applies TCE fundamental constructs and implicit assumptions to analyze digitally-mediated TC and the complexities of implementation. A narrative case study is presented to provide some understanding of practical challenges and opportunities in optimizing health equity within the SCH ecosystem. This study will offer strategic approaches to navigating the intricate landscape of eHealth and leveraging digital health solutions effectively to deliver health services while ensuring equitable access, quality, and safety for users.

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Session 3Governance, risks and challenges of digital transformation

Thursday, June 27th 09:00 to 12:15 (AULA 8)

Discussants

Gerardo Rodríguez Barba (CIATEQ)

The European Union policy design for AI regulation

Nicola Giannelli (University of Urbino Carlo Bo)

Artificial intelligence (AI) is an innovation with significant potential to bring immense benefits to humanity, but it also poses considerable risks. A statement organized by the Center for AI Safety in May 2003 emphasized that mitigating the risk of AI-induced extinction should be a global priority, akin to addressing other societal-scale risks like pandemics and nuclear war. This declaration garnered support from over 500 prominent academics and industry leaders (The Time online, October 24th, 2023).

When queried about the primary social risks of its development, ChatGPT identified key concerns, including Job Displacement, Inequality, Bias and Discrimination, Privacy Concerns, Security Threats, Loss of Control, Social Isolation, Unemployment in Specific Sectors, and Lack of Accountability. Additionally, it underscored the importance of addressing these risks through a combination of ethical guidelines, regulations, and collaborative efforts involving policymakers, technologists, and society at large, as of January 28th, 2024.

One of the major challenges in regulating AI lies in the necessity for a global framework; without it, effectiveness is compromised. However, AI is a central arena for technological competition among global players, and these entities may resist measures that could hinder their innovative capabilities.

In response to these challenges, the Council requested a proposal from the Commission in 2019. The Commission, in February 2020, published a White Paper on the subject. By April 2021, the European Union Commission proposed the first regulation on AI within the Union. This proposal aims to establish a technology-neutral definition of AI systems in EU law and a classification system based on a 'risk-based approach' (EP, EU legislation in progress, June 2023). The suggested AI governance includes national and European-level authorities comprised of experts from member states. These authorities would be empowered to take corrective measures, including prohibition, restriction, withdrawal, or recall of AI systems not complying with the AI act or those presenting risks to health, safety, fundamental rights, or other public interests (Ibidem).

Since June 2020, the European Parliament established a Special Committee on Artificial Intelligence (AIDA), which conducted numerous studies, hearings, and sought expert advice. In May 2022, AIDA issued a Final Report. The European Parliament faces renewal in June 2024, raising uncertainties about the joint approval of AI regulation with the Council before that time.

This paper will narrate the story of this proposal, examining the underlying issues, the evidence considered, and the policy choices that could shape the approach to AI regulation at the European level. (Text corrected by ChatGTP)

(Virtual) The Political Logic of AI Risk Management Framework in the EU: Toward a Tentative and Resilient Governance of AI

Qiuyang Yu (Hubei University)

1.Research question

With breakthrough in algorithms, advancement in computing power, and the acquisition of massive data in the field of information technology, artificial intelligence is rapidly developing and becoming increasingly deeply embedded in various fields of human society, promoting its revolutionary change. While acknowledge the potential benefit that artificial intelligence has for the human civilization, we must also be wary of its hidden risks. As an advocate and regulator of emerging technologies, governments need to balance the future benefits and high risks of artificial intelligence, how to deal with the Collingridge Dilemma has become a public policy issue that governments around the world need to solve urgently. From the General Data Protection Regulation (GDPR) in 2016 to the Artificial Intelligence Act (AIA) in 2023, the EU has established a world-leading artificial intelligence risk management framework. This paper aims to study the political logic of artificial intelligence risk management in the European Union, that is, to think about how different political actors such as EU public policy agencies, multinational technology companies, non-governmental organizations, and citizens perceive the risk factors of artificial intelligence technology, and how to interact with each other under guidance of different risk perception frameworks, and what kind of artificial intelligence risk management framework is constructed during above political interaction process.

2.Methodology

This paper will use epistemic network analysis (ENA) and NVivo to conduct an in-depth text analysis of policy documents in the EU's artificial intelligence risk management framework. Since policy documents are the carrier of information transmission and reflect the publisher's intentions, goals, commitments, expectations, and reactions to external events, therefore studying policy documents can help us understand the risk perception frameworks and role positioning of various political actors in EU AI risk governance.

3.How it fits with the workshops' research questions

Traditional risk management tools, including risk analysis, precautionary principle and liability, are incapable of providing adequate governance of emerging technologies, mainly because the high uncertainty of their realistic risks. Therefore the policy innovation, instigated by governments, are urgent in the digital era. This paper study how heterogeneous political actors within the EU form bridging social capital and linking social capital through political interaction, to deal with AI’s risks with a innovative, tentative and resilient governance framework. It has important implications for other governments’ policy innovation in the field of new technologies.

4.I will present the paper online.

AI is at full speed in public management, but how about the risks and the governmental measures?

Pedro Cavalcante (Brazilian Institute of Education, Development and Research (IDP))

Digital transformation is a process that empowers governments to harness technology's potential to reinforce fiscal transparency and accountability, boost the effectiveness of public expenditure, and enhance outcomes in education, healthcare service delivery, and social welfare. The case of AI is particularly noteworthy as it has developed into a global trend that significantly influences governments' policy decisions and implementation.

Despite the good purposes and benefits, not everything is rosy since AI has also ushered in a host of intricate challenges, risks, and setbacks for governments, society, and businesses alike, such as safeguarding private data and privacy. Furthermore, two other issues threaten the government's ability to deliver public services effectively, transparently, and equitably: digital divide or exclusion and algorithmic discrimination.

Therefore, this paper aims to analyze the effects of the widespread adoption of AI, examining the potential risks it presents to service quality, equity, and transparency. Furthermore, it aims to shed light on ongoing global initiatives that foster accountability in artificial intelligence. In this sense, the policy paper delves into this subject to contribute to the debate on algorithmic accountability. To achieve this, it first discusses AI use's positive and negative effects, providing global examples of algorithmic discrimination. Then, the article presents how the Brazilian public sector has structured and implemented its AI governance strategy and highlights the AI bill's critical points currently under discussion in the nation's parliament. Next, the study scrutinizes how governments worldwide are designing transparency and accountability mechanisms to address the repercussions of AI while aligning them with ethical and integrity standards, as well as participatory and inclusive principles valued by society. Based on these insights, some insights are offered for advancing the design and implementation of practical initiatives within the Brazilian public sector.

Although Brazil has being part of the growing adoption of artificial intelligence, especially in public services, the country has yet to make progress in strengthening the accountability aspect of its AI governance strategy. State initiatives have been relatively shy and lagging behind the prevailing trend of algorithmic accountability embraced by many other nations, as described in the previous section. Compared with other

countries in Latin America and the Caribbean (LAC), Brazil finds itself in the second tier of capacities. The good news comes from the Legislative branch, which has advanced the debate on AI regulation through a bill in the Federal Senate to establish a framework for responsible artificial intelligence governance.

In summary, for AI governance to accomplish its comprehensive goals, it must recognize the intricate interplay between technology and society when setting priorities. This approach is essential for fostering responsible, trustworthy, democratic, inclusive, and human-centered AI implementation in both civil service and business domains. In essence, crafting a robust governance framework for AI focusing on algorithmic accountability is a challenging process of learning, adaptation, and experimentation, marked by progress and setbacks.