

المخاطر والعواقب السلبية للتحويل الرقمي للمجتمع: تجربة دول الاتحاد الأوروبي

Risks and Negative Consequences of the Digital Transformation of Society: The Experience of the Countries of the European Union

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المستخلص

يخصص عدد كبير من الدراسات والمنشورات العلمية للتحويل الرقمي للمجتمع. تشير تجربة دول الاتحاد الأوروبي إلى أن التحويل الرقمي لم يجلب لهم ميزات إيجابية فحسب ، بل جلب لهم أيضا مخاطر. الغرض من المقالة هو دراسة المخاطر والعواقب السلبية للتحويل الرقمي للمجتمع بناء على تجربة دول الاتحاد الأوروبي. تتضمن منهجية البحث استخدام التقارير الواردة من منظمة التعاون الاقتصادي والتنمية والمنظمات الأخرى ، من خلال تحليل مقارن لنتائج التحويل الرقمي في دول الاتحاد الأوروبي وتحديد المخاطر والعواقب السلبية لتنفيذها. تنظم المقالة المراحل الرئيسية لتطوير الحوكمة الإلكترونية من ١,٠ إلى ٤,٠ ، بالإضافة إلى مزاياها الرئيسية. تم تنظيم النماذج الرئيسية التي اقترحتها مؤلفون مختلفون للتنفيذ منذ عام ٢٠٠٠ وحتى الآن. هذا جعل من الممكن تنظيم الأنواع الرئيسية للابتكار ، وهي: الابتكار الداخلي (الإداري ، النظامي ، التنظيمي) ؛ ابتكار العملية الخارجية (الحوكمة) ؛ ابتكار السياسات ابتكار الخدمة (أو المنتج). مكنت دراسة الدراسات العلمية المنشورة من تنظيم المخاطر الرئيسية والعواقب السلبية للتحويل الرقمي للمجتمع ، والتي واجهتها العديد من دول العالم. ومن أهمها: التكرار في العمل في القطاع العام التحيز التكنولوجي ، والظلم ، والتمييز؛ فجوة مساءلة متزايدة ؛ تهديدات لخصوصية البيانات. لقد ثبت أنه بغض النظر عن وجود عدد من التغييرات الإيجابية (مكاسب الكفاءة والإنتاجية ، وفورات التكلفة ، تحس للابتكار ، وهي: الابتكار الداخلي الإداري ، النظامي ، التنظيمي) ؛ ابتكار العملية الخارجية (الحوكمة) ؛ ابتكار السياسات ابتكار الخدمة (أو المنتج). مكنت دراسة الدراسات العلمية المنشورة من تنظيم لمخاطر الرئيسية والعواقب السلبية للتحويل الرقمي للمجتمع ، والتي واجهتها العديد من دول العالم. ومن أهمها: التكرار في العمل في القطاع العام التحيز التكنولوجي ، والظلم ، والتمييز؛ فجوة مساءلة متزايدة ؛ تهديدات لخصوصية البيانات. لقد ثبت أنه بغض النظر عن وجود عدد من التغييرات الإيجابية (مكاسب الكفاءة والإنتاجية ، وفورات التكلفة ، تحسينات الفعالية والجودة ؛ الشفافية والمساءلة والثقة والشرعية) التي أشار إليها غالبية المؤلفين ، لا يمكن للمرء أن يتجاهل المخاطر والعواقب السلبية للتحويل الرقمي للمجتمع.

الكلمات المفتاحية: المجتمع الرقمي؛ التحويل الرقمي؛ الإدارة الرقمية؛ القانون الرقمي؛ مخاطر التحويل الرقمي للمجتمع.

Abstract

A large number of scientific studies and publications are devoted to the digital transformation of society. The experience of the countries of the European Union indicates that the digital transformation brought them not only positive features, but also risks. The purpose of the article is to study the risks and negative consequences of the digital transformation of society based on the experience of the EU countries. The research methodology involves the use of reports from the OECD and other organizations, through a comparative analysis of the results of digital transformation in the countries of the European Union and the identification of risks and negative consequences of their implementation. The article systematizes the main stages of e-Governance development from 1.0 to 4.0, as well as their main features. The main models proposed by various authors for implementation since 2000 and up to now have been systematized. This made it possible to systematize the main types of innovation, namely: Internal process (administrative, system, organizational) innovation; External process (governance) innovation; Policy innovation; Service (or product) innovation. The study of published scientific studies made it possible to systematize the main risks and negative consequences of the digital transformation of society, which many countries of the world faced. Among the most important of them should be mentioned: Labor redundancy in the public sector Technological bias, unfairness, and discrimination; A growing accountability gap; Threats to data privacy. It has been established that regardless of the presence of a number of positive changes (Efficiency and productivity gains, cost-savings; Effectiveness and quality improvements; Transparency, accountability, trust and legitimacy) pointed out by the majority of authors, one cannot ignore the risks and negative consequences of digital transformation of society

Keywords: digital society; digital transformation; digital management; digital law; risks of digital transformation of society.

Introduction

The digital transformation of society, which we have been observing in recent decades, is actively focused on changing not only tools, but also approaches to governance. The countries of the European Union were among the first to start digital transformation and actively implement first its individual elements (information products), and later complex governance systems. At the same time, as with the implementation of any innovation, the implementation of digital technologies in the activities of both individual organizations and states faced many risks. At the same time, various countries also encountered cases when the negative consequences of the implementation of certain management decisions during digitization were more important than their positive effect.

transformation for their further consideration at the next stages of the development of digital society 5.0.

The aim of the study. The purpose of the article is to study the risks and negative consequences of the digital transformation of society based on the experience of the EU countries.

Methodology. The research methodology involves descriptive and analytical approaches to studying the given problem. Thus, the descriptive approach was used for the retrospective analysis of the development of digital transformations of governance (in the study of the evolution of E-Government), as well as for the comparison of models and methods of E-Government. At the same time, the analytical approach allowed based on the analysis of scientific works of other authors and analytical reports of the OECD organizations, identify the risks and negative consequences of their implementation. The main stages of our research were: a retrospective analysis of the main stages of the development of the digital society; study of the main models of digital transformation of governance; identifying and systematizing the main risks and negative consequences of such a transformation.

The problem of research. Our research was devoted to the study of the main risks and negative consequences of the implementation of digital transformation projects, which were carried out in various countries of the European Union in the period from the beginning of the 21st century to the present.

The importance of research from a theoretical and practical point of view. The study is important from a theoretical point of view, as it allows to establish the main features of each of the stages of the digital transformation of governance in the countries of the European Union based on a retrospective analysis. The practical significance of our research lies in the systematization of the main risks and negative consequences of such a

Research plan. We will study this research through three sections:

First Section : *In this section we will do retrospective analysis of the development of digital management transformations -and we will investigate how the digital transformation of E-Governance took place;*

Second Section : *in this section we will make a comparison of models and methods of electronic government- we will compare the main models and methods of e-Government used by countries to implement innovations;*

Third Section: : *in this section we will study of the key risks and negative consequences of the transformation of digital governance - using the scientific works of other scientists who studied the problems related to the digital transformation in e-Governance, we systematize the main risks and negative consequences that different countries encountered at different stages of digitalization of governance.*

First Section :The development of digital governance transformations.

In our society, the evolution of public administration has recently changed from E-Governance 1.0 to E-Governance 4.0.

In the late 1990s and early 2000s, a lot of research focused on “e-Government”, characterised by the provision of online services and setting up of government websites and IT systems within public administrations. It is also sometimes referred to as e-Government 1.0 – the initial applications of World Wide Web technology in the public sector replacing paper transactions. It aimed at internal process innovation to create a government which works effectively and efficiently. To achieve this, public organisations started investing into ICTs, but the mode of operation itself remained mostly the same; only the medium changed.

In the second half of the 2000s, the discourse shifted to eGovernment 2.0, also sometimes referred to as “open” government, also covered under the concept of “e-Governance”. It went hand in hand with Web 2.0 collaborative technologies and aimed at creating an open-source platform in which government, citizens, and innovative companies could interact. It was mostly an external process (governance) innovation, aimed at increasing participation, collaboration and transparency in two-sided exchanges between governments and the public. The government opened-up for bilateral interaction and gained a new role as a provider of open data, web services, and platforms as an infrastructure [2]. More recently, since mid-2010s the literature on ICT-enabled innovations in the public sector speaks about eGovernment 3.0: the “smart” or “intelligent” government [3], powered by innovations related to open and big data, administrative and business process management, Internet of Things (IoT) and blockchain. E-Government 3.0 was assumed not only to work well and be open to people, but also *think* – with the use of data and artificial intelligence – on better ways to make decisions, solve societal problems, optimise resources and boost citizen well-being and participation. It was also about policy innovation: improving sustainability, affordability and appropriateness of policies [4]. Finally, the most recent articles also introduce the concept of eGovernment 4.0 – a transformed and citizen-driven government, which adapts itself to the needs and expectations of citizens, businesses, non-profit organisations, and other stakeholders, and creates

relations and exchanges that are personalised, interactive, and easy to access [5]. The United Nations increasingly sees digital government [6] and specifically eGovernment 4.0 [7] as a tool for building effective, inclusive and accountable institutions to support policy making and service delivery for the sustainable development goals (SDGs)[8]. Nonetheless, it must be stressed that the apparent linearity of the account above is a conceptual simplification [9]. In practice, despite of the emerging interest in Artificial Intelligence (AI) and related technologies, as of early 2019, many national Digital Government programmes, contain many priorities and initiatives grounded in what the academic sources would call eGovernment 1.0 or eGovernment 2.0. The process by which governments have moved towards digitalisation from the late 1990s has been far from linear and the implementation is not necessarily aligned with the academic discourses. For this reason, the concept of digital government, although used in various ways by different authors, is intended in our analysis to cover open (2.0), smart (3.0) and transformed (4.0) government (figure 1). Digital government requires innovations in all areas: internal processes, governance, service delivery and policies. This way of understanding the digital government is in line with the definition provided by the OECD, according to which digital government refers to the use of digital technologies, as an integrated part of governments’ modernisation strategies, to create public value. It relies on a digital government ecosystem comprised of government actors, non-governmental organisations, businesses, citizens’ associations and individuals which supports the production of and access to data, services and content through interactions with the government [10]. This definition is applied further in the review of literature and the analysis of the state of the art conducted in this report and it will set the rationale for the next phases of the DIGIGOV research, underpinning the conceptual framework under development and being the basis for the empirical work and case study research.

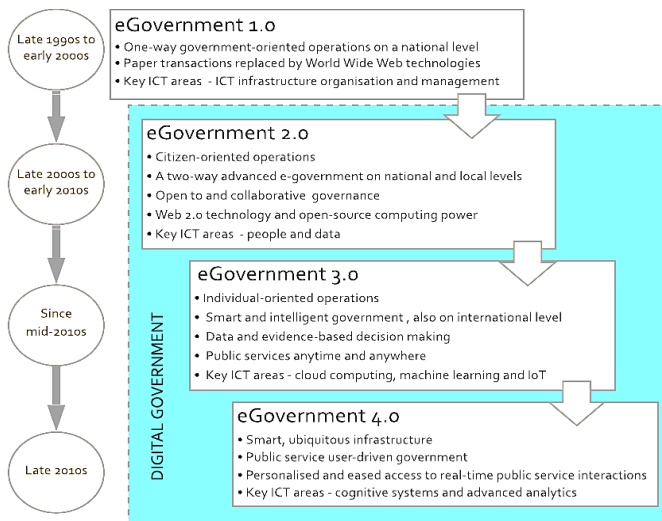


Figure 1. Evolution of e-Government discourse

Source: [1-15]

Second Section: a comparison of models of E-Government models and methods of electronic government .

Most authors of the overviewed models use the notion of ‘transformation’ to denote the transition of governments from one stage to another, although its meaning in this context changed over time. This brief overview illustrates how the scholars’ understanding of the aims and directions of digital transformation in government evolved, with the final goal becoming increasingly ambitious: from fully integrated web presence (missing out on the issues of political participation and changes in decision-making) [24], to intelligent government in which technology has penetrated and changed all functions at all levels. Transformation is the central theme of this study. Further in this review, therefore, we focus on unpacking this term.

Many of the reviewed sources do not define digital *transformation* explicitly [11]. Nonetheless, analysis of numerous articles on the topics allows to list the main features of this phenomenon. The term ‘transformation’ is often used to denote a notable change, modernisation effort or innovation, introducing digital technologies in government’s business processes, service delivery models and culture, restructuring how the government performs basic functions and governs. However, while some

researchers rely on an assumption that transformation will happen through greater use of digital technologies [25], others argue that transformation will not result from “doing things incrementally better, but by doing things fundamentally differently” [26]. Therefore, an important element distinguishing transformation from gradual types of change is the abandonment of analogue operating models (e.g., manual, paper) in favour of the new digital systems [27]. In many cases, the literature relates digital government transformation to the application of specific technologies in government, such as blockchain [28], Internet of Things or artificial intelligence.

Digital transformation tends to be seen as a process. As illustrated with the overview of maturity models above, the literature often metaphorically compares it to other processes such as ‘journey’, moving through stages or ‘maturing’ [28] from the current situation to the higher levels of digitalisation. Transformation can also be seen specifically as the process of moving from traditional government through the initial forms of e-Government towards the Digital Government [29], which entails introducing the necessary initiatives in making changes deeper in the provision of online services through e-government portals, into the broader business of government itself. The new, ‘transformed’, technology-based systems should not only be consumer-friendly, strategy-driven, and capable of providing a better experience for those interacting with the government, but, more importantly, should also improve the way the government systems operate. Some papers apply very specific definitions of transformation in relation to other types of change in government, although it seems that the difference is mostly in the preferred choice of wording. For example, Janowski [18], in the article mentioned above, considered transformation as one of the stages in the Digital Government Evolution Model. Transformation, according to this definition, implies internal government transformation, but does not affect external relationships and is not context-specific (both of these aspects are covered by subsequent stages of engagement and contextualization). Most other authors, however, use a broader definition of

transformation, as encompassing change on all these dimensions. Generally, the digital transformation can be defined as both, (1) transformation of internal processes and (2) as a transformation of the relationships between governments and other social and political actors (institutional transformation) [30], tailored to specific policy areas and needs – basically what Janowski calls contextualisation. Finally, some authors suggest that the aspect of public value is central to evaluation of digital government transformation and related initiatives [31]. This concept covers outcomes, the means used to deliver them, trust and legitimacy, as well as addresses issues such as equity, ethos and accountability. Generating public value for citizens through government's services depends on the level of quality with which they are delivered, in terms of access, cost, fairness of provision and satisfaction levels. For example, digital services have the potential to empower citizens and broaden their engagement with governments [32]. By digitising, governments also can provide services that meet the evolving expectations of citizens and businesses, even in a period of tight budgets and complex challenges such as income inequality, geopolitical instability, and aging populations [33]. Increased trust in government – an important theme in digital government research [34] – is also expected to be fostered by digitalisation. These aspects, in turn, have the potential of increasing the resilience of the country's social and economic system, among other positive effects. However, in sum, not that much conclusive empirical evidence exists that may justify the different definitions and documenting positive changes and the digital transformation itself [35]. On the contrary, the promised gains seem to not have been achieved yet [36]. At the same time, scholars also warn about the potential negative effects of digitalisation in the public sector. For example, poor usability of digital government services, preventing universal adoption, may create digital divide, and this is far from the democratic and egalitarian goals of e-Government [37]; open data initiatives are related to the risk of violating privacy and possible misuse and misinterpretation of data [38], and so on. Academic and grey literature refers to digital transformation in a variety of ways. Meanwhile, the

sources reviewed offer some useful conceptualisation concerning the public sector innovations and their impacts on government [39]. The literature offers several classifications, some of which can be applied to understand digital government transformation. To begin with, all innovations can be defined by several dichotomies.

– *Incremental innovations VS disruptive innovations*. This dichotomy denotes the degree of novelty and change. The first type means incremental improvements of already existing products, processes or services (making them 'better'). The second type means introduction of completely new products, processes or services that replace the pre-existing ones (making them 'different') [40]. It is important to note that some authors further divide incremental ICT-enabled innovations in public sector into technical and organisational, while transformative innovations – into disruptive and radical, the latter being the highest level of change [41-43].

– *Top-down innovations VS bottom-up innovations*. The distinction stems from the types of actors who initiate the process leading to innovations/changes. While 'the top' means governments or institutions higher up in the hierarchy within government, 'the bottom' denotes the society, business or public employees, civil servants and mid-level policy makers who act as change entrepreneurs [41-43]. Various studies on technological, social, organisational and other types of innovation emphasise that depending on whether an innovation is incremental or disruptive, and top-down or bottom up can significantly affect its development [44], success [45-46], scaling process [47] and transformative effects [48], among other aspects.

In addition, most classifications of innovation in the public sector are based on the field in which the innovation is implemented. Drawing on the broader literature on innovation, various authors outline a number of such types of innovation, which are summarized in the Table 1.

a) *Table 1. Types of digital innovations in government*

Source: authors' elaboration

Third Section: The key risks and negative consequences of digital governance transformations.

Although some negative effects of technology adoption have been mentioned in the reviewed literature on citizens' engagement, policy making, public administration, and public services, in general the potential benefits and positive effects figured more prominently, reflecting the ongoing 'hype' about new technologies. In article, we focus exclusively on the negative effects regarding digitalisation of the public sector to bring balance to the overall discussion.

Research has begun to identify the manifold challenges faced in the public sector, spotlighting labour replacement, data management, quality, ethics and privacy concerns [49]. Largely intertwined in all government functions, concerns ask for a more exhaustive scrutiny focusing on negative digitalisation effects on civil societies and governments. Thus, we reviews key adverse effects, covered most widely in the research:

- Labour redundancy in the public sector;
- Technological bias, unfairness, and discrimination;
- A growing accountability gap;
- Threats to data privacy.

2) **Labour redundancy in the public sector.** *Given the potential application of AI to analyse public opinion, inform public policy, analyse trends, direct the police to areas where crime is most likely to occur and so on (see earlier sections in this chapter), it is worth considering what will happen to public sector employees who currently perform these functions. Although literature on the new technologies and public sector employment is relatively scarce, scholarship on automation more generally, which began to evolve with eGovernment 1.0, is still relevant in this field today.*

In order to assess the impact of automation on public sector employment, it is important to understand the routine-biased technical change (RBTC) theory [50].

It posits that new technologies will be used to replace routine tasks, defined as tasks - both manual and cognitive - that can be accomplished by machines using explicit programmed rules [51]. Estimates on the share of public sector employees that primarily perform routine tasks in the EU are not available to allow to estimate the potentials risks of this change. Nonetheless, such risk has been discussed in the literature, along with another possibility: that only the routine tasks will be replaced by machines, allowing more time for public sector workers to perform non-routine work.

To answer which of these effects - job or routine task replacement - is more likely to occur for different types of public sector employees, Frey and Osborne classified public sector employment into three groups [52]:

- Administrative and operative roles, which include administrative but also certain physical jobs such as hospital porters;
- Interactive and frontline roles, such as teachers, social service workers and police officers;
- Cognitive roles, which mostly apply to management positions.

Frey and Osborne argue that technology will likely to replace jobs in the first - administrative and operative group - by 2030. In the UK, these jobs account for roughly a quarter of all public sector employment [52]. Given how rapidly projected replacement can occur and its large extent, governments should consider ways to cushion the impact felt by public sector workers who are likely to lose their jobs.

Regarding interactive and cognitive roles, the scholars argue that technology will more likely replace some routine tasks in these jobs, complementing existing employment. That is because interactive and cognitive roles require both routine and non-routine tasks. Automated robots, for example, can measure patients' vital signals, but cannot interact with patients the same way nurses can.

Furthermore, there is some evidence from the US that jobs in the public sector performed by females and non- whites are more likely to be subject to automation, challenging the public administration's commitment to equity and diversity

if it promotes public sector innovation [53]. Also, even if jobs are not replaced, job satisfaction might decrease: literature cautions that the overreliance on AI creates a sense of lacking control among the citizens and public sector employees [54].

It is nevertheless important not to exaggerate the negative effects on public sector employment. Research on Northern Ireland shows that jobs in public administration, education and health are at the lowest risk of automation compared to other sectors [55]. Theoretical considerations instead suggest that automation will enhance the productivity of the public sector, which will allow for more job creation, compensating at least in part for the job losses [56]. Nevertheless, these considerations lack empirical evidence. Finally, jobs replaced by automated robots will likely yield savings not only in terms of payroll, but also real estate [52], which could allow to create more non-routine jobs.

3) Technological bias, unfairness and discrimination. *Even without human involvement, technology can produce biased results. Analysing independently and starting to learn from their environments, advanced algorithms may introduce unconscious biases by excluding or not including some individuals from the start, such as those who have the least and no access to technology [57]. Some authors also warn that automatic grouping of particular individuals or contexts that make further correlations misrepresents individuals as such [58], reshaping the notion of individualistic identity, and transforming into collectively grouped behaviours and consumptions [59].*

A relevant real life illustration is Canada's immigration and refugee system, raising serious human rights concerns as technology loses the sense of complex and nuanced situations resulting in unjust deportations and visa rejections [60].

Technological shortcomings may also occur because of poor quality of technologies. A number of real-life examples already exist. For example, researchers at the University of California Berkeley tested Amazon Rekognition – an intelligent face recognition tool the tool, which incorrectly matched 28 US Congress members with a database of arrested people [61]. This suggests that the incorrect facial recognition

match biases an individual before the encounter. It also leads to false identifications and correlations crucial in taking further actions.

Another example is IBM's search by skin tone technology for NYPD, which was eventually phased out in 2016 [62]. Quite often police officers would ask individuals to report to police station because of a generic physical characteristics match. These system mismatches increased opportunities for negative effects, such as racial biases and groups targeting. Similarly, a notable investigation by NGO Pro Publica found that a risk assessment software used across the US was biased against black defendants [63]. Meanwhile, the Los Angeles Police Department's tool predicting the likelihood of a next crime PredPol is suspected of reinforcing racial discrimination by directing police officers to black neighbourhoods instead of zeroing on the drug crime scene [64]. The adoption of these tools, often with very little public consent and knowledge, endangers the notions of democracy, civil liberties and human rights. Besides these aspects, Automated Decisions Systems (ADS), which government domains have come to adopt in its functions, present further dangers. Since ADS are relatively new, governments have not yet thoroughly assessed and evaluated this technology. With the main goal of efficiency, the use of this technology often comes at the expense of the most vulnerable populations, since ADS technology may disregard important nuances in predictive analysis and skew results. For instance, in 2013, ADS misidentified the policy target group in Los Angeles County. While assessing and predicting the likelihood of children in danger, ADS failed to create a comprehensive family picture and misidentified a family at-risk resulting in a child's death [65]. Automated decision making in Canada's immigration and refugee system misses the complexity in nuanced situations resulting in unjust deportations and visa rejections [66]. Evidence shows that untested and poorly designed technologies could result in unfair, discriminative and ethically concerning effects within government systems, which also makes it difficult to question or remedy bad decisions and errors at a later stage.

4) A growing accountability gap. *The new era of digital transformation has shown that*

private sector has taken an undisputed lead in adopting new technologies, so it is often advantageous for public agencies to form public-private partnerships to tap into the knowledge already accumulated in private organisations. However, some authors argue that private sector leadership in digitalisation threatens to create a power asymmetry between public authorities and private companies [67]. For example, already in 2014, the Danish Ministry of Tax declared to have no control of over more than 200 systems, which used machine learning algorithms in policy making to directly affect citizens [68].

Scholars also suggest that smart cities are becoming overly dependent on private companies [69]. For example, in the Netherlands, Utrecht's smart city pilots and projects entirely rely on private companies [70]. The local government is not aware how many sensors and cameras exist or what information private companies collect. Companies, in fact, are getting away with it because of their advanced technological developments and bold applications of data compared to public sector.

A Dutch CityTec case depicts how private companies are taking a full control and refuse to share collected data with city municipalities [70]. Outsourced decision making with dubious accountability and regulation effects has proven to be an alarming theme in government processes, questioning the extent to which governments should involve private sectors.

5) Threats to data privacy. Governments collect increasing amounts of data, and are increasingly criticised for employing digital data-driven technologies over preserving privacy concerns. At the same time, although open data is seen as a positive development, making government datasets publicly available may further threaten personal information disclosure, which can result in open profiling or data mining for various private purposes [71].

A number of examples exist depicting a combined private and public sector's invasion into private lives. For instance, in 2013, Seattle's Police Department implemented wireless sensors throughout the city to provide better emergency response, but then faced backlash because sensors

could be used to track people's wireless devices [72]. Swedish government experienced a leak of population's personal vehicle data, forcing the authorities to restrict outsourcing private and sensitive data to third parties [73]. In 2018, a hospital in Portugal received a fine for an indiscriminate access to, violation of and failure to ensure continued integrity and confidentiality of processed personal data of users [74].

Such instances call to question how much power digital technologies award to governments, and how that power might impact democracies. Some authors warn that government access to personal data can result in Big Brother type of surveillance, eliminating checks on government processes [75]. In fact, quite many times digital tools are employed with little public oversight, putting the basis for unethical personal data use practices [76]. These issues relate to important barriers and preconditions for big data use in government.

Conclusions. The synthetic overview of the empirical evidence on the effects presented in literature, as well as of the more prospective and prescriptive arguments, allows to distinguish between three very general groups of effects of the applications of most recent and emerging digital technologies in government:

- *Efficiency and productivity gains, cost-savings.* Applications of ICTs allow saving public resources or allocating them more efficiently. The body of literature on the economics of ICT in public sector provided the most conclusive evidence on actual (rather than expected) outcomes of digital technology applications. Effects, such as reducing operational and labour costs in public administrations, allowing staff to focus on more important tasks, making service delivery faster and cheaper, are more immediate and comparatively easier to measure as compared to the effects on, for example, government accountability or inclusion.

At the same time, these direct effects are among the main drivers of digital innovation, as we will continue to explore in future studies. As anticipated, there is a gap in terms of the possible negative side effects on jobs and employment. Already at a time of the first e-Government wave,

many talked about the redeployment of public sector employees to more added value tasks, which rarely occurred. These gains either remained virtual (no redeployment), or led to layoffs, precarisation and flexibilization of public sector employment. The promise of personnel redeployment calls for new skills in government, as it does in industry in the perspective of Industry 4.0.

- *Effectiveness and quality improvements.* Besides making things cheaper, technologies also allow to make them better. Most of the reviewed sources also highlight – directly or indirectly – the effectiveness and quality of public sector operations, functions and services as a result of digital innovations in government. With more accurate prediction, real-time detection and tracking, improved resource allocation, better decision making, and personalised context-aware and context-smart services, powered by AI and other discussed technologies, governments can develop better, more inclusive and empowering services and policies. These, in turn, improve user satisfaction and solve problems of collective action.

- *Transparency, accountability, trust and legitimacy.* The outcomes of digitalisation in terms of more trustworthy governments and stronger democratic processes are also touched upon in the literature – although they are covered to a lesser extent and supported by weaker evidence. The definition of the impacts and their measurability in this dimension remains still vague and fragmented. While many sources point out several possible negative side effects, generally it is expected that better outputs of the government – in terms of administrative effectiveness, public services and daily interactions between citizens and public administration – should lead to more transparency, accountability and, ultimately, more legitimacy. Given such a long causal chain, these effects are even more difficult to evaluate empirically. Nonetheless, they remain among the core expectations from digitalisation in the public sector.

Important to note, these findings are quite in line with the trends of actual digital government initiatives and reform trends in the last ten years in the EU. The initiatives largely include programs to raise the efficiency and quality of public services,

increase access to services and customer orientation, and encourage further ICT- enabled public sector innovation [77].

The main conclusions we propose are:

First, research on actual effects and impacts of technology in government still lacks comprehensive and conclusive evidence, and the reviewed literature – even the most recent articles – still talks about the transformative effects rather theoretically and normatively.

Second, the image of digital government transformation is often framed as simply the introduction of digital innovations, which are seen as a value or a positive development in itself. Fewer sources speak about transformation in terms of outcomes, caused by these innovations – which are also much more often incremental rather than disruptive. Related to this, the majority of reviewed sources are generally positive about the current and future impacts of digital transformation. As the lack innovations (especially of disruptive ones) is framed as the main problem, generally fewer sources talk about actual and potential problems caused by biased algorithms, insufficient data protection or privacy violations.

Recommendations

The main directions of further development of e-Governance may be:

- 1) The impact of AI on employment in the public sector should be more carefully assessed;
- 2) Creation of unified platforms, rather than individual distributed networks according to areas of activity;
- 3) e-government 4.0 and the "regulatory regime";
- 4) Development of personnel potential to ensure successful digital transformation;
- 5) Adopting an ethical basis for minimizing the negative consequences of new technologies;
- 6) Using the advantages of predictive analytics to ensure policy efficiency and effectiveness;
- 7) Opening access to data through the legal framework that protects privacy;
- 8) Creating a culture of digital transformation in public administration.

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