Hybridity, Digitization and Algorithmic Governance in Bureaucracies[1]

Tero Erkkilä, University of Helsinki (tero.erkkila@helsinki.fi)

Abstract

Bureaucracies and their processing of information have evolved along the formation of state from absolutist to welfare state and beyond. Digitization has both reflected and expedited changes in institutional practices and administrative culture. This paper focuses on the relation of emerging hybrid forms of governance and digitization in bureaucracies. I argue that in oder to understand digital transformations of state, one needs to engage in contextual analysis of the actual changes that might show even paradoxical and unintended effects. Initially, the effects of information systems on bureaucracies were confined to single organizations. But digitization has enhanced interaction with the society in terms of service provision, responsiveness, participatory governance and deliberation, as well as economic exploitation of public data, all of which have contributed to hybrid forms of governance. Indeed, the history of digitization in bureaucracies also reads as an account of its opening, meaning also inclusion of different actors and stakeholders, as well as externalization of certain activities and services. But there are also contradictory developments concerning the use of big data and algorithmic governance technologies that have created new confidential or secretive domains of information processing in bureaucracies, often involving non-state actors and proprietary software. This has created new demands for control, both in terms of citizen information rights as well as accountability systems.

Keywords: Hybridity, Information, Public Administration, e-Governance, Automation, Algorithm, Open Data, Big Data, Privacy, Surveillance, Accountability

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Introduction

Bureaucracies and their processing of information have evolved along the formation of state from absolutist to welfare state and beyond. Digitization has both reflected and expedited these changes, but it is important to keep in mind that digital era governance is also conditioned by existing information resources as well institutional practices and administrative culture. Digitization coincides and facilitates hybridization in public governance (Gritsenko and Wood 2020), understood broadly as the blurring of tradition organizational boundaries such as public and private (Johanson and Vakkuri 2017). Hybridity is also associated with accountability, both as its challenge as well as its type, hybrid accountability (Thomann and Sager 2017; Benish and Mattei 2020).

My paper explores the relationship of digitization and hybridization, discussing how these now progress along each other. I argue that that to understand the digital transformations of state, one needs to engage in contextual analysis of the actual changes that might show even paradoxical and unintended effects. While hybridity is often understood in terms of public-private dichotomy (and its hybrid forms), algorithmic governance and automation of decision-making also highlights the need to consider the emerging hybrid forms of human and non-human agency. Moreover, through digitization we are increasingly also reconsidering the boundaries of national and transnational governance.

Initially, the studies on the effects of information systems on bureaucracies focused on single organizations. But the focus has since shifted towards digitally enhanced interaction with the society in terms of service provision, responsiveness, participatory governance and deliberation, as well as economic exploitation of public data. Indeed, the history of digitization in bureaucracies also reads as an account of its opening. But there are also contradictory developments concerning the use of big data, learning systems and digital surveillance technologies that have created new confidential or secretive domains of information processing in bureaucracies.

Another pressing topic is automation of decision-making, which can range from rules-based decisions to learning systems. This has created new demands for control, both in terms of citizen information rights as well as accountability systems. While one should be cautious about claims of revolutionary changes, the increasing tempo and interconnectedness characterizing digitization of bureaucratic activities poses major challenges on public accountability. My paper proceeds by discussing the historical roots of state information and

changes of information processing in public administration through digitization. It also highlights the transformations of state and new stakeholders and forms of collaboration that are tied with digitization, as well as the emerging questions of accountability. I conclude that instead of readily assuming structural changes, one should engage in contextualized analysis of the actual effects of digitization to fully understand them.

Information Processing, Digitization and State Transformations

Modern state is based on its ability to collect and process information. In order to run the basic state functions, let alone welfare state tasks, bureaucracies need to collect massive amounts of registry data and statistics. State bureaucracies have also traditionally produced cartographical and meteorological information and accumulated data on national health. While such information resources and their processing has been at the heart of bureaucratic activities, there is a wider societal interest in their use. The allocation and processing of information reflects and interacts with the development phases and reform aspirations of public bureaucracy.

The history of information processing and digitization of bureaucracies reads as a narrative on the opening of bureaucratic secrecy and broader societal use of state information. The absolutist state was characterized by state secrecy. Modern Weberian bureaucracy also held its information resources closely to itself. The welfare state governance builds on collecting extensive information on the citizenry and interoperability between different bureaus. Through digitization, the states are reassessing their information resources that are used to provide citizens on-line services but also used as a raw material for digital innovations, both within and outside bureaucracies.

It is commonplace to conflate digitization in bureaucracies with online public services and public organizations use of social media. However, this perception comes to overlook the historical aspects of the digitization process as well as its scope. Digitization in bureaucracies through the use of computers started already in the 1950s, but the governmental use of punch cards started well before that with Hollerith machines being used already in the 1890 US census (Lubar, 1992). The lineages of state information, such as cartography and census, are obviously even longer, reaching back to the absolutist era and its forms of governance (cf. P. Anderson, 1993).

Noteworthy in the early practices of state information management was their secrecy. Any kind of administrative information of state was not to be disseminated outside the sphere of government. All documents, statistics and maps were strictly for the use of government and they were seen as king's property (Würgler, 2002, p. 121), not to be accessed by the citizenry let alone representatives of foreign countries. This portrayed the absolutist perception of government as a domain of king and his administrative machinery, from which the subjects were excluded (Habermas, 1989; Melton, 2002, p. 8).

Even though there might have been certain cases in which absolutist state informed its citizens on state matters such as finances, these were rare events strictly codified and regulated by the state bureaucracy (Rosanvallon, 2000, p. 22). The culture of opacity provided the monarch a god-like figure; the 'mystery of the state' upheld the legitimacy of the rule (Gestrich, 1994, pp. 41, 43–44). Therefore the breaking of public censorship and administrative secrecy were closely related to the degrading of absolutist rule, secularisation and transition to liberal-bourgeois rule (P. Anderson, 1993, pp. 190–191; Gestrich, 1994, pp. 55–56; Habermas, 1989; Melton, 2002, p. 9).

The formation of modern state was also closely linked to states ability to collect and process information, apparent in the rise of statistical institutions (Desrosières, 1998). The early stages of state information management were closely related to the formation of the state. National statistics served the needs of the state and these institutions started to take shape in 17th century although the developments in different countries took different paths (Desrosières, 1998, pp. 24–29). Indeed, the rise of the modern state would not have been possible without statistical information (Sheehan, 2006, p. 5). These instruments of knowledge also imply power relations, as statistics construct and render the subjects of governance "governable" (Miller & Rose, 1990). But statistics also helped to construct nations as imagined communities with measurable attributes (B. Anderson, 1991).

Modern welfare states routinely collect and maintain massive information resources that form the functional base for public administration and state. Registry data is used for various acts of governing – allocating goods and benefits and producing statistics and services. Public information also has a great value in the formation of public opinion and public debate: vast majority of information on social issues originates from the government institutions, even if it would reach the wider public through secondary sources (media, research institutions, private information services etc.).

According to Giddens, modern nation states could be called as surveillance states as the public authorities' knowledge of their subjects of governing is highly detailed (Giddens, 1985, p. 14). Welfare states collect comprehensive data resources on their citizenry for the general steering of the state. However, welfare state governance not only requires in-depth information to be collected on the citizenry, but also on dwellings, real-estate, communities and companies. This has led to the accumulation of comprehensive registry infrastructure. In some context, such as the Nordic countries, there is also a wide-spread use of unified identification numbers, which allows the combining of different registries. One can see this as an aspect of the open and uncovered means of governing; a trust based Nordic institutional peculiarity (Götz & Marklund, 2014; cf. Rothstein, 2005). But this also highlights citizens information rights and the Nordic countries also have a long tradition in open government (Erkkilä, 2012). In short, there is a reciprocated commitment in openness: while the citizens allow the state a pervasive view into their personal lives, the government grants them access to its information.

Computerization and digitization of public administration as well as the rise of internet have influenced the administrative processes and the use of government data in most of the states, raising new issues of governance. Some observers have argued for the birth of a network society or information society, leading to rapid societal transformations, and the developments have also seen to have marked the rise of digital era governance (cf. Castells, 1996; Dunleavy et al., 2006; Lash, 2002). However, states still differ significantly regarding their institutional trajectories. The debates on information society and digitization occasionally run the risk of losing sight of the historical peculiarities of government information, such as registry data.

Even though countries are converging in the technological means of managing public data, there are great differences in the data infrastructure and cultural traditions in its use. For instance, the Swedish census data has an exceptionally long history: after first being collected by the clergy in 16th century, the Swedish population statistics are continuous from 1749, both in Sweden and Finland (Swedish statistical institution was officially formed in 1748 when Finland was still part of Sweden). Public records of countries also differ in their scope, coherence and integration. Again, the Nordic welfare state governance stands out, as it builds heavily on the use of registry data and ability combine them, which also entails potential for the use of big data and automation of governance. Here the institutional trajectories of public information also influence its future potential.

Bureaucratic Transformations and Digitization

Information processing in bureaucracies not only reflects but also facilitates transformations of state and public administration. This happens in the conjuncture of technological change and shifting ideas on the role of state that affect how and for what technological innovations are used in public governance. These might be aimed to serve public sector reform on the one hand and citizen service provision on the other. But they are also linked to public organizations attempts to rearrange their own activities.

In organizational research and science and technology studies 'information' has often been discussed from the perspectives of epistemic communities, knowledge management, information society or risk society (Beck, 1992; Castells, 1996; Haas, 1992; Knorr-Cetina, 1999; Lash, 2002; Nonaka & Takeuchi, 1995). Research has also focused on institutional transformations of the adoption of IT systems in public sector organizations. In early 1990s the focus was still very much on the public administration itself and the use of information technology in bureaucracies was discussed under the notions of public (sector) information systems, highlighting their seamless adaptation to the existing processes (Newcomer & Caudle, 1991). But at the same time, the information systems were also increasingly seen as tools for change, being linked to management ideas such as the total quality management (Hendrick, 1994). The focus on single organizations can be understood against the limited connectivity between different organizations.

The effects of management information systems were also discussed under the label of cybernetics, carrying the idea that control of information would lead to greater control in management, though this idea has been also criticised (Overman & Loraine, 1994). Indeed, the general assumption that both knowledge and power tend to accumulate on top of organizational hierarchies might prove to be quite mistaken, as the street level bureaucrats are often the actors with best knowledge and significant autonomy in their decisions (Lipsky, 1980).

Internet and digitization have changed the tools of government (Hood & Margetts, 2007), carrying the potential for innovation in public management. These aspirations are often linked with structural reforms of public institutions, though the actual structural changes caused by the adoption of IT systems might be limited, even if they would enhance efficiency (Heintze & Bretschneider, 2000). The scholarship that highlights the effects of information technology on public institutions, portrays this "informatization" to carry even revolutionary

potential, shaping the practices and structures of public administration (Kernaghan & Gunraj, 2004).

However, one should be cautious about claims of revolution and modernization of public administration and bureaucracy. There is often no single rationality to reform processes. Instead, many different ideas and aspirations get tangled up with each other, seldom consistent enough to have a single direction and hence producing side-effects or, even, reverse-effects for acts of "modernisation" in public administration (Hood, 1998, pp. 208–211).

Like public sector reforms pursued under the label of New Public Management (NPM) (Christensen & Laegreid, 2007), also the application of information technology to public administration is context specific, reflecting the administrative culture and general political climate as well as possible tensions between state and citizens that differs between countries.[2] A comparative study on the relation of public management reforms and e-government in Europe found that e-government initiatives rather reflected existing patterns of public service provision instead of transforming them (Torres et al., 2005). While digital era governance is also proposed as one of the alternatives for NPM along public value management and collaborative governance, there are also tensions between them, for example through trends of centralization and big data in digital governance (Greve 2015).

This is not to deny the transformative potential of the digitalisation of public information and the use of ICT in public administration. On the contrary, technological changes in its allocation mechanism has made it possible to perceive public information as a non-excludable good (cf. Lane, 1993, p. 23), which could be granted to everyone. In principle, there are very few obstacles for disseminating digital public information and its unlimited re-use could be possible within the frame of existing ethical standards and data resources. In practice, the way bureaucracies perceive their information resources and wish to publish information on and resulting from their activities is still largely constrained by administrative culture, performance management schemes, and legal framework (see next section).

Also technological constraints prevail, for example with public administrations using outdated "legacy systems" that still perform the task that they were originally designed for, but not much

[2] A historical account on adopting Xerox machines in the public administration of communist Hungary demonstrates how the machines were actually used for disseminating anti-government material, rather than enhancing existing administrative processes (Dányi, 2006).

else. This also links public and private collaboration, as the information systems of public sector are mostly designed, operated and integrated by private companies, while the state as the contractor bears the risks and costs of outdated systems, which could even set constraints for interoperability between public organizations (Hellberg & Grönlund, 2013). Estonia's e-government success is partially explained by its lacking of legacy infrastructure (Kalvet, 2012).

Different modalities of data, such as open data and big data, are also associated with different types of public sector reform and transformations within public organizations. The drive for open data coincided with NPM reforms; but it should not be confused with big data, which is not necessarily "open" and implies different kind of public governance and information processing altogether (Clarke & Margetts, 2014). Indeed, big data analysis in public organizations often concerns sensitive information resources, such as data on public health and taxation that governments hold onto themselves and only share with strategic partners.

Knowledge management in public administration is also seen to stress the role of stakeholders (Riege and Lindsay 2006). though the body of knowledge management research on public organizations is criticised for being fragmented (Massaro, Dumay, and Garlatti 2015). In similar fashion, organizational learning in public organizations has been deemed as somewhat under-researched topic with a tendency to overlook the contextual factors and seek analogies from private sector organizations (Rashman, Withers, and Hartley 2009). This highlights the need for contextualized analysis of knowledge in public organizations with broader geographic coverage and versatility in policy domains concerned.

Interaction with Society: E-Governance, Digital Democracy and Hybridization

Traditionally, information processing in bureaucracies has been a task conducted in the "back end" of activities and not visible for the citizens. Technological developments in the processing of information are also reflected in the ways that bureaucracies are interacting with the society. This also implies hybrid forms of public governance, as digital public data is being shared with different societal actors, but also becoming a commodity sold by public organizations.

The widespread use of punch cards and computerization of public administration coincided with the rise of welfare state functions that hardly could have been possible without them. Since the development of the Internet in the 1990s, digital public services have also come to

involve the citizens, making the processing of their personal information visible. As a concept e-governance is service oriented and highlights the interaction between the government, citizens and businesses, though also linking to public sector reform (Bélanger & Carter, 2012; Dunleavy et al., 2006).

Often discussed as a "revolution" (Garson, 2004), digital or electronic government is seen to bring major changes and advances in enhanced efficiency, public sector performance and democratic responsiveness (Forlano, 2004; Garson, 2004; West, 2005). Here, the research fields on digital government and public management research are converging (Gil-Garcia et al., 2018). E-governance is also often associated with e-democracy or digital democracy as computer-mediated participatory governance (Chandler & Munday, 2016), though these should not be conflated as e-governance initiatives carry various other motivations and may even have unintended effects in democratic terms (Sundberg, 2019). Hence, the assessment of democracy enhancing effects of e-governance initiatives should be done against a typology of democracy (Dahlberg, 2011). Open government, though often narrowly used as a synonym for open data, also highlights the participatory aspects of digital governance (A. J. Meijer et al., 2012).

Scholars have identified different stages and determinants in e-government, according to which countries, and cities, differ (Basu, 2004; Ingrams et al., 2018). Indeed, digital governance is not only confined to national bureaucracies. The concept of smart cities refers to digital governance on a sub-national level, referring to digital and data-driven urban governance. Along the technological aspects, this is also an organizational challenge for management and co-operative governance in an urban space (Batty, 2013; A. Meijer & Bolívar, 2016; Öberg et al., 2017). The smart cities paradigm also emphasises the linkages between public and private actors as well as their relation to citizens and services. In addition, transforming the existing processes of government, the use of digital online platforms also allows governments to collect initiatives and information from citizens for enhancing and co-producing public services, though this also entails its limitations (Mergel, 2018).

Public bureaucracies like all organizations are becoming image conscious and have also adopted new information strategies accordingly (Yiannis, 2005). An apparent sign of this is the adoption of social media even by organizations that oversee information resources of strategic value, for instance in foreign policy, defence and security matters. The adoption of social media can be understood as a diffusion process, where organizations learn from each

other (Mergel & Bretschneider, 2013). Despite their barriers of implementation, the use of ICT and social media is seen to have potential for increasing government transparency and curbing corruption (Bertot et al., 2010; Jaeger & Bertot, 2010).

Public information is also a valued resource of knowledge economy. In this context, public information is perceived as a "good" or a "commodity" for which there is a "market". For example in Europe the concept of public sector information has been a marker for a new domain of governing re-use of digital public data, such as cartographic information (Blakemore & Craglia, 2006). The policy discourse of public sector information refers to a European-wide policy problem that emerged in 1990s in the conjuncture of NPM and digitization of public data, where public organizations started charging for the use of their data (European Commission, 1998). This is somewhat paradoxical, as the performance management schemes building on budget transparency effectively diminished the access to public information and interoperability of public bureaus that started charging for their data.

This might even lead to constellations, where organizations act both as regulators and market actors in a certain domain. For example, the Finnish Population Register Centre is responsible of the data protection of the Finns, but at the same time makes significant revenues by selling the data that it us supposed to protect (Erkkilä, 2012, Chapter 4). This shows how technology and contradicting rationalities of hybrid governance and blurring public-private boundaries cause potentially unintended effects in the use of public data, but also contradictory demands of accountability.

State Surveillance and Transnational Governance

There are also claims for the rise of a surveillance state that is constituted with the help of digital technologies. While surveillance state is often posited in the realm of intelligence and policing (Atkinson, 2015), it has also been identified in the allocation criteria of social security, leading also to reflexivity by the recipients of benefits as well as the society at large (Manji, 2017). Security threats posed by terrorism have been seen behind the move towards surveillance state, but it is facilitated by the availability of technological tools and is seen also to have grown out from welfare state; in addition, the lines between public and private data collection is seen to have blurred (Balkin, 2008).

The dystopian views of an Orwellian surveillance state are at present posited on the state's ability to collect and process massive information resources stemming from various sources, but the socialization to a life under surveillance is seen to stem from the cultural shift caused by digital devices, commercial applications and service platforms whose use pervades everyday life and normalizes the idea of constant surveillance (Giroux, 2015). Hence, the (digital) surveillance state coincides with surveillance capitalism (Zuboff, 2019). This again demonstrates the blurring of public-private boundaries due to digitization and the increasing power of major digital platform producers such as Google and Facebook. This has also raised calls for their regulation, which is difficult due to the global nature of these companies. Consequently, the European Commission has made the regulation of big tech its ambit (Espinoza 2020a; 2020b).

Indeed, the use of big data is seen to cause systemic changes on the forms and aims of surveillance (Andrejevic & Gates, 2014). The Chinese initiative of social credit system has taken the development to an unforeseen level, classifying citizens and organizations for their trustworthiness and rating them for their eligibility and access to education and markets, for example (Liang et al., 2018). The Chinese system is seen to entail different modalities and functional logics of transparency that entail power relations, but also potential contradictions (Hansen and Weiskopf 2021). Such effects obviously also vary between democratic and non-democratic regimes.

While international statistics and exchanges of diplomatic or surveillance information between nations have a long history, national bureaucracies are increasingly exchanging other types of information, which makes the different cultures of data processing and regulatory schemes of privacy visible. In the aftermath of the September 11th, 2001 attacks in the United States, the exchange of information in security matters has intensified, concerning for example airline passenger data. These evolving practices of transnational governance of public information also involve new venues of decision-making, where institutional practices and regulations are being adopted (Hosein, 2004). But it has also led to transnational debates and struggles over the regulation of privacy and how the personal information of individuals can and should be treated (Farrell & Newman, 2019).

Technological innovations such as the use of biometric identification has also been adopted transnationally (Liberatore, 2007). In the European context, there have been concerns over the erosion of personal privacy following the launching of the Area of Freedom, Security and

Justice in 1997 and the concerns over terrorism (Gonçalves & Jesus, 2013). Also the exchange of data through the EU information systems concerning law enforcement and immigration in the Schengen area has expanded, also blurring the lines of national bureaucracies (Broeders, 2007; Johnson & Williams, 2007; Zaiotti, 2007). Along registry data, national governments are also in hold of documents stemming from international organizations that might be treated according to different standards than documents of national origin (Erkkilä, 2012, Chapter 5).

The proliferation of surveillance state technologies may also come to touch upon the boundaries of hybridity such as public vs. private and human vs. artificial intelligence, while also testing the division of "national" and "international". For example, Chinese companies have been exporting surveillance technologies to other countries, raising concerns that the algorithmically collected data might spill from these companies to the Chinese state (Kynge et al. 2021; Mozur, Kessel, and Chan 2019). This demonstrates the difficulty of classifying actors and identifying agency and accountability relations in such constellations.

Algorithmic Governance: Automated Decision-Making, Big-Data and AI

The notion of algorithmic governance has risen as a marker of a new shift in information processing through machine-based learning and big data. Often also discussed under the label of artificial intelligence (AI), algorithms seem to have acquired new connotations in this conceptual shift, increasingly associated with autonomy. This is remarkable, since algorithms are logical orders of reasoning that enable computing and statistical inference alike. Algorithms have been traditionally compared to law-like hierarchies that are largely predetermined, meaning that there is not necessarily machine learning implied.

But through the hopes and anticipations set for AI, algorithms have acquired seeming agency that sees "the algorithm" as a potential actor. Consequently, automation and algorithms are often conflated with AI and machine learning. This conceptual confusion is problematic, as it blurs the different modalities of computer-aided decision-making, ranging from rule-based decision-making (systems based on legal or other rules) to systems that are machine learning assisted or where decision-making is fully based on machine learning, creating different kind of needs for designing accountability measures (Veale et al., 2018).

AI and big data are seen to contain serious transformation potential for public administration, but also challenges (Pencheva et al., 2020). Artificial intelligence has been seen to imply benefits and dangers for public administration, concerning responsiveness, judgement and accountability (Barth & Arnold, 2016). Indeed, the bureaucratic hierarchies have traditionally provided somewhat clear chains of responsibility, potentially blurred by automation and increasing agency and discretion by machines.

Algorithms are increasingly being used and developed for decision-making in various bureaucratic activities. The use of service bots might be the most apparent application of algorithms in public governance, where on-line help chats are increasingly being automated. But countries have also extended their use of machine learning and big data analysis in health care systems, national health research and taxation. There are also attempts to use the algorithmic analysis and prediction on law enforcement and governance of social benefits (Margetts & Dorobantu, 2019).

The automation of decision-making also creates new hybrid forms of public governance, where the human and non-human agency is difficult to tell apart. This also creates apparent problems for accountability. In Finland, the legal overseers recently found National Tax Administration's and Finnish Immigration Service's use of automated decision-making illegal, as it did not comply with the current legal requirements that administrative decisions are always associated with a responsible civil servant (Ahonen and Erkkilä 2020). Such chains of responsibility are not present in automated decision-making processes, where various individuals are engaged in drafting the algorithmic rules and parameters as well as selecting data, but no single individual makes the actual decision. To allow algorithms such agency, Finland is currently revising its legislation (Oikeusministeriö 2020). This marks an opening for novel hybrid arrangements of public governance, where agency lies at least partially on algorithms or we come to acknowledge shared responsibility in legal terms. Also public organizations themselves are adopting codes of conduct concerning the use of algorithms and artificial intelligence, as demonstrated by the National Tax Administration in Finland (Verohallinto 2019).

Biases and Black Boxes

The standing scholarship points to the evolving power relations and biases of algorithms that are often perceived as black boxes with major social and political influence (Bucher, 2018;

Pasquale, 2016). The algorithms are seen to carry social biases both through design but also through the data that they use. The biases in data are particularly pressing in machine learning, where algorithms are being "taught" by exposing them to existing data resources, effectively also exposing them to biases in the data.

Such biases also concern the use of algorithms in public governance, where information services but also decisions might be partially automated, or there are attempts to anticipate certain incidents that need governance intervention. Eubanks study discusses the issues emerging from the use of algorithms in governing social benefits and health care issues in the United States, showing also how inequality might become systemic feature of such automated initiatives (Eubanks, 2018).

The issues concerning the opaque character of algorithms raises obvious questions of accountability. Here the different historical traditions of state information are becoming visible. Many novel solutions concern the core functions of state governance, highlighting also institutional trajectories in registry keeping and use of state knowledge that are potentially changing. This also draws attention to the increasing role of proprietary algorithms in national governance of knowledge and innovation as many of them are products of private companies that also are used in co-producing new information resources.

Changing Accountability System: Algorithmic Transparency

Though the global spread of freedom of information laws is also linked to political conflicts in local contexts (Berliner, 2014; Worthy, 2017), it has also been linked to the growth of public sector and welfare state; as the scope of government activities grew and its reach of private life increased, the adoption of information access laws was an accountability measure to potentially balance this (Bennett, 1997). Countries have also adopted data protection ombudsmen, who are responsible authorities for privacy matters. In some countries, such as the UK, these tasks may also belong to the mandate of an information commissioner. These institutions function as complaint handling bodies but also provide legal assistance.

There are also international co-operation networks for these actors (European Data Protection Board, 2018; Global Privacy Assembly, 2019). At the same time, the number of countries with privacy acts has risen globally. In 2019, over 130 countries had adopted a data privacy law, most of whom also had a data protection authority in place (Greenleaf, 2019). But while

the liberal notion of (information) rights highlights the individual, we should also consider the systemic issues of accountability.

Max Weber outlined some consequences of introducing numerical governance to modern bureaucracy, identifying a shift towards instrumental rationality (cf. Weber, 1978, p. 975). This leads us to ask what exactly is new in the emerging constellations of algorithmic governance. We can at least highlight tempo and interconnectedness of the present transformations and processes. The changes we are witnessing are progressing fast, but more notable is the drive towards automated administrative procedures running real-time, uninterrupted by human agency. Interconnectedness is demonstrated in the increasing coupling of data, systems and actors, including those outside bureaucracies. There is also a real concern over concentration of technological platforms, often privileging major corporations, which might have consequences for both democracy and risk management (Perrow, 1999; cf. Winner, 1980).

There are also arguments that due to technological changes the accountability measures should be reconsidered, highlighting horizontality and transparency (Bovens & Loos, 2002; Petrakaki, 2018). In this respect the accountability measures also become engrained in the use of technology. As governance by algorithms is increasingly rule-based, resembling legal hierarchies, the logical operations and decisions of government are increasingly taking place when these knowledge products are being created. Hence, the accountability system should take the development into account, including the potential trade-offs in responsiveness and openness of the system (Erkkilä, 2007; Margetts & Dorobantu, 2019; cf. Mulgan, 2003).

Algorithmic transparency has often been proposed as an accountability measure. Here the focus is on the logical operations of the code, what the algorithm is instructed to do, and how this is documented to the subjects of algorithmic governance. This ultimately involves not only understanding of the algorithm but also "how the machine thinks" (Burrell, 2016). However, transparency is at the hub of various social interests, such as security, safety and openness (Janssen & van den Hoven, 2015), making it difficult to find generalizable solutions. Moreover, algorithmic transparency has been criticized for being of limited effect as an accountability mechanism (Kroll et al., 2016). For example, it is somewhat unclear who would be the suitable and competent audience of algorithmic transparency (Kemper & Kolkman, 2019).

Indeed, algorithmic governance challenges bureaucratic accountability, as it is becoming difficult to answer the basic questions of accountability: who is accountable, to whom, for what and how (Mulgan, 2000)? The civil servant's legal responsibility for his or her actions is already difficult to establish with simple rule-based automation, where there is no single individual who makes decisions. Rather, there might be several individuals responsible for different elements of the process that produces the decisions, such as people developing, testing, and maintaining the system and its parameters and criteria, but also individuals responsible for maintaining the data used. The regulation becomes increasingly difficult if we consider the possibility of learning systems that might even alter their own functionality, meaning that the documentation of the decision-making process becomes outdated. There are also dilemmas rising from semi-automated systems, where the algorithm prepares the decision that is then formally made by an administrator (cf. Harvard Law Review, 2017). Here one must ask if the individual has real discretion and capacity to challenge the analysis and proposal for a decision prepared by the machine.

Regulating the emerging issues has also become increasingly transnational, but accountability systems are still rooted in national bureaucratic traditions and legislation. A challenge for the future of digital governance is the ability agree on joint standards. Alone in data privacy there are diverse ethical standards globally. The GDPR data privacy directive of the European Union has paved way for a global model on privacy or at least compelled countries and organizations outside the EU to alter their practices on data privacy (Greenleaf, 2019). However, a major challenge will be the transnational governance and regulation of algorithmic governance and self-learning systems that concern information of individuals (see for example Council of Europe, 2018). Moreover, as algorithmic governance is becoming increasingly transnational, the regulatory frameworks run the risk of being bound by national borders.

Towards Contextual Analysis of Hybridity and Digitization in Public Governance

For scholars of politics and public administration, hybrid governance and digitization makes an interesting and important field of study that invites us to consider dialogues of change and continuity, control and democracy, and efficiency and deliberation. Information processing in bureaucracies both reflects and facilitates transformations of state and public administration.

The development of digital public governance advances on technological innovations and shifting ideas on the role of state.

Modern state is based on its ability to collect and process information and registries on its subjects of government. The rise of the welfare state tasks saw the rise of the public registry infrastructure. Through ICT and digitization of public information resources, the use and allocation of public information has changed. On the one hand, we can see a trend towards online public services and opening of public data for potential new uses, also outside the bureaucracies. On the other hand, the digitization of public data has also allowed for automation of public decision-making and use of learning algorithms and big data that might not be open by nature, but rather concerns confidential information in domains such as national health, security and taxation.

These developments have been discussed under various labels such as management information systems, e-governance, digital democracy, information society, knowledge economy, smart cities, surveillance state, AI and algorithmic governance. A joint tendency for these different lines of inquiry is the argument of a discontinuity with the past, maybe even a revolution of activities. But a closer look at the actual institutional developments shows a more complex and context-bound picture, where the emerging activities are constrained by past institutional and technological choices, administrative culture and values, as well as coinciding other reform agendas. Information societies seldom just “emerge” from somewhere and often there are long trajectories of data collection and processing that underlies them. One should not belittle the changes that have occurred as digitization has indeed allowed far-reaching changes in public bureaucracies. But instead of readily assuming structural changes or improvements of efficiency, responsiveness and democracy of public administration, one should engage in contextualized analysis of the actual changes.

The concern over privacy emerged along the computerization of public administration and expansion of welfare state functions, leading to countries’ adoption of privacy acts that have since diffused globally. Interestingly, the role of bureaucracies in collecting and processing information might even be on the retreat as private companies are increasingly in hold of data on their customers that far exceeds the data resources of the state. Nevertheless, the new constellations of information processing in bureaucracies such as the transnational sharing of registry data, automation of decision-making, and the use of big data and learning systems in public administration have created major challenges on the existing accountability systems.

While one should again be cautious about claims of revolution, the increasing tempo and interconnectedness of activities are pushing states and international organizations to think about ethical standards and ways of regulating the emerging issues.

While hybridity is often understood in terms of public-private dichotomy (and its hybrid forms), algorithmic governance and automation of decision-making also highlights the need to consider the emerging hybrid forms of human and non-human agency. Moreover, through digitization we are increasingly also reconsidering the boundaries of national and transnational governance.

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