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ICT Occasions Changes in E-Government: The Case of Elster

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KEYWORDS

E-Government
Public Sector
Regulative Powers
Functional Simplification and Closure

ABSTRACT

The academic community has developed a vast interest in analysing information and communication technology in the public sector. Drawing on the concepts of functional simplification and closure combined with Mintzberg's forms of bureaucracy, this paper aims to investigate how technology influences processes by which decisions are made in the public administration. The analysis of the German tax declaration system, known as Elster, reveals four aspects: Elster allows faster decision making, redistributes discretionary power, makes the work of public officials more demanding and analytical, and increases the degree of formalization in the decision-making process. These findings indicate how the regulative powers of this technology are able to structure surrounding social and organisational systems. This paper concludes with a call to further analyse the role of normative agreements, such as the one epitomized by the Konsens council, in the successful deployment of technology.

Introduction

The outbreak of COVID-19 and the resulting protective measures by authorities worldwide have forced many organisations to move their operations online. The media report many different, innovative approaches on how businesses tap into the potential of information and communication technology (ICT) to continuously ensure the provision of services. Simultaneously, governments across the globe face similar challenges. The British House of Commons was headlined for proposing the introduction of a 'virtual Parliament' as a solution (BBC News, 2020). However, while such use of ICT by governments and public administrations is suddenly trending in news outlets, technology has already played an essential role throughout the last few decades. One example is the German tax declaration system, called Elster, which has contributed to the digitalisation of the finance ministry since the 1990s. Yet, news media primarily cover the changes that impact citizens. Therefore, reports about Elster's effect on the operations of the public administration have been rather scarce. Nevertheless, considering the continuing permeation of ICT in all agencies, it remains important to develop and maintain an understanding of how the public sector evolves and which implications such initiatives have. Especially, the goal of automating discretion has consequences in the delivery of public services. It creates new levels of accountability in a highly political context (Homburg, 2008). These levels often refer to the system designers behind the technology, who gain influence on how public policy is enacted on the ground.

Consequently, this paper aims to address this gap and analyse how the integration of technology into an organisational system induces changes in operational and decision-making processes. Building on the case of Elster, the author draws from multiple theories to argue that ICT does not simply increase efficiency but that certain functions are able to shape the context in which the technology is embedded. The author structures this paper as follows: After reviewing how the literature has conceptualised ICT in the public sector, the paper describes and subsequently adopts a theory-grounded approach to analyse the case study. Thereafter, the paper concludes with its findings and offers future research avenues.

Literature Review

The academic community evinced an early interest in researching e-government initiatives. Consequently, multiple schools of thought have emerged that analyse the deployment of technology in the governmental sector. A dominant proportion of the literature has conceptualised the use of ICT as a means to further rationalise public sector activities. This idea is rooted in the New Public Management (NPM) vision, which has its origins in the private sector (Gruening, 2001). While Weber's (1947) bureaucratic form initially provided organisational efficiency by enforcing hierarchical structures, division of labour and formal set of rules, an increasingly complex environment inhibits it from doing so. As the need to integrate becomes more prominent, traditional bureaucracies are incapable of achieving the same levels of efficiency given this growing uncertainty (Cordella and Tempini, 2015). Consequently, a new

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way of managing the public sector inspired by market economics has been postulated. Proponents of NPM suggest a management culture, which views citizens as customers, whose individual needs are to be satisfied. Their goal is to eliminate bureaucratic elements and use ICT to increase efficiency, effectiveness and accountability in the public sector (Dunleavy et al., 2006; Hood, 1991; Self, 2000). However, reforming the public administration to a market-based organisation affects its capabilities to provide services that follow the principles of equality and impartiality (Chapman, 1991).

As a result of this critique, academics have started to look beyond such economic outcomes. Bovens and Zouridis (2002) emphasise that the deployment of technology in the public sector transfers some discretionary power to the system architects, therefore requiring additional supervision. Cordella (2007) analyses ICT for its potential to support the bureaucratic administration in providing services in line with democratic values. He highlights that technology can both support the bureaucratic ideal of efficiency via rule-based decision making and facilitate enforcing principles of equality and impartiality (ibid.). Hence, bureaucratic organisations can be strengthened rather than radically transformed. Rather than only improving the value-for-money ratio, technology can also help to enhance the democratic process, e.g. by enabling citizens to be more directly involved in policymaking (Brewer et al., 2006). Furthermore, technology can be conceptualised as a carrier of governmental aims. Not only is the use of technology influenced by pre-existing institutional conditions (Fountain, 2001), but also its design and choice are shaped by public policies (Cordella and Iannacci, 2010). Therefore, technological artefacts both are the result of social, political and institutional negotiations and shape the enactment process.

Such influential potential of ICT is also captured by the concepts of functional simplification and closure. In contrast to the dominant literature, which focuses on instrumental terms, i.e. how technology helps to accomplish certain ends, this approach views technology as a structuring agent that supports human actions (Kallinikos, 2005). On the one hand, functional simplification involves the isolation of an operational domain, within which reality's complexity is simplified into a set of causal relationships. Although these relations can themselves be quite complex, the initial reduction of the inputs tends to make the system controllable. By further specifying how the technology handles the individual elements of this domain, it helps human actors deal with reality. The intricacies of the contemporary world are therefore broken down into piecemeal parts and their relationships to each other, i.e. the technology creates structure. On the other hand, functional closure refers to "the construction of a protective cocoon that is placed around the selected causal sequences or processes to safeguard undesired interference and ensure their recurrent unfolding" (Kallinikos, 2005, p. 190). Thus, the technological system is black-boxed and decoupled from other organisational and social spheres. Social interaction with the technology is highly limited to those with special skills, training and roles. Consequently, ICT can be seen as a regulative power that structures social and organisational interactions (Bovens and Zouridis, 2002; Kallinikos, 2005; Cordella and Tempini, 2015) as well as shapes the outcome of legislative processes (Contini and Mohr, 2014; Cordella and Gualdi, 2019).

As illustrated above, ICT in the public sector has been conceptualised in various ways. Each approach offers a slightly distinct perspective complementing the others. While the focus has been on ICT so far, its impact on different types of bureaucratic organisations must also be considered. As Mintzberg (1983) points out, bureaucracies can be differentiated based on the nature of the task, the environment and the prime coordinating mechanism. Machine bureaucracies rely on the standardisation of work processes. These organisations execute highly routine tasks in a stable environment with a high degree of formalisation. The nature of and the solution for each task can be fully determined in advance, therefore automated. On the other hand, professional bureaucracies tend to standardise skills, whereby highly trained professionals complete non-routine, complex tasks. They use human analytical skills to overcome the uncertainty and ambiguity of the complex environment. Thus, these jobs cannot be readily automated.

Drawing on the concepts of functional simplification and closure combined with Mintzberg's (1983) taxonomy, this paper aims to analyse how the deployment of technology occasions a change in the processes by which decisions are made in the public administration. Case study research may, therefore, be the most appropriate means to understand such phenomena in their natural setting (Benbasat, et al., 1987). While this research design generally allows deeper insights into the political, social and technological dimensions of e-government initiatives, this paper concentrates on the affordances of technical functionalities. The ground needed for the analysis is provided by the German tax declaration system Elster. Predominantly, secondary data sources, such as newspaper articles and online reports, were used, which were complemented by an interview with a person who has acted as Elster's public point of contact.

Case Study

Elster – an acronym for 'Elektronische Steuererklärung' – was conceptualised in 1996 and first introduced to the public in 2004. It refers to a platform that allows citizens to submit their tax data online and authorities to automatically assess and process certain tax declarations. It is managed by the tax authorities of Bavaria and is part of Konsens, a nationwide council, which aims to use ICT to integrate and standardise tax administration processes across counties (Krebs and Platzer, 2010). Additional objectives include increasing both the efficiency in processing tax declarations and the quality of the collected data.

Elster's deployment consisted of two phases. The first phase started in 2004 and required users to download the software onto their personal computers. In a

second phase at the end of 2006, Elster was available to the public as an online portal. Initially, it only offered the declaration of wage taxes, but more functionalities were added over the years to further encompass other tax forms (Krebs and Platzer, 2010). While it has been mandatory for employers to use Elster to declare taxes since 2005, private citizens still have the option to request a paper form. In 2018, over 23 million citizens opted for the paperless alternative (Elster, 2018).

Prior to digitising the tax declaration process, citizens would fill in the said paper form and send it to the tax office (Figure 1). After contractors manually transcribed the data into the computer, they would assess each declaration based on completeness. If a form was incomplete, the citizen had to be contacted for clarification. To establish whether a submission was plausible, tax officials used a guide indicating reasonable ranges for each value and their tacit knowledge and experience to come to a conclusion. Based on the decision, they would either further process the declaration or inquire additional proof (Anonymous, 2020).

Elster has changed this procedure (Figure 2). One consequence includes that the responsibility for the manual data entry has been pushed from contractors to citizens. To submit their tax declaration, citizens can now access the platform via the Internet and fill in the digitised form. The submission process can only be completed if all mandatory fields contain values, and the initial logic checks are passed. The declarations of citizens, who choose the traditional way, are still transcribed into the computer and then uploaded into Elster's database. Subsequently, the submitted declarations are first assessed by Elster's risk management software (RMS) (Link and van Dorp, 2011).

While the exact specifications of this software are confidential, its basic cornerstones are publicly available. It compares a citizen's new tax declarations with the existing database to detect any irregular developments (Hoyer, 2018). Further, the RMS uses statistical methods like the chi-squared test to analyse the number of occurrences of single digits (Olfen, 2017). The underlying idea is that every person has an unconscious preference for specific digits. Thus, if a digit appears more often or less often, the software identifies and flags these systematic deviations. The software uses these and other methods to categorise citizens into three classes (Kloth, 2010). Each class indicates a certain risk of possible tax evasion. Class 1 contains high-risk cases, which have annual earnings exceeding €500,000 or wide scope of design for declaring taxes due to the complex legal framework. For example, wealthy individuals, who have access to tax experts, may be able to circumvent certain regulations. These cases are completely analysed by a tax official. Class 2 encompasses medium risk cases.

If the RMS detects a suspicious family of values, the tax official has to assess these particular fields. Lastly, class 3 comprises low-risk cases, which are automatically processed by the system without any human intervention. Nevertheless, 2% of all declarations are evaluated manually. Furthermore, the RMS records all processing steps, thereby ensuring transparency in its operation. These measures are important to prevent fundamental errors, such as the one that occurred in 2012. It was detected that the RMS classified any work-related deductions as low-risk cases, thereby de facto waving them through the system (Kleinz, 2018). Consequently, new evaluation criteria had to be designed and incorporated into

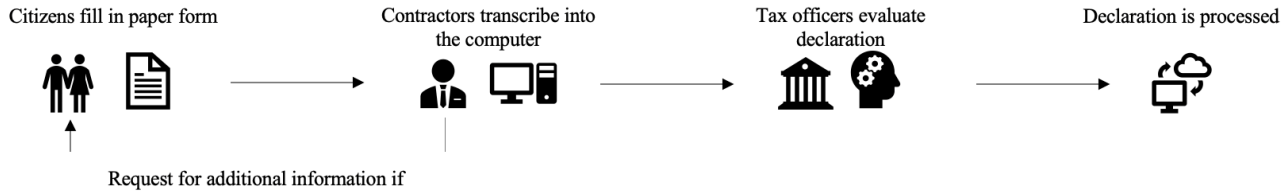

Figure 1: Traditional process

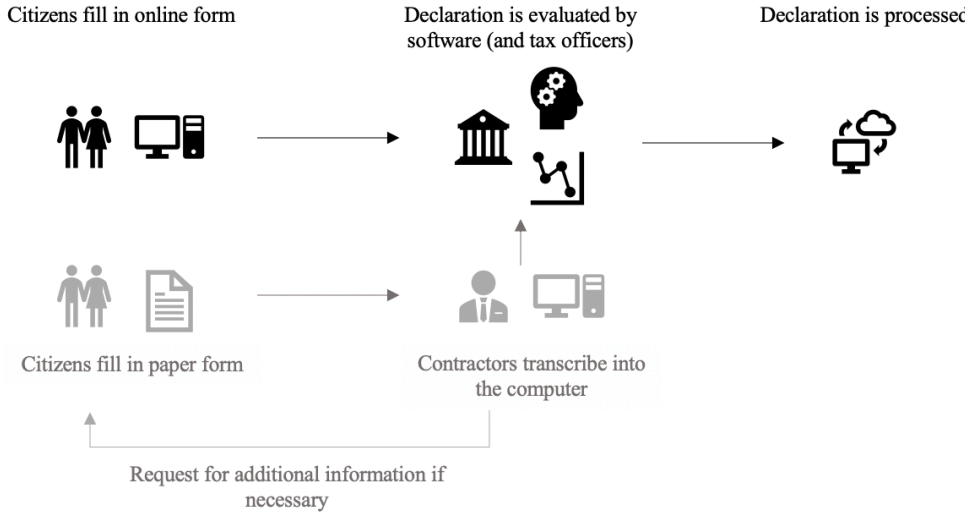

Figure 2: New process

the system. More generally, regular adaptations of the software are also required when the government changes the tax law.

Analysis

The introduction of Elster demonstrates the effort of the tax authorities to rationalise their operations. Hereby, the Konsens council provides the normative agreement that the overarching goal of all its initiatives is the standardisation in the financial administration across German states. Consequently, Elster is regarded as a contribution to this goal, as it sets the default methods for the entry, processing and storage of tax data. This not only facilitates the integration of databases across German states but also creates less room for human variance. On the side of the citizen, Elster uses coded plausibility mechanisms to ensure that the online form is filled in completely with correct values. This minimises the need for tax officials to reach out to citizens for clarification, thus saving time in the overall process and ensuring higher quality of data. To take full advantage of this improved efficiency, the government widely encourages the public to use the paperless alternative. On the side of the tax authorities, Elster's RMS assesses each declaration uniformly, therefore preventing tax officials from relying purely on their tacit knowledge.

Using Bovens and Zouridis' (2002) terminology, this technical control function further indicates a transformation from a street-level into a system-level bureaucracy. While previously, tax officials 'on the streets' had the full authority of processing tax declarations and enacted public policy through their decision-making, class 3 cases are now automatically handled by the RMS. As cases from class 1 and 2 still require human ratification, the full transformation to the system level is not yet complete. Nevertheless, this case shows how some discretionary power has shifted from the street bureaucrats to the system designer, who determines the specificities of the statistical algorithm analysing each tax declaration. As a result, a new layer in the bureaucratic process has been introduced.

As these multiple layers are associated with different tasks, they can be better analysed with Mintzberg's (1983) taxonomy. Elster and its RMS exemplify a system aimed at the automation of routine tasks. Each declaration is evaluated and then assigned to a risk category. As this evaluation is primarily based on a logical, rule-based process, Elster can be used to streamline the execution of this machine bureaucracy task. A similar task involves the final processing of cases from all classes, which does not require any advanced analytical capabilities. It includes tasks such as the upload of the data into the database or the initiation of a possible reimbursement payment. Hence, this is a simple process that is automated as well. Consequently, tax officials can concentrate their efforts on cases from class 1 and 2. Given their complexity, these cases exhibit legal intricacies that are not written in the code. Therefore, their evaluation cannot be automated by software but require more in-depth analysis and human judgment. Thus, the RMS of Elster allows tax officials to focus on professional bureaucratic tasks.

Functional Simplification and Closure

Previous notions of how technology can increase efficiency, distribute discretionary power and automate routine tasks can be complemented by the concepts of functional simplification and closure. These theoretical ideas – rather than referring to the technical artefact itself – describe the relationship with the surroundings, in which the technology operates. Hence, the focus is on the character of the very operations that define the service in its context (Kallinikos, 2009). Reviewing the whole process, a tax declaration is created by a citizen, assessed in terms of its risks by the RMS, either analysed by a tax official or directly processed.

Compared to the procedure prior to Elster's introduction, the risk assessment function has been isolated from the analogue routines. Before, public officials used their tacit knowledge to interpret the rules and guidelines. Based on their understanding, they determined the class of each tax declaration and therefore, the detail of analysis required before a decision is made. The execution of this task has now been made more formal and explicit, i.e. functionally simplified. By disaggregating human judgment into several statistical and logical operations, reality's complexity is reduced to a set of causal relationships that are standardised into sequenced scripts. For example, after analysing whether the annual earnings exceed the threshold of €500,000, the software compares the current values with previous years' values. If the percentage difference is abnormal compared to a given average delta, the software assigns the tax declaration to a higher risk class. Equally, the software allocates cases based on the results of the chi-squared test at a significance level of 0.05 or lower. All of these mathematical relationships and thresholds specify how the technology handles the individual elements of a tax declaration, thereby rendering this specific function automatable. Since the inputs and the causal connections within the operational domain are stylised, the system remains controllable to a large degree. However, as Hanseth and Ciborra (2007, p.56) point out, a consequence of this simplification is that the technology manages unexpected matters by excluding them. This also applies to the case of Elster. Its RMS relying on a finite set of statistics and pre-set conditions are not able to cope with every tax declaration. Especially cases from class 1 may take advantage of grey areas of the tax law, which are not encoded into the software. This ambiguity cannot be readily simplified into specific causal relationships, thus automated. Therefore, the system directs these particular cases to the tax official for additional assessment.

Synchronously with functional simplification, these software processes are decoupled from the broader organisational surroundings, i.e. functionally closed. The execution of the software scripts is completed without any undesired interference. The closure is achieved by highly regulating the interfaces with the system. Social contact is restricted to those individuals,

who are appointed certain roles and possess the required computational and mathematical skills (Link and van Dorp, 2011). Further, the Elster software enforces information requirements, which determine the inputs that are allowed by the system. As a consequence of this "protective cocoon" (Kallinikos, 2005, p. 190), the outcome of the software process is consistent and replicable over time. Nevertheless, a system that is functionally closed can still be changed. Elster's software is regularly adjusted to comply with current legislation. Moreover, the practice of manually cross-checking 2% of all declarations and recording each step of the process reveals erroneous outcomes, such as the one in 2012. As a result, the blackbox of the software is opened, and the corresponding simplified relationships corrected.

Thus, the concepts of functional simplification and closure illustrate how technology facilitates automation by structuring reality's complexity. As machine bureaucratic processes are already highly formalised, their structuration, and therefore automation, occurs more readily.

Therefore, the deployment of technology goes beyond what proponents of NPM postulate. Elster exemplifies that it does not simply embody a neutral means to complete existing operations more efficiently. Rather, it offers new ways of enframing and arranging pre-determined logical steps of actions, which constitute organisational procedures (Cordella and Contini, 2017). This means that the underlying character and composition of the operations of tax officials have changed through the mediation of technology, therefore influencing how organisational practices are executed.

Conclusion

The aim of this paper is to analyse how the deployment of technology occasions a change in the decision-making processes in the public sector, using the case of the German tax declaration system. As the foregoing theory-driven analysis indicates, there are noteworthy differences to the operations prior to Elster's introduction on various levels. Generally, four aspects of how a decision is reached can be highlighted.

First, Elster allows to take a decision faster. As the plausibility mechanisms ensure that citizens fill in the online form completely and appropriately, the quality of the submissions is increased, and the time spent on clarifying missing information is minimised. Therefore, more data is timely available, on which tax officials can base their decision. Moreover, Elster redistributes discretionary power. Building on Bovens and Zouridis' (2002) findings, programmers and system designers are now assigned a proportion of the authority over the tax assessment process. They design the technology that takes over some responsibilities previously assumed by tax officials. Consequently, this new division of decision-making power requires additional checks and balances, such as the random cross-checking of 2% of all declarations and the recording of each processing step. These measures allow the finance ministry to assess how computer scientists transform policies and tax legislature into code. Third, Elster makes the decision-making process of tax officials more analytical and demanding. Using Mintzberg's (1983) types of bureaucracy as a lens, tasks with different characteristics become more visible and, thus, can be separated. Routine work processes that are highly formalised can be differentiated from complex, ambiguous tasks which require analytical skills. As the simple processes are automated by Elster's system, tax officials are to deal with more intricate procedures. These require the broader knowledge and more advanced skill sets. Finally, Elster increases the degree of formalisation in the tax assessment process. As the technology simplifies a system with legal, cultural and organisational components into a set of statistical relationships and thresholds, the decision-making process becomes more explicit, and less interpretation of rules is needed. The further closure of the technical system fends off interference from the surrounding environment and ensures consistent execution of the operation. As a result, a more homogeneous assessment is achieved, which simultaneously enforces the principles of equality and impartiality in the delivery of public services to a larger extent.

Therefore, Elster can be seen as a good e-government initiative which is designed as a support for professional bureaucracies and which strengthens democratic values. Hereby, the Konsens council plays a major role as it provides the overarching normative agreement. It thus aligns the legislature and the different agencies with paving the way for Elster's deployment.

However, these research findings have to be seen in light of some limitations. First, the data collection method provides only limited insights into the workings of the public administration. As mostly secondary data sources were used, such as news articles and online reports, their narratives may be biased towards their targeted readership. To overcome this limitation, an interview with a contact person for Elster was conducted to reveal a more detailed account of the operations of tax officials. Additional interviews could not be conducted due to the emergent COVID-19 situation. Consequently, aspects like the involvement of tax officials in the design of the software, the prevalent social system in the office or the influence of Konsens could not be clarified. Therefore, future studies could provide deeper insights into the role of such normative agreements in the implementation of technology in public organisations. As the research question focuses on procedural changes, the notions of functional simplification and closure combined with the idea of different bureaucratic forms provided a suitable lens through which to analyse the impacts of Elster on an operational level. However, other aspects, such as the perceptions, opinions and interests of individual public officials, are not addressed. A further avenue of research could shed light on how agents actually enact Elster's technology, therefore influencing policy-making on the streets.

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