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Principles and Elements of Governance of Digital Public Services

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***Abstract*—Digital technologies can be valuable tools to create better public services that benefit society as a whole. Governance is the way to align digital public services with the interests of society. In this article, we discuss principles and elements of governance of digital public services.**

Digital technologies, especially algorithms, Internet, artificial intelligence, voice interface technologies and IoT, are transforming the world, modifying how we communicate, live, and work. In many countries, better and more efficient public services are being demanded by society, due to economic pressures, ageing populations, new forms of social services, and digital transformation initiatives.[1] Digital technologies can be valuable tools to create better public services that benefit society as a whole and in particular the most vulnerable groups. Mechanisms and procedures are needed to assure that digitization of public services meets society's needs and is not adopted because of the technological fads pushed by the technology industry.

Thus, a natural question that arises is: How can we use digital technologies to improve public services? Governance is the answer. Governance is the way to align digital public services with the interests of society. A governance framework for digital public services should be able to oversight the process of procurement, development, delivery, and evaluation of digital public services. In this article, we discuss principles and elements of governance of digital public services.

Digital public services are usually developed and operated in a decentralized way and

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distributed over different parts of the public administration. The governance ecosystem of digital public services has many players with very different legal statuses, which depend on the formal organization of government as well as on the informal power structure, based on political interests. Common principles could be the element that will put together different interests in government to create digital public services that are inclusive, effective, and legitimate.

A set of high-level principles could be useful to shape the governance structure of digital public services. Principles should be formulated by a multistakeholder group, involving different sectors of government, civil society, and businesses. For example, an overarching principle to guide the digitization of public services could be one that emphasizes the inclusive nature of public services in a simple statement, such as: Assure that digital public services leave no one behind.[10] Good governance must also adhere to general principles such as transparency, accountability, openness, fairness, and responsiveness, to ensure that digital public services meet the legitimate expectations and needs of citizens.

There are elements that we consider important for the governance of digital public services. They can be applied to the governance framework, depending on the stage of digitization of the public services. The elements that follow provide practical support for the development of a framework for governance of digital public services.

ELEMENT #1: HAVE COPRODUCTION GUIDELINES

One of the central elements for governance of digital public services is the capacity with which algorithms can promote public services' coproduction and customization. Coproduction of public services is the involvement of users with the provision of services, in which deliveries will be the result of the relationship between the users of the service and the organization that provides it.[2] Coproduction occurs through the long-term involvement of users and professionals that provide services. The active role of citizens in the production of public services increases customization and improves service delivery and avoids technocratic governance.[3] Additionally, the involvement of users and civil society in the production process can contribute to include an accountability perspective to the public service algorithms.

Digitization of public services involves redesigning process—from service demand to delivery—so as to ensure that public services' bureaucratic paper processes are not simply transposed to digital processes. Coproduction is necessary so that public services can expand their delivery capacity and anticipate or predict the needs of citizens.[4] In addition, coproduction promotes services that are need-based holism. The coproduction element allows for more resilient and responsive governments, which may be able to respond to different problems in real time.

Thus, public service digitization strategies should consider coproduction as a necessary condition for the increase of efficiency. Associated with algorithms that can be used to collect and analyze user data, digitization should aim to promote increasingly customized and anticipated public services. Algorithms can collect data and anticipate future individual lives.[5]

They can be augmented with the use of machine-learning tools in order to promote changes based on knowledge about citizen behavior. That way digital public services can predict, nudge, and drive citizens' behavior.[6] Individual citizens, understood as users of public services, are coproducers and data sources that can be analyzed by the use of machine learning algorithms to customize public services.

ELEMENT #2: HAVE INCLUSIVE AND EQUITABLE POLICIES

Public services result in rights and benefits for citizens. Governments should provide public services in an inclusive perspective by law and to reach social justice. Assuming that digital public services are not only the shift from interaction between the citizen and the bureaucracy to the interaction between the citizen and the computer, they must contain an inclusion perspective.

The main factors that promote citizens' exclusion derive from digital divide. The interaction between man and computer requires individual skills to access its economic, political, and social dimensions. Digital divide refers to the growing gap between nonprivileged portions

of society and increasingly digitized and Internet-based organizations. Internet access is a structural condition of digital divide. The other condition refers to the different level of knowledge between people who have access to information technology and those who do not. Digital literacy is the individual's ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.[7]

Digital public services have the potential to promote coproduction and customization through algorithms and machine learning. However, algorithms can produce exclusion by simply ignoring portions of society that are not users of digital public services. Rural populations, illiterates, and residents of areas without Internet access may be summarily excluded by digital services that they cannot access.

The governance of digital public services should create mechanisms to expand digital literacy and Internet access infrastructure as essential points for promoting digital inclusion and allowing citizens' interaction with online services.

ELEMENT #3: COMPLY WITH DATA PROTECTION REGULATION

Digital public services must follow standards and regulation for data protection. Risks related to cybersecurity issues or even misuse of data by governments can break users' trust in digital public services. Regulatory standards are needed where data may be misused—for various purposes such as commercial, political, or social—or where systems are subject to cybersecurity issues.

Protecting citizens' privacy is key to building trust in the institutional functioning of digital public services.[8] To this end, regulatory authorities need to be created, or strengthened if they exist, to constitute a set of standards that are enough to delimit the applicability of protection, the scope of regulation and the penalties, which should apply to different companies. Personal data processing must be regulated from end to end in order to avoid problems of misuse and insecurity. At the same time, regulation of data protection must be dynamic in order to meet the challenges of organizations going through digital transformation.

Compliance with data protection regulation should result in governments' provision of a set of standards for citizens' action, as well as channels for them to communicate with the regulatory authority for privacy protection.[9] Initiatives such as the General Data Protection Regulation (GDPR) of the European Union are recommended in order to exercise extra-territorial regulation, and to define authority and principles within the scope of personal data protection.

ELEMENT #4: DEVELOP DIGITAL AND DATA-RELATED SKILLS

Lacking digital expertise in its workforce can lead to serious consequences for governments' provision of digital public services. Human resources' recruitment and retention are on-going challenges for governments, which are in short supply of qualified personnel, due to uncompetitive rates of pay and unclear career progression rules.

The use of digital technologies in governments transforms the government workforce. Algorithms gradually replace street-level bureaucrats with street-level algorithms.[12] Algorithms gradually replace people and make discretionary decisions about rights and benefits. The result of the use of digital technologies is the reduction of the size of the workforce, suppression of clerk activities, adoption of big data practices, redefinition of the profile of civil servants, introduction of artificial intelligence and others. Public service work shifts to the back office, requiring new skills from public servants.[13]

Human resources' policies in the public sector have faced radical changes. OECD's reports[9] on the subject have emphasized the importance of handling strategically the processes through which governments are going through. Public servants should develop technology skills and develop more proactive and analytical skills that can support a profile of greater service experimentation and innovation.[14]

Digital public services impact governments and their management tools. In this case, the process of digital transformation of public services depends on building skills that enable the transformation and proper use of digital tools for governments. These skills are related to dynamic learning ability in organizations so that they can learn from mistakes and successful experiences.

ELEMENT #5: HAVE PROCUREMENT GUIDELINES

The quality of public expenditure is directly related to procurement processes—a key public management policy. Procurement governance has been deeply impacted by the acceleration of the path of technological transformations. The current context has no precedent in terms of speed, volume, and value. Procurement policy is central to providing infrastructure for government digital technologies.

On one side of the table—the government—there are political appointees, high-level officials, middle managers, public lawyers, and contractors. On the other side of the table, you find marketing people from the big tech companies, such as Amazon, Microsoft, Google, Facebook, and Apple—all globally connected and on the frontier of digital innovation. This formal procurement policy relationship creates an information asymmetry that impacts the technology infrastructure available to governments.

The digital capacity deficit in the public sector is not usually trivial nor easily solvable. Third parties can play an important role in reducing informational asymmetries. Universities, think-tanks, and consultants should be called upon to support the decision-making process despite the unfairness of the default negotiation. It is not only a matter of resources—human, financial, technological—but of governance arrangements. Together they can establish guidelines to guide government procurement of infrastructure, making the most of available technology.

ELEMENT #6: DEVELOP ALGORITHMIC DECISION-MAKING POLICIES

A working definition of decision-making algorithms is given by European Commission[20]: ''A software system—including its testing, training, and input data as well as associated governance processes—that, autonomously or with human involvement, takes decisions or applies measures relating to social or physical systems on the basis of personal or nonpersonal data, with impacts either at the individual or collective level.'' Decision-making algorithms in public services have been used in many areas such as education, healthcare, transportation, security, and judicial system. Examples of government applications include risk-assessment algorithms that estimate the likelihood of recidivism for criminals and customer service chatbots used by local governments to answer questions from their constituents. The use of algorithms has the potential to improve the quality of decision-making.[17,19] They have possibility to increase speed, reduce cost, improve accuracy, support new types of applications, and extend the reach of public services, depending on the availability of communication infrastructure. Although algorithmic decision-making can improve efficiency of public services, it also faces some challenges, such as errors, biases, discrimination, and other undesirable behavior patterns. Its impact needs to be monitored. As algorithmic decision-making is used in an ever-growing number of public service applications, it is necessary to protect citizens against negative side effects of algorithmic decisions. As pointed out by Brauneis and Goodman,[16] ''In the public sector, the opacity of algorithmic decision making is particularly problematic, both because governmental decisions may be especially weighty and because democratically elected governments have special duties of accountability.'' It is clear that governance bodies should provide government-wide oversight of services that rely on algorithmic decisions. Governance mechanisms and measures need to be specified to achieve transparency accountability and fairness in digital public services.

In order to minimize risks and negative consequences of automated decision-making in public services, governments have to create governance frameworks to deal with the development and use of this kind of technology. Frontrunner countries in this area have already proposed and developed governance frameworks, policies, and principles for guiding the use of algorithmic decision-making.[17–19] One example proposed by Copeland[15] is: ''Every algorithm used by a public sector organization should be accompanied with a description of its function, objectives, and intended impact, made available to those who use it.'' Before decision-making algorithms and artificial intelligence technologies are deployed in large scale in government, a key question should be answered by public administrators[17]: Who should be responsible for governing, auditing, and assuring algorithmic decision-making systems?

CONCLUSION

The rapid evolution of digital technologies requires flexible and adaptive governance framework for digital public services. Flexible governance approaches should support multi-stakeholder dialogues and partnerships with other government organizations, industry, and civil society in order to create sustainable, inclusive, and principle-based solutions for digital public services.[11] The process of digital transformation of public services is underway in several countries. Governance frameworks, with their principles and elements, is key in the digital transformation of public services and should be created. In this article, we presented a number of principles and elements that point in the direction of adaptive governance models.

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